REPORT

KEYSTONE VALLEY REGIONAL FIRE DISTRICT

ORGANIZATIONAL ANALYSIS

NOVEMBER 2016

Prepared by:
Municipal Resources, Inc.
120 Daniel Webster Highway
Meredith, NH 03253
603-279-0352
866-501-0352 Toll Free
603-279-2548 Fax
all@mrigov.com
www.mrigov.com

Municipal Resources

TABLE OF CONTENTS

Municipal
Resources
Inc.

TABLE OF CONTENTS

REPORT

Municipal Resources

APPENDICES

Municipal Resources

REPORT

Municipal
Resources
Inc.

120 Daniel Webster Highway
Meredith, NH 03253

Municipal Resources
www.municipalresources.com

tel: 603.279.0352 • fax: 603.279.2548
toll free: 866.501.0352

REPORT

KEYSTONE VALLEY REGIONAL FIRE DISTRICT

ORGANIZATIONAL ANALYSIS

NOVEMBER 2016

CHAPTER 1

INTRODUCTION

PROJECT OVERVIEW

Municipal Resources, Inc., of Meredith, New Hampshire, was engaged by the Keystone Valley Regional Fire District, located in Parkesburg, Pennsylvania, to conduct an operational assessment of the District. This assessment included the following key elements:

1. A comprehensive risk assessment;
2. A standard of cover/response time analysis;
3. A review of internal operations staff and management resources;
4. An analysis of policies and procedures of the fire department;
5. A financial sustainability analysis;
6. An analysis of the organizational structure; and
7. A review of facilities and equipment.

The assessment employed the following methodologies: a tour of the community, a tour of adjacent protection areas, evaluation of target hazards, review of the fire facilities, review of fire apparatus and equipment, interviews with key fire service personnel, interviews with key

municipal personnel, evaluation of the training program, and interviews with fire district employees. There was also a review of relevant statistics, standard operating procedures, and operational data that was furnished by the district.

Each community determines the composition of fire services that residents receive by balancing the level of risk against the cost to provide these critical services. Based on our review of the Keystone Valley Regional Fire District, it is clear that the residents of the district expect the timely response of at least one unit on a 24/7 basis. This report will focus on assessing the department based on the service expectation described above.

In conjunction with the on-site visits, the data collected and observations made were subjected to analysis by the project team, both individually and collectively. All recommendations for improvement are based on various administrative regulations promulgated at the federal and state levels, nationally accepted consensus standards developed by ISO (Insurance Services Office), NFPA (National Fire Protection association), CFAI (Commission on Fire Accreditation International), and CAAS (Commission on Accreditation of Ambulance Services), and industry best practices and procedures. However, since every community has unique characteristics, challenges, and resource limitations, our recommendations are specifically designed to address the immediate and long-term needs of the Keystone Valley Regional Fire District.

PURPOSE

The overall intent and goal of the study and plan was to assess and make recommendations regarding:

- Gaining a better understanding of overall risk to the communities that comprise the municipalities which participate in the district.
- Evaluate the current service delivery system and identify areas for improvement.
- Develop long-range planning strategies to meet the current and future needs of stakeholders, to include 5, 10, and 15 year goals and objectives.
- Identify the fiscal impact of service needs on taxpayers and the participating municipal governments.

These activities are part of KVRFD's ongoing emergency services oversight and planning responsibilities, and are focused on identifying the risks that their customers are currently exposed to, the potential future risks, and development of an appropriate set of responses to those threats in a fiscally responsible manner. The long-range strategic plan will make recommendations for long-term success, viability, and stability, together with improved

efficiency, operations, and safety for both firefighters and citizens today, as well as projecting future needs for the provision of fire and rescue services throughout the district's service area.

SCOPE OF WORK

MRI conducted a comprehensive review of the manner in which fire and emergency medical services are provided within the Keystone Valley Regional Fire District's coverage area. This assessment will assist with determining whether existing organizational structures, staffing, equipment levels, and facilities are adequate to provide a level of service in the district that is in line with generally accepted standards and benchmarks for a department of like character.

Using this review as a basis, MRI made recommendations for improvements that take into consideration the current and future financial ability of the district and its member communities, appropriate modifications to the delivery systems to provide optimum service to the entire community, adequacy of physical facilities and equipment, efficient use of resources, and whether the current organizational structure is appropriate or should be modified. These recommendations provide the basis for the development of the five, ten, and fifteen-year strategic plan for the district's fire and emergency medical services.

METHODOLOGY

MRI's project methodology and approach was targeted to fulfill the scope of work in a thorough and comprehensive manner. To that end, we utilized a seven-phase process to conduct our assessment of the Keystone Valley Regional Fire District and develop our strategic plan recommendations. The seven phases include:

1. Development of an Action Plan

2. Orientation, Stakeholder Input, Data Gathering, and Identification of Significant Issues Facing the Community and within the Fire District

3. Information Review, Inventory, and Assessment of the Emergency Risks of the Fire District and Response Effectiveness and Operational Readiness of the Keystone Valley Fire Department

4. Develop a Comprehensive and Detailed Assessment and Inventory of Current Fire Department Operations

5. Evaluation of the Effectiveness, Efficiency, and Quality of Service of the Fire Protection System within the Keystone Valley Fire Department

6. Preparation of a Final Evaluation Report and Strategic/Master Plan Recommendations for the Keystone Valley Regional Fire District

7. Presentation of a Final Project Report and Strategic/Master Plan Recommendations

PROJECT TEAM

Peter J. Finley, Jr. most recently served as Chief of the Winslow Township Fire Department in New Jersey, where he was responsible for the planning, establishment, and initial deployment of the career component of the department. He previously served for 4 ½ years as the Chief of Department for the City of Vineland, New Jersey Fire Department where he initiated significant changes within the department including updating and modernizing equipment, providing the department's first ever formal officer training, and significantly increasing the capabilities of the regional hazardous materials response team. During his tenure the department received more than one million dollars in various grants. He formerly commanded the Vineland Rescue Squad gaining significant EMS operations and command experience, as well as completing an overhaul of that organization's operations. Chief Finley serves as an Adjunct Professor in the Fire Science Program at Camden County College. Chief Finley received his Associate in Applied Science degree from Atlantic Community College in New Jersey, and earned his Bachelor of Science degree in Fire Science/Administration from the University of Maryland. He is a graduate of the National Fire Academy's Executive Fire Officer Program, earning perfect scores on three of his four Applied Research Projects. He was awarded an Outstanding Research Award for his 2002 paper titled, "Residential Fire Alarm Systems: The Verification and Response Dilemma". Chief Finley holds nearly two dozen state and national certifications and is a member of a number of fire service organizations, including achieving the prestigious Chief Fire Officer designation from the Commission on Fire Accreditation International. He is a member of a number of fire service organizations and is currently serving as President of the New Jersey Career Fire Chiefs Association where he has been involved in the development and administration of fire service promotional examinations. From 2003–2005 he served on the Training and Education Committee of the Governor's Fire Service and Safety Task Force. He also previously served on the state committee that developed New Jersey's first Firefighter I Instructor Manual.

Brian P. Duggan recently retired from the Fire Department in Northampton, Massachusetts, where he has instituted substantial changes to modernize and restructure the entire department including equipment, facilities, personnel, and training. In conjunction with his staff, Brian has created a regional Advanced Life Support Program that currently serves eighteen communities within the Northampton Area. He formerly commanded the Northborough, Massachusetts, Fire Department, and has significant experience with the Massachusetts Department of Fire Services where he held several key positions. Mr. Duggan developed and directed the Graduate and Undergraduate Fire Science Programs at Anna Maria College in Paxton Massachusetts from 1995 - 2003. Mr. Duggan has a Business

Management/Fire Science degree from Providence College and a Master's Degree of Business Administration (MBA) from Nichols College in Dudley, Massachusetts. He is also a graduate of the National Fire Academy Executive Fire Officer Program and the Senior Executive Program for State and Local Leaders at Harvard University. In December 2012, Mr. Duggan received a Master's Degree in Homeland Security through the Naval Post Graduate School based in Monterey, California, where his thesis entitled *"Enhancing Decision-making during the First Operational Period of Surge Events"* was selected as an outstanding thesis. He is one of only a few fire service professionals to be designated as a Chief Fire Officer by the Commission on Fire Accreditation International. He leads the Massachusetts fire service through his affiliation as Chairman of the Fire Chief Association of Massachusetts Technology Committee and as a Regional Director on the Massachusetts State Fire Mobilization Committee. Mr. Duggan has authored several publications, inclusive of writing Section 7, Chapter 3, Fire Department Information Systems, in the Nineteenth and Twentieth Editions of the National Fire Protection Association's Fire Protection Handbook. Chief Duggan has served as a subject advisor to MRI since 2002.

ACKNOWLEDGEMENTS

MRI would like to take this opportunity to thank the Keystone Valley Regional Fire District, the members of the board of fire commissioners, Fire District Administrator Raymond Stackhouse, the members of the Parkesburg, Highland, and West Sadsbury municipalities who spoke with us, the members of the fire department board of directors, Fire Chief Brian Gathercole, Deputy Fire Chief Rob Cazillo, Chief Engineer Gary Myers, and the entire membership of the Keystone Valley Fire Department for being most cooperative and helpful in assisting us in carrying out our work on this project. We especially appreciate the candor and integrity of these personnel, all of whom demonstrated their professionalism and genuine desire to improve and strengthen the fire and EMS services that they deliver to the citizens of, and visitors to, the Keystone Valley Regional Fire District.

Municipal Resources

CHPTER 2

COMMUNITY RISK PROFILE

OVERVIEW

Fire and rescue services serving all communities generally have a common overall mission; the protection of life and property, but different community profiles in which they operate. These dissimilarities create very different fire and rescue services operational needs based upon a unique community risk profile, service demands, and stakeholder expectations.

A community risk assessment is a comprehensive process to identify the hazards, risks, fire, and life safety problems, and the demographic characteristics of those at risk in a community. In each community, there are numerous hazards and risks to consider. For each hazard, there are many possible scenarios and potential incidents that could be encountered depending on timing, magnitude, and location of the hazard or incident. A thorough risk analysis provides insight into the worst fire and life safety problems and the people who are affected. The analysis results create the foundation for developing risk-reduction and community education programs. Conducting a community risk analysis is the first step toward deciding which fire or injury problem needs to be addressed. Risk analysis is a planned process that must be ongoing, as communities and people are constantly changing. Too often, an objective and systematic community risk analysis is a step that is overlooked in the community education process. Many emergency service organizations address risks based on a perceived need for service that isn't really there. This approach can be costly (i.e., misdirected resources, continued property loss, injuries, or deaths) [1]. In short, a good community risk assessment will produce a picture of what the hazards and potentials for incidents are, identify who is at risk, and attempt to quantify the expected impacts (Figure 2-1).

[1] https://www.usfa.fema.gov/downloads/pdf/coffee-break/fm/fm_2014_2.pdf February 5, 2016

Municipal Resources

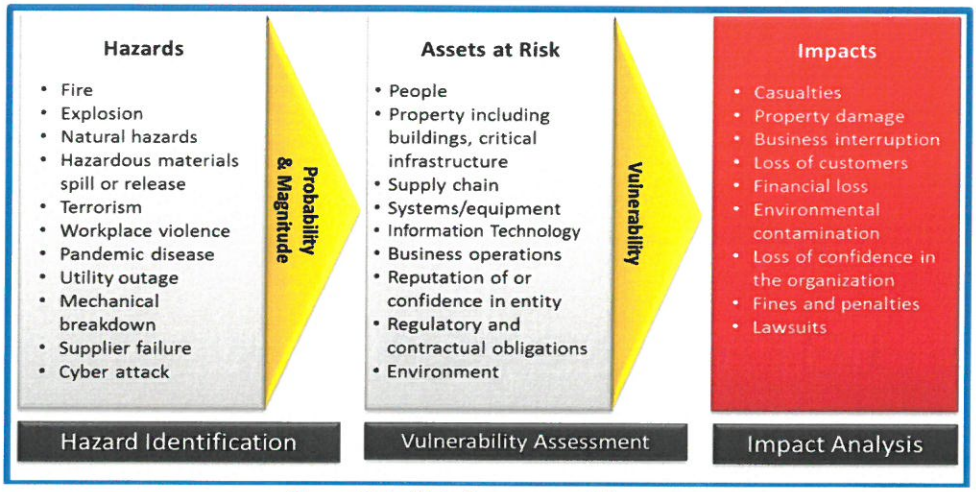


Figure 2-1: Risk Assessment Process
Image credit: www.ready.gov/risk-assessment

Understanding the definition of hazards and risk is critical to the risk assessment process. Hazards are physical sources of danger that can create emergency events. Hazards can be items such as buildings, roadways, weather events, fires, etc. Risk relates to the probability of a loss due to exposure to a hazard. People and property can be at risk. Consequences to the community are also factors to consider. Each of these factors is assessed during the community risk process.

A fire risk assessment is performed by assessing such factors as the needed fire flow, probability of an incident, consequences of an incident, and occupancy risk. The "score" established is then utilized to categorize the area, or even individual properties, as one of low, moderate, or high/maximum risk. This categorization can assist the department with establishing fire risk/demand areas or zones. Having this information readily available provides the community and the fire department with a better understanding of how fire stations, response run cards, and staffing patterns can be used to provide a higher concentration of resources for higher risk scenarios or conversely, fewer resources for lower levels of risk.[2] The community fire risk assessment may also include determining and defining the differences in fire risk between a detached single-family dwelling, a multi-family dwelling, an industrial building, and a high-rise building by placing each in separate category.

According to the NFPA *Fire Protection Handbook*, these hazards are defined as:

> **High-hazard occupancies:** Schools, hospitals, nursing homes, explosives plants, refineries, high-rise buildings, and other high life-hazard or large fire-potential occupancies.

[2] *Fire and Emergency Service Self-Assessment Manual,* Eighth Edition, (Center for Public Safety Excellence, 2009), p. 49.

Municipal Resources

Medium-hazard occupancies: Apartments, offices, mercantile, and industrial occupancies not normally requiring extensive rescue by firefighting forces.

Low-hazard occupancies: One-, two-, or three-family dwellings and scattered small business and industrial occupancies[3].

NFPA also identifies a key element of assessing community vulnerability as fire department operational performance which is a comprised of three elements: resource availability/ reliability, department capability, and operational effectiveness[4].

Resource availability/reliability: The degree to which the resources are ready and available to respond.

Department capability: The ability of the resources deployed to manage an incident.

Operational effectiveness: The product of availability and capability. It is the outcome achieved by the deployed resources or a measure of the ability to match resources deployed to the risk level to which they are responding.[5]

The implementation of successful community risk reduction strategies after completion of a community risk assessment are linked directly to prevention of civilian and firefighter line of duty deaths and injuries. In fact, they directly address goals found in firefighter Life Safety Initiatives 14 and 15. Virtually every risk reduction program in the fire and emergency services will have elements of what are called *"The 5 Es of Prevention"*. These include:

Education
Enforcement
Engineering
Economic Incentives
Emergency Response

[3] Cote, Grant, Hall & Solomon, eds., *Fire Protection Handbook* (Quincy, MA: National Fire Protection Association, 2008), p. 12.
[4] http://www.nfpa.org/assets/files/pdf/urbanfirevulnerability.pdf.
[5] National Fire Service Data Summit Proceedings, U.S. Department of Commerce, NIST Tech Note 1698, May 2011.

Municipal Resources

Understanding and addressing only one element will not lead to a successful program. All five "Es" must be integrated into every program for it to be effective[6] (Figure 2-2). Strong fire prevention codes have been shown to be an extremely effective means to reduce risk in a community. Fire alarm and sprinkler systems mandates for not only commercial buildings, but all occupancies, including single-family dwellings, dramatically reduces fire risk and increases life safety. Code implementation that doesn't require these creates an increased risk. Strong code provisions and enforcement have demonstrated a greater ability to decrease fire problems than continuing to acquire more traditional fire department resources.

Figure 2-2: Five Es of prevention in a community risk reduction program.
Image credit: www.beaherosaveahero.org

OBSERVATIONS

The MRI study team conducted a basic fire safety risk assessment of the Keystone Valley Fire Department's response area. The greatest fire safety concern is the potential life loss in fires that occur in non-sprinklered, single and multi-family residential dwellings, during sleeping hours, which is consistent with national trends. These fires are often fueled by new "lightweight" construction and more flammable home contents. A series of studies conducted by Underwriters Laboratories (UL) researchers suggested that the time to escape a house fire has dwindled from about 17 minutes, 20 years ago, to 3 to 5 minutes today. This poses a severe risk not only to occupants, but also to firefighters as they now have less time to do their job and save residents' lives and property.

Although its district is primarily rural in nature, the Keystone Valley Fire Department's response area does encompass pockets that are both urban and suburban in nature. The Borough of Parkesburg is the former, and the commercial development along the Route 30 and Route 10 corridors is characteristic of the latter. As result, although currently somewhat limited in number and scope, Keystone Valley's district provides a mix of challenges and hazards that must be protected by its emergency services. Ongoing construction, or recent occupancy, of new target hazards of various types and uses was evident in several different areas of the district. Additional developments are in various stages of planning or the approval process. This includes the possibility of Lancaster General Hospital constructing a new full service hospital,

[6] http://www.beaherosaveahero.org/2013/10/community-risk-reduction-crr-overview/ February 5, 2016

Municipal Resources

including a trauma center and medical complex, along the Route 30 corridor, near the Sadsbury/West Sadsbury township line.

Like many small Pennsylvania boroughs, Parkesburg has an older center core and downtown area with numerous closely spaced, abutting, and even interconnected buildings (Figures 2-3 thru 2-6). This includes a number of blocks of traditional row type dwellings, and several large, multi-family structures. Many of these buildings date to the later part of the 19th and early years of the 20th century. These types of structures and areas can contribute to rapid fire spread from one building to another, requiring an aggressive attack to contain and control. Interspersed throughout this area are some newer and refurbished buildings and complexes (Figure 2-7).

The western section of the borough was developed later, primarily after WW II, and includes some relatively new housing developments that have been constructed over the past several years. The Knoll at Parkesburg which includes 100 homes, is still under construction, although nearing completion (Figure 2-8). These newer developments feature modern, lightweight construction which can fail rapidly when exposed to a fire situation. There are plans for a new development that will include 150 townhouse type dwelling units; however, the developer is considering seeking approval to change the development to 300 apartments. Another development proposes 31 new dwelling units for persons 55 and older.

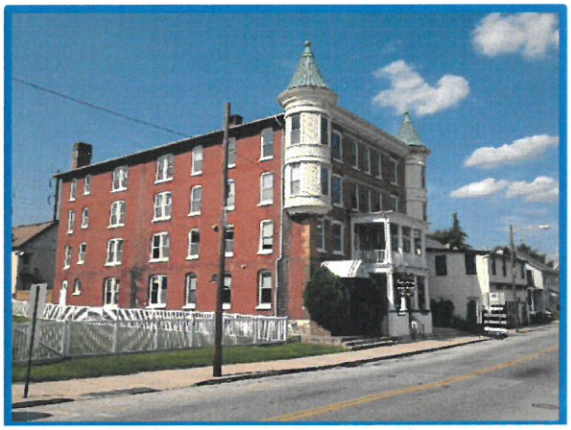


Figure 2-3 (left): The Parkesburg Hotel is an example of a large multi-occupancy building which poses a serious life hazard risk.

Figure 2-4 (right): Closely spaced wood frame dwellings create a serious fire spread potential.

Figure 2-5 (left) and 2-6 (right): Front and rear views of a mixed-use occupancy in downtown Parkesburg often referred to as a "taxpayer" which has commercial and business uses on the first floor and apartments on the upper two floors, creating a significant life hazard and fire control problem.

Figure 2-7 (left): Westminster Place at Parkesburg, a new four-story, senior citizen apartment building, with ground floor business and retail space.

Figure 2-8 (right): The Knoll at Parkesburg with new single-family homes being constructed *with lightweight building materials which fail quickly in a fire situation.*

Parkesburg has several large warehouses on its western edge, the largest operated by A Duie Pyle Trucking (Figure 2-9). There are also several other industrial facilities that lie just outside the borough on Lower Valley Road in West Sadsbury Township. This includes Victory Brewing Company, another A Duie Pyle facility, High Energy, the Book Barn, and the now vacant Quad Graphics plant (Figures 2-10 thru 2-13).

Figure 2-10 (left): A Duie Pyle Trucking warehouse on the western edge of Parkesburg.
Figure 2-11 (right): Victory Brewing Company factory, warehouse, and restaurant, on Lower Valley Road in West Sadsbury Township.
Both of these facilities are equipped with full automatic fire suppression systems.

Figure 2-12 (left): High Energy plant on Lower Valley Road is one of the Keystone Valley Fire Department's most significant target hazards due to the specialized nature of its operations. The building is equipped with a full automatic fire suppression system.
Figure 2-13 (right): The Book Barn, a book storage and distribution facility. Despite its significant size and heavy fire load created by the storage of books, this facility is not equipped with an automatic fire suppression system.

The area around the intersection of Route 30 and Route 10 is an area that has experienced significant commercial growth, a trend that will continue, and perhaps even accelerate, for the foreseeable future. This development consists primarily of retail and business establishments including several strip mall type shopping centers, and WalMart and Home Depot big box stores (Figures 2-14 and 2-15). It includes a Penn Medicine outpatient facility that, while not in the KVFD response area for first due fire response, is for EMS, and has substantially increased responses for those types of incidents. The Sadsbury Towne Center project is a large mixed use development proposed for near the Routes 10 and 30 intersection that has been described as similar to what is found in the Exton area.

Municipal Resources

Figure 2-14 (left): Development around the intersection of Routes 10 and 30 in Sadsbury Township consists of several strip shopping centers that include big box stores like the Home Depot (pictured figure 2-15, right) and WalMart. These complexes are generally equipped with full automatic fire suppression systems.

Fortunately, most of these commercial and industrial structures are equipped throughout with complete automatic fire suppression (sprinkler) systems, which considerably reduce the overall risk of these structures. However, the firefighting and emergency response challenges that may confront firefighters in these types of commercial structures and occupancies are none-the-less much more complex, often require significantly more resources to mitigate, and are potentially more dangerous from a life safety perspective to both occupants and firefighters, than those usually found in single-family dwellings. While built-in fire protection should significantly reduce the spread of fire, it may not completely extinguish the fire. Firefighters still need to complete the extinguishment and perform ventilation, overhaul, and salvage operations. Buildings more than three stories in height pose a special risk in an emergency. Fire on higher floors may require the use of ladder trucks to provide an exterior standpipe to be able to deliver water into a building that does not have a system in place. For victims trapped on higher floors, a ladder truck may be their only option for escape. Large area buildings, sometimes referred to as horizontal high rises, such as warehouses, malls, and large "big box" stores often require greater volumes of water for firefighting, and require more firefighters to advance hose lines long distances into the building. They also present challenges for ventilation and smoke removal.

Some of the facilities oversee their own specialized in-house risk management and loss prevention programs. However, aggressive enforcement of fire and building codes in both new and existing facilities will continue to be a critical factor in managing risk throughout the district. This challenge will be even more significant for Keystone Valley than many fire departments due to the fact that four different municipalities, each with their own boards, priorities, and ordinances, are involved. Communications regarding major projects is reported to be good with three of the municipalities. Any new development projects that are proposed in these communities are sent to the KVFD for review and input on fire protection needs and

concerns. Unfortunately, the fourth municipality does not welcome fire department input nearly as readily as the others do.

The remainder of the district's coverage area is very rural in nature. This includes many farms, some of them larger commercial operations Figure 2-16), widely spaced single-family homes, and scattered small businesses including some that would present significant hazards in a fire situation such as the storage and distribution of propane (Figure 2-17). The lack of significant development does not necessarily mean that there are not real hazards that the fire department must protect. There are several very large estates located in the district's coverage area, with more being built. One home alone in Highland Township is reported to have a construction cost of approximately $12,000,000.

The KVFD district includes one school serving children in grades Kindergarten through 8. There are also three daycare centers. There are no facilities for high risk populations, such as nursing homes or assisted living facilities.

Figure 2-16 (left): Large commercial farming operation located in the Keystone Valley Fire Department response area.

Figure 2-17 (right): Small businesses are scattered throughout the various townships the fire department serves. Some however, such as this propane storage and distribution facility on Route 30 in West Sadsbury, can create significant fire hazards and risks.

Being able to develop an adequate water supply for firefighting purposes is perhaps the most critical, non-safety, aspect of firefighting operations. If an adequate water supply cannot be established quickly, and maintained, effective firefighting operations will simply not be possible. The Insurance Services Office (ISO) also places a high priority on a municipality's water supply needs and capabilities as part of its periodic evaluations.

Parkesburg has an excellent municipal water supply system throughout most of the borough. There is a 48" main that runs parallel to the railroad main line, with some hydrants available

that supply directly off this line. The smallest mains in the borough are 8" in diameter, with a static water pressure of 75 PSI. The main system has good distribution throughout the town. Much of the borough's east end water system was upgraded several years ago. The only shortcoming is there are areas where the mains dead end, rather than traversing from one side of town to the other, due to the railroad line. There is also a growing area of water mains and hydrants that is accompanying the growth occurring along Routes 10 and 30. Much of Sadsbury Township is also covered by a municipal water supply system with hydrants.

Rural communities that do not have a municipal, pressurized water supply must supply their needs from other sources. Sometimes static water sources (lakes, rivers, ponds, cisterns) are drafted out of, either manually, or with dry hydrants, to achieve the needed water supply to fight a fire. In cases where static water sources are not readily available, and often even if they are, fire departments must utilize water tankers/tenders to carry or shuttle the needed water supply from the source to the incident scene.

Outside of the areas in Parkesburg and Sadsbury Township that are protected by fire hydrants, the fire department has a limited number of reliable water sources. There are a few static water supply sources located throughout the district, but they are limited in number, and consist of a couple of dry hydrants/ standpipes and drafting sites (Figures 2-18 and 2-19). These water supply sites are going to be most effective primarily for fires that are located within a reasonably close proximity to them. Using them as a fill point for tender operations is definitely a sound tactical option; however, it will take time to establish this type of water supply relay. It would be a false sense of security to suggest that they will serve to cover the majority of the fire district as its primary fire suppression water source.

Figure 2-18 (left): Dry hydrant/standpipe on Route 30 designed to make drafting water from the pond in the background quicker and easier for fire personnel.
Figure 2-19 (right): Drafting site available for fire department use at a farmer's pond.

Pennsylvania has adopted a statewide Uniform Construction Code that regulates the building and numerous other code components (fire, electrical, mechanical, etc.) of new construction throughout the commonwealth. These codes have replaced individual codes that were enacted in various municipalities. The latest edition of these codes adopted by the state is the 2009 edition of documents developed by the International Codes Council (ICC). Regrettably, the new code as adopted by Pennsylvania, does not mandate, or even permit the requiring of installing residential sprinkler systems in one- and two-family dwellings (the ICC code does contain the requirement, but it has been regressively and politically deleted by Pennsylvania and other states, including New Jersey).

Automatic sprinklers are highly effective elements of total system designs for fire protection in buildings. They save lives and property, producing large reductions in the number of deaths per thousand fires, in average direct property damage per fire, and especially in the likelihood of a fire with large loss of life or large property loss. They do so much quicker, and often more effectively and with less damage than firefighters do. No fire safety improvement strategy has as much documented life safety effectiveness as fire sprinklers because they actually extinguish the fire or, at a minimum, hold it in check and prevent flashover, until the arrival of the fire department. In 2007-2011, fires in all types of structures, when sprinklers were present in the fire area of a fire large enough to activate sprinklers in a building not under construction, sprinklers operated 91% of the time[7]. When they operated, they were effective 96% of the time, resulting in a combined performance of operating effectively in 87% of reported fires where sprinklers were present in the fire area and fire was large enough to activate sprinklers[8]. **In homes (including apartments), wet-pipe sprinklers operated effectively 92% of the time. When wet-pipe sprinklers were present in the fire area in homes that were not under construction, the fire death rate per 1,000 reported structure fires was lower by 82%, and the rate of property damage per reported home structure fire was lower by 68%[9].** In all structures, not just homes, when sprinklers of any type failed to operate, the reason most often given (64% of failures) was shutoff of the system before fire began[10].

Though the law prohibits municipalities from requiring these systems, the fire department can approach the developer/builder/owner to discuss the pros and cons of residential sprinkler systems during the approval process for subdivisions and large single-family residences, and encourage them to consider the installation of these life safety systems. There are a number of publications that the fire department can use as resources to market the benefits of residential fire suppression systems, including from NFPA, which has developed the standards for the design and installation.

---

[7] U. S. Experience with Sprinklers. John R. Hall, Jr. National Fire Protection Association, June 2013.
[8] U. S. Experience with Sprinklers. John R. Hall, Jr. National Fire Protection Association, June 2013.
[9] U. S. Experience with Sprinklers. John R. Hall, Jr. National Fire Protection Association, June 2013.
[10] U. S. Experience with Sprinklers. John R. Hall, Jr. National Fire Protection Association, June 2013.

As an alternative to fire sprinkler systems, some communities have adopted ordinances applicable to any new subdivision being built with three or more houses that a water supply cistern to hold water necessary for fire suppression operations be installed in the development. In some cases, individual homes that exceed a certain size, perhaps 3,000 square feet, would be required to comply with the requirements as well (Figures 2-20 and 2-21). The requirements for these systems are detailed in several NFPA standards. This is an important fire and life safety initiative for a primarily rural community and fire department.

The fire district should also explore other locations throughout the community for the possible installation of additional cisterns and/or dry hydrants/standpipes at drafting locations that may provide the district and the fire department an outstanding opportunity to enter into strategic public/private partnerships to not only improve fire protection at selected sites, but also to provide for the greater good of the community as a whole. If the Keystone Valley Fire Department developed a compelling public safety education program, property owners might allow the installation of, and access to, cisterns on their property that can be utilized for fire suppression water supply. With a thorough knowledge and understanding of how it would benefit them, and their neighbors, a property owner is more likely to assist in this public safety initiative. As an additional incentive, the townships might consider a property tax abatement for the installation of cisterns on private property.

Figures 2-20 and 2-21: Pump house and fire department connections to access water in below ground cistern stored for firefighting use in a planned subdivision in Berlin, MA. The Keystone Valley Fire Department should consider encouraging their member townships to adopt a proactive fire and life safety regulation requiring these in any planned subdivision of three or more homes, and for any home that exceeds a certain designated square footage.

The fire service assesses the relative risk of properties based on a number of factors. Properties with high fire and life risk often require greater numbers of personnel and apparatus to effectively mitigate a fire emergency. Staffing and deployment decisions should be made with consideration of the level of risk within each area of the community.

- **Low Risk:** Minor incidents involving small fires (fire flow less than 250 gallons per minute), single patient non-life threatening medical incidents, minor rescues, small fuel spills, and small brush or outside fires.

- **Moderate Risk:** Moderate risk incidents involving fires in single-family dwellings and equivalently sized commercial office properties (needed fire flow generally between 250 gallons per minute to 1,000 gallons per minute), life threatening medical emergencies, hazardous materials emergencies requiring specialized skills and equipment, technical rescues involving specialized skills and equipment, and larger brush and outside fires, particularly if structures are exposed.

- **High Risk:** High risk incidents involving fires in larger commercial properties with sustained attack (fire flows more than 1,000 gallons per minute), multiple patient medical incidents, major releases of hazardous materials, and high risk technical rescues.

The potential emergency risks present in the Keystone Valley Fire Department response area are not limited to just structural fire incidents. The presence of the retail and shopping complexes, along with other businesses in the various municipalities creates increasingly heavy traffic conditions throughout the area. This includes not only the roads around, and leading directly to various locations, but on other roads, as well as drivers' attempting to avoid the congestion found on the primary highways. These traffic conditions not only create additional incidents, such as motor vehicle accidents, they can also significantly, and negatively, impact response times. In addition, there is heavy truck traffic on Routes 10, 30 and 41, at least a percentage of which are carrying hazardous materials, which could result in a significant incident.

Amtrak's Keystone State mainline from Philadelphia to Harrisburg bisects the fire district from east to west (Figure 2-22). It also divides Parkesburg Borough in two. This electrified mainline, which numerous high speed passenger trains utilize each day, creates a number of potential hazards. These include:

- Mass casualty incident involving a train anywhere within the fire district's response area.

- The high voltage electrified lines that provide power to the trains create additional hazards and challenges for emergency responders dealing with incidents involving the railroad.

- The railroad line limits the number of crossings from one side of the district to the other, and a number of those that do exist are small, which may hinder the ability of fire apparatus to utilize them (Figure 2-23). They are also prone to flooding during heavy rainstorms.

Figure 2-22 (left): An Amtrak Keystone State train stops in Parkesburg. (Photo credit: PennDOT)
Figure 2-23 (right): The railroad line creates a barrier that bisects the fire district with only limited road passages from one side to the other, several of them very undersized, such as this one limiting the size of vehicles that can utilize them. This situation can adversely impact response routes and response times.

The weather a community experiences can impact the fire department's ability to respond. Snow, ice, and other conditions can slow response. Major storms can create emergency situations that can overwhelm local emergency response forces. The Keystone Valley area enjoys a moderate climate typical of the mid-Atlantic region. Thunderstorms, strong wind storms, and significant rain events happen several times in an average year. Tropical storms and hurricanes also occasionally impact the area. Snowfall is experienced annually and occasionally in amounts that paralyzes the region. Although rare, even tornadoes have occasionally touched down in Chester and Lancaster Counties.

Overall it is our assessment that the Keystone Valley Regional Fire District's current relative basic fire and life risk translates to (Figure 2-24):

OCCUPANCY DESCRIPTION	RISK
Single-family Residential (unsprinklered)	Moderate
Multi-family Residential (sprinklered)	Moderate
Multi-family Residential (unsprinklered)	High
Commercial (retail and office) (sprinklered)	Moderate
Commercial (retail and office) (unsprinklered)	High
Industrial	Moderate/High
Open Space	Low
Transportation Incident	Moderate

Figure 2-24: Keystone Valley Regional Fire District Fire and Life Safety Risk Levels.

Municipal Resources

The above information is intended to provide a community "snapshot" of the Keystone Valley Regional Fire District. It is not intended to be all-inclusive or comprehensive. For the fire district and various municipal governing bodies and first responders, it serves to put the fire district, and its associated hazards and risks, into some context as the Keystone Valley Fire Department works to carry out the recommendations of this study and implement the long-range strategic plan.

Looking ahead, the KVFD response area will continue to experience steady, if not high, growth and development, particularly in Parkesburg and along the Route 10 and 30 corridors and surrounding area. Estimates for Parkesburg project that the population will increase over the next 10 years from about 3,800 to around 5,000, an increase of more than 30%. While this development will have a definitive impact on the Keystone Valley Fire Department's fire and EMS services, the exact amount is difficult to quantitatively and accurately predict. Increased development of any type will mean an increase in the number of people living, working, and traveling within the fire district. Each of these will reasonably be expected to result in an increased number of requests for service from the KVFD. They can also significantly impact response times through increased traffic and congestion.

It is likely the most significant increase in requests for emergency fire and EMS services will be EMS related. More people simply increase the number of medical emergencies that occur. It would not be unreasonable to expect that the increase in EMS incidents would be proportional to the increase in population; however, that is not always the case. Although a number of factors can ultimately impact the requests for service, such as ages or socio economic status of new residents, or an aging population, it could reasonably be anticipated that a potential 30% or more increase in population, along with increases in employment, would translate into a significant increase in emergency medical incidents.

RECOMMENDATIONS

2.1 The Keystone Valley Fire Department should make it a priority to complete a comprehensive fire and rescue community risk assessment. This assessment should be done in conjunction with a fire and EMS calls for service demand analysis, include the development of a pre-incident planning program for target and high hazard locations in the community, and take into consideration the fire department's operational capabilities and preparedness.

2.2 The Keystone Valley Fire Department should work to develop and implement an internal risk management plan following the recommendations of NFPA 1500, *Standard for a Fire Department Occupational Safety and Health Program*, and NFPA

1250, *Recommended Practice in Fire and Emergency Services Organization Risk Management.*

2.3 **The Keystone Valley Regional Fire District should strongly encourage its participating municipalities to consider adopting a municipal ordinance requiring the installation of a fire water supply cistern in any new development consisting of three of more homes, or for any individual home of larger than a designated square footage.**

2.4 **The Keystone Valley Regional Fire District should develop a plan to strategically install large (30,000-gallon minimum) underground cisterns on public properties throughout its service area including town hall, public works, etc. The funding to install these cisterns should be included in each municipality's Capital Improvement Plan. Cost for these cisterns will vary based upon construction costs and to what extent the municipality's Public Works Department is able to assist in their installation.**

2.5 **The Keystone Valley Regional Fire District should consider entering into public/private partnerships with private property owners to facilitate the installation of cisterns on private properties in various locations throughout the fire district. As an additional incentive, each municipality might consider a property tax abatement for the installation of cisterns on private property.**

2.6 **The Keystone Valley Fire Department should develop a compelling public education program that explains the significant benefits to residents and property owners of installing cisterns for the storage of fire suppression system water supplies on various properties throughout the fire district.**

2.7 **The Keystone Valley Fire Department should develop a compelling public education program that includes discussing the benefits of installing residential fire sprinklers in new one and two story homes. Though Pennsylvania's construction codes do not allow residential fire sprinkler systems to be mandated there is no prohibition for property owners to install them if they determine that it is in their best interest.**

2.8 **The Keystone Valley Fire Department and each participating municipality should make it a priority to identify additional suitable locations for dry hydrants or standpipes throughout the district and, in conjunction with the public works department, or through the formation of public/private partnerships, install as many of them as possible each year based upon the highest risk areas and/or year round accessibility and usability.**

CHAPTER 3

STAFFING, RECRUITMENT, AND RETENTION

OVERVIEW

The fire service has experienced tremendous technological advances in equipment, procedures, and training over the past fifty years. Better personal protective equipment (PPE), the widespread use of self-contained breathing apparatus (SCBA), large diameter hose, better and lighter hand lines and nozzles, and thermal imaging cameras are just a few of the numerous advances in equipment and procedures that have allowed firefighters to perform their duties more effectively, efficiently, safely, and with fewer personnel. However, the fact still remains that the emergency scene in general, and the fire ground involving a structure fire in particular, is a dynamic, dangerous, frequently unpredictable, and rapidly changing environment where conditions can deteriorate very quickly, placing firefighters in extreme personal danger.

The operations necessary to successfully extinguish a structure fire, and do so effectively, efficiently, and safely, requires a carefully coordinated and controlled plan of action, where certain operations, such as venting ahead of the advancing interior hose line(s), must be carried out with a high degree of precision and timing. Multiple operations, frequently where seconds count, such as search and rescue operations and trying to cut off a rapidly advancing fire, must also be conducted simultaneously. If there are not enough personnel on the incident initially to perform all of the critical tasks, some will, out of necessity, be delayed. This can result in an increased risk of serious injury or death to building occupants and firefighters, and increased property damage. Understanding the community's risk greatly assists fire and rescue service management planning for and justification of staffing and apparatus resources.

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,* 2014 edition (National Fire Protection Association, Quincy, MA) outlines organization and deployment of operations by volunteer/call, and primarily volunteer/call fire departments.

Paragraph 4.3.2 of NFPA 1720 on *Staffing and Deployment* states that Table 4.3.2 (Figure 3-1) shall be used by the authority having jurisdiction (AHJ) to determine staffing and response time objectives for structural firefighting, based on a low hazard occupancy, such as a 2,000 square foot, two-story, single-family, without basement or exposures.

Municipal Resources

Some of the key provisions of NFPA 1720 are as follows:

- Paragraph 4.3.1 on *Staffing and Deployment* states that the fire department shall identify minimum staffing requirements to ensure that a sufficient number of members are available to operate safely and effectively.

- Paragraph 4.3.2 on *Staffing and Deployment* states that Table 4.3.2 shall be used by the authority having jurisdiction (AHJ) to determine staffing and response time objectives for structural firefighting, based on a low hazard occupancy such as a 2,000 square foot, two-story, single-family without basement or exposures.

FIGURE 3-1
STAFFING AND RESPONSE TIME TABLE FROM NFPA 1720

Table 4.3.2, Staffing and Response Time				
Demand Zone	Demographics[1]	Minimum Staff to Respond	Response Time[2] (minutes)	Meets Objective (% of time)
Special risks	AHJ	AHJ	AHJ	90 %
Urban	>1000 people/mi.^{2}	15	9	90 %
Suburban	500 - 1000 people/mi.^{2}	10	10	80 %
Rural	< 500 people/mi.^{2}	6	14	80 %
Remote*	Travel distance > 8 mi.	4	Dependent upon travel distance	90 %

Overall, the Keystone Valley Regional Fire District is a rural demand zone; however, it also has specific areas that are both suburban and even urban in nature.

- Paragraph 4.3.3 on *Staffing and Deployment* states that upon assembling the necessary resources at the emergency scene, the fire department should have the capability to safely commence an initial attack within 2 minutes, 90% of the time.

- Paragraph 4.6.1 on *Initial Firefighting Operations* states that initial firefighting operations shall be organized to ensure that at least 4 members are assembled before interior fire suppression operations are initiated in a hazardous area.

- Paragraph 4.7.1 on *Sustained Firefighting Operations* states that the fire department shall have the capability for sustained operations, including fire suppression; engagement in search and rescue, forcible entry, ventilation, and preservation of property; accountability of personnel; the deployment of a dedicated rapid intervention crew (RIC); and the provision of support activities for those situations which are beyond the capabilities of the initial attack.

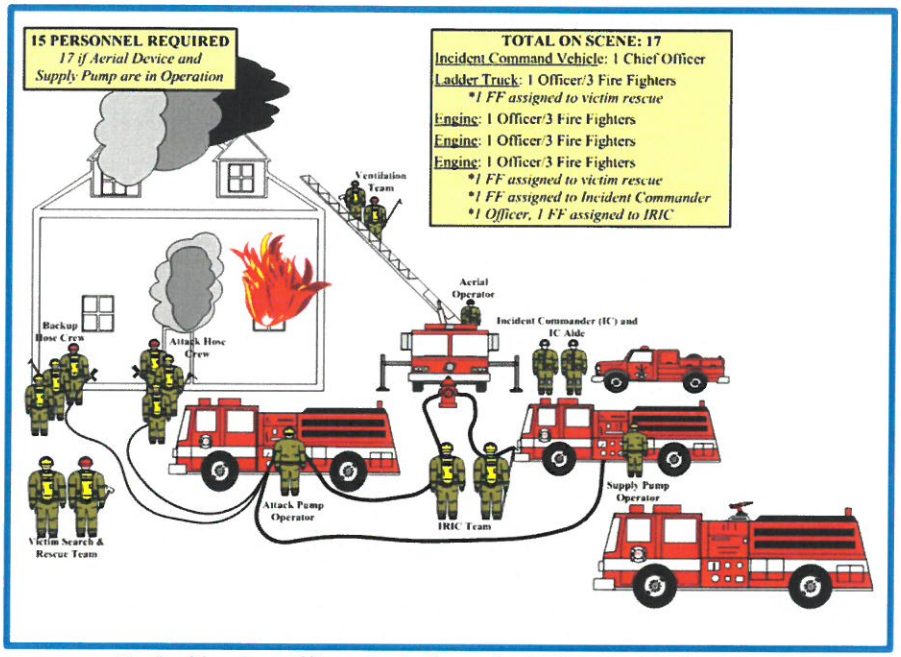
- Paragraph 4.7.2 on *Sustained Firefighting Operations* also states that the capability to sustain operations shall include sufficient personnel, equipment, and resources to effectively, efficiently, and safely conduct the appropriate operations.

  Note: *While the NFPA standards are nationally recognized consensus standards, it is still the responsibility of the local jurisdiction to determine the acceptable level of risk and corresponding fire protection/EMS services. When applying any standard, including the NFPA standards, it is important to apply the document in its entirety. One should not selectively extract requirements to the exclusion of others or take a requirement out of context.*

Some jurisdictions add additional response resources and in some instances exceed the specifics of national benchmarking for personnel and other resources, particularly when the incident is in a larger structure where the life hazard may be higher and/or the potential fire situation much more complex. Personnel needs for fires involving large, more complex structures, such as large commercial occupancies, of which Keystone Valley has a growing number of, will require a significantly greater commitment of initial personnel, probably minimally in the area of 22 to 24. This should include reported fire incidents in buildings that are fully sprinklered. While sprinklers are highly effective, they are not 100%. Until such time as the extent and seriousness of the incident can be determined, a full complement of personnel and apparatus should be dispatched.

Figure 3-2 illustrates the critical tasks and resource deployment required on low and moderate-hazard incidents such as residential and small commercial structure fires. Although some people advocate that these types of incidents can be handled with fewer personnel, unless it is a small fire, there is the possibility there will not be sufficient personnel available to perform all the critical tasks necessitating that some be delayed (Figure 3-3).

FIGURE 3-2
LOW TO MODERATE RISK RESPONSE-INTERIOR FIRE ATTACK



Typical basic staffing needs for a single-family dwelling fire.
Image credit: IAFF 266

Figure 3-3: Keystone Valley firefighters, assisted by mutual aid companies, work at a two-family, attached dwelling fire. If insufficient personnel are available on the fireground, critical tasks, such as opening up the roof for ventilation, may be delayed and impact the effectiveness and efficiency of firefighting efforts.

Photo credit: Keystone Valley Fire Department

Municipal Resources

There has been much research done by a number of fire departments on the effects of various staffing levels. One constant that has emerged is that company efficiency and effectiveness decrease substantially, while injuries increase, when company/unit staffing falls below four personnel. A recent comprehensive yet scientifically conducted, verified, and validated study titled *Multi-phase Study on Firefighter Safety and the Deployment of Resources* was performed by the National Institute of Standards and Technology (NIST) and Worcester Polytechnic Institute (WPI), in conjunction with the International Association of Fire Chiefs, the International Association of Fire Fighters, and the Center for Public Safety Excellence. This landmark study researched residential fires, where the majority of fire, injuries, and fatalities occur. The study concluded that the size of firefighter crews has a substantial effect on the fire department's ability to protect lives and property in residential fires and occupancies. Several key findings of the study include:

- Four-person firefighting crews were able to complete 22 essential firefighting and rescue tasks in a typical residential structure 30% faster than 2-person crews, and 25% faster than 3-person crews.

- The 4-person crews were able to deliver water to a similar sized fire 15% faster than the 2-person crews, and 6% faster than 3-person crews, steps that help to reduce property damage and reduce danger/risks to firefighters.

- Four-person crews were able to complete critical search and rescue operations 30% faster than 2-person crews, and 5% faster than 3-person crews.

The United State Fire Administration, part of the Federal Emergency Management Agency, in the Department of Homeland Security, recommends that a minimum of four firefighters respond on or with each apparatus. In its respected text book *Managing Fire Services,* the International City/County Management Association (ICMA) states, "that at least 4 and often 8 or more firefighters under the supervision of an officer should respond to fire suppression operations". They further state, "If about 16 firefighters are not operating at the scene of a working fire, within the critical time period, then dollar loss and injuries are significantly increased, as is fire spread".

Beyond the NFPA standard(s), which as standards do not carry the weight of regulation or law, is the Occupational Safety and Health Administration (OSHA) Respiratory Protection Standard, CFR 1910.134, which does carry the weight and force of regulation, thus making compliance mandatory. One key provision of the Respiratory Protection Standard that is directly applicable to fire department staffing is known as the "Two-In/Two-Out" rule. In brief, this regulation specifies that anytime firefighters operate in an environment/atmosphere that is "immediately dangerous to life and health" (IDLH), whenever 2 members enter the IDLH area together/as a team, they must maintain visual or voice communication with 2 additional firefighters who must remain outside of the IDLH atmosphere, prepared to render immediate emergency

assistance to those inside. However, the OSHA rule does provide an exception which states that the rule does not apply in emergency rescue situations where a person is visible and in need of immediate rescue, or there is credible and reasonable information that potentially viable victims are still in need of rescue.

To comply with the "Two-In/Two-Out" rule, a team of 4 firefighters must be assembled before an interior fire attack can be made, when the fire has progressed beyond the incipient stage, except in an imminent life threatening situation when immediate action could prevent the loss of life or serious injury before the team of 4 firefighters are assembled (Figure 3-4). The serious concern of the MRI study team is that the OSHA "Two-In/Two-Out" rule permits an exception for life hazard or rescue situations. The reality is that in one of the most serious life hazard fire situations that can be encountered, trapped civilians, a firefighter may need to place himself/herself in extreme danger by entering the structure alone.

FIGURE 3-4
OSHA TWO-IN/TWO-OUT

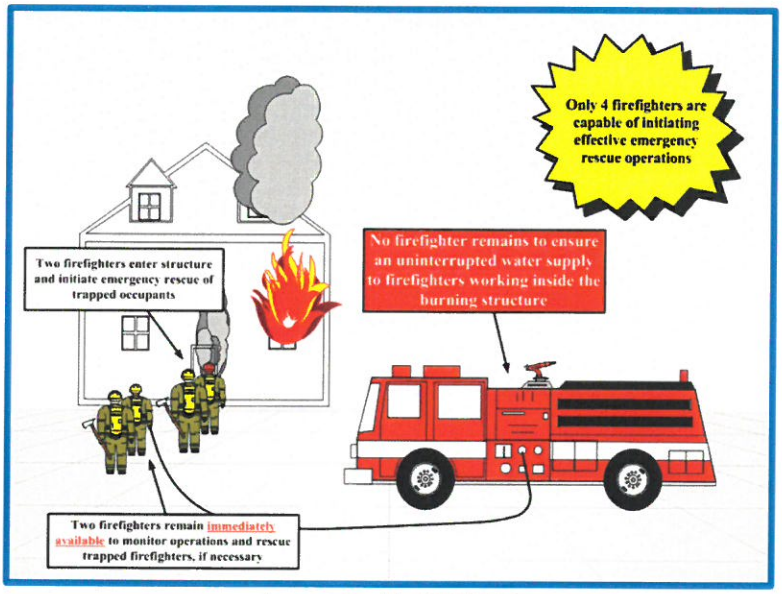


Image Credit: IAFF 266

OBSERVATIONS

By definition, the Keystone Valley Fire Department is still a primarily volunteer organization. The career staffing, which is comprised solely of part-time, per-diem personnel, is primarily dedicated to staffing for the department's ambulance. The necessity to provide consistent, reliable, EMS response 24/7 was the driving factor that originally led the Parkesburg and Pomroy fire companies to consider some form of in-station staffing prior to the formation of

Keystone Valley. However, moving forward, the department is considering formally transitioning these personnel into a more versatile role, as both fire and EMS responders, an operational change that is, in reality, already being implemented when possible. The remainder of the department's personnel, including the senior officers, receive no real compensation of any type for emergency response, training, or any of the multitude of duties and responsibilities they perform.

At the time this study was conducted, the Keystone Valley Fire Department's volunteer staffing was 65 members, based upon incident activity statistical data provided to the MRI study team by the department. There are an additional 20 personnel who are listed as career staff, including a career supervisor and the EMS manager, for a total potential staffing level of 85 personnel. However, the staffing levels varied from a low of 58 volunteer personnel in 2014, to a high of 71 members in 2015. As with many call/volunteer departments today, there is a core group of older, long-time members of the department, with a second group of young, newer firefighters. Many, but not all, of these personnel are certified firefighters. There is a dearth of personnel who would fall into the middle, between the other groups both in age and years of experience.

The size of the department, personnel wise, would generally be adequate to handle the expected emergency work load in a fire district the size of Keystone Valley. Some studies that have been conducted indicate that particularly in smaller communities, the fire department can anticipate about one percent (1%) of their year round population may be expected to be members of the fire department. The department does have an operational policy, Number 300-7: *Active Emergency Responder Participation Minimum Requirements,* which stipulates that members must maintain a minimum of 25 emergency responses annually, a minimum of 3 department training sessions quarterly, and 12 annually (based on a calendar year). It was reported to the study team that the chiefs pull the gear of members on a regular basis for failing to respond or meet training requirements. The policy also includes a remediation process that members are required to complete when they fail to meet the provisions of the policy, particularly from a training perspective. This is a commendable effort which MRI considers to be a ***Best Practice***.

In almost any call/volunteer emergency services organization there is going to be a percentage of members whose names still appear on the "active" roster, yet they no longer truly are, or are minimally so, for a variety of reasons. Factor in that most members of the department have a primary job other than the fire department, that probably limits their availability to respond, mostly during normal business hours, and the current staffing picture becomes much more of a concern. It was reported to the MRI study team that about 30 to 35 of the volunteer fire and EMS personnel, and perhaps 10 fire police members of the department, are truly active and meet the response and training requirements. This fact is consistent with the number of sets of firefighter personal protective equipment (PPE) in the stations, which totaled 35 at Parkesburg and 6 at Pomroy. However, it was also reported that there is a core group of about 10 to 15

personnel who really are the backbone of the department and are the true firefighting force. Conversely, there are a number of personnel whose names still appear on the roll call sheets who show little to no response activity.

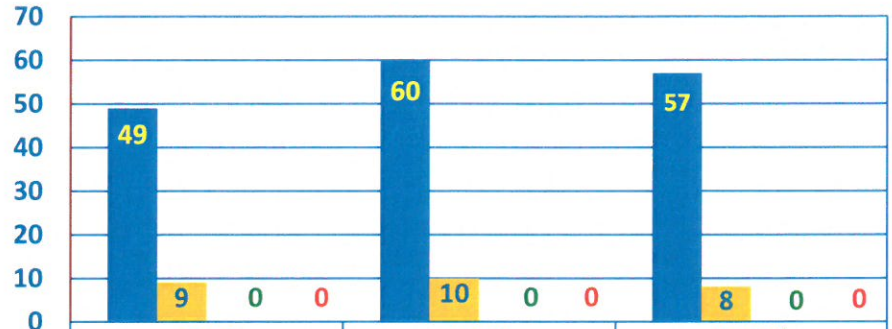
In 2014, out of 58 personnel listed on the department's roster, 36 (62.1%) met the department's 25 incident eligibility requirement (remember that 25 incidents equate to just 2 incident responses per month). However, with 321 fire incidents that year, 25 responses equates to an overall response average of just 7.8%, which is a very low response percentage for a department which relies on its volunteer personnel to provide the majority of its fire response capabilities. The department's highest responder responded to 145 incidents (45.2%). The career staff responded to 200 (62.3%) of the incidents.

In 2015, the department roster listed 71 personnel, of which 35 (49.3%) met the 25 incident threshold. This was a drop of nearly 14% from the previous year. With 282 responses, 25 incidents equate to a response average of 8.9%. The highest responder made 130 calls for a response average of 46.1%. The next highest responder had 94 calls, exactly one-third of the total. The career staff responded to 211 incidents (74.8%).

For the first seven months of 2016, through July, and utilizing 13 incidents as the benchmark, 37 out of 65 personnel (56.9%) achieved this number. The highest responder was at 90 incidents (45.0%). The career staff had responded to 134 out of 200 incidents (67%).

FIGURE 3-5

KEYSTONE VALLEY REGIONAL FIRE DEPARTMENT
PERSONNEL RESPONSE STATISTICS
2014 - 2016*



	2014 (321 INCIDENTS)	2015 (282 INCIDENTS)	2016* (200 INCIDENTS)
25% OR LESS RESPONSE	49	60	57
26% TO 50% RESPONSE	9	10	8
51% TO 75% RESPONSE	0	0	0
76% OR GREATER RESPONSE	0	0	0

*Through July 31, 2016

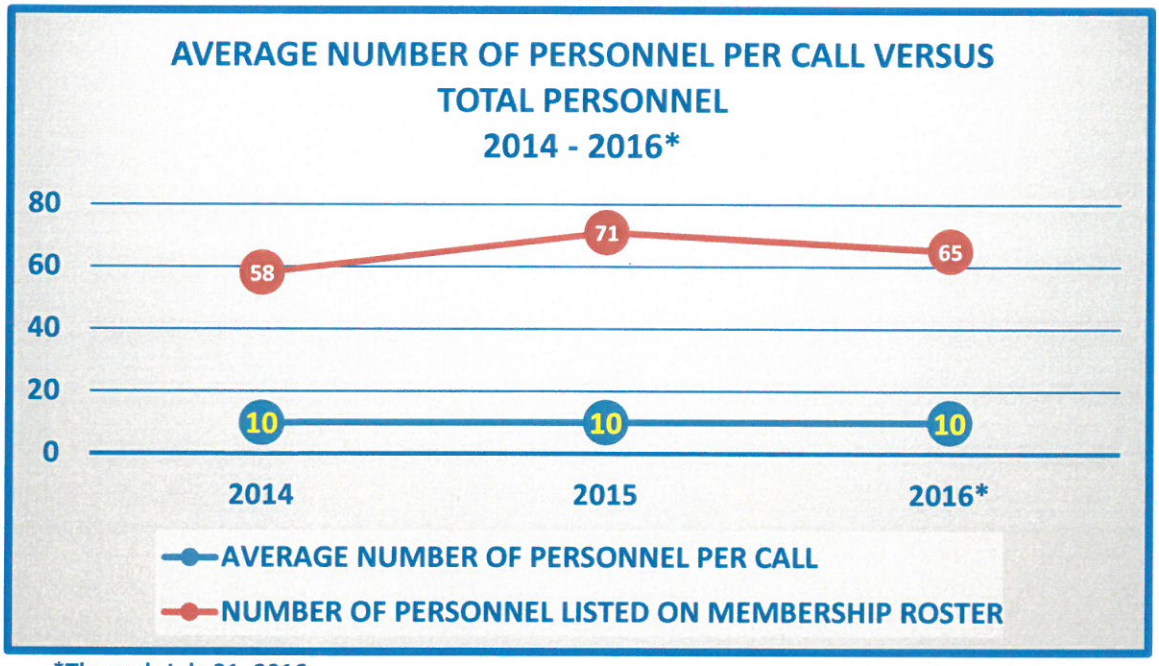
As Figure 3-5 illustrates, the KVFD has just about 8 to 10 personnel who are responding to a significant percentage of incidents and, in reality, carrying the bulk of the department's workload. Yet even the most reliable responders are responding to less than 50% of the fire incidents the department is dispatched to. With the department nearing an average of 1 fire related incident per day, the department's most active personnel are responding to about 3 incidents per week.

Overall, the KVFD consistently averaged 10 personnel responding per incident from 2013 through 2015. On face value, these numbers are adequate and would come close to meeting the personnel requirements in NFPA 1720 for a community such as Keystone Valley, particularly with regard to rural area response. However, Keystone Valley does not track compliance with NFPA 1720 so it is unknown how many personnel from neighboring departments that respond on automatic aid who may have been on these incidents as well. Conversely, it is impossible to determine if all of the personnel who are calculated into these averages actually responded to the incidents as firefighters (as opposed to, for instance, fire police), or if they just stood by at the station. The time it took them to arrive on location (if in fact they did) is also unknown. However, framed a different way, and looking at just Keystone Valley's statistics, on average

Municipal Resources

just 17.2%% of the fire department's members responded to each incident in 2014; 14.1% in 2015; and 15.4% through July 2016 (Figure 3-6). Data was not readily available regarding whether there was a difference in staffing levels during the day, as opposed to night and weekends, or if more personnel responded to building fire and rescue incidents as might normally be expected.

FIGURE 3-6



*Through July 31, 2016

The MRI study team was informed by a number of the stakeholders that we interviewed that the department's staffing is one of its biggest challenges, one that is growing more significant as the number of incidents continue to gradually increase. Companion issues, and most likely contributing factors to the staffing issues, are recruiting, and then retaining, good, active, contributing members, and getting those members to respond to incidents on a regular basis. Morale issues, possibly residual effects of the merger that created the department, appear to also be playing a role.

Based upon the statistics from the three years analyzed, and acknowledging the fact that a few personnel were just short of achieving at least a 25% response average, it is our assessment that the Keystone Valley Fire Department currently has about 10 to 12 truly active, volunteer members of the department, who **respond to at least 1 out of every 4 fire incidents** the department is dispatched to. It is important to keep in mind that a member responding to more than 60 calls in a year may still only be responding to a little more than 1 per week. Adding to the challenge is the reality that most personnel work and have many other obligations that limit the amount of time that they can devote to the fire company. This is especially true during the

Municipal Resources

day. In addition, the increasing incident volume will continue to increase the pressure on the active personnel who are carrying the department. Without the career staff supporting the volunteer personnel in fire operations we believe the department would be struggling even more to fulfill its core missions.

When discussing staffing, it must also be noted that although many of the members of the fire companies are certified firefighters, a number still are not. Personnel, who are not certified as firefighters and up-to-date in their training, even though they may still arguably be able to contribute, should not be counted toward active "firefighter" numbers. They cannot be counted towards unit staffing for incidents, and depending upon their level of training (or lack thereof in some cases), could actually be a liability to the department and the district.

On the EMS side of the department's operations, primary staffing is provided by the career staff which is comprised of 18 part-time personnel, a career supervisor, and an EMS manager. On-duty career staffing is 2 personnel, 24/7. Each career member works between 12 and 36 hours per week. They normally work either 12 or 24 hour shifts. Their primary responsibility is to staff and respond with the primary ambulance. Beyond the career staff, the MRI team was informed that there are only about 4 volunteer personnel who run with and/or will pick up ambulance shifts. This often creates response challenges when there are simultaneous or overlapping incidents, or incidents that require more than one ambulance. During the day, the availability of volunteer personnel to staff a second ambulance is almost non-existent.

It does appear to the study team that the Keystone Valley Fire Department is struggling with its fire and EMS staffing, and the department at times, particularly during the day, has difficulty mustering sufficient qualified/certified personnel. Several members of the department informed the study team that apparatus responding staffed with just two personnel, sometimes just the career staff, is becoming more common, particularly during the day. This is not an indictment of the volunteer system, or a situation that is limited to Keystone Valley, or even the northeast, it is has been occurring across the country for probably the last 20 or 25 years. Keystone Valley, being in Pennsylvania which has a long and proud tradition of volunteer emergency services dating back to colonial times, is fortunate to have not felt the impact significantly until somewhat recently.

In March 2004, the International Association of Fire Chiefs (IAFC) issued a report by the Volunteer and Combination Officers Section, entitled *A Call for Action: Preserving and Improving the Future of the Volunteer Fire Service*. Among other things, the report highlighted the fact that the ranks of volunteer/call firefighters nationwide are declining due, at least in part, to an increasing demand for services. There are estimates that over the past four decades the number of volunteer firefighters in Pennsylvania has declined from around 300,000 in 1976, to about 50,000 today. There are also various other factors that are prevalent to the reduction in the number of volunteer and on-call firefighters in communities such as those served by Keystone Valley. Among them is that the demographics of many communities today do not

support a sufficient number of the type of person who is attracted to the fire service in the 21st century - someone with time to dedicate to public service, or a young person who wants to make a career of it.

The Keystone Valley Fire Department does not have a formal recruitment and retention program for volunteer personnel. The department has only very infrequently actively recruited for new members. The MRI study team was informed that most new members of the department are recruited by word of mouth or are "walk ins". The local Octorara High School has a strong protective services course that usually generates about 5 or 6 applicants a year. The department's website, while having a tab with information on how interested personnel can volunteer for the department, does not prominently display the need for volunteers. This is something that is frequently displayed very prominently on the websites of many call/volunteer departments.

The KVFD did inherit a FEMA Staffing for Fire and Emergency Response (SAFER) grant for volunteer recruitment and retention when it absorbed the former Martin's Corner Fire Company. This grant of about $88,000 was awarded in 2011, and was directed towards providing incentives to personnel for obtain training and certifications. Personnel were compensated at $10.00 per hour for attending training sessions, and received $250.00 for each certification they received from the National Board on Fire Service Professional Qualifications (NBFSPQ), also known as the Pro Board. The performance period for this grant expired in May of 2016, with close out expected in September.

There are a number of things that the Keystone Valley Fire Department and its member municipalities could try as part of their marketing efforts to increase the number of active, volunteer firefighters in the department. These suggestions include, but are certainly not limited to:

- Placing a prominent banner or link on the home page of the Keystone Valley Fire Department website and websites of all participating municipalities.
- Conducting a recruitment mailing to all residential properties in the fire district with information about the fire department and recruiting new members.
- Working with local businesses in an attempt to form partnerships that would allow employees to leave work to respond to emergency incidents when needed.
- Provide a tax abatement incentive for volunteer firefighters modeled after a program in place in the State of Connecticut.

Figure 3-7: Volunteer recruitment lawn sign.

Upper Merion Township recently enacted a recruitment program that, among other ideas was the purchase and placement of yard signs and banners in visible locations throughout the township (Figure 3-7). There are also regular public service announcements on the township's public access television station and messages on the electronic message board outside the township building.

Even if the recruitment obstacles can be overcome, hurdles remain before a new member is a productive member of the department. The training commitment alone is daunting, as well as costly to the department. To become a certified firefighter takes several hundred hours. Once certified, there are the dozens of hours of annual training spent maintaining firefighter and EMT (if required) skills and certifications. Unfortunately, in 2016, the average citizen does not want to spend a great deal of personal time dedicated to the fire and emergency services, especially when family commitments take priority. Other reasons are for difficulty recruiting and retaining members include:

- An overall reduction in leisure time.
- Employment obligations and the common need to maintain more than one job.
- The virtual elimination of employers understanding and flexibility relating to this form of community service.
- Significant decrease in the number of shift workers available to respond as members of the fire department at different times throughout the day.
- Increased family demands.

The KVFD does provide several events annually to show their appreciation to the members of the department. Each summer they hold a picnic for members of the department and their families. They also hold a Christmas party prior to the holidays.

It is easy to believe that increasing the number of volunteer firefighters can be a cure all to eliminate all staffing, and thus response problems. Unfortunately, in 2016, this is an increasingly difficult problem to overcome. However, there is still a small town feel too much of the area protected by the KVFD, and perhaps more importantly, still a sense of community. These are key attributes that may increase the likelihood of success for any volunteer firefighter recruitment and retention program.

The Keystone Valley Fire Department has expressed a desire to retain a strong volunteer firefighting force. We concur and believe that goal is realistic, achievable, and financially imperative, for the foreseeable future. However, it will require the implementation of program(s) to recruit and then retain personnel, a strong commitment from the participating municipalities, and strong leadership in the fire department.

As previously mentioned briefly, the federal government has a version of the Staffing for Fire and Emergency Response (SAFER) grant program that pertains strictly to volunteer and on-call firefighters. It provides competitively awarded funds to municipalities to recruit and retain on-call and volunteer firefighters. The grants fund expenses such as recruitment campaigns, and can provide money for such as expenses as tuition for college curriculums in fire science, for EMT and paramedic training, health insurance for volunteer members, physical fitness programs, uniforms, and various tax incentives offered to attract new candidates to join the fire department, and then stay for an extended period of time. We believe that the department should attempt to secure a SAFER grant to recruit and retain volunteer members, citing an attempt to meet the NFPA 1720 fire response standards.

In November 2005, the IAFC Volunteer and Combination Officer's Section released a second report, called *Lighting the Path of Evolution: Leading the Transition in Volunteer and Combination Fire Departments*. This report further expanded on issues and strategies for maintaining high service levels to the community, and safety for emergency response personnel, while simultaneously keeping costs down. One prominent question asked in the report was "How can fire departments ensure the delivery of services are reliable?" The answer was the development of a list of "indicators for change", where fire department managers and local government leaders need to be cognizant of warning signs pointing to potential problems and "prepare for change before it is forced on them by external circumstances".

At a minimum, caused primarily by limited availability of the volunteer firefighters due to their commitments to their regular, full-time occupations, effective day time responses appear to be growing increasingly problematic for the department. At times, although made, the response is slow, resulting in an unacceptably long delay in getting emergency assistance to the 9-1-1 caller. In still other instances, although the apparatus may respond, it is not adequately staffed with SCBA qualified firefighters, thus limiting the on-scene fire suppression tactical options, when the provisions of the Two-In/Two-Out regulation would be applicable.

We fully support the continued use of a strong primarily volunteer fire department in Keystone Valley, and believe that this model can continue to serve the needs of the department and the communities that it serves, for the foreseeable future. However, we also believe that the incident volume, which will most likely continue to increase each year, along with the multitude of other daily tasks which need to be performed will strain the department's ability to meet these expanding service demands. This will be particularly true in Keystone Valley since the fire and EMS operations are combined into a single emergency services provider.

At the time of this study, the career staff, which consists of 2 personnel on-duty 24/7, was officially designated to provide staffing for the primary ambulance. In reality, the unofficial practice has been to utilize these personnel for fire responses, if they are appropriately trained and qualified. This can include either splitting the crew if only 1 is a certified firefighter, or abandoning the ambulance for a fire response if both are cross-trained. For some time now the KVFD has been considering requiring all of the career staff to be cross-trained as both firefighters and EMTs; however, they have not formally adopted this policy.

Limited staffing, particularly during the day when volunteer personnel are usually at their full-time jobs and thus unavailable, presents the KVFD with one of its most significant challenges, one that if not successfully resolved will challenge the department's ability to fulfill one of its core missions. With an average of just over three EMS incidents per day it makes both operational and fiscal sense to ensure these personnel who are on-duty and available for response are cross-trained to handle both types of emergency incidents, thus increasing their versatility and productivity. The study team strongly encourages the Keystone Valley Regional Fire District and Department to formally adopt this operational and personnel policy requiring all career staff to be cross-trained and capable of performing both functions. We believe that the continued use of part-time, per-diem personnel, who do not require benefits, to be the most cost effective and fiscally responsible course to pursue.

Although they have certain formal duties they are supposed to complete every day, the MRI study team observed significant differences in productivity between various on-duty career staff. While a few of the personnel were observed performing various duties around the station, cleaning, washing apparatus, performing maintenance and serviceability inspections, etc., this was the exception rather than the rule. A larger number of the personnel were observed doing little more than lounging in recliners, either watching television or even sleeping. In at least one instance, one member of the crew was busy almost all day doing various chores, while his partner slept in a chair. It did not appear that the department's officers who observed this behavior were concerned by it. This type of behavior, on days when consultants who were assessing the department were on site, does not portray the career staff in a positive light. More troubling is the perception of the department that members of the public could develop based upon observing this type of behavior and lack of productivity.

While effective, efficient, and safe, emergency scene operations, particularly initial fire attack operations, is the overriding reason for considering the cross-training and response of career staffing, that is not the sole justification. Some of the other benefits of having the career staff also respond to fire incidents, particularly during the day, when most of the volunteer force are at their primary jobs, including, but certainly not be limited to:

- Quicker and guaranteed compliance with the OSHA Two-In/Two-Out requirement for initial fire attack;

- Performing fire prevention inspections (possible future duty) and other fire prevention activities;
- Developing pre-fire/incident plans;
- Performing fire apparatus, tool, and equipment inspections, testing and maintenance;
- Performing basic station maintenance and cleaning;
- Performing fire hydrant testing, maintenance, and flow testing; and
- Assisting the fire chief with various day-to-day administrative duties and/or special projects.

Each of the career staff should be assigned ancillary duties that they would be responsible for performing and/or coordinating. They should also be required to be "productive" for the benefit of the department, during at least a portion of their on-duty time, particularly on the day shift. The sum total of these benefits would be to assist with taking the work load off the volunteer staff and letting them focus their available time on training and emergency incident response.

Consideration could also be given to utilizing volunteer personnel to supplement in station staffing, on nights and weekends. Personnel who pull at least one duty shift per week could possibly maintain their member in good standing status with the fire department. When on-duty they could also complete their required training, participate in various department/station projects, pre-fire planning, etc., and possibly even membership recruitment activities.

Under a different type of duty crew system, the department could be divided into 2 or 3 duty crews. Each duty crew would have their own separate alert tone and would function on some type of a rotational system with the other crew(s), perhaps 1 week on, and either 1 or 2 weeks off. Only the "duty crew" would be dispatched initially to minor incidents, often referred to as "still alarms". The advantage of the duty crew system is two-fold. It preserves the active, primary response role of what is a relatively strong volunteer force, while simultaneously reducing the constant need for personnel to respond to all incidents. Under the duty crew system multiple stations and units would still be dispatched and respond to potentially serious incidents, such as any type of reported structure fire, rescue incidents, etc., based upon the run card protocols. All personnel would be encouraged to respond to these types of incidents.

There are no easy or guaranteed solutions to the staffing quandary facing Keystone Valley and many other communities throughout the country. This is particularly true in departments that

provide EMS due primarily to the much high number of requests for service these departments must respond to. It is also important to stress that what may work in one community with regards to staffing and call/volunteer recruitment and retention, may not work in another nearby community. Each community must individually determine what programs, incentives, and motivations will work, and be most effective in their community. It is also worth mentioning again that the challenges that are facing Keystone Valley are not in any way unique to the community or in any way a reflection on the Keystone Valley Fire Department. The same issues are being faced by many, if not most, volunteer fire departments throughout Pennsylvania, the northeast, and in fact, across the country. Increased training and incident response demands, a reduction in available time to dedicate to these types of activities, and an overall decrease in volunteerism all play roles in the staffing challenges confronting many volunteer emergency services providers.

RECOMMENDATIONS

3.1 The Keystone Valley Fire Department should apply for a federal SAFER grant for volunteer recruitment and retention. This grant should be utilized to develop a marketing and recruitment program to attract new members, and provide incentives for the retention of those personnel such as tuition reimbursement, health care benefits, tax abatements, etc. This program should consist of:

- **Developing a recruitment brochure and mailing it to all residents;**
- **Performing public outreach through the local media;**
- **Contacting community and service groups;**
- **Developing an eye catching banner on the fire department and each municipality's web site;**
- **Placing recruiting messages on electronic sign board at municipal facilities;**
- **Placing signs recruiting volunteer personnel at the main entrances to the fire district and lawn signs to be placed throughout the fire district;**
- **Placing signs/banners recruiting volunteers in local businesses particularly high volume locations; and**
- **A continued active and visible presence at the local high school.**

Municipal Resources

3.2 The Keystone Valley Fire Department should attempt to enter into partnerships with local businesses to allow their personnel to respond, when needed, to emergency incidents during working hours, without any financial penalty.

3.3 In cooperation with their participating municipalities, the Keystone Valley Fire Department should explore the feasibility of utilizing, and in fact encouraging, borough and township employees to perform "dual roles" by serving not only in their full-time positions, but also serving the fire department as volunteer firefighters.

3.4 In cooperation with their participating municipalities, the Keystone Valley Fire Department should encourage giving priority attention for hiring to selected borough and township positions, such as public works, to personnel who are currently serving as active volunteer firefighters.

3.5 The Keystone Valley Regional Fire District/Department should formally adopt the policy of requiring that all of the career staff be cross-trained as firefighters and EMTs, and be utilized for both fire and ambulance responses. Some of the other benefits of having the career staff be cross-trained for both fire and EMS duties, particularly during the day when most of the volunteer force are at their primary jobs, include, but would certainly not be limited to:

- Quicker and guaranteed compliance with the OSHA Two-In/Two-Out requirement for initial fire attack;
- Performing fire prevention inspections (future duty) and other fire prevention activities;
- Developing pre-fire/incident plans;
- Performing fire apparatus, tool, and equipment inspections, testing and maintenance;
- Performing basic station maintenance and cleaning;
- Performing fire hydrant testing, maintenance, and flow testing; and
- Assisting the fire chief with various day-to-day administrative duties and/or special projects.

3.6 The on-duty career staff should not be permitted to sit around and/or sleep all day. They should have designated "work" periods and duties during the day where they are

productive and performing various assignments for the good of the department or the community.

3.7 The Keystone Valley Fire Department should consider utilizing volunteer personnel to supplement in station career staffing, particularly nights and weekends. Personnel who pull at least one duty shift per week could possibly maintain their member in good standing status with the fire department. When on-duty, they could also complete their required training, participate in various department/station projects, pre-fire planning, etc., and possibly even membership recruitment activities. Under a different type of duty crew system, the department could be divided into 2 or 3 duty crews. Each duty crew would have their own separate alert tone and would function on some type of a rotational system with the other crew(s), perhaps 1 week on and either 1 or 2 weeks off. Only the "duty crew" would be dispatched initially, along with the career staff, to minor incidents, often referred to as "still alarms", reducing the need for the entire department to respond.

Under the duty crew system, multiple stations and units would still be dispatched and respond to potentially serious incidents such as any type of reported structure fire, rescue incidents, etc., based upon the run card protocols. All personnel would be encouraged to respond to these types of incidents.

3.8 The Keystone Valley Fire Department should explore ways to incentivize the duty crew personnel and program with the goal of maximizing buy in and participation of department members, while simultaneously reducing the emergency response burden on all members of the department.

CHAPTER 4

FACILITIES, APPARATUS/EQUIPMENT, AND CAPITAL PLANNING

FACILITIES

OVERVIEW

Fire and EMS stations are a critical community asset. The station facilities of a modern fire and EMS department are designed to do much more than simply provide a garage for apparatus and a place for firefighters and EMS personnel to wait for a call. A fire EMS station should, at a minimum, provide adequate, efficiently designed space for the following functions:

- Housing of fire apparatus and ambulances, with adequate space for apparatus length and height (and the housing of all equipment, including staff, service and support vehicles, including trailers)
- On-duty crew quarters, with sufficient toilet/shower/locker room space for both sexes
- Adequate sized sleeping facilities (as necessary)
- Kitchen and eating area
- Training and meeting space
- Administrative offices
- Vehicle maintenance (as necessary)
- Hose drying and storage (as necessary)
- Supply and equipment storage
- Public entrance/reception area

Many communities find that an emergency services station is an ideal place to locate the community's emergency operations center (a large room, such as a training classroom, can be designed to serve as the EOC when needed). Meeting rooms are also frequently made available to community organizations, thus increasing their versatility. However, in today's environment, serious consideration must be given to station security and whether allowing

members of the public, who are not members of the department, to utilize these facilities, particularly if there is open, or easy access to the operational areas of the facility.

National best practices, such as guidance provided by the National Fire Protection Association (NFPA) and the Federal Emergency Management Agency (FEMA), recommend that among other things, the following features be included in modern fire and rescue station capabilities:

- Seismic-resistant construction (based on local risk assessment)
- Flood hazard protection (based on local risk assessment)
- Automatic fire sprinkler system and smoke detection system
- Carbon monoxide detectors
- Vehicle exhaust extraction system
- Capability to decontaminate, launder, and dry personal protective equipment, station uniforms, tools, and equipment
- Adequate facility security
- Emergency power supply and system redundancy
- Exercise and training area(s)
- Compliance with the Americans with Disabilities Act (ADA)
- Compliance with current fire and building codes
- Adequate storage for supplies and equipment, including emergency medical and disaster supplies
- Adequate parking for on-duty personnel, administrative staff, and visitors
- Capability for future expansion

Fire and EMS capital facilities are exposed to some of the most intense and demanding uses of any public local government facility, as they are subject to use, and may be occupied, 24 hours a day. While the demands of use may be somewhat less in stations that are staffed by volunteer personnel, the very nature of fire and rescue operations necessitate that all stations be functional, adequate to fulfill the department's core missions, and be well maintained.

Well-designed fire and EMS facilities enable staff to perform their duties effectively, efficiently, and safely. As a facility ages, it may no longer meet the needs of an evolving department and/or community, thus negatively affecting morale, efficiency, safety, security, technology, and overall efforts to provide quality fire, rescue, and emergency medical services. It may also hamper the ability of the department to keep pace with increasing and/or expanded requests for, and/or levels of, service. Older and/or obsolete facilities are also expensive to maintain due to inefficient energy systems. When these conditions occur, typical remedies include expanding, renovating, and/or replacing the existing facilities. In some communities it also makes sense to consider a consolidation of several older and/or obsolete facilities into one or more new, green, operationally adequate stations, that may be better located for the department to fulfill its current and future missions.

Fire and EMS station facilities should be an important component of a municipal capital improvement plan (CIP). A long-term plan should be in place that takes into consideration the expected life expectancy of a facility, space needs, technology needs, and location requirements, based on response times, travel distance, changes in community development patterns, and regional fire protection capabilities. The construction or renovation of fire stations is a costly proposition that should be planned well in advance in order to balance other community needs for capital projects.

OBSERVATIONS

The Keystone Valley Fire Department currently operates from two stations. The main station is the former Parkesburg Fire Company #1 station, located at 329 West First Avenue in Parkesburg. This is known as the Central Station. The second station is the former Pomeroy Volunteer Fire Company #1 facility, located at 1918 Valley Road in the Pomeroy section of Sadsbury Township. It is referred to as the East Station. The fire department owns both stations free and clear, with no mortgages or debt on them.

Parkesburg Station

The Parkesburg/Central station serves as the focal point of department and fire district activities, and is relatively centrally located within the existing fire district boundary (Figures 4-1 and 4-2). The original part of the facility, which was constructed in 1934 and now houses the administrative and crew areas of the department, appears to be Type III, ordinary construction. The current apparatus bays, which were added in 1977 when the station was renovated and expanded, are of Type II, non-combustible construction.

The Parkesburg Fire Company #1 was always an independent entity and owned their own station. However, in the mid-1970s, when planning was underway for the renovations and expansion to the station, the fire company ended up partnering with the borough to finance the necessary constructions costs. From 1977 when the expansion was completed, until 2005,

the Parkesburg borough hall and police departments were co-located in the station also. They relocated to the new facility just east, on First Avenue, in 2005. At around that time the borough turned ownership of the old borough hall (the 1934 section of the building) to the fire company for $1.00.

Figure 4-1 (left) and 4-2 (right): Front and rear views of the Parkesburg/Central station which is the Keystone Valley Fire Department's main facility and the focal point of all department and district operations and administration.

The newer part of the station consists of a total of four apparatus bays, two of which are double depth, with drive through capability. The other two bays are single depth and are not drive through capable. All of the apparatus bays are relatively narrow by current day standards with little room for personnel to move between the various vehicles. With storage areas in the station being nearly non-existent, spare tools and equipment, hose, and firefighter personal protective equipment (PPE) are all stored in the apparatus bays (Figures 4-3 and 4-4). The apparatus bays are also the location of the department's air compressor, which is used to refill self-contained breathing apparatus cylinders. This is a less than optimal location for this unit. There is a small office and radio room off the apparatus bays where crews can complete reports and perform other duties (Figure 4-5).

Engine 8-2, Rescue 8, Ladder 8, Utility 8, Ambulance 8-1, and Ambulance 8-2 are all normally deployed from this station. However, Engine 8-1 and Tanker 8 are also periodically rotated into this station to assist with equalizing responses and mileage.

Figure 4-3 (left): Storage of spare hose, equipment, tools, and even SCBA is crowded into the apparatus bays.
Figure 4-4 (right): Firefighter PPE is stored in racks in the apparatus bays, which is not recommended as it is exposed to UV light and vehicle exhaust emissions fumes and particles.

The older section of the building houses the department's administrative functions. Upon entering the building from the front, there is a short hallway that has two offices (Figure 4-6). One serves as the office for all of the department and district officers. The other serves as a day room for the on-duty crew along with an office/work area for the EMS manager and career supervisor. There is a key FOB access system for all of these areas including entry into the building. Continuing back the hallway is a lobby area for the social hall where fire company memorabilia is on display. There is a large multi-purpose room/social hall where fire district and fire department meetings, training classes, and other events are held. There is a large commercial kitchen adjacent to this area.

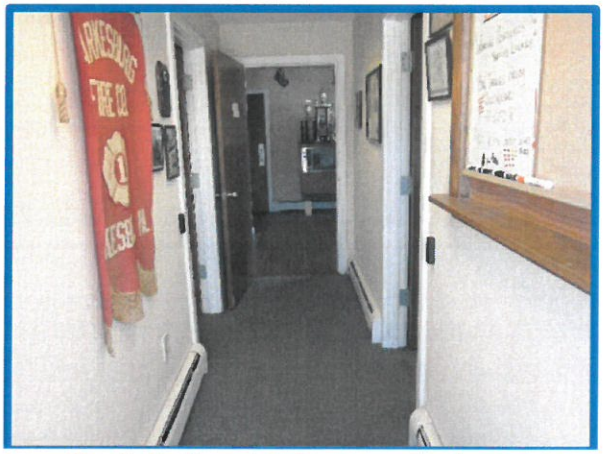


Figure 4-5 (left): Small radio and report completion room located adjacent to the apparatus bays.
Figure 4-6 (right): Department/district administrative area from the front entrance. The single office for all department/district officers is on the right. The day room for the career staff, which also serves as a work area for the EMS manager and career supervisor, is on the left.

Municipal Resources

In the rear of the multi-purpose room there is an area that is the sleeping area for the career staff. This consists of two bunks and several recliners. For living quarters, this area is in poor condition. As can be seen in Figure 4-7 below, there are areas where the plaster has either fallen off the wall, or been removed, leaving exposed wood lathe visible. **The smoke detector for the area was missing, which is a major safety concern for personnel who may be sleeping in this area (Figure 4-8).** There are no shower or locker facilities for on-duty personnel to use during their shifts.

Figure 4-7 (left): Bunk roof area for on-duty career staff. Note exposed wood lathe next to the exit door.
Figure 4-8 (right): Missing smoke detector in the bunkroom creating a serious safety hazard for sleeping personnel.

Additional specific concerns regarding this facility include, but are not limited to:

- The station is not equipped with an automatic fire suppression system, nor is it is equipped with an automatic fire detection/alarm system.
- The apparatus bays are very small for a modern fire station. This limits the amount of apparatus and/or equipment that can be stored in the station. In addition, hose and equipment cannot be efficiently loaded/unloaded inside during cold or inclement weather, nor can equipment be removed from the apparatus and set up for training and maintenance activities.
- The facility is not in compliance with the requirements and recommendations of **NFPA 1500:** *Standard on Fire Department Occupational Safety and Health Program* (National Fire Protection Association, Quincy, MA, 2013 edition), which provides requirements for facility safety, maintenance, and inspections.
- The facility is not in compliance with the requirements and recommendations **NFPA 1581:** *Standard on Fire Department Infection Control Program* (National Fire Protection Association, Quincy, MA), which

Municipal Resources

has requirements to provide minimum criteria for infection control in the fire station, in the fire apparatus, during procedures at an incident scene, and at any other location where fire department members are involved in routine or emergency operations.

- The facility is not in compliance with the requirements and recommendations of **NFPA 1851:** *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* (National Fire Protection Association, Quincy, MA). This standard provides safety requirements for storage and cleaning of personal protective equipment.

- The building is not equipped with a source capture, vehicle exhaust emissions system to direct exhaust and fumes directly to the exterior of the station.

The MRI team feels strongly that the current station is inadequate for current fire department operations and priority consideration should be given to its replacement. Ultimately, operations cannot be conducted effectively or efficiently at this station, personnel cannot be comfortably housed, and safety will be an ongoing concern.

The Keystone Valley Fire Department does have plans for a new, up-to-date station, to replace the existing Parkesburg facility. Planning to replace the station has been ongoing for approximately 10 years, having started with the Parkesburg Fire Company #1, prior to the consolidation into Keystone Valley. All together, there has been approximately $200,000 to $250,000 invested in planning and design work. Some of the concepts regarding the facility were revised subsequent to consolidation based upon the changing operational needs of the department.

It was reported to the MRI study team that the architect has final plans for the station prepared. Estimates for construction costs are between $2,500,000 and $3,000,000. It is estimated that the monthly mortgage for the new facility will be approximately $10,000 to $12,000 for 30 years. Financing to allow construction of the new facility will be obtained by the fire department, not the fire district. They are currently exploring various options that may be available regarding funding and have several firm commitments that are being evaluated.

In September 2016, the department was notified that they had been approved for a $2,500,000, United Sates Department of Agriculture, 40-year mortgage loan, at 2.375% interest, for the new station. An 18-month construction loan will finance the actual construction costs, at which time the USDA loan will be provided. The 40-year term and very low interest rate will be very beneficial to the department in the form of lower monthly and yearly payments.

The new station will include three, triple depth apparatus bays, that will be capable of storing most vehicles three in a row, allowing up to nine vehicles to be deployed from the station. It will also include much needed administrative and training space, as well as appropriate crew quarters for the on-duty personnel and other members who may be pulling duty in the station. Figure 4-9 shows an artist's rendering of what the new facility will look like. We encourage both the Keystone Valley Regional Fire District and Fire Department to continue to pursue this much needed facility project which we believe will significantly improve their operational efficiency.

Figure 4-9: Artist's rendering of the new Keystone Valley Fire Department and fire district headquarters station that will replace the existing Parkesburg station.

Pomeroy Station

The Pomeroy/East station is, more accurately, a complex of buildings. It was the location of the former Pomeroy Volunteer Fire Company. The main station building is comprised of four apparatus bays (Figure 4-10). Three of them are small, single deep bays, with low ceiling height, which face the front of the station. The fourth bay, which is now used for storage, is a double deep bay that was an addition to the station and exits from the side of the building. The station has a kitchen area, restrooms, and a bingo/social hall in an attached building. There is a basement that is utilized as a practical training area for search and rescue evolutions. The apparatus bays areas are of masonry construction. The attached bingo hall is Type V, wood frame construction.

Figure 4-10 (left): Original/main station building at Pomeroy.
Figure 4-11 (right): Low ceiling heights and shallow depth apparatus bays make the station unsuited for the housing of full size apparatus.

Tac 8, Traffic 8, and Brush 8, along with a light tower, were housed in the building at the time of this assessment. The low ceiling height and shallow depth of these bays render them useless for the housing of any type of full size apparatus (Figure 4-11).

To the rear/side of the original station is a building that now serves as the main "station". This building is a two, single deep bay facility, of Type 5, wood frame construction, basically a "pole barn" (Figure 4-12). The interior is comprised of the apparatus bays, a small office area constructed of plywood, with a mezzanine area above that functions as a crew area, a small bathroom, and a storage area (Figure 4-13). Engine 8-1 and Tanker 8 are normally deployed from this building.

Figure 4-12 (left): Pole barn which now serves as the "main" station in Pomeroy and houses Engine 8-1 and Tanker 8.
Figure 4-13 (right): Interior of the station showing plywood "office" and crew area on mezzanine above.

Municipal Resources

Additional specific concerns regarding these facilities include, but are not limited to:

- The buildings are not equipped with an automatic fire suppression system, nor are they equipped with an automatic fire detection/alarm system.

- The apparatus bays in both buildings are very small for a modern fire station. This limits the amount of apparatus and/or equipment that can be stored in the station. In addition, hose and equipment cannot be efficiently loaded/unloaded inside during cold or inclement weather, nor can equipment be removed from the apparatus and set up for training and maintenance activities.

- The facilities are not in compliance with the requirements and recommendations of **NFPA 1500:** *Standard on Fire Department Occupational Safety and Health Program* (National Fire Protection Association, Quincy, MA, 2013 edition), which provides requirements for facility safety, maintenance, and inspections.

- The facilities are not in compliance with the requirements and recommendations **NFPA 1581:** *Standard on Fire Department Infection Control Program* (National Fire Protection Association, Quincy, MA), which has requirements to provide minimum criteria for infection control in the fire station, in the fire apparatus, during procedures at an incident scene, and at any other location where fire department members are involved in routine or emergency operations.

- The facilities are not in compliance with the requirements and recommendations **NFPA 1851:** *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* (National Fire Protection Association, Quincy, MA). This standard provides safety requirements for storage and cleaning of personal protective equipment.

- Neither building is equipped with a source capture, vehicle exhaust emissions system to direct exhaust and fumes directly to the exterior of the station.

The MRI team feels strongly that neither of these buildings are anywhere near adequate for the operations of a modern-day emergency services provider. Ultimately, personnel cannot be comfortably housed in either of these buildings and safety will be an ongoing concern.

As will be discussed farther in Chapter V, *Fire and EMS Operations*, the Pomeroy station provides very little operational benefit to the Keystone Valley Fire Department. With a location that is just a short distance from the district line in several directions, and a very limited membership roster (there were only six sets of PPE at the station), the department/district should give long-term consideration to closing this station and selling off the assets.

The fire department also owns two other residential structures adjacent to the original fire station that, with a total of 4 apartments, are used as a revenue generating rental properties. We do not believe that this is a business the fire department should remain in. Selling these properties would generate additional revenue for the department that can be reinvested toward needed capital projects that will benefit the department's many long-term operational needs.

Atglen and Martin's Corner Stations

When discussions and negotiations regarding the formation of the Keystone Valley Fire Department were in progress, the Atglen Volunteer Fire Company and Borough of Atglen were participants. Ultimately, the Atglen Fire Company joined Keystone Valley, but was disbanded in less than 2 years as there were only a few active members. At that point the KVFD closed the Atglen station. In the meantime, Atglen Borough made the decision to contract with the Christiana Fire Company in Lancaster County to provide fire and EMS services to the borough. This arrangement was made prior to the formation of the KVFD. The former Atglen/West fire station (Figure 4-14) was then sold by the KVFD for approximately $115,000.

The Martin's Corner Fire Company was not a part of the original KVFD as its response area was not contiguous to the fire district. However, the fire company was struggling and requested to join Keystone Valley, a move that was ultimately approved. Shortly thereafter, the fire company disbanded. The fire station (Figure 4-15), which was not part of KVFD's operational plan, is up for sale with negotiations currently underway with a prospective buyer. The district is also in negotiations to maintain one acre of land for the possible future location of a cell tower, which will generate additional monthly income to supplement other sources of revenue. Another acre of vacant land is still for sale.

The money from the sale of Atglen and later, Martin's Corner, will be reinvested by the KVFD into its long-term capital needs.

Figure 4-14 (left): Former Atglen Fire Company/KVFD West station which was sold for $115,000.
Figure 4-15 (right): Former Martin's Corner Fire Company station for which negotiations on a sale are underway.

RECOMMENDATIONS

4.1 **The Keystone Valley Fire Department should continue to make replacement of the Parkesburg station a high priority. The current location is centrally located within the district and appears that it will meet the needs of the fire department and the fire district for the foreseeable future.**

4.2 **Although the design of the new building is almost finalized, the station should, to the extent practical, be a "green" facility, and include, but not necessarily be limited to, the following components:**

- **a.** **Adequate space for fire apparatus, both current and future;**
- **b.** **Compliance with nationally recognized standards for fire station design and operation;**
- **c.** **Energy efficiency;**
- **d.** **A complete, automatic fire sprinkler system, and smoke detection system;**
- **e.** **Carbon monoxide detectors;**
- **f.** **Modern training capabilities;**
- **g.** **Adequate, secure office space;**

h. **Adequate, secure storage for equipment and records;**

i. **Safe and secure living quarters for career and possible duty crew personnel;**

j. **Adequate apparatus exhaust system;**

k. **Handicapped accessibility for all areas;**

l. **Capability for decontamination and cleaning of firefighter and EMT protective clothing and equipment;**

m. **Adequate parking for staff vehicles and personal vehicles of on-duty career or duty crew personnel and other responding personnel;**

n. **Adequate space for outside training;**

o. **Dedicated physical fitness area;**

p. **Adequate social and meeting spaces;**

q. **Building integrity and capability for continuity of operations during disasters (e.g. emergency power, seismic protection, protection from flood and high winds, food storage, emergency medical supplies, redundant systems for water supply, sewage, and communications, etc.); and**

r. **Building "sustainability" which means employing design and construction practices that significantly reduce or eliminate the negative impact of the building on the environment and occupants.**

4.3 The existing Parkesburg station should, at a minimum, immediately have battery operated smoke detectors and carbon monoxide detectors installed for the protection of the on-duty crew. These detectors should be tested and inspected on a monthly basis to ensure they are in proper working order (and have not been removed).

4.4 The Keystone Valley Fire Department should divide the existing Pomeroy property into four separate and distinct lots. The original fire station and the rental properties next door should be sold as soon as possible, with the proceeds being reinvested back into the department's long-range capital needs.

4.5 The newer Pomeroy station building should be maintained for the short-term, if for no other reason than there is no room to store the engine and tender at the existing Parkesburg station; however, as will be discussed further in Chapter 5, *Fire and EMS Operations*, its long-term benefit to KVFD operations is minimal, as is justification to keep it open. Once the new Parkesburg station is completed it should be decommissioned as a station.

APPARATUS AND EQUIPMENT

OVERVIEW

The resources that the fire department uses to perform its core mission and mitigate a wide range of emergency incidents, are generally divided into two major categories, apparatus and tools/equipment. Apparatus generally includes the department's motorized vehicle fleet and the major emergency response apparatus such as engines (pumpers), water tenders, aerial apparatus including towers and ladders, rescue vehicles, and ambulances. Specialized apparatus includes emergency units such as lighting vehicles, brush trucks, and other off-road vehicles. They also often include trailers for specialized applications such as technical rescue, hazardous materials response/equipment, hazardous material decontamination, structural collapse rescue equipment, breathing air/light support units, foam units/supplies, and mass casualty incident supplies. Support vehicles that are critical to fire department operations, both routine and emergency, include command post and emergency communications units, command/staff vehicles, and maintenance trucks.

The geography, infrastructure, hazards, and construction features within the community all play a major role in determining the composition of each department's unique and individualized apparatus fleet and equipment inventory. Keystone Valley's characteristics present the fire department with a wide variety of strategic and tactical challenges related to emergency response preparedness and mitigation. This includes fire suppression operations, emergency medical responses, and complex incidents requiring special operations capabilities, such as technical rescue and hazardous materials emergencies.

Large commercial buildings, mid-rise structures, and a diverse mixture of target hazards present much different operational hazards and challenges than those required for operations in single-family dwellings. These factors, as well as projected future needs, must be taken into consideration when specifying and purchasing apparatus and equipment. Every effort should be made to make new apparatus as versatile and multi-functional/capable as is possible and practical.

The tools and equipment that a fire department utilizes cover a wide assortment of resources necessary to effectively, efficiently, and safely respond to, and mitigate, a wide range of

emergency incidents. These resources include, but are certainly not limited to, the firefighters' personal protective equipment (PPE), self-contained breathing apparatus (SCBA), hose, nozzles, adapters, master stream appliances, ground ladders, radios, hydraulic rescue tools and equipment, and various hand and power tools. The technology and standards for fire department equipment are constantly evolving to improve the effectiveness, efficiency, and safety of firefighters.

Today's fire departments are obligated to establish and document formal programs and procedures to ensure that equipment is replaced regularly, maintained properly, and deployed in accordance with accepted standards and department procedures. Proper training on the use and maintenance of equipment is essential to effective and safe firefighter performance, and minimizes the KVFD's risk exposure.

OBSERVATIONS

The Keystone Valley Fire Department deploys an array of fire apparatus and several other emergency response vehicles to accomplish the missions of the department.

This department's current apparatus fleet includes three pumpers (engines), one of which is equipped with rescue tools and serves as rescue engine; one 75' quint[11]; one water tender/pumper combination; one mini-pumper; one utility vehicle, which can also function as a back-up rescue; one fire police unit; one brush truck (owner by the state); two Type III ambulances; and two command vehicles. The department does not have any formally designated reserve apparatus to replace vehicles that are out of service for routine maintenance, or if long-term maintenance/repair is necessary on front-line units.

Overall, the Keystone Valley Fire Department's current apparatus fleet make-up with regard to types and numbers of apparatus is somewhat large for a community of the size and demographics of the existing district. This is particularly true since the majority of the department's vehicles are versatile and have multiple capabilities. However, it should also be noted that Keystone Valley provides response with an aerial apparatus and for rescue to a much larger area than the department's first due fire district, making these resources more regional than strictly local in nature. It should also be noted that Keystone Valley has significantly reduced the size of its apparatus fleet since consolidation and continues to do so.

The average resources for communities comparable to Keystone Valley are:

- 2 - 3 pumpers (average is 2.4)
- 0 aerial ladders (average is .28)

[11] A "quint" serves the dual purpose of an engine and a ladder truck. The name *"quint"* refers to the five functions that these units provide: fire pump, water tank, fire hose, aerial device, and ground ladders.

- 2 -3 other fire suppression vehicles (average is 2.25 - not command, staff, or support vehicles)

A review of the Keystone Valley Fire Department's current apparatus in terms of age, condition, and capabilities finds a fleet whose conditions range from excellent to fair. The department's pumpers are 15, 17, and 22 years old. The quint, at 4 years of age, is the department's newest major firefighting vehicle, followed by the tender/pumper at 10 years.

The following summarizes the Keystone Valley Fire Department's apparatus and vehicle fleet:

Figure 4-16: Engine 8-1; 1999 KME pumper
1250 GPM pump capacity; 750 gallon water tank;
50 gallons Class A foam; rescue tools
Good condition
Assigned to Pomeroy/East station

Figure 4-17: Engine 8-2; 2001 Pierce pumper
2000 GPM pump capacity; 750 gallon water tank
50 gallons Class A foam; 30 gallons Class B foam
Very good condition
Assigned to Parkesburg/Central station

Figure 4-18: Rescue 8; 1994 E-One pumper
1500 GPM pump capacity; 750 gallon water tank;
rescue tools
Fair condition
Assigned to Parkesburg/Central station

Figure 4-19: Ladder 8; 2012 Pierce Quint
1500 GPM pump capacity; 480 gallon water tank
75' aerial ladder
Excellent condition
Assigned to Parkesburg/Central station

Municipal Resources

Figure 4-20: Tanker 8; 2006 Mack/4 Guys tanker/pumper
1500 GPM pump capacity; 3200 gallon water tank
Very good condition
Assigned to Pomeroy/East station

Figure 4-21: TAC 8; 2009 Ford Mini-pumper;
300 GPM skid pump capacity; 200 gallon water tank
Rescue tools
Excellent condition
Assigned to Pomeroy station

Figure 4-22: Utility 8; 2002 Ford F550/SEMO
Utility vehicle with rescue tools
Good condition
Assigned to Parkesburg/Central station

Figure 4-23: Ambulance 8-1; 2008 Chevrolet/Horton
Type III modular ambulance
Good condition
Assigned to Parkesburg/Central station

Municipal Resources

Figure 4-24: Ambulance 8-2; 2013 Chevrolet/PL Custom
Type III modular ambulance
Very good condition
Assigned to Parkesburg/Central station

Figure 4-25: Command 8; 2006 Ford Expedition
Command vehicle
Good condition
Assigned to Parkesburg station/duty officer

Figure 4-26: Chief 8; 2009 Chevrolet 4x4
Command vehicle
Very good condition
Assigned to fire chief

Figure 4-27: Traffic 8; 2009 Chevrolet utility truck
Fire Police unit
Good condition (removed from service during study)
Assigned to Pomeroy/East station

Figure 4-28: Brush 8; 1984 Chevrolet 4x4 brush truck
125 GPM skid pump capacity; 200 gallon water tank
Owned by Pennsylvania Department of Natural Resources
Poor condition (removed from service during study)
Assigned to Pomeroy/East station

Municipal Resources

Despite the lack of clear guidance in the various NFPA standards, there is a significant body of knowledge that suggests that fire apparatus definitely has a finite life span. The reasonable serviceable life span of fire apparatus will depend on a number of variables such as the level of use, local environment and operating conditions, and very importantly, the scope of preventative maintenance. It is generally accepted that lower use fire apparatus, such as units serving communities that are suburban in nature, might still be mechanically sound after twenty years or more due to their lower frequency of use. However, after twenty years, technical and functional obsolescence may make the apparatus less desirable to use, even if mechanically sound and serviceable. However, that does not mean that it will still not be serviceable as a spare or reserve apparatus.

One of the biggest factors that can impact serviceable life of the apparatus is the level of preventative maintenance that is receives. NFPA 1911: *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus* (2012 edition), provides guidance on this important aspect of fire department support operations. Apparatus manufacturers also identify suggested programs and procedures to be performed at various intervals. As apparatus ages, it is reasonable to expect that parts will wear out and need to be replaced. It follows then that maintenance costs and overall operating expenses will increase. As a result, cost history and projected costs for the future must be considered as a factor in determining when to replace or refurbish a fire apparatus. In addition, reliability of the apparatus must be considered. Experiencing low downtime and high parts availability are critical factors for emergency equipment maintenance and serviceability. A pro-active preventative maintenance program can assist with holding costs to an acceptable level.

Overall, and despite the fact that the department's newest pumper is 15 years old (the quint and tanker are newer), the Keystone Valley fleet appears to be well maintained and in decent condition (the sole exception is the brush truck). None of the department's vehicles (again with the exception of the brush truck) are unreasonably old, have excessive mileage on them, and all still appear to be in very serviceable condition. The department has a knowledgeable and dedicated chief engineer who oversees the apparatus fleet. He is assisted by an assistant engineer at each of the department's stations. The engineers perform thorough inspections on all the department's vehicles including oil, batteries, and a number of other components. They provide a detailed monthly engineer's report to the fire chief and board.

Preventative maintenance is performed on the apparatus on a regular basis. The ambulances, due to their much higher number of responses and associated mileage, are serviced every six months. The engines are serviced on an annual basis, along with receiving a state mandated inspection. The ladder is serviced a minimum of one time per year.

Minor repairs are performed in-house by the engineers. More significant repairs, along with the regular servicing of the fleet, is performed by Phoenix Fire in New Holland. Phoenix is a certified, full service, emergency vehicle repair center, including for pumps and body work. All

of their service personnel are certified emergency vehicle technicians (EVT). Phoenix performs the required annual pump tests on all department apparatus. Both Phoenix and the fire department maintain records on these tests. The MRI team reviewed these records and found them up-to-date.

The annual required testing of Ladder 8's aerial ladder, as well as all the department's ground ladders, are performed by American Test Centers. These records were also reviewed and found to be current and in good order.

Test results provide an indicator of apparatus' condition and are a valuable tool in budget planning. Often, as a result of this testing, minor maintenance issues can be resolved, which will delay or eliminate the need for major repairs in the future. It is also important to remember that from a safety and performance perspective, this annual testing needs to be completed to ensure that the overall rating, capacity, and functionality of the pumps and ladders are reliable during emergency incidents.

The department's ambulances are rotated from first out to second out on a monthly basis in order to equalize their use and assist with extending their serviceable life. Apparatus is periodically relocated from one station to the other in order to equalize use on them as well.

The KVFD has plans to replace the existing Rescue 8 (rescue pumper) which is 22 years old and in fair condition. However, before proceeding, they are awaiting the completion of this analysis of the department. There seems to be a debate among the members of the department regarding whether the new "rescue" should be a dedicated, single function, rescue truck, or if it should be a combination rescue pumper like the department currently utilizes.

It is our strong opinion that in smaller departments such as Keystone Valley, that all apparatus should, to the extent possible, be multi-functional and versatile. The rescue incidents that the KVFD is called upon to handle are overwhelmingly related to motor vehicle collisions. We believe that a dedicated, sole function rescue truck would be a luxury that the department does not need. A well-equipped and organized rescue pumper can be outfitted with several sets of hydraulic rescue tools, air bags, assorted hand, electric, and pneumatic rescue tools, and scene lighting. However, it will also be able to function as a regular pumper with hose and water, which will make it self-sufficient, particularly in minimum staffing conditions. It is also our opinion that with the purchase of this vehicle the KVFD can replace both the 1994 E-One and the 1999 KME pumpers.

NFPA 1901, *Standard for Automotive Fire Apparatus* (National Fire Protection Association, Quincy MA, 2016 edition) and ISO (formerly the Insurance Services Office), provide standards for the minimum complement of equipment that should be carried on fire apparatus. It is important to recognize that each agency has different requirements for apparatus and equipment. NFPA focuses broadly on the safety and performance of the apparatus, while ISO

focuses specifically on the fire suppression capabilities of the apparatus. These differences are most significant for equipment carried on pumpers and aerials. Differences between NFPA and ISO equipment for pumpers include hose, monitors, ground ladders, foam, and radios. Differences for aerial equipment include self-contained breathing apparatus (SCBA), ground ladders, and radios.

Figure 4-29: Equipment on the apparatus is neatly organized and mounted in the compartments.

The MRI study team found the equipment located on each piece of apparatus in the Keystone Valley Fire Department to be well maintained and ready for use. All apparatus had a typical selection of portable hand, power, and service tools, and equipment utilized for firefighting and other emergency operations. For the most part, the equipment appears to be organized and serviceable (Figure 4-29).

The KVFD has three sets of Hurst brand hydraulic extrication tools (Jaws of Life) with a full complement of tools and accessory tools. These tools were obtained through a $108,000 Assistance to Firefighters Grant (AFG) award in 2015. They are carried on Rescue 8, TAC 8, and Utility 8.

These hydraulic rescue tools are used by emergency rescue personnel to assist in extrication of motor vehicle crash victims, as well as other rescues from small spaces. These tools include cutters, spreaders, and rams. The department has a contract that provides annual servicing and repairs.

Thermal imaging cameras (TICs) are valuable pieces of equipment used by firefighters during fire incidents. By rendering infrared radiation as visible light, such cameras allow firefighters to see areas of heat through smoke, darkness, or heat-permeable barriers. Thermal imaging cameras pick up body and other types of heat, and are used to more quickly locate and remove trapped fire victims. They are also often used to find hidden fire behind closed walls. KVFD has four of these units, one each on Engines 8-1 and 8-2, Ladder 8 and Rescue 8. Two of the cameras are Bullard and two are MSA.

Automated external defibrillators (AEDs) are portable electronic devices that automatically diagnose the life-threatening cardiac arrhythmias of ventricular fibrillation and ventricular tachycardia in a patient, and is able to convert (treat) them through delivery of an electrical shock. They have become a critically important life-saving tool. Every piece of KVFD apparatus is equipped with an AED, allowing certified personnel to more quickly, and effectively, treat certain cardiac patients.

Personal protective equipment (PPE) includes the full ensemble that encapsulates a firefighter who will be engaging in firefighting operations. It includes a helmet, Nomex® hood, turnout coat, turnout pants, boots, SCBA, gloves, eye shield, and if appropriate, station uniform. The specifications and related requirements for PPE can be found in various NFPA standards. The MRI team examined a number of sets of firefighter PPE and found them to be relatively clean and ranged in condition from very good to fair condition. Some of the PPE showed the effects of routine wear, but the majority was in good condition.

Self-contained breathing apparatus (SCBA) is a device worn by firefighters to provide breathable air in an IDLH (Immediately Dangerous to Life and Health) atmosphere, such as fires and hazardous material incidents. This is an integral and critically important piece of equipment that a firefighter must use in order to safely perform their job. Keystone Valley's SCBA are state of the art Scott brand, which were placed in service about 18 months prior to this study. They appear to be properly maintained and are equipped with integrated personal alert safety system (PASS) devices. They are equipped with heads-up displays (HUD) that allow the user to monitor his/her air supply through an electronic display in the wearer's face piece. All of the department's apparatus, including both ambulances, is equipped with at least one SCBA for every riding position as is recommended by NFPA standards.

All active, interior qualified members of the department have been issued their own individual SCBA masks. Many departments issue individual facemasks in order to minimize the chance of exposure/ transmission of infectious and/or communicable diseases and other illnesses (even the common cold) between members. Each member having their own personal mask also ensures that they are wearing a correctly sized, properly fitting mask, not just the mask that happened to be available. The masks used by Keystone Valley are sized to each firefighter who has been fit tested. The department maintains a supply of some small and large face masks available for personnel who require one of these non-standard sizes.

Annual flow testing of SCBA is required by NFPA Standard 1852, *Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)*. All of the SCBA are in compliance with the flow testing requirement. They are all reported to be compliant with a current hydrostatic test that must be performed every three years.

It is the current best practice in the fire service that every firefighter who is wearing an SCBA and/or entering an atmosphere that is immediately dangerous to life and health (IDLH) should be equipped with a portable radio. The rationale is that should they become trapped, lost, disoriented, or experience any other type of emergency, they can summon help on their portable radio. Many departments now have a portable radio assigned to either every riding position on every piece of apparatus, or to every on-duty member. Keystone Valley utilizes the former method with a radio assigned to every riding position. In 2015, the KVFD received a state grant for the purchase of 19 portable radios, including programming software. These

radios were to supplement the number of portable radios received from Chester County as part of a radio system upgrade.

The department has a total of eight multi-gas meters that are deployed throughout their apparatus fleet. Each fire company is equipped with multi-gas combustible gas detectors. The multi-gas meter is a small, hand-held device that can detect natural gas, CO, and oxygen depleted environments that allow firefighters to detect and monitor hazardous environments.

One area where the KVFD appears to be deficient with regard to its equipment maintenance and testing is on performing annual hose testing. Both NFPA and ISO mandate that all fire hose be tested on an annual basis. The MRI team was informed that the department generally only tests hose every two to three years. That testing is scheduled for 2016. The department should make this an annual practice; the same as it does for its pumps and ladders.

The MRI study team also noted that during one of our field visits the KVFD was conducting an auction for the sale of surplus saws of various types (Figure 4-30). We were informed that when the consolidation originally occurred there were 18 pieces of apparatus that were all equipped to varying levels. As the department has evolved and disposed of excess apparatus, it also developed an inventory of surplus tools and equipment. The department has kept the most up-to-date equipment, or that which is in the best condition, for its own use, and is gradually disposing of the rest through events such as this auction. The proceeds from the sale of this unneeded equipment is then reinvested back into the department for other needs.

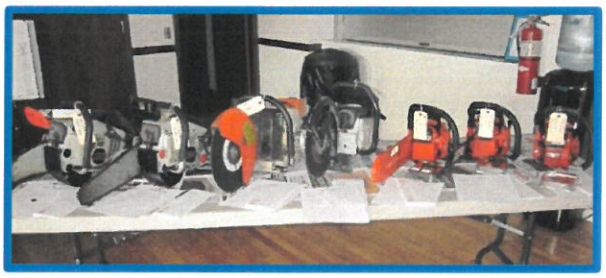


Figure 4-30: Surplus saws displayed for inspection prior to being auctioned off by the department.

Our review of apparatus pumping capabilities found that no apparatus had the capabilities of delivering compressed air foam on the fireground. Compressed air foam systems (CAFS) are a method by which a foam-producing agent and air are added to water, which creates a far more effective tool to extinguish fires. Equipment is available to retrofit most existing fire apparatus. The use of these foam systems in fire suppression has been well documented to reduce fire knockdown time by up to 78%, compared with the use of just water. This means that when using compressed air foam, firefighters are exposed to dangerous operating conditions for less time, and can operate at a safer distance from the fire.

CAFSs require about 15 gallons of water to achieve the same knockdown that 70 gallons of straight water achieve. This means that much less water is required with foam. This reduction in water translates into far less structural, smoke, and water damage, which are the typical kinds of damage sustained in a structure fire. Using a CAFS also reduces overhaul and cleanup operations because there is less damage and more evidence preserved for fire investigation.

In addition, it is well documented in the fire service each year that physical fitness and cardiovascular disease continue to be a leading contributor to line of duty injury and death for fire service personnel. CAFSs minimize the weight in these attack lines and thus lessen the physical strain placed upon personnel during limited staffing situations. This is a particularly important consideration for volunteer fire service organizations and personnel who may initially be deployed to structure fires.

RECOMMENDATIONS

4.6 The Keystone Valley Fire Department should continue to right size its apparatus and vehicle fleet to make it appropriate for the community, as well as provide increased efficiency in operations. Ultimately the department's apparatus and vehicle fleet should consist of:

- **1 - Standard engine**
- **1 – Rescue engine**
- **1 – Tanker engine**
- **1 – Quint**
- **2 – Ambulances**
  - ✓ **1 – Combination fire pumper/rescue/ambulance**
  - ✓ **1 – Standard ambulance**
- **2 – Command vehicles**
- **1 – Utility vehicle (pick-up truck)**

4.7 The Keystone Valley Fire Department should replace the current 1994 rescue engine and the 1999 pumper with a single, well-equipped, and organized rescue pumper that is outfitted with several sets of hydraulic rescue tools, air bags, and assorted hand, electric, and pneumatic rescue tools, along with scene lighting. It will also be able to function as a regular pumper with hose and water which will make it self-sufficient, particularly in minimum staffing conditions.

4.8 The Keystone Valley Fire Department should give consideration to equipping the new rescue pumper (and subsequent engines purchased) with a compressed air

foam system (CAFS) capability to improve fire knock down capabilities, especially in limited staffing conditions. Consideration could also be given to retrofitting Engine 8-2, Ladder 8, and Tanker 8 with CAFS systems to increase their operational effectiveness.

4.9 The Keystone Valley Fire Department should consider the sale of the following units:

- **2002 Ford utility**
- **2009 Chevrolet fire police unit (Completed during study)**

Once the new rescue engine is delivered:

- **1994 E-One rescue pumper**
- **1999 KME pumper**

The 1984 Chevrolet brush truck should be returned to the state. (Completed during study.)

4.10 The deployment of units at the Pomeroy/East station should be reduced to TAC 8 and Tanker 8 pending the completion of the new Parkesburg station. At that time, serious consideration should be given to decommissioning the Pomeroy/East station.

4.11 The Keystone Valley Fire Department should continue its excellent vehicle inspection and maintenance program that is coordinated through the chief engineer.

4.12 The Keystone Valley Fire Department should take steps to enhance their current program of hose testing in accordance with NFPA and ISO standards. All hose should be tested annually (at intervals no greater than 12 months). All tests conducted, results, including deficiencies noted, and any corrective action taken should be documented, and should be available in the department's data base and files.

4.13 Based upon its limited financial resources, the fact that most of its responses are EMS related, and the need to have the career personnel cross-staffed for both fire and EMS operations due to limited staffing particularly during the day, the KVFD should consider "out of the box' options such as the acquisition of a combination fire pumper and ambulance as utilized by Volusia County, Florida (Figures 4-31 and 4-32). The Volusia County units have the following features:

- **500 GPM fire pump**
- **300-gallon water tank**

- **30 gallon CAFS foam tank**
- **2 – 1 3/4" crosslays**
- **300' – 400' of 3" supply line**
- **Hurst rescue tools**
- **Full ALS capable ambulance box (156" length, 73" of headroom)**

If the KVFD were to purchase one of these units when it is time to replace the next ambulance, then the TAC/utility unit could be eliminated.

Figures 4-31 and 4-32: Front and rear views of combination fire pumper/rescue/ambulance unit utilized by Volusia County, Florida. Note: Volusia County will probably purchase four door units the next time to provide one additional riding position and additional equipment storage space.

Photo credits: Fire Apparatus Magazine

CAPITAL PLANNING

OVERVIEW

Capital infrastructure is essential to all communities. A Capital Improvement Plan (Program), or CIP, is a plan in government, usually 5 to 10 years in duration, which identifies major (capital) projects and equipment purchases, organizes long-term projects, provides a planning schedule, and identifies options for financing the plan. The plan serves as a mechanism for decision-making, to identify priorities early to allow for more deliberate planning of financial resources, and to communicate those long-range plans and needs to the jurisdiction's stakeholders and taxpayers. Service quality can only be maintained if governments are committed to keeping their capital assets in good condition.

Budgetary pressures often divert government resources away from capital renewal. At a time when many governments are challenged by citizen demands for additional or improved services and taxpayer resistance to higher tax levies to pay for these services, the capital budget is often the first to be cut in an effort to balance the budget. Careful planning is required to ensure that capital needs receive the full attention and commitment of government officials. A well-planned capital improvement program is a crucial tool to systematically plan for and manage capital needs. On-going service delivery can be assured only if adequate consideration is given to capital needs. If facilities and infrastructure are not maintained, they will deteriorate until costly maintenance is required, services are threatened, and community growth stagnates or declines.

A white paper developed by the Fire Apparatus Manufacturer's Association (FAMA) suggests that the front line life span of active duty fire apparatus in a suburban setting ranges from 16 to 19 years, with the possibility of an additional 9 to 10 years in a reserve, or spare status. The International City/County Management Association (ICMA) suggests that the life span of a fire pumper should be 20 years, and the life span of an aerial ladder should be 25 years.

One common recommended practice is to purchase one major piece of fire apparatus every 5 years. The goal of this strategy is to spread major purchases out over time in an effort to allow the governmental entity to maintain a consistent level of debt service. Regardless, the decision is left to each locality and represents a balancing of numerous factors: fire department activity levels, maintenance costs and history, individual vehicle reliability, funding availability, technological changes, firefighter safety, and vehicle use. Fire apparatus must be replaced before it becomes unreliable, but it must be held in service for as long as practical to maximize the benefit of the large initial investment from the community.

OBSERVATIONS

Prior to the consolidation of the various independent entities into the Keystone Valley Regional Fire District and Department none of the participants had a formal vehicle replacement or capital plan in place. Although Parkesburg appeared to be financially stable, the other initial partners where not. Unfortunately, a lot of these issues were not disclosed, and as a result, not discovered until after the consolidation had taken place. The end result of this is that Keystone Valley was initially saddled with a significant amount of debt.

Over the past three years the KVFD has worked to eliminate that debt, sell off surplus resources, and reinvest the revenue back into the department for its current and future needs. The product of these efforts is that the department now owns all the buildings and apparatus, with no mortgages or loans that are being backed by collateral. The final loan payment for apparatus, in the amount of $67,448.03, was made in 2015. The department is described now as being "heavy on assets with no debt". This will definitely have positive implications for the fire district and fire department moving forward. It is anticipated that beginning in 2017, the

KVFD will begin paying off a mortgage on the new Parkesburg Station of about $107,000 per year.

As was mentioned previously, in September 2016, the department was notified that they had been approved for a $2,500,000 United Sates Department of Agriculture, 40-year mortgage loan, at 2.375% interest for the new station. An 18-month construction loan will finance the actual construction costs, at which time the USDA loan will be provided. The 40-year term and very low interest rate will be very beneficial to the department in the form of much lower payments.

At the time of this assessment the KVFD does not a have formal capital, or vehicle replacement plan. However, the fire district does have two capital accounts that they maintain for the fire department, one for funding apparatus purchases, and the other for building needs.

We also recommend that the fire department establish a formal replacement plan for equipment. The regular replacement of large cost items such as hose, ladders, PPE, portable radios, and even SCBA on an incremental basis will avoid major one-time increases in the annual operating budget where such purchases should be funded. The life expectancy of these items can be estimated based on usage and manufacturer's recommendations. Items such as hose and ladders can remain in service indefinitely provided they successfully pass their annual tests. In this case, they can be replaced at the time the apparatus is replaced with a new vehicle.

RECOMMENDATIONS

4.14 The Keystone Valley Fire Department should implement the capital apparatus and vehicle plan contained in Figure 4-33, below.

FIGURE 4-33
RECOMMENDED APPARATUS CAPITAL REPLACEMENT PLAN

YEAR	APPARATUS/VEHICLE TO BE PURCHASED	APPARATUS/VEHICLE TO BE REPLACED	AGE OF VEHICLE	REPLACEMENT COST
2017	Rescue Engine	Rescue 8 – 1994 E-One Engine 8-1 – 1999 KME	22 Years 17 Years	$650,000
2018	None			
2019	None			
2020	Ambulance/Pumper	2008 Ambulance 2009 TAC	12 Years 11 Years	$500,000

Municipal Resources

YEAR	APPARATUS/VEHICLE TO BE PURCHASED	APPARATUS/VEHICLE TO BE REPLACED	AGE OF VEHICLE	REPLACEMENT COST
2021	Command 8	2006 Ford Expedition	15 Years	$55,000
	Utility Vehicle	New general use vehicle	N/A	$55,000
2022	None			
2023	None			
2024	Chief 8	2009 Chevrolet 4x4	15 Years	$60,000
2025	Engine	Engine 8-2 – 2001 Pierce	24 Years	$750,000
2026	Ambulance	2013 Chevrolet PL Custom	13 Years	$220,000
2027	None			
2028	None			
2029	None			
2030	None			
2031	Tanker	2006 Mack/4 Guys	25 Years	$750,000
2032	None			
2033	Ambulance/Pumper	2020 Ambulance/Pumper	13 Years	$600,000
2034	None			
2035	None			
2036	Command 8	2021 Command Vehicle	15 Years	$70,000
2037	Quint	2012 Pierce Quint	25 Years	$950,000
2038	None			
2039	Ambulance	2026 Ambulance	13 Years	$240,000
2040	None			
2041	None			
2042	Rescue Engine	2017 Rescue Engine	25 Years	$900,000

Municipal Resources

4.15 The Keystone Valley Fire Department should establish a formal replacement plan for fire and rescue equipment. The regular replacement of large cost items such as hose, ladders, PPE, portable radios, and even SCBA on an incremental basis will avoid major one-time increases in the annual operating budget.

4.16 The Keystone Valley Fire Department should negotiate to obtain additional capital vehicle funding for ambulances from Highland Township and Sadsbury Township since the department provides primary EMS services to 100% of both townships.

4.17 When making capital purchases, such as apparatus, the Keystone Valley Fire Department should explore the significant cost savings benefits that may be obtained by participating in cooperative purchasing consortiums such as Pennsylvania's COSTARS[12] program, or the Houston Galveston Area Council (H-GAC) Buy program (HGACBuy)[13] which is a government to government procurement service that is available nationwide.

[12] COSTARS is the Commonwealth of Pennsylvania's cooperative purchasing program and serves as a conduit through which registered and eligible local public procurement units (LPPUs) and state-affiliated entities (Members) are able to leverage contracts established by DGS to cost effectively and efficiently identify suppliers with whom to do business.

[13]The HGACBuy website states, "As a unit of local government assisting other local governments, HGACBuy strives to make the governmental procurement process more efficient by establishing competitively priced contracts for goods and services, and providing the customer service necessary to help members achieve their procurement goals. All contracts available to members of HGACBuy have been awarded by virtue of a public competitive procurement process compliant with state statutes."

Municipal Resources

CHAPTER 5

FIRE AND EMS OPERATIONS

OVERVIEW

Fire, rescue, and emergency medical system (EMS) incidents, and the fire department's ability to respond to, manage, and mitigate, them effectively, efficiently, and safely are mission critical components of the emergency services delivery system. In fact, fire, rescue, and EMS operations, provide the primary, and certainly most important, basis for the very existence of the fire department. Insuring that the department is operationally prepared; necessary equipment is provided, tested, inspected, and maintained; and that adequate funding is allocated to ensure that the department is able to fulfill its core mission, are basic responsibilities of the governing body of the municipality or municipalities that it serves. Utilization of an incident command system and adherence to safety procedures are also important pieces of the system.

As introduced in Chapter III, *Staffing, Recruitment and Retention*, 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,* 2014 edition (National Fire Protection Association, Quincy, MA), outlines organization and deployment of operations by volunteer/call, and primarily volunteer/call fire departments.

In addition to structural and other types of firefighting operations, the fire department is tasked with responding to and managing a broad spectrum of other types of emergencies, including, but not limited to, vehicle crashes, building collapse, water and ice rescue, mass casualty incidents, weather related emergencies, natural, and technological disasters. These types of incidents require specialized equipment and training, and in small communities are frequently handled by a regional team, or by a larger, more capable neighbor. In all types of emergency responses, an incident command system (ICS) should be utilized that conforms to the National Incident Management System (NIMS) guidelines that have been promulgated by the U.S. Department of Homeland Security. While firefighter safety is a primary focus throughout all operations, a formal component of the ICS program includes the consistent designation and use of an on-scene safety officer when appropriate.

OBSERVATIONS

The Keystone Valley Fire Department is fortunate to have a dedicated membership who strives to provide the best possible services to the community given the limitations and constraints, primarily from a time commitment standpoint, of a primarily volunteer fire department, in a growing community.

Municipal Resources

Fire Operations

Overall, the department appears to be well-trained, well-equipped, and generally well-prepared to serve the needs of the district that it protects. In fact, in our opinion, they probably do so more effectively and efficiently than a lot of other fire departments of comparable size and composition do. However, that does not mean they are without weakness, or areas where there could be significant improvement. Concerns include lingering personnel challenges related to the department's formation in 2013, poor relationship with some of their mutual aid partners, and extended response times associated with travel distances and staffing shortages. Certain aspects of the staffing issues are identified in Chapter III, *Staffing, Recruitment and Retention,* while others will be discussed in this chapter.

The strategic and tactical challenges that the various hazards the department protects need to be identified and planned for through a community risk analysis planning and management process as recommended in paragraphs 4.2 and 4.2.1, *Community Risk Management,* of National Fire Protection Association (NFPA) Standard 1720 – *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments* (2014 Edition). The need for a comprehensive risk assessment process was discussed in Chapter 2, *Community Risk Profile.*

Keystone Valley provides an interesting mix of challenges and hazards that must be protected by its fire department. While large portions of the district still reflect its traditional, primarily rural character, Parkesburg Borough and the areas around Routes 10 and 30 present a much different picture. These highways are home to several large shopping complexes. The Route 30 corridor is targeted for significant development over the next few years. The firefighting and emergency response challenges that confront firefighters in these types of structures and occupancies are much more complex, require more resources to mitigate, and are potentially more dangerous from a life safety perspective to both occupants and firefighters, than those usually found in single-family dwellings. In addition, the presence of these facilities/occupancies in the district creates increased traffic conditions, not only on in the vicinity of these complexes, but on other roads as well, as drivers attempt to avoid the occasional congestion found on the primary highways.

The Keystone Valley Fire Department is well-equipped to respond to a wide variety of emergency incidents. As with most communities in the United States, the primary focus of firefighting operations is on fires in residential occupancies (single- and two-family dwellings, multi-family units, etc.) due to the high potential for loss of life. Firefighting in commercial occupancies is extremely important to the economic well-being of the district and its member communities, but large commercial occupancies are often equipped with automatic fire suppression systems to reduce risk and damage from fire. Until Pennsylvania adopts a progressive rather than regressive fire code that mandates the installation of residential fire sprinkler systems, and over time, they become much more widespread as a critical lifesaving

feature in a high percentage of homes, the fire department will continue to be the only "front-line" resource available for firefighting and rescue.

Despite its growing commercial base, the department does not have any type of pre-fire/incident planning program, which is one of the most effective tools the fire department has to assist them with handling fires and other emergencies in these facilities. Paragraph 5.5.1 of NFPA 1720 states, *the fire department shall set forth operational guidelines to conduct pre-incident planning*, while paragraph 5.5.2 states, *particular attention shall be provided to target hazards.*

The purpose of a fire pre-planning program is to allow firefighters to become familiar with buildings and/or facilities within their response area prior to an emergency, alert them to on site hazards and risks, and develop a detailed fire response plan for them that includes specific tactics that will be required to mitigate fires or other emergencies. Information collected for pre-fire/incident plans include, but is certainly not limited to, data such as:

- the occupancy type;
- floor plans/layouts;
- building construction type and features;
- fire protection systems (sprinkler system, standpipe systems, etc.);
- utility locations;
- hazards to firefighters and/or firefighting operations;
- special conditions in the building;
- apparatus placement plan;
- fire flow requirements and/or water supply plan; and
- forcible entry and ventilation plan.

The information contained in pre-fire/incident plans allows firefighters and officers to have a familiarity with the building/facility, its features, characteristics, operations, and hazards, thus enabling them to more effectively, efficiently, and safely conduct firefighting and other emergency operations. Pre-fire/incident plans should be reviewed regularly and tested by periodic table-top exercises and on-site drills.

The KVFD currently operates from two stations (figure 4-1). The central station which serves as the department's main base of operations and headquarters is located at 329 West First Avenue in Parkesburg. The east station is located at 1918 Valley Road in the Pomeroy section of Sadsbury Township. The department previously had a west station in Atglen Borough, but that station was closed approximately two years after the formation of the KVFD. The department ultimately sold this station.

The Parkesburg station is centrally located within the borough and is relatively centrally located within the fire district area as a whole. The Pomeroy station on the other hand, is situated literally on the fire district border (Figures 5-2 and 5-3). As the regional department is currently configured, it serves no real operational purpose to the KVFD other than to attempt to ensure that the Sadsburyville Fire Company does not try to expand its territory at the expense of current residents of the fire district. As figure 5-4 illustrates, both the Sadsburyville station, and the Westwood station in Valley Township, are within a 1.5-mile radius from the Pomeroy station. Conversely, the Sadsburyville station, if it was to be integrated into Keystone Valley, and in conjunction with the Parkesburg station, could just as adequately protect the district that is now served by the Pomeroy station, with the exception of a small area of Highland Township. Together, the Parkesburg and Sadsburyville fire stations would provide the best, most cost-effective service to Sadsbury Township as a whole.

FIGURE 5-1
CURRENT FIRE STATION LOCATIONS

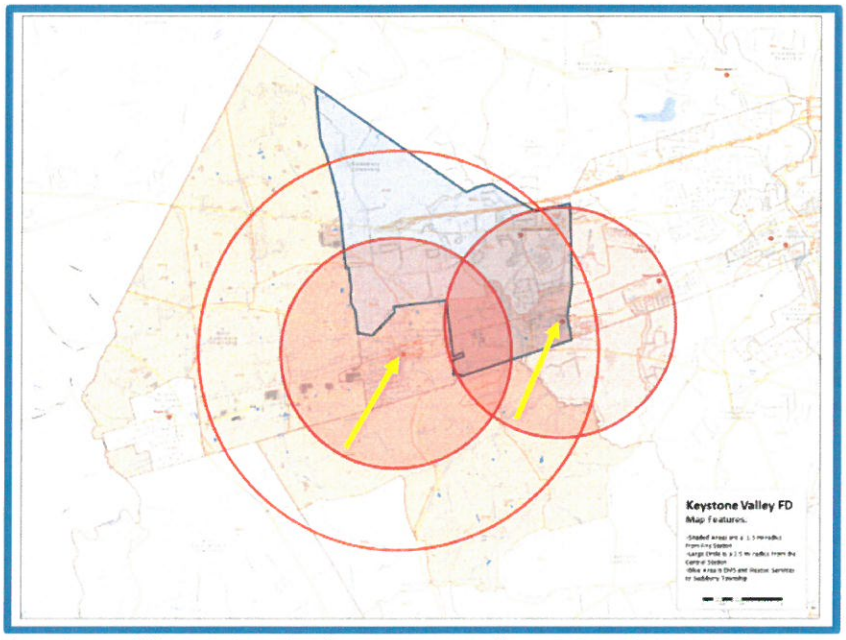


Figure 5-1: Current locations of fire stations in the Keystone Valley Regional Fire District area. Parkesburg station is indicated by the red dot and yellow arrow on the left, and the Pomeroy station by the red dot and yellow arrow on the right. The small red circles indicate the ISO 1.5-mile travel distance recommendation for engine companies. The larger red circle denotes the 2.5-mile travel distance for the ladder, which responds from the Parkesburg station.

Municipal Resources

Figure 5-2 (left) and 5-3 (right): Both of these photos were taken from the Pomeroy fire station property. The red arrow in the photo on the left points to townhouses that are not in the Keystone Valley Regional Fire District, but rather in Valley Township, served by the Westwood Fire Company. It was reported to the study team that during a fire in this complex, the Pomeroy station was never dispatched. The red arrow in the photo on the right points to a home that is located in East Fallowfield Township, also not in the Keystone Valley Regional Fire District.

FIGURE 5-4
CURRENT FIRE STATION LOCATIONS INCLUDING SADSBURYVILLE

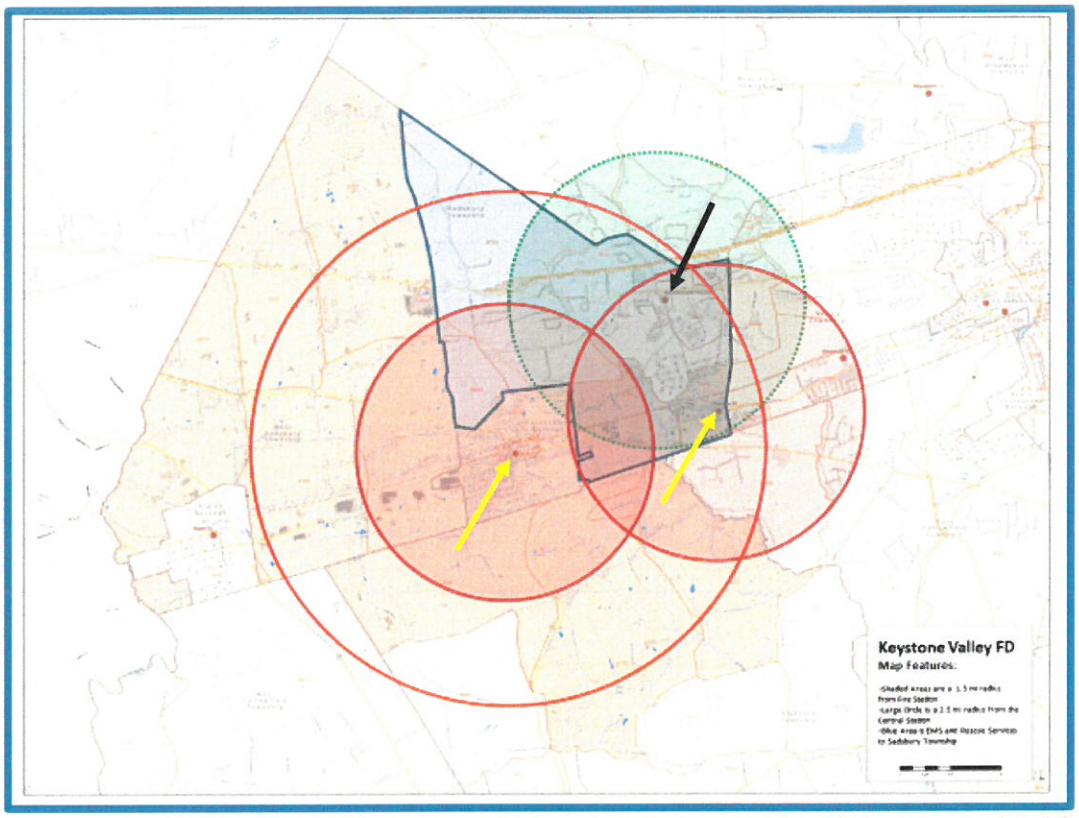


Figure 5-4: Current fire station locations include Parkesburg and Pomeroy with yellow arrows and Sadsburyville with a black arrow.

Although the Keystone Valley Fire Department does not provide primary fire protection to all of Sadsbury Township, the operational function provided by the Sadsburyville station is limited to basic engine operations. Keystone Valley provides the all-important ladder responses to the full township. The ladder companies on structure fires are the units and personnel responsible for performing forcible entry, laddering the upper floors and roof of buildings, performing search and rescue for trapped occupants, ventilating the fire building, and controlling utilities. Without these critical tasks being performed, the engine companies (Sadsburyville) will often be unable to perform their duties effectively, efficiently, or safely. The ladder responding from the Parkesburg station provides response within the recommended 2.5-mile radius, for all of Sadsbury Township, except small areas in the northeast and northwest corners. The KVFD also performs often life critical vehicle extrication and other rescue operations for all of the township, as well as providing all basic emergency medical services.

Although the leadership of the Sadsburyville Fire Company declined to speak with the MRI study team regarding this study, we do not see any reason why the fire company and the remainder of Sadsbury Township should not be integrated into the Keystone Valley system. The township already relies heavily on the KVFD for multiple emergency services functions that the township's other fire company does not provide. The township should not allow small town politics and/or the protection of traditional territorial fiefdoms to interfere with the provision of the most cost-effective emergency services possible.

West Sadsbury Township, while still extremely rural in nature, is poised to experience significant growth in the coming years. At the present time, most of the township is well outside of the 1.5-mile travel distance from the Parkesburg station. While not really a significant issue at the present time due to a low volume of calls, increased development, particularly large or high density projects, will most certainly result in increased incident volume of all types. This will be particularly true if a new full service hospital is constructed within the township. Most of the development would be expected along the Route 30 corridor.

Figure 5-5: Example of a small station that could serve as a west station for the KVFD serving West Sadsbury Township with an engine and an ambulance.

While perhaps a decade or more away, so in the latter years of the accompanying strategic plan (if not later), the Keystone Valley Fire Department will need to seriously analyze the need for a new station along the Route 30 corridor in West Sadsbury Township. While many factors will impact the exact site, for the sake of discussion, in the vicinity of Blackhorse Road would appear to be a good location. Should the new hospital be constructed, there might be an opportunity for a public/private partnership for construction of the needed station. We would envision the station being a small station, housing an engine and an ambulance (Figure 5-5).

Figure 5-6 shows the improved coverage that would be provided by the KVFD to Parkesburg, Sadsbury, and West Sadsbury with this configuration of three stations. Highland Township is anticipated to remain primarily rural, with little significant growth, so there is no justification for additional resources to be deployed there as it would not be cost effective. As a rural township, it is reasonable that there will be longer travel distances and thus longer response times to emergency incidents.

FIGURE 5-6
OPTIMAL LONG-TERM STATION LOCATIONS

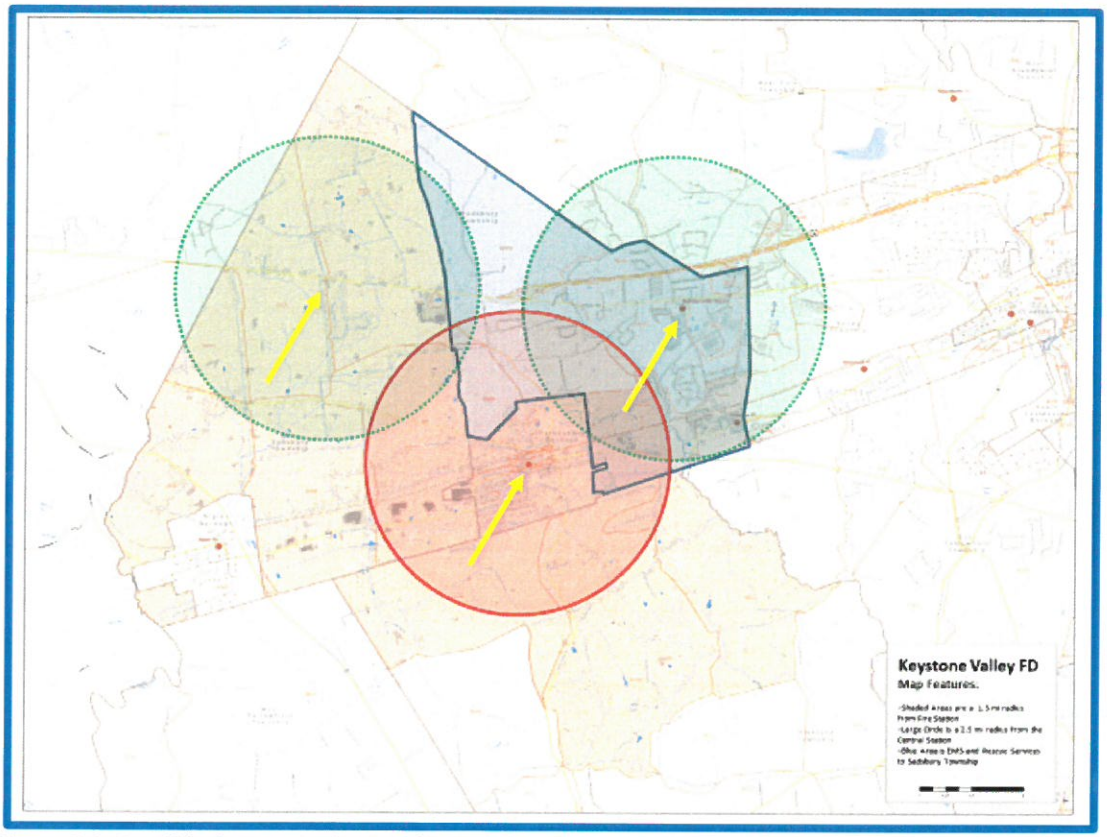


Figure 5-6: Possible future station configuration with Parkesburg, Sadsburyville, and a new station in West Sadsbury, along the Route 30 corridor.

One area that would ultimately significantly impact any decision on a new "west" station in West Sadsbury is the availability of volunteer personnel to staff it. The MRI study team was informed that virtually no current members of the KVFD live in that area. This will be an area where the department will want to focus recruitment efforts in an attempt to get new members who live in this area. These efforts should be ongoing and target both current residents, as well as new people who might move into any new residential developments.

The Keystone Valley Fire Department does have an Incident Management System (IMS) in place, and from most accounts it is effective and is utilized on most incidents. Use of an IMS is mandated by federal regulations, as well as numerous other regulations and standards. It is imperative that the Incident Commander (IC) exercise overall command and control to insure the proper coordination of incident operations, which prevents freelancing, and competing/dangerous strategies and tactics being employed. It was reported that this is generally the case in Keystone Valley.

A critical component of ICS is the establishment of the role of safety officer to monitor conditions at an incident scene to ensure that appropriate safety procedures are being followed. The Keystone Valley Fire Department appears to have a strong safety culture. It was reported to the team that, when necessary, a safety officer is usually assigned to an incident. The department does have an accountability system that appears to work and be effective. It is imperative that officers lead by example, as this sets the tenure for the entire safety culture of the department.

Being able to develop an adequate water supply for firefighting purposes is perhaps the most critical, non-safety aspect of firefighting operations. Quite simply, if an adequate water supply cannot be established quickly, and maintained, effective firefighting operations will simply not be possible. Only part of Keystone Valley Fire Department's area, primarily Parkesburg Borough and Sadsbury Township where significant development is occurring, is protected by a municipal water supply system. The operational challenges associated with establishing effective rural water supply operations due to equipment and personnel needs can be significant and in many cases requires the response of a large contingent of resources from multiple fire companies.

The MRI study team noted that the Keystone Valley Fire Department has limited specialized operations capabilities. There are a number of valid reasons for this, and the situation here is in fact quite common with smaller, volunteer fire departments that do not have the resources, or personnel, to undertake these types of endeavors. Specialized operations can include but are not limited to:

- Hazardous materials incidents
- Rope rescue including high angle
- Water and ice rescue
- Trench/collapse rescue
- Confined space rescue
- Urban search and rescue (building collapse)

The department has provided awareness, and in some cases, particularly with hazardous materials, operational level training to its personnel. More specialized, technical level resources to handle these rare, but dangerous types of incidents are available regionally through the Chester County fire service mutual aid and specialized operations systems.

Dispatch Protocols and Mutual Aid

At the time of this assessment, the Keystone Valley Fire Department is dispatched by and follows Chester County dispatch and response protocols. The county policy on emergency incident dispatch for fires is to initially dispatch the designated company or resources. If there is no response after four minutes, then the incident is dispatched again. If there is no response within an additional two minutes, then mutual aid resources are dispatched.

Over the past several years, the county has worked to significantly upgrade the fire and EMS radio and communications systems. All apparatus has recently been outfitted with new computers and have GPS capabilities.

Incidents are normally dispatched as a single dispatch or a hazard box. A single dispatch results in dispatch of Keystone Valley alone. Reported dwelling fires include 2 additional engines, 1 additional ladder, and 1 additional taker along with the KVFD. The response for hazard boxes which are for large buildings or other facilities with a life hazard concern is KVFD, Sadsburyville for engines, Cochranville for a rescue, Gap for a ladder, and Westwood for an ambulance. All structure fire incidents get a response of 2 basic life support (BLS) ambulances, and 1 advanced life support (ALS) unit. Mutual aid is also dispatched on the initial alarm for a rapid intervention team (RIT).

The KVFD response protocols seem reasonable provided they are achieved on a regular basis. If neighboring departments are dispatched and fail to respond, or if they respond with unqualified personnel, necessary staffing levels will not be achieved. The KVFD requires minimum staffing on apparatus of 2 personnel to correspond with the on-duty career staffing. It was reported to the study team that usually additional volunteer personnel will respond to supplement the career staff. The average response is reported to be 6 personnel. Units responding out of the district on mutual aid must have a minimum of 3 certified firefighters on board.

Keystone Valley has mutual aid agreements with all of its surrounding fire departments. It always operates within the framework of the Chester County emergency response system. The chief informed the MRI team that while the mutual aid agreements used to be written, they are now just verbal. Having just verbal agreements can lead to misunderstandings regarding the expectations of either or both parties to the pact.

Insurance Services Office

The Insurance Services Office's (ISO) Public Protection Classification (PPC) program evaluates communities according to a uniform set of criteria defined in the Fire Suppression Rating Schedule (FSRS). This criterion incorporates nationally recognized standards developed by the National Fire Protection Association (NFPA) and the American Water Works Association.

Every city, town, or area that provides fire protection services is subject to being graded to establish a PPC. Individual buildings, both residential and commercial, are subject to the community's PPC. When calculating property insurance premiums, insurance companies using the PPC apply a factor that reflects a particular community's PPC. Some individual facilities within a community may also be individually assessed and assigned their own specific rating.

A community and fire department's ISO rating may play a major role in determining the fire insurance rates that are paid by property owners in that community. The ISO rating system classifies fire departments from Class 1 to Class 9, with 1 being the best and 9 being the lowest. Many communities with limited or no municipal water supply systems are a Class 9. An ISO rating of 9 is a reflection of very limited fire protection in the community, thus resulting in potentially higher fire insurance premiums for both residential and commercial properties. However, despite the lack of widespread municipal water supply systems in the municipalities served by KVFD Parkesburg, Highland, and Sadsbury, all achieved ISO ratings higher than Class 9 (West Sadsbury's report was not available).

FIGURE 5-7
FOUR KEY PARTS OF ISO PPC EVALUATION PROCESS

Source: ISO

Although there may be validity to the argument that is often raised today, that this rating may no longer be utilized by all insurance companies that issue policies to industrial and commercial facilities within the communities that the KVFD serves, ISO is still recognized as a comparative benchmark of public fire protection. Moreover, within the past several years, ISO has

significantly revised its FSRS, and as a result changed the PPC, to reflect new innovations and technology, and the evolving standards and industry best practices within the fire service. Among these changes are:

- ✓ Greater reference to nationally accepted consensus standards; NFPA and AWWA.
- ✓ Increased recognition of automatic fire sprinklers.
- ✓ Greater reliance on technology-based solutions (e.g., GIS, thermal imaging cameras, etc.).
- ✓ Increased emphasis on fire training activities.
- ✓ New reference to national standard safety requirements.
- ✓ New reference to accreditation; Focus on master/strategic planning.

According to ISO, the PPC helps measure the effectiveness of fire protection and provides an important advisory evaluation to both insurers and communities. It is applied nationwide, and more than ever incorporates accepted national consensus standards. Broadly speaking, the cost of insurance premiums are generally lower, with better protection, which translates into lower losses; the cost is higher in areas that have lower levels of protection, which often translates into higher losses. Many insurers still rely on this information, at least partially, to set their fire insurance rates.

In April 2015, ISO concluded its most recent survey of Parkesburg Borough, and Highland, Sadsbury, and West Sadsbury Townships. Interestingly, all three municipalities for which the reports were available received different scores and ultimately classifications. In Pennsylvania, each township is still evaluated individually by ISO rather than, in this case, as well as others, the evaluation being conducted by the KVFD's protection area. It is unclear whether this is a Pennsylvania regulation, ISO procedure, or if it is because both Highland and Sadsbury Townships are also protected by other fire departments besides Keystone Valley.

For this most recent evaluation, the areas where the municipalities were the weakest and consequently lost the most points, was for deployment analysis, company personnel, training, and water supply. For instance, Highland Township earned none of 10 possible points for deployment analysis.

For company personnel, Parkesburg earned just 3.44 points out of 15 possible. Sadsbury earned 7.64, while Highland earned 4.29. Earning less than ¼ to less than ½ of the available points for company personnel is attributable to the fire departments being fully volunteer and not having

any fire personnel regularly staff the station. The cross utilization of the career staff, supplemented by implementation of duty crews, could help increase the points awarded for this aspect of operations.

For the important training function, Parkesburg received just 3.99 of the 9 available points, Sadsbury 3.55, and Highland 3.61. While we will acknowledge that some ISO targeted hours of training are considerable, particularly for volunteer personnel, there are certainly areas that could be improved upon within the context of the overall training program.

FIGURE 5-8
ISO CLASSIFICATION COMPARISON
KEYSTONE VALLEY MUNICIPALITIES

	PARKESBURG BOROUGH	HIGHLAND TOWNSHIP	SADSBURY TOWNSHIP
Credit Available – Emergency Communications	10	10	10
Credit Earned – Emergency Communications	7.91	7.91	7.91
Credit Available - Fire Department	50	50	50
Credit Earned – Fire Department	31.66	22.66	33.96
Credit Available – Water Supply	40	40	40
Credit Earned – Water Supply	17.73	14.07	28.46
Credit Available - Community Risk Reduction	5.5	5.5	5.5
Credit Earned – Community Risk Reduction	2.77	.83	1.10
TOTAL POSSIBLE POINTS AVAILABLE	105.5	105.5	105.5
TOTAL POINTS EARNED	56.27	43.44	70.78
ISO PPC RATING	CLASS 5/5Y	CLASS6/6Y	CLASS 3/3Y

Many communities, including all those in the Keystone Valley Regional Fire District, develop split classifications. An example of the split classification is the 3/3Y for Sadsbury Township. The first number refers to the classification of properties within 5 road miles of a fire station, and within 1,000 feet of a creditable water supply. The second number, the Y designation, applies to properties within 5 road miles of a fire station, but beyond 1,000 feet of a creditable water supply.

It is our belief that with the implementation of recommendations within this report and the accompanying strategic plan, along with other changes that Keystone Valley and its participating municipalities can implement internally that may not be specifically identified,

that the various entities should be able to achieve an improved ISO rating. If possible, the Keystone Valley Fire Department should attempt to get ISO to recognize and rate their department and district.

EMS OPERATIONS

OVERVIEW

Emergency Medical Services (EMS) operations are an important component of the comprehensive emergency services delivery system in any community. Together with the delivery of police and fire services, it forms the backbone of the community's overall public safety life net. In fact, as a percentage of overall incidents responded to, it could be argued that EMS incidents constitute the greatest number of "true" emergencies, where intervention by trained personnel does truly make a difference, sometimes literally between life and death.

NFPA 450 *Guidelines for Emergency Medical Services (EMS) and Systems*, 2013 edition (National Fire Protection Association, Quincy, MA), provides a template for local stakeholders to evaluate an EMS system and to make improvements based on that evaluation. The Commission on Accreditation of Ambulance Services (CAAS)[14] also promulgates standards that are applicable to their accreditation process for ambulance services. The Commonwealth of Pennsylvania regulates EMS agencies, and certain federal Medicare regulations are also applicable.

Heart attack and stroke victims require rapid intervention and care, and transport to a medical facility. The longer the time duration without care, the less likely the patient is to fully recover. Numerous studies have shown that irreversible brain damage can occur if the brain is deprived of oxygen for more than 4 minutes. In addition, the potential for successful resuscitation during cardiac arrest decreases exponentially with each passing minute that cardio-pulmonary resuscitation (CPR) or cardiac defibrillation is delayed.

OBSERVATIONS

The Keystone Valley Fire Department provides emergency medical services (EMS) response at the basic life support (BLS) level to all of Parkesburg Borough, Highland, Sadsbury, and West Sadsbury Townships. Coverage is provided 24/7 by a 2-person career crew who are deployed from the Center/Parkesburg station. The department is a licensed EMS provider through the Pennsylvania Department of Health. Although there are a number of volunteer members of the department who are certified as Emergency Medical Technicians (EMTs), only a few will actually pick up ambulance shifts. Since all of the career personnel are part-time scheduling, to make sure all shifts are full, presents the department with ongoing challenges.

[14] The Commission on Accreditation of Ambulance Services (CAAS) is an independent commission that established a comprehensive series of standards for the ambulance service industry.

The department operates two, well-equipped, and maintained ambulances. Since many of the career staff are cross-trained for both fire and EMS, both ambulances carry self-contained breathing apparatus (SCBA) and some basic firefighting forcible entry tools.

Advanced life support (ALS) response for more serious incidents, such as cardiac emergencies, is provided by Southern Chester County, Jennersville Hospital, and Brandywine Hospital. The ALS personnel respond in "chase" vehicles and can meet the ambulance either on the scene or intercept them while enroute to the hospital. The paramedics can then begin to provide potentially life-saving advanced medical interventions and treatments.

Since many of the career staff is cross-trained for fire, the KVFD will split the EMS crew for fire responses if only one of the crew is a certified firefighter. If both personnel are certified firefighters, they will abandon the ambulance for the fire apparatus. All hands or working fire incidents receive a response of 2 BLS ambulances and 1 ALS unit. One BLS unit is utilized as standby for transporting any injuries to the hospital; the other unit assists with on scene rehabilitation for emergency responders.

The vast majority of the EMS incidents are handled by the on-duty career staff. However, there are a growing number of times where there are simultaneous, or overlapping, incidents. The growth within the townships that it serves is one reason for this increase. However, another is the distance to the hospitals when patient transport is necessary. It was reported to the study team that the average EMS incident, that involves transporting to the hospital, takes between one and two hours. The closest hospital involves a 24 mile round trip, while several others, where patients are frequently transported to, are 50 to 60 mile round trips.

Paoli Hospital and Lancaster General Hospital are the closest trauma centers. Patients are usually transported by ground to these facilities rather than using medical helicopters.

Overall, the EMS operations appear to be relatively well run and managed. There are procedures in place that cover various aspects of EMS operations. The department has a very proactive medical director who provides QA monitoring, quarterly EMS training, and clinical consults when needed. The EMS manager and career staff supervisor work collaboratively to oversee the day-to-day aspects of the EMS operations and the career staff.

The department has investigated the possibility of upgrading the level of service they provide from the BLS level to ALS. While there are obvious benefits to it from a patient care perspective, they do not believe that it makes fiscal sense. In fact, with the changes in insurance reimbursements brought about the Affordable Care Act (ACA), a growing number of EMS providers are looking to get out of the ALS business. Increasingly, private insurance companies and the government have reduced (or are considering reductions in) reimbursement rates, and are becoming more reluctant in general, to compensate departments for the full cost of

emergency room transportation fees, especially for non-emergency treatment. Communities that provide EMS transport services are therefore facing pressure on their transport revenues.

Mobile Integrated Health Care and Community Paramedic (MIH/CP) presents a possible solution to some of these problems. Mobile Integrated Healthcare is defined by the National Association of EMTs (NAEMT) as "*the provision of healthcare using patient-centered, mobile resources in the out of hospital environment.*" It can be provided through community paramedicine programs, which are programs that use EMTs and paramedics to provide this out-of-hospital health care. MIH/CP programs can help facilitate more appropriate uses of emergency care resources, and enhance access to primary care, particularly for underserved populations, by focusing on chronic disease management, post-discharge follow up, and transport to non-emergency care settings.

The benefits of MIH/CP are therefore two-fold. These programs could potentially help provide more appropriate health care to community residents, and if reimbursement arrangements can be agreed upon, also offer a substitute funding stream, separate from emergency transport, for community based EMS transport programs. Although this type of program has apparently been studied locally and determined to not be feasible or viable at the present time due to a high possible liability, this is an opportunity that the Keystone Valley Fire Department should continue to explore and consider.

One area of concern for the MRI team is the KVFD EMS "turnout" time, that is the time from when the incident is dispatched until a unit is actually responding. It was reported to the team that this time is generally between one and two minutes. Data provided to the team showed that is actually averaged two minutes, thirty-three seconds (00:02:33) in 2014. It decreased somewhat to two minutes, eleven seconds (00:02:11) in 2015. Either of these times are unacceptably long for personnel in a staffed station to turn out. NFPA 1710 recommends a turnout time of 60 seconds from dispatch to response. With today's continually increasing traffic, the only place that emergency services providers can generally make up time is in the station during their turnout.

DEMAND FOR SERVICE

One of the best ways to get a broad overview picture of an emergency services provider is to look at and analyze their emergency response/incident statistics. Looking at statistical data that is compiled from incident reports will assist with determining the adequacy of current operations, as well as identify trends in responses (i.e., increasing vs. decreasing, changing types of incident requests, increasing response times, frequency of simultaneous incidents, etc.). Utilizing current trends to help predict future ones, while not an exact science, can be helpful to communities and fire departments in predicting and planning for future operational needs. However, as with any other type of statistical analysis, the information that is analyzed is only as good and/or reliable as the data that was originally entered and has been provided for

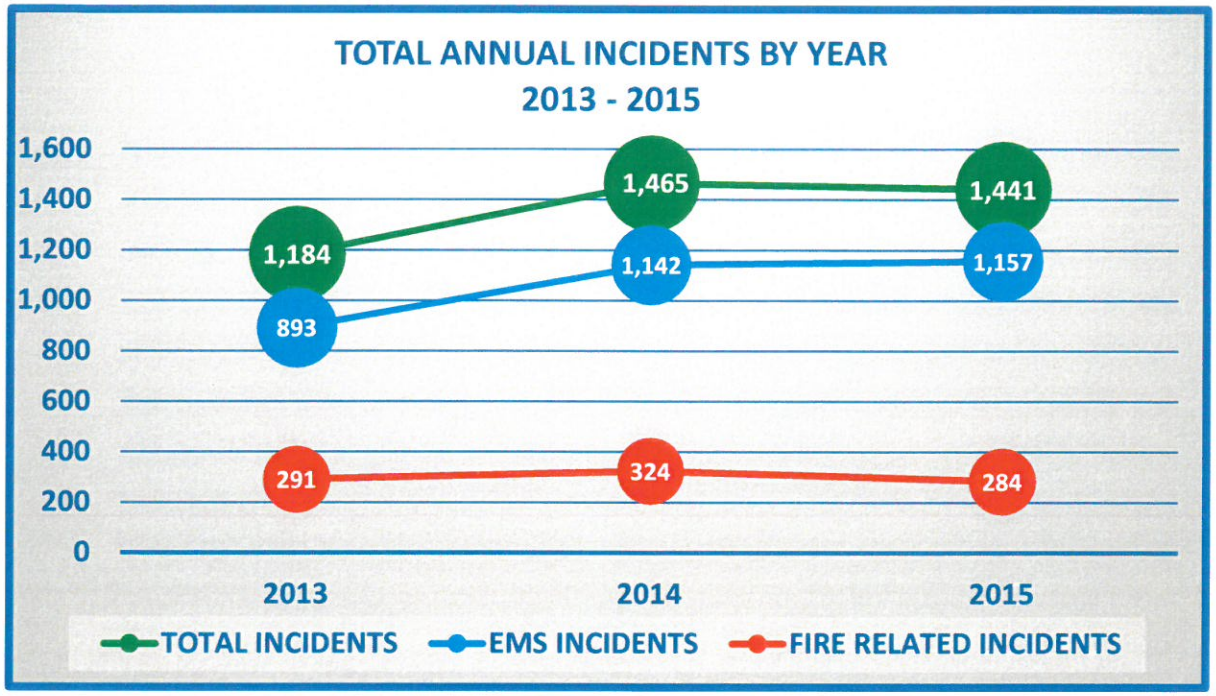
evaluation. The data that was analyzed for this report was provided to the MRI study team by the Keystone Valley Fire Department and covers the period from the department's formation in 2013 through 2015.

During the three-year period from January 1, 2013, through December 31, 2015, the Keystone Valley Fire Department responded to a total of 4,090 emergency requests for assistance, an average of 1,363 per year, or 3.7 per day. This includes both fire related and emergency medical incidents (figure 5-9). The number of EMS incidents has increased each year from a low of 893 in 2013, to a high of 1,157 in 2015. There was an increase of 249 incidents (27.9%) from 2013 to 2014, but just 15 incidents (1.3%) from 2014 to 2015. For fire incidents, the numbers were less consistent, increasing from 291 in 2013, to 324 in 2014, an increase of 33 (11.3%), before decreasing by 40 (12.3%) to 284 in 2015 (figure 5-10). Nationwide statistics, and the ongoing residential and commercial development occurring in the district, would suggest that these incidents will continue to gradually increase from year to year.

FIGURE 5-9
KEYSTONE VALLEY FIRE DEPARTMENT INCIDENT TOTALS 2013 - 2015

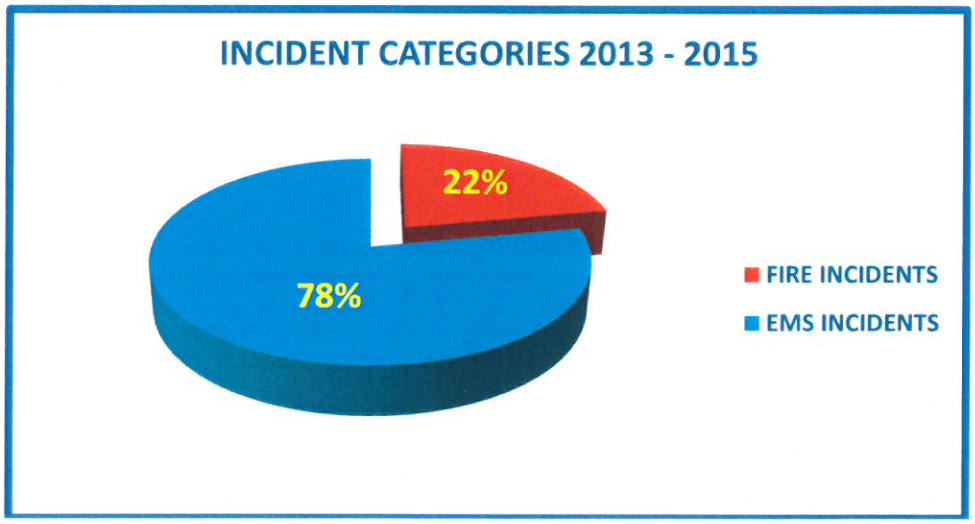
YEAR	TOTAL EMERGENCY INCIDENTS	AVERAGE PER DAY	EMS INCIDENTS	AVERAGE PER DAY	FIRES & OTHER INCIDENTS	AVERAGE PER DAY
2013	1,184	3.2	893	2.4	291	0.8
2014	1,465	4.0	1,142	3.1	324	0.9
2015	1,441	3.9	1,441	3.9	284	0.8
AVERAGE	4,090	3.7	3,476	3.2	899	0.8

FIGURE 5-10



As is the case with virtually all fire departments which provided EMS services, nearly four out of five requests for service are medical related (Figure 5-11).

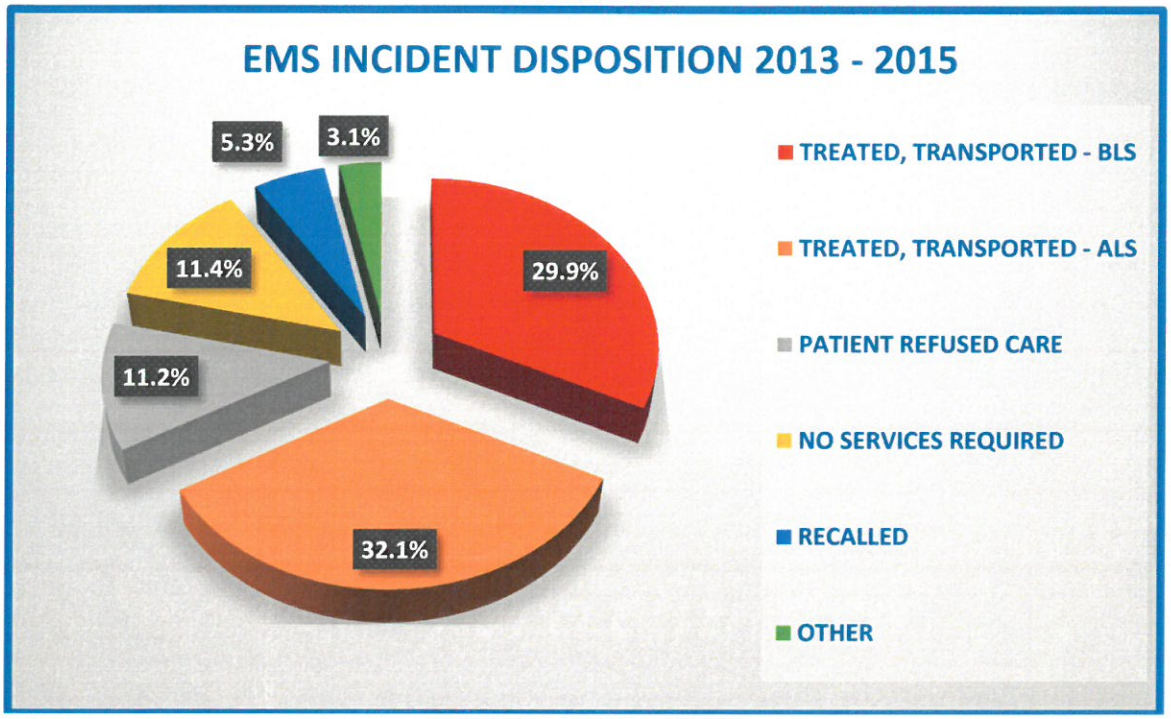
FIGURE 5-11



Municipal Resources

The KVFD's EMS reporting data base includes about 50 different incident classifications that have occurred over the past three years, some occurring on a regular basis, while others occur much less frequently. However, we can break the incidents down into seven broad categories relative to the final disposition of the incident/patient (Figure 5-12).

FIGURE 5-12



NOTE: Does not equal 100%

The study team did note that a larger percentage of patients who were treated and transported were classified as ALS rather than BLS. In most cases ALS incidents account for about 30% to 35% of incidents to which EMS responds. Although the BLS/ALS ratio was nearly even in 2013 and 2014, which is still higher than normal, the proportion increased significantly in 1025 when 96 more ALS patients were treated and transported than BLS. This increase corresponds to the opening of the Penn Medicine outpatient and urgent care center on Route 10 near Route 30. This facility has created a significant increase in EMS service requests. In fact, there have been some discussions regarding stationing an ambulance at that facility during times of high usage to relieve the burden from the on-duty EMS unit.

Every emergency services organization periodically experiences simultaneous, or overlapping, incidents. Whether they are handled by that department themselves, or through automatic/mutual aid, provisions need to be made to ensure that these incidents are handled effectively, efficiently, and in a timely manner. However, as the number of simultaneous, or overlapping, incidents increases, that community and/or department can no longer rely on their neighboring communities/departments to handle an ever increasing percentage of their

Municipal Resources

incidents. The study team was informed that "dropped" EMS calls were becoming an increasing problem for the department. From January through May 2016, the KVFD was unable to handle a total of 51 EMS incidents, which equates to about ten per month. This number also equates to 10.5% of 496 EMS incidents during this time, so one in ten. Eighty percent (80%) of the dropped calls occur from 0600 to 1800, when most of the volunteer personnel would be at work and most likely unavailable to respond. This is an area the department will need to begin making contingency plans to enhance its ability to handle these incidents.

The KVFD's requests for service are spread throughout all of the municipalities that the department serves. In addition, as with any robust emergency response system, the department periodically responds on mutual aid, both EMS and fire, to a number of neighboring communities (Figure 5-13).

FIGURE 5-13
KEYSTONE VALLEY FIRE DEPARTMENT INCIDENT RESPONSES BY MUNICIPALITY

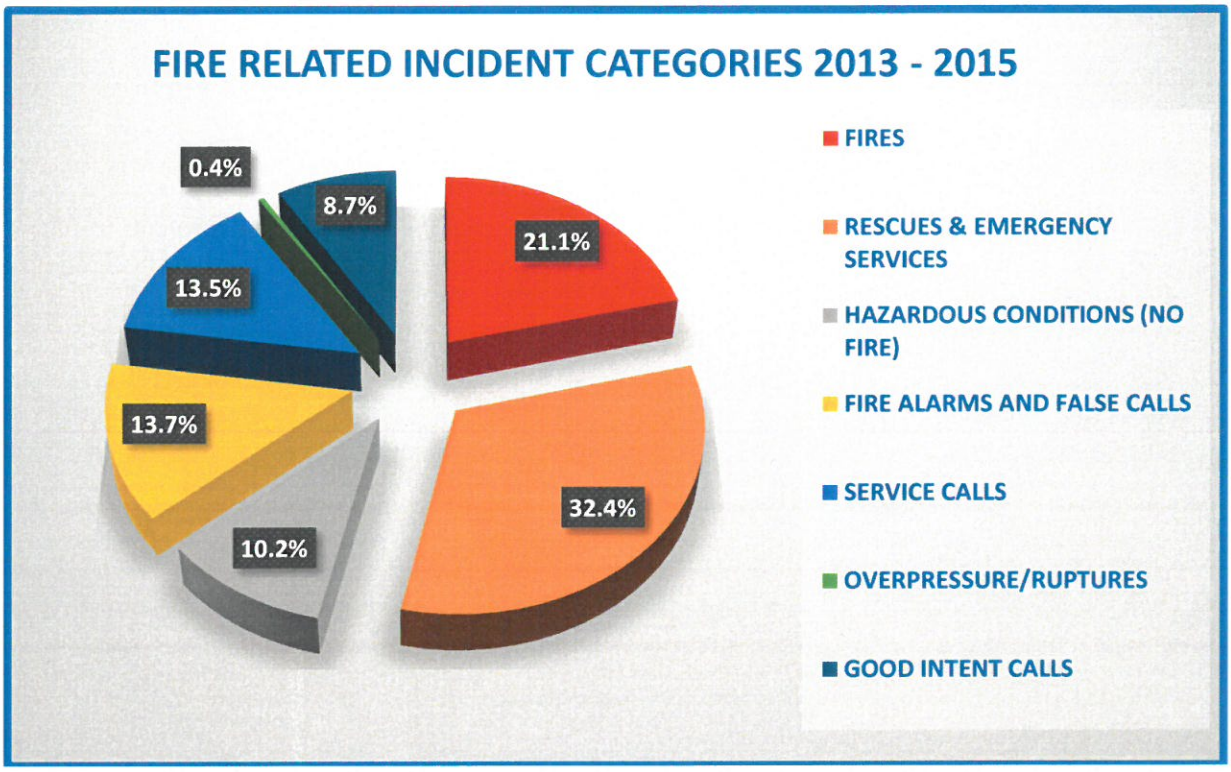
	EMS CALLS 2013	FIRE CALLS 2013	EMS CALLS 2014	FIRE CALLS 2014	EMS CALLS 2015	FIRE CALLS 2015
PARKESBURG BOROUGH	428	27	548	85	451	79
HIGHLAND TOWNSHIP	26	13	61	26	77	21
SADSBURY TOWNSHIP	140	31	298	63	355	48
WEST SADSBURY TOWNSHIP	52	37	140	78	197	79
MUTUAL AID	39	31	81	72	76	57

For actual fire incidents, the statistical sample for departments such as Keystone Valley is generally quite small. Usually, per NFIRS protocols, the category for "Fire Incident" must be an actual fire situation, that in many, but not all, situations caused some type of damage. Many of the incidents that are classified under other types of incidents were also probably initially dispatched as some type of fire incident, but ultimately were classified otherwise, for reporting purposes, based upon the situation actually found at the scene. From 2013 through 2015, the department responded to a total of 158 actual fire incidents, an average of 53 per year, or slightly more than one per week. Actual fires accounted for 21.1% of the department's total responses during these years (Figure 5-14).

Fire departments respond to many other types of incidents that may or may not be fire related. These types of incidents frequently constitute the largest number of fire department responses and each must be treated as an emergency. In the case of automatic fire alarm systems, the incident must be treated as a potential actual fire until such time as a trained and qualified emergency responder arrives on the scene and determines otherwise. Other incidents, such as

fuel or chemical spills, create other dangers and hazards to people, property, and the environment unless they are properly mitigated (Figure 5-14).

FIGURE 5-14

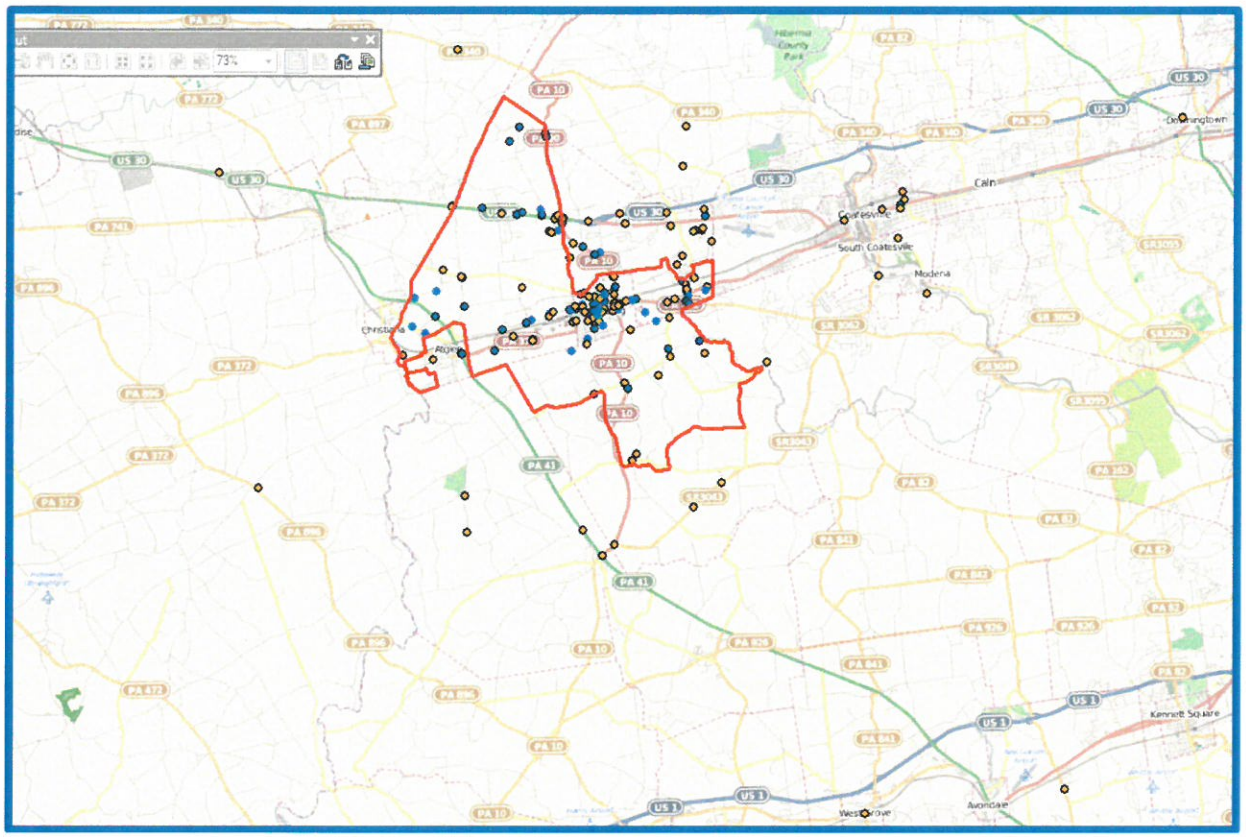


The KVFD experiences very few actual fire incidents each year which cause actual damage. In 2013, the department had just 3 fires that caused a total of $6,600.00 in damage. In 2014, there were 13 fire incidents which caused a total of $19,525.00 in damage, just 5.8% of the property valued at $337,325.00. In 2015, the department handled 11 actual fires which caused $919,300.00 in damage. However, $900,000.00 of this damage occurred in a single incident that also resulted in $739,900.00 in property saved. Another incident caused just $2,000.00 in damage in property valued at $175,000.00.

When the KVFD was first formed, the original fire district administrator had the capability to plot the location of all fires and other incidents on a map to better illustrate incident "hot spots" and better analyze demand for service statistics (figure 5-15). Having the ability to plot current incidents can better illustrate where incident activity is occurring and can assist with future planning and long-range resource need and deployment analysis. It can also be used to plot things such as the location of the residences of volunteer members of the department which can also assist with deployment analysis. The department has not had this capability since early 2015.

Municipal Resources

FIGURE 5-15
KEYSTONE VALLEY FIRE DEPARTMENT FIRE INCIDENT LOCATIONS 2014



STANDARDS OF COVER

OVERVIEW

The Commission on Fire Accreditation International defines "Standards of Response Coverage" (SOC) as being those adopted, written policies and procedures, that determine the distribution, concentration, and reliability of fixed and mobile response forces for fire, emergency medical services, hazardous materials, and other forces of technical response.[15] It is described as a "tool" to:

- assess community fire and non-fire risk
- define baseline emergency response performance standards

[15]https://www.iafc.org/files/1VCOS/sop_CPSE_CFAI_Standard_of_Cover_Template.pdf

Municipal Resources

- plan future station locations
- determine apparatus and staffing patterns
- evaluate workload and ideal unit utilization
- measure service delivery performance
- support strategic planning and policy development relative to resource procurement and allocation[16]

It is further noted that this process is totally reliant upon the accuracy and comprehensiveness of a local fire agency's needs, data, and policies.[17]

The community risk and vulnerability assessment evaluates the community as a whole, and with regard to property, measures all property and the risks associated with that property, and then segregates the property as either a high-, medium-, or low-hazard, which are further broken down into varying degrees of risk. According to the NFPA *Fire Protection Handbook*[18], these hazards are defined as:

High-hazard occupancies: Schools, hospitals, nursing homes, explosives plants, refineries, high-rise buildings, and other high life-hazard or large fire-potential occupancies.

- **Operations response capability:** At least 4 pumpers, 2 ladder trucks (or combination apparatus with equivalent capabilities), 2 chief officers, and other specialized apparatus as may be needed to cope with the combustible involved; not less than 24 firefighters and 2 chief officers, plus a safety officer, and a rapid intervention team. Extra staffing of high hazard occupancies is advised.

Medium-hazard occupancies: Apartments, offices, and mercantile and industrial occupancies, not normally requiring extensive rescue by firefighting forces.

- **Operations response capability:** At least 3 pumpers, 1 ladder truck (or combination apparatus with equivalent capabilities), 1 chief officer, and other specialized apparatus as may be needed or available; not less than

[16] http://www.iafc.org/associations/4685/files/downloads/CONFERENCES/FRI/FRI10/FRI10_spkrSeminar33-StandardsOfCoverBasic.pdf
[17] https://www.iafc.org/files/1VCOS/sop_CPSE_CFAI_Standard_of_Cover_Template.pdf
[18] Cote, Grant, Hall & Solomon, eds., *Fire Protection Handbook* (Quincy, MA: National Fire Protection Association, 2008).

16 firefighters and 1 chief officer, plus a safety officer, and a rapid intervention team.

Low-hazard occupancies: One-, two-, or three-family dwellings and scattered small business and industrial occupancies.

- **Operations response capability: A**t least 2 pumpers, 1 ladder truck (or combination apparatus with equivalent capabilities), 1 chief officer, and other specialized apparatus as may be needed or available; not less than 12 firefighters and 1 chief officer, plus a safety officer, and a rapid intervention team.

OBSERVATIONS

A comprehensive risk assessment of the Keystone Valley Regional Fire District has not been completed. MRI includes a basic assessment in Chapter II, *Community Risk Profile*. It should be emphasized that Keystone Valley enjoys a relatively low fire rate. The KVFD has not established a formal SOC for the district for either fire or EMS incidents.

From the perspective of effective emergency response, there are 3 main factors that are used to help determine the deployment of resources: response time, travel distance, and call volume. For most evaluations, response time is the most critical factor; an important measuring instrument to determine how well a fire department or EMS provider is currently performing, to help identify response trends, and to predict future operational needs. Getting emergency assistance to the scene of a 9-1-1 caller in the quickest time possible may be critical to the survival of the patient, and/or successful mitigation of the incident. Achieving the quickest and safest response times possible should be a fundamental goal of every fire department and EMS provider. It is not just a cliché that during critical life threatening situations, minutes and even seconds truly do count.

Structural firefighting has become far more challenging and dangerous in the last thirty years with 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. A fire can easily double in size and intensity every 30 seconds. If firefighters cannot arrive in a timely manner and attack the fire quickly, a strong possibility exists that a dangerous flashover (simultaneous ignition of the all combustible materials in a room) will occur.

Flashover can occur within five to seven minutes of fire ignition, and is one of the most dangerous events that a firefighter, or trapped civilians, can face. When a flashover occurs, initial firefighting forces are generally overwhelmed and will require significantly more

resources to affect fire control and extinguishment. For an urban community, NFPA 1720 recommends the entire initial response of 15 personnel be on scene within 9 minutes of dispatch. For suburban communities, they recommend 10 personnel on scene in 10 minutes, while in rural areas it is suggested that 6 personnel arrive within 14 minutes. It is important to note though that for rural incidents, particularly those with only 6 personnel, operations will pretty much be limited to those that are defensive in nature.

It is also important to keep in mind that once units arrive on scene they will need to get set up to commence operations. NFPA 1720 recommends that units be able to commence an initial attack within 2 minutes of arrival, 90% of the time. Figure 5-16 illustrates that flashover often occurs within about 8 to 10 minutes after the fire's inception. It also illustrates that the fire department's response time to the fire is one of the only aspects of the timeline that the fire department can exert direct control over.

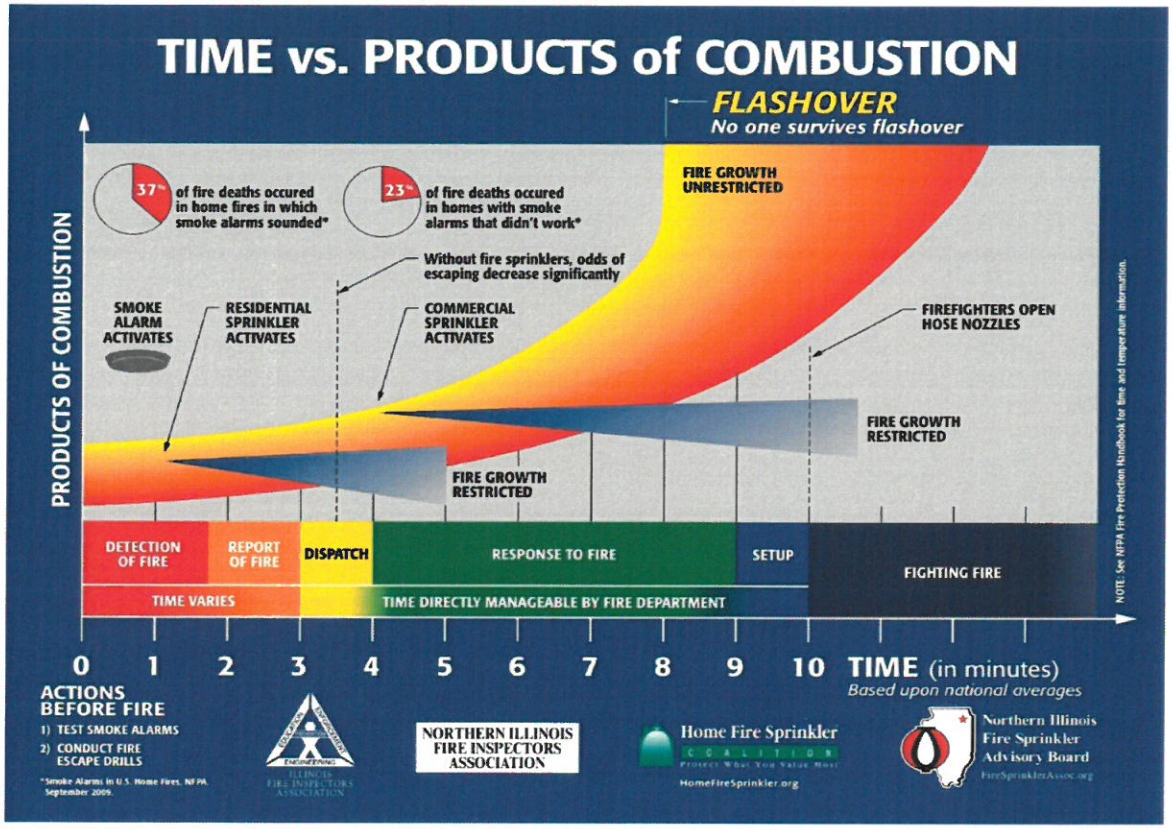


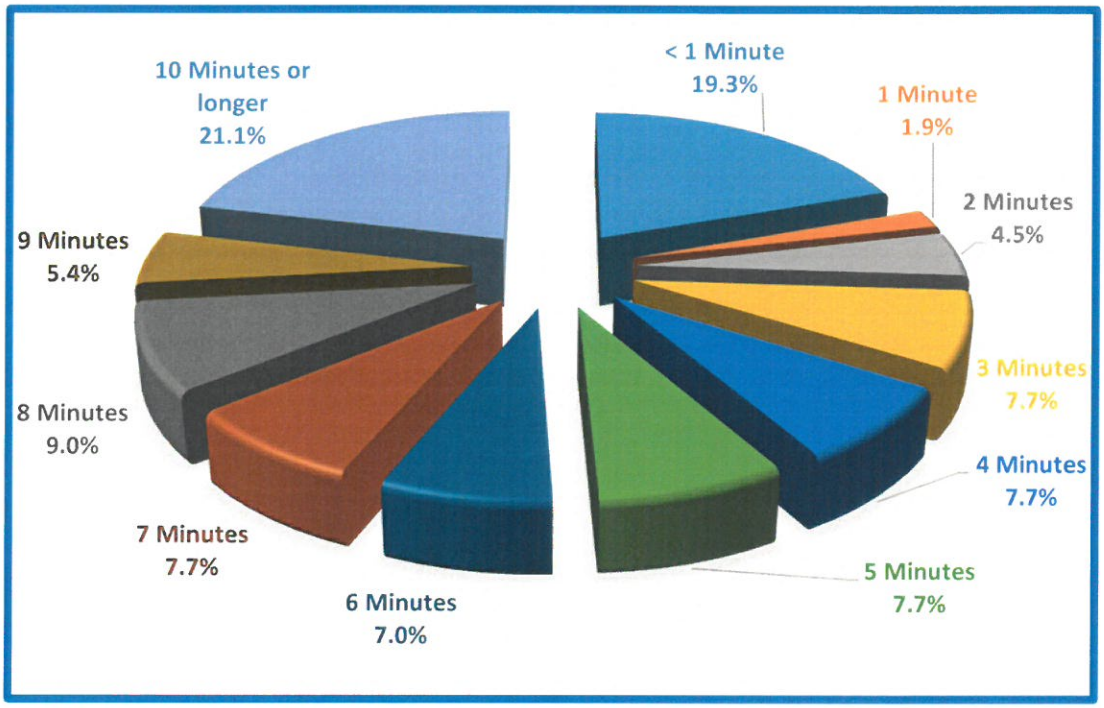
Figure 5-16: Time versus products of combustion curve showing activation times and effectiveness of residential sprinklers (approximately 1 minute), commercial sprinklers (4 minutes), flashover (8 to 10 minutes) and firefighters applying first water to the fire after notification, dispatch, response and set up (10 minutes).

Image credit: Northern Illinois Fire Sprinkler Advisory Board
http://firesprinklerassoc.org/images/newflashoverchart.jpg

Municipal Resources

The Keystone Valley Fire Department does not have a formal, or established SOC for their district. This is not unusual for a smaller department such as this, particularly one where there can easily be different response and demand zones due to the diversity of the communities that the department serves. The department also does not normally track response times by municipality. An analysis of the Keystone Valley Fire Department's incident response times for fire incidents in 2014, 2015, and the first six months of 2016, indicate the department having a unit on location within 5 minutes of dispatch, ranged between 39.6% of the time in 2015, to 54.7% of the time in the first 6 months of 2016. Looked at from the opposite direction, from 2014 through June 2016, between 18.7% and 26.5% of fire related incidents took longer than 10 minutes for the first unit to arrive on location (figures 5-17, 5-18, 5-19).

FIGURE 5-17
INCIDENT RESPONSE TIMES – 2014



Municipal Resources

FIGURE 5-18
INCIDENT RESPONSE TIMES – 2015

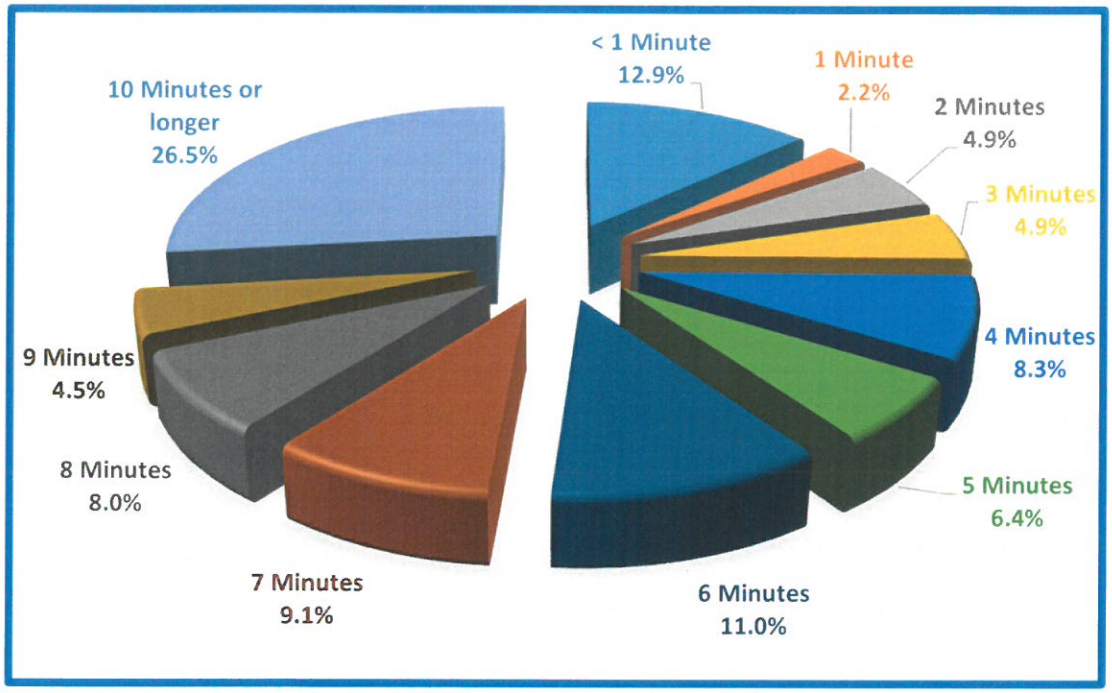
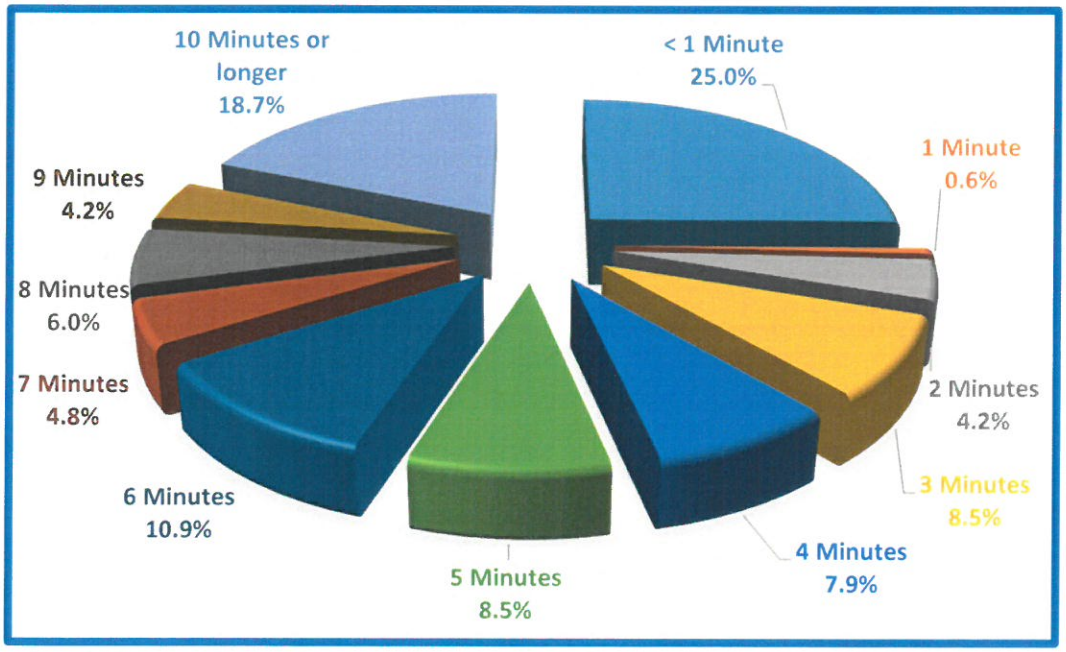


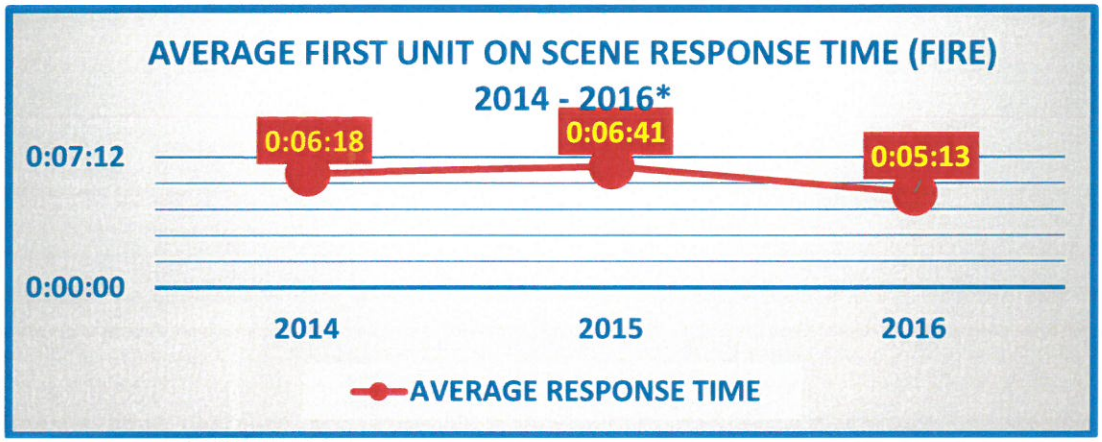
FIGURE 5-19
INCIDENT RESPONSE TIMES – 2016 (1/1/16 – 6/21/16)



Municipal Resources

While not as reliable of a response time barometer over the period that was analyzed, Keystone Valley's *average* first unit on scene response times for fire incidents ranged from five minutes, thirteen seconds (00:05:13) in 2016, to six minutes, forty-one seconds (00:06:41) in 2015 (Figure 5-20). Different data provided by the department indicated an average response time of six minutes, twenty seconds (00:06:20) in 2016, to eleven minutes, forty-six seconds (00:11:46) in 2014. The reason for these differences could not be determined, although one possible explanation for the improved times from both sets of data is the more frequent use of the career staff for responding to fire incidents.

FIGURE 5-20



* Through 6/21/16

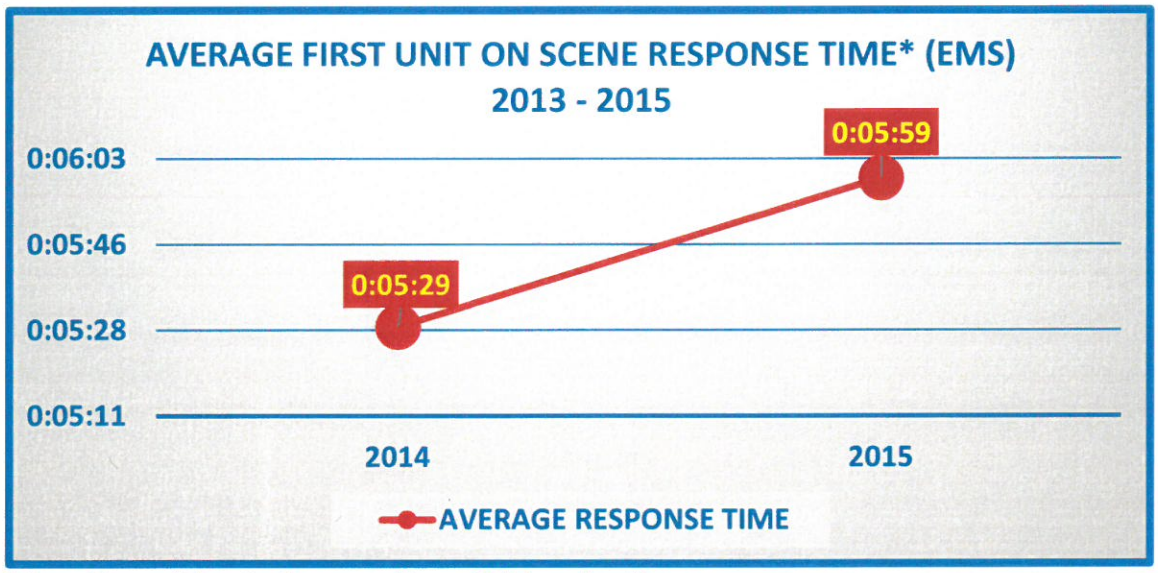
For EMS incidents, nationally, the standard of care based on stroke and cardiac arrest protocols is to have a unit on scene at a medical emergency within 6 minutes. Paragraph 4.1.2.1(4) of NFPA 1710[19], which would be applicable to KVFD EMS operations since they are provided by in station, career personnel, recommends that for EMS incidents, a unit with first responder or higher level trained personnel and equipped with an AED should arrive within 4 minutes of response (6 minutes of receipt of the call), and an Advanced Life Support (ALS) unit should arrive on scene within 8 minutes (10 minutes of call receipt). Paragraph 4.1.2.2 recommends the establishment of a 90% performance objective for these response times. CAAS recommends that an ambulance arrives on scene within seven minutes, fifty-nine seconds (00:07:59) of dispatch.

[19] NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments,* 2014 edition (National Fire Protection Association, Quincy, MA), outlines organization and deployment of operations by career and primarily career fire departments.

Municipal Resources

The incident reporting system/data base (EMS Charts) currently utilized by the KVFD apparently does not have the capability to extract response time data broken down by minutes like can be done with the Firehouse fire reporting software. As mentioned above, while not as reliable of a response time barometer over the period of 2014 and 2015 that was analyzed, Keystone's *average* first unit on scene response times for EMS was five minutes, twenty-nine seconds (00:05:29) in 2014, increasing by 30 seconds to five minutes, fifty-nine seconds (00:05:59) in 2015 (Figure 5-21).

FIGURE 5-21



* From time unit is actually responding until it is on location.

Overall, the KVFD's response times are reasonable, particularly for the aspects of department operations that are primarily handled by the volunteer personnel. However, we believe there are definitely opportunities for improvement. NFPA Standard 1720 provides only limited guidance as far as overall on scene response times, limited to the full response assignment for reported structure fires based upon the type of fire demand zone that the department is protecting. It was reported to the MRI study team that under normal driving and road conditions, virtually the entire KVFD response district is within a ten-minute response time from the central station. This can provide a benchmark upon which the department can base at least part of its SOC.

It is the opinion of the MRI study team that the KVFD establish multiple demand zones for the provision of services within its district, both fire and EMS. EMS turnout time must be improved and reduced down to less than 60 seconds from completion of dispatch to unit responding. An average turnout time of two minutes, eleven seconds (00:02:11), to two minutes, thirty-three seconds (00:02:33), is simply unacceptable for a station that is staffed by career personnel. For fire related response, turnout time has been slightly lengthened to allow for the donning of

PPE. A major component of being able to manage response time relates to turnout time. Utilizing the career staff more in a cross functional role, and the implementation of a duty crew program, particularly an in station one, will also assist with reducing response times and improving service delivery.

It is important for us to stress also that Keystone Valley has a good fire and EMS system, one they should justifiably be proud of. The members are very proud of their department and they do a very good job of mitigating incidents once they arrive on scene (Figures 5-22 and 5-23).

Figure 5-22 (left): Keystone Valley Fire Department personnel, assisted by surrounding departments, work to control a fire in a row of dwellings in Parkesburg Borough.
Figure 5-23 (right): KVFD fire and ambulance personnel work to extricate and treat victims of a motor vehicle accident.

TRAINING AND FIRE PREVENTION

OVERVIEW

The training and fire prevention functions of every fire department are important components of the overall fire protection delivery system in that community.

Training is, without question, one of the three most important functions that a fire department should be performing on a regular basis; the others being response to emergency incidents and fire prevention activities. One could even make a credible argument that training is, in some ways, more important than emergency responses because a department that is not well-trained, prepared, and operationally ready, will be unable to effectively, efficiently, correctly, and safely, fulfill its emergency response obligations and mission. A comprehensive, diverse, and ongoing training program is absolutely critical to the fire department's level of success.

An effective fire department training program must cover all of the essential elements of that specific department's core missions and responsibilities. The program must include an appropriate combination of technical/classroom training and manipulative or hands-on/practical evolutions. Most of the training, but particularly the practical, standardized, hands-on training evolutions, should be developed based upon the department's own operating procedures and operations while remaining cognizant of widely accepted practices and standards that could be used as a benchmark to judge the department's operations for any number of reasons. Numerous case studies of firefighter fatality and injury incidents have documented the importance of training. For example, the failure to train for and use widely accepted firefighting practices was a significant conclusion in the many investigations that were conducted after the Charleston, South Carolina, Super Sofa Store fire in June 2007, that resulted in the deaths of nine firefighters. As with all other fire department operations, there must be consistency in how the training is being conducted.

Certain U.S. Occupational Safety and Health Administration (OSHA) regulations dictate that minimum training must be completed on an annual basis, covering various topics including a review of the respiratory protection standard, self-contained breathing apparatus (SCBA) refresher and user competency training, SCBA fit testing (29 CFR 1910.134); Blood borne Pathogens Training (29 CFR 1910.1030); Hazardous Materials Training (29 CFR 1910.120); Confined Space Training (29 CFR 1910.146); and structural firefighting training (29 CFR 1910.156). In order to receive U.S. Department of Homeland Security grant funding (including terrorism grants, FEMA grants, and firefighter safety grants), each municipality must implement the National Incident Management System (NIMS) which mandates specific incident management/command training for all personnel (including police and all personnel involved with disaster response and emergency preparedness). Finally, National Fire Protection Association (NFPA) standards contain recommendations for training on various topics; such as a requirement for a minimum of 24 hours of structural firefighting training annually for each fire department member.

The core service that a fire department provides to the public it serves begins with fire prevention. Fire prevention activities are one of the most important missions of a modern-day fire department. A comprehensive municipal fire protection system 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 priority objectives of every fire department. Educating the public about fire safety and teaching them appropriate behaviors on how to react should they be confronted with a fire is also an important life safety responsibility of the fire department.

Fire prevention activities in a municipal fire department typically include fire safety inspections; fire code enforcement; issuance and oversight of permits; review of construction plans for new buildings and the renovation of existing buildings; and public fire safety education programs. Since fire prevention should be approached in a systematic manner, and because the district

has other departments that have a vested interest and/or responsibility in these efforts, various activities such as plan reviews, permits, and inspections should be coordinated with similar activities in the municipal building inspection department and the planning department.

OBSERVATIONS - TRAINING

The KVFD appears to have a very good, well rounded training program for its personnel. Training is generally scheduled by the quarter and broken down into areas of operations such as engine operations, truck company operations, rescue operations, and EMS. The focus is generally directed towards basic "bread and butter" type operations.

Department training is generallly conducted three times per month. Of these, two are considered to be training, while one is a drill. The differentiation is that drills tend to have a more hands on, practical application component to them (figures 5-24 and 5-25). During the cold weather months, training consists of various mandatory topics such as CPR, AED, bloodeborne pathogens, and hazardous materials operations refreshers. Annual fit testing and SCBA confidence training are also conducted.

When compared to many other volunteer fire departments, Keystone Valley has an above average amount of training. In 2014, department personnel participated in 70 different training activities, encompassing 4,236.5 staff hours. In 2015, personnel logged 3,123.5 staff hours in 47 training activities. A review of the department's personnel training records for these two years document a number of personnel with several hundred hours of training for the year which is very impressive for volunteer personnel. Personnel who do not attend at least 12 training sessions in a year are subject to the provisions of the participation/active member policy. In addition to the department's normal three times monthly training and drills, additional specialized, or more complex, training sessions are periodically scheduled as necessary resources are available. This includes live fire training at the Chester County Fire Academy.

THE KEYSTONE VALLEY FIRE DEPARTMENT IS IN THE PROCESS OF SEEKING RECOGNITION BY THE OFFICE OF THE STATE FIRE COMMISSIONER OF PENNSYLVANIA FOR ACCOMPLISHMENTS IN TRAINING AND EDUCATION THAT MEET OR EXCEED NATIONALLY RECOGNIZED STANDARDS.

There are a number of ways to evaluate the effectiveness of the fire department's training program. One increasingly common way is through the use of annual skills proficiency evaluations where all members of the department are required to successfully perform certain skills, and/or complete standardized evolutions, either individually, or as part of a team. Post course evaluations, post incident critiques, and evaluation of incident operations and statistics can also provide important feedback regarding the training program. **It is important that all training, no matter how minor or inconsequential, be documented.** Failure to do so can expose the department, and fire district, to significant liability.

Professional development for fire department personnel, especially officers, is also an important part of overall training. There are numerous excellent opportunities for firefighters and officers to attend training on a wide range of topics outside of Keystone Valley, including several nearby county fire academies, the Pennsylvania State Fire Academy in Lewistown, and the Volunteer Incentive Program (VIP) at the National Fire Academy (NFA) in Emmitsburg, Maryland. Annual events, such as the Fire Department Instructor's Conference (FDIC) in Indianapolis and the Firehouse Expo previously held in Baltimore, provide a wide range of classroom training as well as extensive hands on evolutions.

Figure 5-24 (left): KVFD personnel negotiate a self-contained breathing apparatus confidence course.
Figure 5-25 (right): Department personnel participate in live fire training at the Chester County Fire Academy.

OBSERVATIONS – FIRE PREVENTION

Because it serves multiple municipalities, each with their own codes and ordinances, at the time of this assessment, the KVFD has only a limited formal involvement in fire prevention activities, primarily comprised of public fire education events.

The KVFD fire chief does receive plans for new development projects for review and comment from both Parkesburg and West Sadsbury. Highland has their own fire marshal who works well with the department. Sadsbury township is reported to be inconsistent in involving the KVFD in the development planning and approval process. This is problematic as much of the new development is centered in Sadsbury, near Routes 10 and 30.

Once new buildings are constructed and issued a certificate of occupancy, there are generally no other routine inspections performed unless some type of complaint is received. These complaints are generally handled by the municipality in which the building is located and the method varies between them. There is no formal fire prevention inspection program by the fire

department although some inspections may get performed by the various township inspectors or fire marshals. This system is a typical practice that is utilized across Pennsylvania.

There are many reasons that existing buildings are required to be inspected for fire code compliance. The obvious purpose is to ensure that occupants of the building are living, working, or occupying a building that is safe for them to do so. Many buildings are required to have specific inspections conducted based on the type of occupancy and the use of the buildings, such as, but not limited to, healthcare facilities, schools, restaurants, and places of assembly. These inspections are mandated by various statutes, ordinances, and codes. The inspections themselves are often limited to specific areas within the building and to particular time frames. The fire inspectors will also witness a test of required fire protection systems and equipment.

Fire inspections can also identify violations and make follow-up inspections to ensure that violations are addressed and that the fire code is enforced. In fire prevention, the term "enforcement" is most often associated with inspectors performing walk-throughs of entire facilities, looking for any hazards or violations of applicable codes. Educating the owner to the requirements, as well as the spirit and intent of the code, can attain positive benefits for fire and life safety.

As Keystone Valley Fire Department's response area continues to expand its economic base, the need to expand the fire department's responsibilities for fire prevention and inspection will increase. Performing complex, technical inspections can be a very time consuming endeavor. As a result, we believe that the department should work with its participating municipalities to assume a much greater role in the ongoing fire prevention needs within its service area. If successful, we believe there would be enough work to justify the hiring of a full-time fire marshal/inspector.

From strictly a fire prevention perspective, the fire marshal/inspector's duties could include:

- plan reviews for new construction and renovations, including fire sprinkler systems and fire alarm systems
- in progress inspections of various construction and renovation projects
- signing off on certificates of occupancy for new and renovated buildings
- issuing permits and conducting various permit-related inspections
- conducting quarterly school inspections
- conducting other routine fire prevention/occupancy inspections

- performing change of ownership, smoke detector/carbon monoxide detector inspections in residential occupancies
- observing acceptance tests of fire protection systems (fire alarm systems, automatic fire sprinkler systems, and fire extinguishing systems)
- responding to citizen inquiries and complaints

In a district with an expanding commercial occupancy base, and much more development planned, these duties alone would seem to be enough to probably keep one full-time person reasonably busy. In addition, this person could serve as the department's volunteer recruitment and retention coordinator.

Public fire education's role is to provide programs that aim to reduce loss of life and property through education, rather than codes or enforcement. Public education can take time and resources that do not show an immediate impact. Providing public fire and safety education is also an opportunity for public awareness and building public relations. The fire department's public image will often determine how well their message is heard.

Through coordination with department members, the local school system, and various community groups, fire departments can provide very effective public fire education and safety programs. Preventing fires in the home is the area where the department can have the greatest impact on reducing deaths, injuries, and property damage, since 70% of all fires, injuries, and deaths occur in fires in residential occupancies. The KVFD has an active, on-going public education program that targets various groups within the community (figure 5-26 and 5-27). In conjunction with other departments who also serve the Octorara Area School District, the department also provides fire prevention week activities in the schools.

The KVFD does not have a formal written procedure in place regarding the investigation of fires. Generally, for any fire that results in property damage, the fire chief or ranking officer will conduct an initial investigation. Investigators from the Chester County Fire Marshal's Office are requested to assist with any significant fire incidents. The Pennsylvania State Fire Marshal's Office and Pennsylvania State Police are often called in for fires that result in a fatality, or when additional specialized resources are required.

Figures 5-26 (left) and 5-27 (right): Keystone Valley Fire Department personnel are actively involved in public fire education programs in the local schools.

Fire prevention should be promoted as a key component of the vision of the Keystone Valley Fire Department and should be a major aspect of its primary mission. Aggressive fire prevention programs are the most efficient and cost-effective way to reduce fire risks, fire loss, and fire injuries, and fire deaths in the community. Fire prevention is a key responsibility of every member of the fire department and to the extent practical, every member of the department should have a responsibility for fire prevention.

RECOMMENDATIONS

5.1 The Keystone Valley Fire Department should establish a formal pre-incident planning program with the goal of having an up-to-date pre-plan for every business and commercial occupancy (including schools, churches, etc.). The purpose of a pre-incident planning program is to develop a fire/emergency response plan for buildings in the district. A pre-fire/incident plan includes data such as the occupancy type, floor plans, construction type, hazards to firefighting, special conditions in the building, apparatus placement plan, water supply plan, and forcible entry and ventilation plan. Pre-planning will improve the firefighter knowledge of the specific tactics needed to handle a fire or other emergency at a facility, and will alert them to on-site hazards and risks. Pre-fire/incident plans should be reviewed regularly and tested by periodic table-top exercises and on-site drills. In addition, the department should develop a plan to make pre-fire/incident plans accessible on mobile data terminals (notebook/laptop computers) on fire apparatus, ambulances, and command vehicles for use enroute to an incident and while on-scene.

5.2 The Keystone Valley Fire Department should establish a standard of cover comprised of two separate fire and EMS demand zones reflective of both the urban/suburban component of the department's coverage area, as well as the much more rural area. The SOCs should be based upon a hybrid of the NFPA 1720 recommendations for various types of communities.

5.3 **The Keystone Valley Fire Department should adopt standard of cover benchmarks to have the first unit responding to each emergency incident within 1 minute of dispatch (career staff), and have the first unit on scene within 5 minutes after responding, to all types of calls, 90% of the time in Parkesburg Borough, and the areas that are within a 2-mile radius of the central station.**

5.4 **The Keystone Valley Fire Department should adopt standard of cover benchmarks to have the first unit responding to each emergency incident within 1 minute of dispatch (career staff), and have the first unit on scene within 10 minutes after responding to all types of calls, 90% of the time, in areas of the district that are outside of a 2-mile radius of the central station.**

5.5 **As part of its standards of cover benchmarks, the Keystone Valley Fire Department should seek to have the entire first alarm assignment for reported structure fires, with at least 15 personnel, on scene within 10 minutes from dispatch, 90% of the time in Parkesburg Borough, and the areas that are within a 2-mile radius of the central station.**

5.6 **As part of its standards of cover benchmarks, and in order to initiate other than very limited defensive fire attack operations, the Keystone Valley Fire Department should seek to have the entire first alarm assignment for reported structure fires, with at least 15 personnel, on scene within 14 minutes from dispatch, 90% of the time, in areas of the district that are outside of a 2-mile radius of the central station.**

5.7 **The Keystone Valley Fire Department, in consultation and cooperation with its neighboring departments, should, if necessary, revise its run cards to ensure that a sufficient number and type of various resources (engines, ladders, tankers, etc.) are dispatched to various types of reported emergencies to allow the department to achieve its SOC benchmarks. The numbers and types of resources initially dispatched should be based upon a risk management process or pre-fire/incident plan.**

5.8 **Long-term, the Keystone Valley Fire Department should further analyze the need for an additional fire/EMS station in West Sadsbury Township, in the northwest area of the current district.**

5.9 **The Keystone Valley Fire Department should establish a formal "performance improvement" process for fire suppression operations. The process should include the adoption of performance standards such as NFPA 1720, including on scene performance indicators such as:**

- **On-scene to charged line at the front door of a structure fire: two minutes or less, 90% of the time.**

- **Water from hydrant to supply engine: three minutes or less, 90% of the time.**

The point of the performance measures is to identify the community's expectations in a quantifiable way, and to use the measurement of the fire and rescue service's performance against these objectives to identify areas which may need improvement or additional resources. The process should also include a provision for modifying SOGs, training priorities, and equipment as determined by the performance improvement program.

5.10 Once a number of the key recommendations found in this report are implemented, the Keystone Valley Fire Department should request that ISO conduct an evaluation of the Keystone Valley Regional Fire District (as opposed to the individual municipalities) and its fire department for the purpose of establishing the department's own ISO rating.

5.11 The only place that the emergency services can really reduce response times is in the station. The Keystone Valley Fire Department should take immediate steps to improve their response "turnout" time, that is, the time from dispatch until the unit is actually responding. For a station that is staffed around the clock, turnout time should generally be 60 seconds or less, particularly for EMS incidents. The department leadership should carefully track improvements in these times which will ultimately result in lower response times and improved patient care.

5.12 An engine from the fire department should be dispatched automatically to every emergency medical call that is triaged through emergency medical dispatch (EMD) and is believed to be an unconscious person, or a respiratory, or cardiac arrest.

5.13 The Keystone Valley Fire Department should continue to explore the feasibility of implementing some type of community based mobile integrated health care in an attempt to provide better service to the community, and to the extent possible, attempt to minimize the recurring demand on the service from continual and repeated use of critical resources for non-emergent responses.

5.14 The Keystone Valley Fire Department should explore the feasibility of entering into a partnership with Penn Medicine to provide funding to staff a second EMS unit during times of peak usage, and station it at the Route 10 location to alleviate the workload on the primary EMS response unit.

5.15 The Keystone Valley Fire Department should explore different options for EMS

reporting software that will allow the department to track and analyze response times better, such as breaking them down by minutes.

5.16 The Keystone Valley Fire Department should explore opportunities for the use of GIS technology by the department. This can include for pre-fire planning, hydrant locations and flow rate, rural water supply locations, etc. In addition, it will allow the department to once again track and plot incident locations to establish trends and identify "hotspots".

5.17 The Keystone Valley Fire Department should implement periodic basic skills proficiency evaluations for ALL active personnel. These proficiency evaluations, consisting of standardized evolutions, can be based upon recognized standards and benchmarks, in conjunction with performance criterion and benchmarks, established through evaluation of, and based upon, KVFD operations and procedures.

5.18 In order to assist with the large amount of training that needs to be done, and in recognition of their important role in the delivery of training and the success of the program, the Keystone Valley Fire Department should provide fire instructor training for any members of the department who wish to take it. All officers should be formally certified at a minimum of Fire Instructor Level I.

5.19 The Keystone Valley Fire Department should strongly consider requiring its fire officers to obtain a certain level of fire officer certification as a job requirement, such as Fire Officer I for lieutenant, Fire Officer II for captain, and Fire Officer III for chief level officers.

5.20 The Keystone Valley Fire Department should continue to encourage personnel to seek additional training on their own, and to the financial and practical extent possible, send personnel to outside training opportunities such as the Firehouse Expo, and the Fire Department Instructors Conference in Indianapolis. Information gained at this training can then be brought back and delivered to other members of the department.

5.21 The Keystone Valley Fire Department should mandate that all officers participate in additional officer related training each year in order to be eligible to retain their position. A reasonable requirement might be thirty-two hours of training consisting of:

- **Firefighting strategy and tactics, incident management, or safety training (sixteen hours)**
- **Leadership or management training (sixteen hours)**

5.22 **The Keystone Valley Fire Department should develop a plan that will allow the department to assume responsibility for fire inspection and code enforcement within the fire district's area, which will allow it to proactively address the increasing routine, post occupancy fire prevention, and code enforcement needs of the community.**

5.23 **If the Keystone Valley Fire Department is successful at enacting recommendation 5-22, above, the department should consider the establishment of a full-time fire marshal/ inspector position to assist with the ever increasing number of fire inspections, particularly to proactively address routine, post-occupancy inspections. This person could also serve as the volunteer recruitment and retention coordinator.**

5.24 **If recommendation 5-22 and 5-23, above are implemented, the Keystone Valley Fire Department should consider the implementation of a fire prevention inspection fee to fund a program where all businesses and commercial occupancies in the fire district are inspected at regular, periodic intervals.**

5.25 **The Keystone Valley Fire Department should continue to promote and provide year round public fire safety education programs, in the schools, and throughout the community.**

CHAPTER 6

ORGANIZATIONAL STRUCTURE AND ADMINISTRATION

ORGANIZATIONAL STRUCTURE

OVERVIEW

The organizational structure of any organization or entity, whether public or private, establishes and illustrates the important heirarcial relationships between various personnel, supervisors/ subordinates, levels, divisions, and bureaus within the organization that allow it to function properly, operate effectively, and efficiently in its daily operations or the pursuit of its mission. It also helps to clearly define the organizational chain of command from top to bottom, an especially important consideration in a quasi-military public safety organization such as the fire department where everyone from the highest rank to the lowest is subject to receiving orders, and with the exception of the lowest rank, also issues them. Effective communications in any organization, but especially public safety agencies, are essential, and a cohesive chain of command allows everyone to know excactly who they report to and/or who reports to them.

OBSERVATIONS

The Keystone Valley Fire Department was officially formed at 1000 hours on March 19, 2013, when the members of the Parkesburg, Pomeroy, and Atglen Fire Companies voted to officially disband their individual organizations and consolidate their operations into the new department. This was the culmination of a process that had begun four years earlier, in 2009. The governing bodies of these four municipalities approved an Intergovernmental Cooperation Agreement (ICA) in August 2012 (effective November 20, 2012), that approved the formation of the Keystone Valley Regional Fire District by no later than July 1, 2013, provided appropriate agreements had been executed with the various fire companies that would disband to form the new regional department. The original agreement is for a period of 5 years after which the member communities may elect to remain with the district, or withdraw, provided they provide a minimum of 1 year notice that they intend to do so. If no notification is received to the contrary, their membership is automatically renewed for another 5 years.

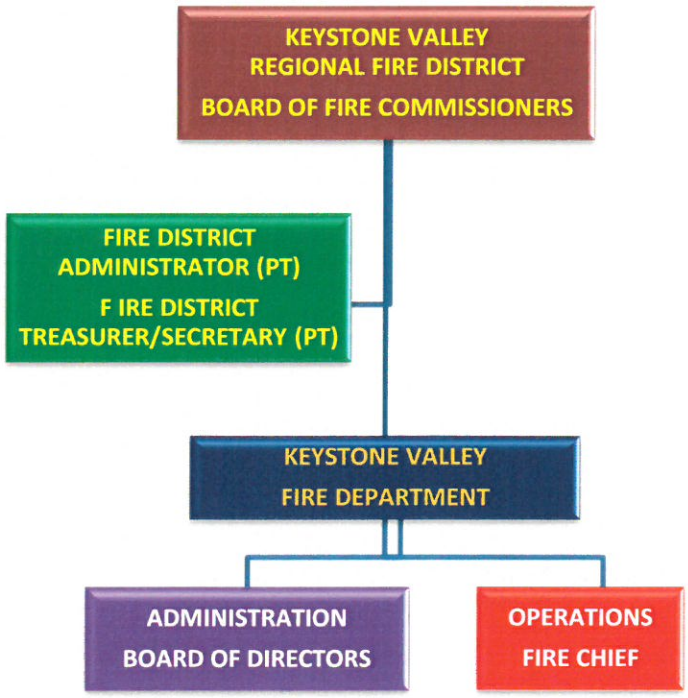
As has been previously noted, the department provides full, first due fire protection to Parkesburg Borough and West Sadsbury Township. It also provides first due fire protection to portions of both Sadsbury and Highland Townships, although it provides specialized fire protection and rescue services to most or all of those municipalities. The department also provides full EMS protection to all four communities.

The fire district is overseen by a 5 member Board of Fire Commissioners (BOFC) which is comprised of 1 representative of each of the participating municipalities, and 1 representative from the fire department. The fire district employs a part-time administrator, who works approximately ten hours per month, while earning $30.00 per hour. It also provides stipends of $45.00 per month to the treasurer and $50.00 per month to the secretary.

The BOFC, which oversees the fire district, appears to be appropriately configured. Each participating municipality, along with the fire department as a major stakeholder, should have representation on the board. We do not recommend any changes in this respect other than that Sadsbury Township should formally appoint a representative to the fire district.

The Keystone Valley Fire Department is the operational component of the Keystone Valley Regional Fire District which is the legal entity that allows the regional department to exist and serve multiple communities. The district and the department have a signed operating agreement that establishes the roles, responsibilities, and obligations of both entities. The fire department has a 5 member Board of Directors (BOD) which handles the department's administrative operations and functions. This includes overseeing the budget and funding, the career staff, human resources, and personnel matters, and the EMS committee. The fire chief is responsible for all emergency operational aspects of the department.

FIGURE 6-1
KEYSTONE FIRE DISTRICT/DEPARTMENT OVERALL ORGANIZATIONAL STRUCTURE

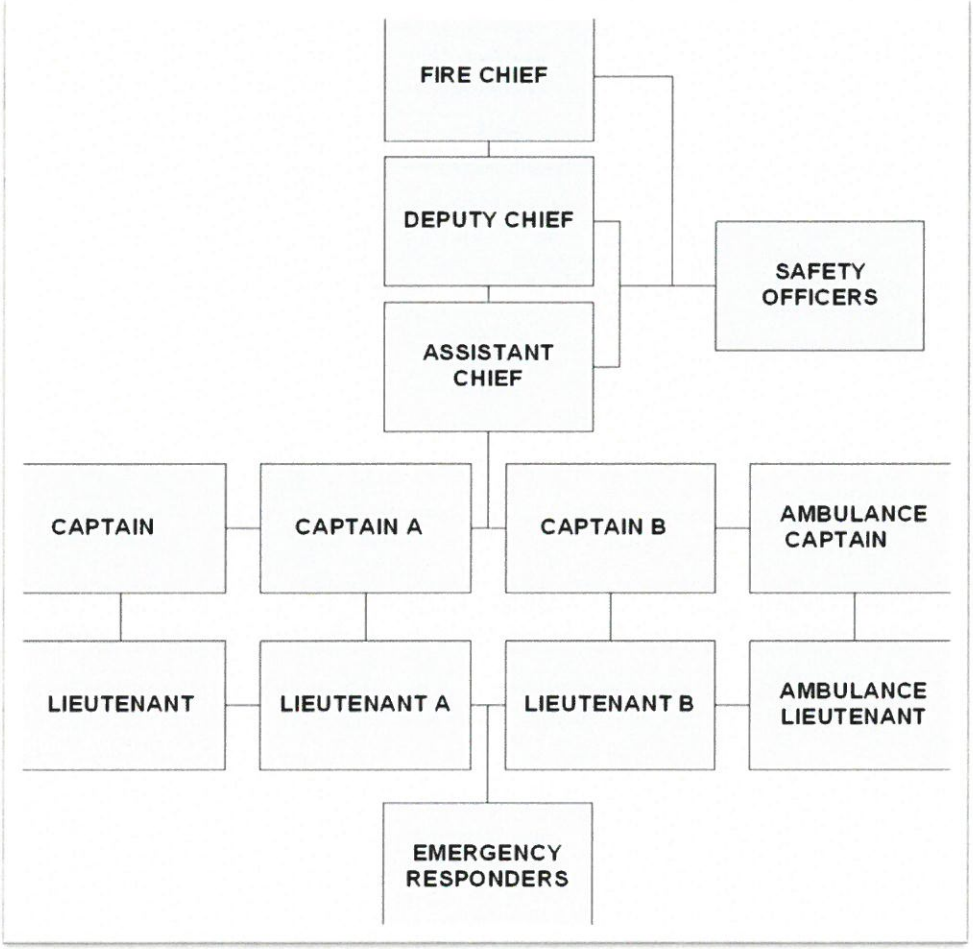


Municipal Resources

On the operational side of the department, the fire chief is assisted by a deputy fire chief, an assistant fire chief, three captains, three lieutenants, and two EMS lieutenants (Figure 6-2). It was reported to the study team while the report was being finalized that the department was downsizing the number of operational officers. For operational matters, the EMS manager and career staff supervisor also report to the fire chief. Administratively, these two personnel report to the EMS committee.

All of the department's fire officers are fully volunteer and receive no compensation for their wide-ranging duties and responsibilities. The EMS manager is a part-time position that pays $25.00 per hour for 12 hours of work per week. The career staff receive $14.00 per hour. The career staff supervisor is compensated an addition $2.00 per hour for her duties.

FIGURE 6-2
KEYSTONE VALLEY FIRE DEPARTMENT
FIRE OPERATIONS ORGANIZATIONAL STRUCTURE



Municipal Resources

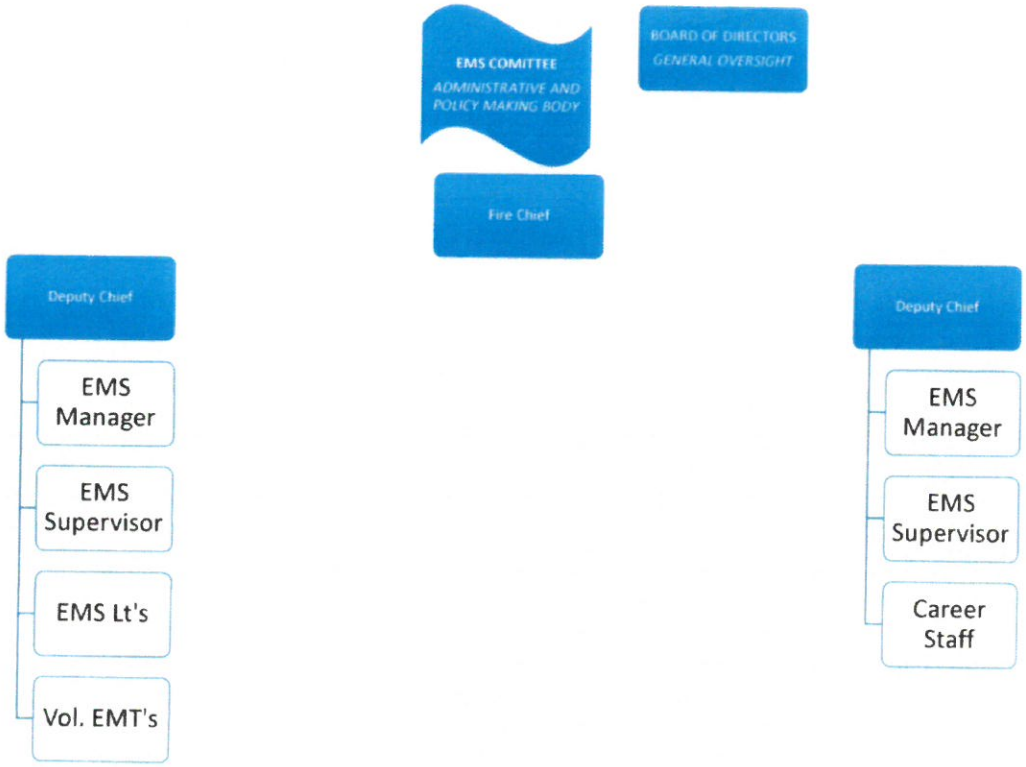
It is the opinion of the MRI study team that the fire department organizational structure is unnecessarily large, and does not appear to be conducive to the most effective or efficient operations. We question the need, particularly operationally, for the fire department BOD. They appear to be handling a number of functions that would be considered part of the day-to-day operations of the department. Normally, a BOD is responsible for setting policy (although in this case that may be the responsibility of the fire district), providing fiscal oversight, and in some instances, approving personnel actions. Even with conceding those functions to them, the BOD is too large. The department's bylaws permit it to be reduced from the current 5 members to 3, which we believe should be done. Long-term, particularly if some of the other recommendations contained in this report are implemented, we believe the BOD should eventually be disbanded.

On the EMS operations side, the BOD provides general administrative oversight. The EMS committee is comprised of the deputy fire chief, two EMS lieutenants, the career staff supervisor, and a member of the board of directors. It is designated as the administrative and policy making body for EMS operations. The fire chief and deputy fire chief oversee the operational functions of EMS, with the EMS manager and career supervisor reporting to them as well (Figure 6-3).

The department's main organizational structure and the sub-structure for EMS operations also appears to be unnecessarily complex and not streamlined for efficiency. For instance, the EMS manager and career staff supervisor report to the fire chief for certain matters and the EMS Committee or BOD for other things. The fire chief appears to report to the EMS committee for EMS matters, yet the committee is primarily comprised of personnel who are subordinate to him in the chain of command. This type of arrangement is sure to cause problems and can result in conflicting directions, priorities, and a lack of clear vision for what needs to be done. In addition, our interviews with the various senior staff of the department seemed to indicate that there was no one person who had a good overview of the entire department, either operationally, or administratively. We believe this does a disservice to the department.

The current fire chief appears to (and by all accounts does) an excellent job of leading the department and handling the myriad of tasks that are associated with managing a modern, full service, fire and EMS provider. With no compensation for his duties, and an increasingly complex operation to administer with ever increasing duties, responsibilities, meetings, etc., the demands on his time are probably becoming close too unreasonable. We believe that the time has come for the Keystone Valley Fire Department to consolidate a number of the part-time and volunteer positions into a single, full-time career fire/EMS chief who will coordinate and direct all aspects of department's day-to-day operations and administration. This is in no way an indication that the current chief is not a strong leader or an excellent chief. Rather, it is an acknowledgement that the KVFD has reached a new phase in its evolution.

FIGURE 6-3
KEYSTONE VALLEY FIRE DEPARTMENT EMS ORGANIZATIONAL STRUCTURE



The KVFD has well written job descriptions in their bylaws for each of the department's operational ranks from lieutenant to fire chief. They also include EMS officers, safety officers, and fire police officers. The descriptions include the primary and secondary responsibilities, essential functions, minimum qualifications, certifications/licenses required, and knowledge, skills, and physical demands. We found the descriptions very thorough and definitely appropriate. For most, but not all positions, the personnel need to have served in lower ranking positions for at least one term (the length of a term is not defined).

According to the department's bylaws, all of the officer positions are elected by the membership. The chief may then assign the officers to various functions. At the time of this assessment, there was no rank appropriate assessment process to evaluate the knowledge, skills, and abilities of personnel who have met the minimum qualifications to hold each respective rank. There are also no continuing education requirements for personnel to continue to maintain these positions once elected.

Municipal Resources

ADMINISTRATION

OVERVIEW

The use of rules and regulations, operational procedures, and various other forms of written communications are vital parts of a fire department's overall operations. Rules and regulations establish expected levels of conduct and general obligations of department members, identify prohibited activities, and provide for the good order and discipline necessary for the credible operation of a quasi-military emergency services organization. Operational procedures ensure the consistent, effective, efficient, and safe operation of various aspects of the department's operations, both emergency and routine. One of many common denominators among the best fire departments across the United States is that they have a comprehensive and up-to-date operational procedural manual, and their personnel are well versed and well-trained in those procedures. The inclusion of written documents, such as training and safety bulletins, serves to make the system more effective.

OBSERVATIONS

Although it is a relatively new department which utilizes the simple yet effective slogan *"Working Regionally to Survive Locally"* the KVFD does not have a formal mission or vision statement, or a set of core values. Well-designed mission and vision statements identify the very reason for the department's existence and help to ensure that all personnel are working toward the same goals, or are proverbially, "all rowing in the same direction". The development of core values helps to establish what the department and its membership stand for.

The Keystone Valley Regional Fire District has a set of written bylaws that were adopted in July 2015. This document provides very broad direction over the fire district's aspect of operations. The Keystone Valley Fire Department has comprehensive, well-written, and well-organized bylaws that were most recently revised and adopted in September 2014. Among the numerous sections of this document are General Rules and Rules of Conduct. The department does not have a standalone rules and regulations document.

The fire department has also adopted a number of policies that are separate from, but incorporated into, the bylaws, including:

A. Social Media Policy

B. Whistle Blowing Policy

C. Document Destruction Policy

D. Equal Employment Opportunity (EEO) Policy

E. Dress Code Policy

F. Alcohol Policy

G. Illegal Substance Policy

H. Purchase Order Policy

I. Electronic Surveillance and Door Access System Policy

For the most part, these policies appear to be well-written. Some have been reviewed by the fire department's attorney.

Effective communications systems are key to successful operation of any emergency services organization. SOPs/SOGs and other orders are mission critical to consistent, effective, and safe operations. Without them there is a tendency to "freelance" and personnel may not all be on the "same page" regarding a wide range of emergency and administrative operations. The KVFD apparently has only a limited number of operational procedures or guidelines in place. The lack of an effective system of standard operating procedures/guidelines (SOPs/SOGs) will have an adverse impact on many different facets of the day-to-day operations of the department that can result in a lack of consistency during operations, freelancing, unsafe actions, loss of accountability and discipline, poor performance of individuals and operational crews, and increased risk to firefighters and citizens.

There are no operational procedures/guidelines in place to deal with mission critical operations such as *Structure Fires*, *Basic Engine Company and/or Truck Company Operations*, Vehicle Fire, *Vehicle Extrication Operations*, *Rural Water Supply/Tender Operations*, *Thermal Imaging Camera,* and *Automatic External Defibrillator Use* to name just a few. These are the types of operational procedures/guidelines that are most important and provide standardization and consistency of operations.

In addition to providing normal operational direction, the SOP/SOG manual can be used to develop procedures or guidelines necessary to implement and/or comply with various statutes, regulations, policies, and plans. Doing this provides not only a clear distinction between the various types of documents; it would also serve to clarify the relative importance of each type of document.

Fire department personnel can provide a valuable technical resource in the development of SOPs and SOGs. For the most part, the development and drafting of these policies should not be a top-down management driven process. Input from personnel at all levels will strengthen the quality and effectiveness of SOPs and SOGs. In addition, the department training officer

should play a critical role in the development and implementation of any SOPs and SOGs. We also encourage fire departments to draw upon the policies, practices, and procedures of other organizations, both local and distant. The experiences and lessons learned from other fire departments can be extremely helpful in the development of SOPs and SOGs. No fire department should be expected to write a policy document from scratch, or without a template.

Although they do try to comply with the appropriate regulations as part of their operations, the Keystone Valley Fire Department does not have either a formal respiratory protection plan, or a blood borne pathogens/exposure control plan. Both of these plans are critical to the safety of employees, to the department's overall risk management program, and are required by OSHA regulations. Failure to have an appropriate plan can present liability issues to the district and department. Model plans are available on line that can be easily adopted to Keystone Valley.

From a fiscal management and oversight standpoint, both the fire district and fire department appear to be well-managed and financially prudent. The MRI team was provided with, and reviewed, several years' worth of operating budgets and year end fiscal reports. Annual financial statements and accountant reports are posted on the department's website.

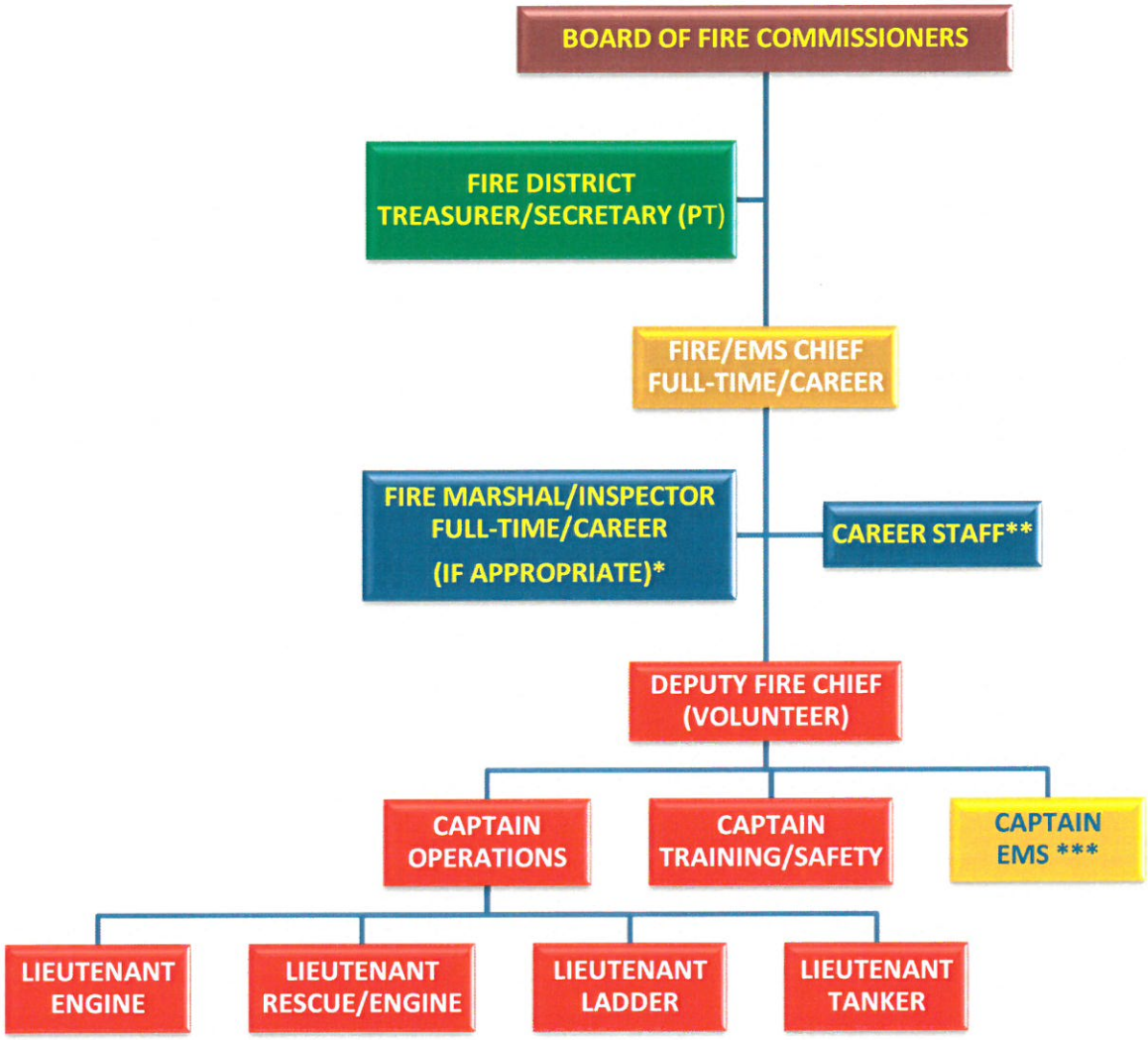
RECOMMENDATIONS

6.1 The Keystone Valley Fire Department's organizational structure should be significantly revised and streamlined for more effective and efficient operations of the department (figure 6-4). Significant changes should include:

- **Reducing the fire department BOD position from 5 members to 3 now, and totally disband it within 5 years. (If desired, it could be reconfigured into an advisory board for the fire chief.)**
- **Combine the current part-time positions of fire district administrator, EMS manager, and career staff supervisor with the volunteer fire chief into a single full-time position of career fire and EMS chief. This will create a singular person responsible for all day-to-day operational and administrative aspects of the department.**
- **Eliminate the EMS committee.**
- **If the KVFD assumes greater responsibility for the fire prevention and inspection functions within its coverage area, a position of fire marshal/inspector should also be created. This person could also**

function as the department's volunteer recruitment and retention coordinator.

FIGURE 6-4
RECOMMENDED KEYSTONE VALLEY FIRE DEPARTMENT ORGANIZATIONAL STRUCTURE



* Creation of the position of Fire Marshal/Inspector would be contingent upon the department assuming greater responsibility for fire prevention and code enforcement functions.

** The career staff would be supervised and report directly to the fire chief for day-to-day operations. However, they would fall into the normal chain of command for emergency scene operations.

*** The need for a volunteer EMS captain will be predicated upon an increase in volunteer personnel participating in EMS operations.

Municipal Resources

6.2 Managing, administering, and leading a modern day fire and rescue services organization requires a complex set of knowledge, skills, abilities, training, and experience. In addition, he/she needs a tremendous amount of time to commit to the position. The Keystone Valley Fire Department should create a full-time, career position of fire/EMS chief. This chief should be a working chief, who responds to many emergency incidents and takes an active, hands on role in incident mitigation. However, his/her primary responsibility will be to provide the necessary vision, leadership, and coordination to more closely integrate the current somewhat compartmented fire and EMS operations into one.

6.3 Once the position of fire/EMS chief is created, through a variety of evaluative and assessment measures, the district and department should attempt to select a leader who possesses the ideal combination of assets they have identified as necessary to meet the unique needs of the Keystone Valley Fire Department to lead it through its continuing growth and evolution.

6.4 All officer positions, from lieutenant to fire and EMS chief, should continue to be filled based upon the person's firefighting/emergency medical services training, certifications, and experience commensurate with the position being sought. The Keystone Valley Fire Department should consider the addition of successful completion of a formal, rank appropriate assessment process, and a basic practical skills evaluation.

6.5 Based upon the recommendations contained in this report and the accompanying strategic plan, the Keystone Valley Fire Department should develop a formal process for implementing a long-term vision for the department. An early part of this process should include the development of a formal mission statement, vision statement, and set of core values. Well-designed mission statements should properly and accurately reflect the department's overall mission within the community. Vision statements identify the very reason for the department's existence and help to ensure that all personnel are working toward the same goals, or are proverbially, "all rowing in the same direction". The development of core values helps to establish what the department and its membership stand for.

6.6 The Keystone Valley Fire Department mission statement should be prominently displayed in each station along with the vision statement and core values.

6.7 The Keystone Valley Fire Department should form a committee to develop a standalone rules and regulations document. This document, which could be further enhanced as suggested below, should then be submitted for approval by the Board of Fire Commissioners, and then be distributed to, and signed for, by each member of the department. It could then provide an orientation overview, and indoctrination to

the department's behavioral expectations for new personnel. Some additional suggested sections for the Rules and Regulations could include, but are by no means limited to:

- **A preamble**
- **The department's mission statement**
- **Objectives of the department**
- **Purpose of the rules and regulations**
- **Organization**
- **Conflicts between department documents (state statutes, district/department policy, rules and regulations, operational procedures, general orders)**

6.8 The Keystone Valley Fire Department should form a committee to begin development of a comprehensive department standard operations procedures or guidelines (SOP/SOG) manual starting with mission critical procedures such as, but not limited to, *basic engine company and truck company operations, dwelling fires, commercial structures, rapid intervention team operations, personnel accountability, gas leaks, hazardous materials incidents, ice rescue, vehicle extrication operations, thermal imaging camera, and automatic external defibrillator use.*

The committee should be comprised of a cross-section of members of the department. The committee should be given whatever support is necessary to complete at least a basic manual within one year. If necessary, outside professional assistance is available to assist with facilitating this endeavor.

The general set up and organization of the manual is a very important consideration and the department must insure that the manual/system is easy to utilize, and cross-reference the necessary procedure. If personnel are going to be required to learn and adhere to the department's procedures, then the format, organization, and filing of them must be user friendly; otherwise they will sit on a shelf unused.

The first operational procedure should identify and explain the components of the Written Communications System, including the use and organization of the SOP Manual and other components of the system such as standardized forms. This procedure should also contain a provision that the entire SOP Manual will be reviewed on at least an annual basis and that updates and revisions can/will be made

at any time, as necessary. All procedures/revisions should be approved and issued after being signed by the fire chief.

6.9 The Keystone Valley Fire Department should develop a comprehensive respiratory protection plan in accordance with 29 CFR 1910.134, and a blood borne pathogens/ exposure control plan in accordance with 29 CFR 1910.1030. Appropriate SOPs that implement various components of these plans should also be developed. Annual training as required should be provided to all personnel.

CHAPTER 7

MEMBERSHIP SURVEY

OVERVIEW

Having a sense of common vision is important in any organization to ensure that the organization and its personnel are moving in unison toward a common goal(s). Having a common vision is not only about making sure that all parties are aware that they are in the same boat and rowing, but even more importantly, that they are rowing in the same direction. The impact of not sharing a common vision will be very noticeable in the quality and quantity of work performed, but also with the spirit and passion that the work of the organization is accomplished.

The perceptions shared by members of an organization can be extremely important in either establishing, or conversely, distorting that sense of a unified common vision. Whether accurate or not, and regardless of the myriad of factors that can influence them, the individual and/or shared perceptions of members of an organization can, and often do, become their reality. If there is a perception of distrust, or lack of mutual respect, between members of the organization, and/or between management and labor, the goal of successfully achieving that sense of common vision will be difficult, if not impossible.

Part of the process of this assessment involved administering an anonymous survey instrument to members of the department to obtain feedback from them on the issues that were specific to it.

OBSERVATIONS

During the period July 6, 2016 to August 24, 2016, MRI conducted an on-line survey of personnel within the Keystone Valley Fire Department. Thirty-one members of the department participated in the survey. Of those, twenty-two (70.9%), completed the survey in its entirety, nine (29.1%) did so partially. Since it is impossible to determine why those who only partially completed the survey chose to not answer certain questions, key findings as listed below reflect the percentage of personnel who completed that respective question, rather than the overall sample.

The survey also contained a number of questions that asked the respondent to provide their opinions in a short answer format in order to answer the query. Questions number 3, 5, 8, 12, 18, 40, 42, 43, 44, 45, 47, 63, 66 and 67 all fit into this category. In order to develop a clear understanding of the overall survey responses/results it is important for the reader to also

examine the comments that are voluntarily included to provide additional enhancement to the standardized survey question responses. The full survey results can be found in Appendix A. The survey revealed the following:

1. Respondents included 13 firefighters, 2 junior firefighters, 2 chief officers, 5 officers, 2 EMT/paramedics, 5 members of the board of directors, and 2 people who classified themselves as "other".

2. Fourteen respondents (45.16%) strongly agree that the formation of the Keystone Valley Fire Department/District has increased the level of service offered to member communities, while another 13 (41.94%) agree. Just one person (3.23%) disagrees.

3. Twenty-three personnel (76.6%) responded that the KVFD is a very good or excellent place to volunteer and serve their community, while six (20%) felt it was just average.

4. 50% of the personnel either strongly agreed or agreed that the department's facilities provide a clean and safe environment in which to deliver a professional level of service. 26.7% were neutral on the topic, and 23.3% either disagreed or strongly disagreed.

5. 18 members (60%) agreed or strongly agreed that the department was a well-managed organization. Nine (30%) were neutral, while three (10%) disagreed.

6. Seventeen respondents (56.7%) agree there is a high level of mutual respect across all ranks within the department, six (20%) were neutral, and seven (23.3%) disagreed.

7. Nearly 70% of respondents believe that they receive support and encouragement necessary to be successful.

8. The majority of respondents (62%) believe that there is a common vision and that the department operates with a set of common goals.

9. Three quarters of the respondents feel that expectations within the organization are clear.

10. Just 43.4% of those surveyed believe that internal discipline is fairly and consistently administered. Nearly one in four (23.3%) are neutral, while 33.3% either disagree or strongly disagree.

11. 81.5% of those who responded believe the department should establish a judicial board to deal with member discipline.

12. Twenty-five members (92.6%) believe that training is adequate.

13. Most respondents agree that training opportunities are distributed equitably and fairly.

14. 74% of respondents received personal and professional satisfaction from the job that they do within the Keystone Valley Fire Department.

15. The majority of respondents (61.5%) concur that they receive timely and quality feedback from their supervisors.

16. A slight majority (53.8%) of respondents believe personnel are treated fairly and equitably relative to the opportunity to obtain job assignments and specialty positions, while nearly 1/3 (30.8%) are neutral.

17. 85.8% of respondents believe the apparatus within the Keystone Valley Fire Department is adequate and has been well maintained.

18. Nearly 90% of respondents believe policies, procedures, rules and regulations provide clear guidance to members.

19. 78.7% of respondents believe officer selections are made fairly.

20. 59.2% of respondents believe that the administration of the Keystone Valley Fire Department provides fair and equal treatment to all employees.

21. 69% believe that the Keystone Valley Fire Department is a good "employer".

22. Just over half (53.9%) feel that the fire department administration welcomes suggestions and input.

23. Over 85% of respondents are proud to be members of the Keystone Valley Fire Department.

24. 70.4% of respondents believe that residents of the Keystone Valley Regional Fire District value the service that the department provides.

25. The majority of respondents (55.6%) agree that supervisors provide quality guidance and support.

26. The majority of respondents (85%) agree that safety procedures that have been developed and implemented are adequate for the organization.

27. 66.7% of those surveyed feel the administration of the Keystone Valley Fire Department and the Keystone Valley Regional Fire District work well together on issues affecting the service area.

28. 88% of the members agree that the officers of the department work well together on the incident scene.

29. 88.9% of respondents believe that firefighters ad EMT/paramedics work well together during incident response.

30. 76.9% believe the Keystone Valley Fire Department works effectively on emergency scenes with mutual aid public safety agencies such as surrounding fire companies and EMS squads.

31. 87% of those who replied believe that the Keystone Valley Fire Department provides the district with an acceptable level of fire protection.

32. The strongest response received during the survey indicated that 91.3% of members of the Keystone Valley Fire Department responding to the survey believe that the Emergency Medical Services (EMS) system provides an acceptable level of service to the community.

33. Just 38.1% of respondents believe the department has weaknesses that should be addressed, while 69.1% do not believe it does.

34. 78.3% of the respondents would recommend that friends/neighbors join the Keystone Valley Fire Department.

35. Just 31.8% agreed that improvements in compensation would improve their availability to participate with the department.

36. 73.9% feel that the department is well regarded by the people in the communities that they serve.

37. Just 30.4% of those who responded feel that the administration of the department supports or helps the team spirit of the department, while 47.8% were neutral.

38. 50% feel that individual initiative is supported and administration channels the initiative in a constructive way.

39. Just 40.8% feel that the administration of the department is receptive to their concerns.

40. 59.1% of the members feel that improvement is acknowledged.

41. Only six personnel (28.6%) agree that recruiting efforts are adequate and ongoing for the department, while eight (38.1%) disagree.

42. 68.1% agree the Incident Command System (ICS) is used effectively by the department on every incident.

43. The vast majority of members (81.8%) feel the Keystone Valley Regional Fire District should continue to seek opportunities for expansion into adjacent coverage areas.

44. Respondents were asked to rate the Keystone Valley Fire Department in several areas. These ratings include the quality of training, personal protective equipment, apparatus, support from the member townships, dispatch operations, and morale. Ratings were on a scale of 1- 5 with five being the best:

AREA OF RATING	HIGHEST PERCENTAGE RESPONSE
Training	4
Personal Protective Equipment (PPE)	5
Fire apparatus quality	5
Support from the member townships	4
Dispatch operations	5
Department morale	3

While the majority of those who responded to the survey did so in a positive manner and agreed with the statements that were presented, the results were by no means unanimous. This shows that the leadership of the fire district and fire department both still need to continue to make it a priority to continue to work at fully integrating the various company personnel into the unified department. The need to attempt to address and resolve ongoing animosities between Keystone Valley and surrounding departments such as Sadsburyville, Cochranville, and Westwood, was mentioned a number of times in the comments to various questions. While all parties agree that the companies work well together on the emergency

scene, the underlying current regarding overall relations between the companies is a concern to at least a portion of the department's membership.

RECOMMENDATIONS

7.1 The chiefs and officers of the Keystone Valley Fire Department must continue their ongoing efforts to develop a new sense of shared and common vision in the consolidated department rather than the separate and independent fire companies that merged to form it. To that end, maintaining open lines of communication, being cognizant of the opinions expressed in this survey, attempting to include a broad cross section of stakeholders in major decisions such as the design of a new station that recognizes and preserves the history and heritage of the individual companies while simultaneously planning for the department's current and future operational needs, and instilling a sense of one team–one mission and esprit de corps will all help to instill an increased sense of pride in the organization.

CHAPTER 8

CONCLUSIONS AND FUTURE VIABILITY

The missions performed by the fire department are some of the most basic and fundamental functions of government; to ensure the safety and protection of its residents and visitors. The real issue facing the Keystone Valley Fire Department, and the municipalities it serves, is to determine an acceptable level of risk and then define an appropriate level of service for the community. There is no "right" amount of fire protection or EMS delivery. It is a constantly changing level based upon the expressed needs of the community. Determining the appropriate level of service also involves deciding upon the municipalities' fiscal ability, and willingness, to pay for the desired level of service. Planned growth of the KVFD is essential to provide a consistent service level to the community, while keeping pace with increased demands for service caused by continued development. It is the unenviable task of the Board of Fire Commissioners to translate those needs into reality, maximize the delivery of fire, rescue, and EMS services, and do it in the most fiscally responsible manner possible, which we believe they do. The major challenge they will face is convincing the remainder of the governing bodies of their respective municipalities that their continued support, particularly fiscally, is a good investment.

An additional area of significant concern for the MRI study team is the ongoing uncertainty regarding the continued participation of Sadsbury Township in this regional endeavor. We are also very concerned about the lack of cooperation that was afforded to the study team by surrounding fire companies. These issues will be discussed in greater detail later in this chapter.

The National Fire Protection Association (NFPA) Standards 1710 and 1720 have been referred to within this study and should be considered by the department and its member communities as a foundation to determine an acceptable level of service and reasonable standard of cover. The recommendations in this report consider applicable NFPA standards, other regulations, such as OSHA, as well as commonly accepted fire and EMS best practices.

Based upon our analysis of the current operations of the Keystone Valley Fire Department, we have found an organization that is well-equipped, well-managed, and appears to be well-trained. On paper, at least, it appears to have sufficient personnel to handle the expected workload within the community it serves. As would be expected, the department has a dedicated core group of members who are trying to make their organization one that provides dependable, high quality, emergency services to the municipalities that it serves. From all accounts, once they arrive on the scene of an emergency, these personnel perform their duties competently, and can be counted upon to complete assignments given to them. They should be commended for their efforts and given the support they need to continue to try to be successful.

The department has done a very good job of right sizing the apparatus fleet (something they continue to do), reducing duplication of resources, and disposing of excess inventory including unneeded facilities (something they also continue to pursue). The department has been able reinvest the proceeds from the sale of these assets into current and future department needs.

However, although the fire department possesses a number of very definitive, positive attributes, it is also facing significant challenges both today, and looking toward the future. With volunteerism declining, and the ranks of volunteer emergency services personnel dwindling nationwide, the Keystone Valley Fire Department faces the dual challenges of attempting to balance a credible emergency response system staffed primarily with volunteer members, while simultaneously facing an increasing number of requests for service, both emergency and non-emergency, fueled by continuing residential and commercial development. The biggest challenge facing the Keystone Valley Fire Department is fielding sufficient personnel, consistently and in a timely manner, to respond to the emergency incidents they are called upon to mitigate. The ability to properly fund the necessary improvements to the department will also present challenges.

A June 2005 report, prepared by the Pennsylvania Legislative Budget and Finance Committee titled *"The Feasibility of Regionalizing Pennsylvania's Volunteer Fire Companies"* notes "Pennsylvania has more fire companies than any other state and in some cases, multiple fire companies in close proximity are resulting in unnecessary and inefficient overlap and duplication of firefighting resources"[20].

In most municipal governments, residents of the community, the voters/stakeholders/ taxpayers, choose the elected officials who will represent their interests and serve as the governing body. A key question that should be asked is: *"If taxpayers could choose their public services, would they choose the services they receive today?"* This question can grow even more complicated when the emergency services providers, both fire and EMS, are autonomous or independent organizations.

As early as 2009, the leadership of the Parkesburg, Pomeroy, and Atglen Fire Companies recognized the need to look at the way that fire and EMS services were being provided in the municipalities they serve. In fact, while both the old entities and the new are referred to as fire departments, it was actually the provision of EMS services, which accounts for more than 75% of the incidents the department handles, that really drove consolidation efforts. Driven in large part by the increasing number of EMS related incidents and a dwindling number of available personnel, the companies realized they would be unable to survive long-term if the model they used for providing service was not radically modified. At the time, several of the companies had only a few members who were resistant to change, even as their organizations were collapsing

[20] http://www.newpa.com/download/feasibility-of-regionalizing-pa-volunteer-fire-companies-house-resolution-148/?wpdmdl=56795

under the increased expectations of the communities they served. In short, several of the companies would not have been able to survive as independent entities.

The new Keystone Valley Fire Department became operational on March 19, 2013, as a result of what the Pennsylvania Department of Community and Economic Development (DCED) considers to have been a consolidation. DCED defines a consolidation as when two or more companies combine into a single entity, which results in the termination of all companies, and the creation of a new company or department with a new name. All assets and liabilities of the old companies are transferred to the new company.

The new district and department were heralded for its opportunities to produce cost saving efficiencies, and to enhance and ensure consistent, coordinated, and efficient emergency services to the area it serves. It adopted the very relevant mantra *"Working Regionally to Survive Locally"*. It was estimated that the consolidated department would produce about $188,000 in annual savings and more than $1,800,000 in long-term savings. While the department has been managed in a fiscally sound manner, not all of the short-term savings have been realized. This is due to the fact that although Parkesburg was in sound financial shape at the time of consolidation, neither Atglen nor Pomeroy were. Both were dealing with financial issues and had unaccounted for debt which was not fully disclosed during the process leading to consolidation. As a result, the KVFD was forced to assume these liabilities upon consolidation and has allocated significant resources to successfully paying down that debt. We believe that, long-term, the department will still realize significant cost efficiencies while simultaneously enhancing the provision of service to its "customers".

There does appear to be a few areas where the department and district have not done as good a job as they possibly could have regarding the new entity. First, although the fire chief does try to attend as many of the local governing body meeting as he can, several stakeholders we interviewed informed the team that the district and department have not always done a really good job of marketing themselves or even keeping the various municipalities informed of the district's progress. While we are not convinced this is the case, perception can often become the reality. Moving forward, the district and department will need to take steps to eliminate that perception.

It was also reported that in the early post-merger period that there were lots of personnel who were involved. It was reported that at times there were 50 to 60 people at department meetings and other events. This would be expected with the normal bump in morale and positive momentum a new endeavor produces. Over time though that participation has declined again, often a normal occurrence after the initial "newness" wears off. A couple of those interviewed believe that one of the issues, not only with participation by the membership, but concern among the townships, is that the department is Parkesburg "centered".

We believe that the falling off in participation is more than likely just a result of the newness wearing off, coupled with the continuing decline in volunteerism that is occurring throughout the country. However, as was discussed above, if there is perception that the department is Parkesburg centered, steps should be taken to counter that opinion.

The KVFD officers and other personnel reported that they work well on emergency scenes with their mutual aid partners such as Sadsburyville Fire Company and Cochranville Fire Company. However, the companies only train with each other on a very sporadic basis and it is very obvious that the relationships off the emergency scene are very strained at best. We certainly have concerns that despite the positive assessment of emergency scene operations, that the overall dysfunctional relationship between these various entities could impact those operations at any time.

As part of the process of conducting this study and developing the accompanying strategic plan, the MRI study team attempted to reach out to the leadership of the Sadsburyville, Cochranville, Westwood, and Christiana fire companies. No response was ever received at all from Westwood. At their request, copies of the standard questions we normally ask surrounding fire departments when conducting these types of studies, along with a few that would be specific to the parameters of this study, were forwarded by email to the chiefs of the Sadsburyville, Cochranville, and Christiana fire companies. No further response was ever received from Sadsburyville or Christiana. Cochranville did eventually respond, but only to inform the study team that their board of directors had voted to decline to answer the questions we had asked. Despite having performed several hundred public safety studies over the past 25 years, having surrounding departments refuse to speak to us, or provide any information what-so-ever regarding the department we are studying, is truly unprecedented.

The lack of response to these inquiries provides a disturbing snap shot to the dysfunctional relationship that exists between Keystone Valley and the departments that surround it. Since we were unable to obtain any perspective from these organizations, we are left to draw conclusions based upon our collective experiences. That experience tells us that the lack of cooperation from these organizations, and their unwillingness to even express their point of view, much less engage Keystone in discussions regarding further cooperative or regional endeavors, indicates a desire to protect long-established fiefdoms and territories, as opposed to being concerned about even exploring opportunities to provide services more economically, efficiently, effectively, and even quicker. While we cannot say for certain, it is difficult for us to believe that, if objectively self-evaluated, these organizations are not experiencing many of the same issues that drove the formation of Keystone Valley. We suspect that, as with many struggling emergency services providers, they may be portraying a false sense of security based upon an operational readiness that may no longer exist.

The lack of a cohesive, cooperative relationship between departments that often work together is of great concern to the MRI team, and should likewise be for the governing bodies of the

communities that participate. However, it is also our experience that, particularly when dealing with volunteer emergency services organizations or providers, municipal governing bodies are often unwilling to make difficult decisions that may prove to be politically unpopular with what is often a formidable constituency, albeit often a special interest one. We believe the greatest risk from these relationships is in Highland and Sadsbury Townships, with the latter being the most concerning due to the significant growth and development that is still occurring there.

The original ICA that was signed by Parkesburg Borough and Highland, Sadsbury, and West Sadsbury Townships in November 2012, provides for the initial term of agreement to be for 5 years, which will end in November 2017. Any municipality may withdraw from the fire district provided that at least one year of notice, before the upcoming calendar year, is provided to the other municipalities. If no notice of intent to withdraw is received, the agreement is automatically renewed for another 5-year term. While the MRI study team are not legal experts, we would recommend that the BOFC seek the advice of their legal counsel regarding what that actual date for notification is. It would appear that with just over a year to go until the end of the first 5-year agreement, that the window for any participating municipalities to withdraw is rapidly closing, if it has not already.

Sadsbury Township in particular seems to lack investment, and possibly even be disengaged with the KVFD and its operations, despite the fact that it provides the vast majority of its emergency services. At the time of this assessment, the township did not have an officially appointed member of their Board of Supervisors (BOS) serving on the BOFC. One of their supervisors attends meetings and apparently unofficially serves as their representative. However, in addition to not being formally appointed as the representative, this member is also a member of the KVFD, which could present a potential conflict of interest. The MRI study team attempted to contact the two other members of the Sadsbury Township BOS, but neither responded to requests to be interviewed.

It is our belief that longer-term commitments are needed from the participating municipalities in order to allow the KVFD to properly develop and implement long-range plans. The strategic plan that accompanies this report looks forward about 15 years, yet if any of the current member communities withdrew after 5 years, many of the recommendations for progress would be much more difficult, if not impossible to implement. In fact, a significant break-up of the fire district would create significant financial problems for it, and the municipalities that remain.

Government is a monopoly usually defined by geography, and our geographic boundaries, often laid-out a century or more ago, frequently determine what services we receive and who provides them. In other cases, the provision of services, particularly volunteer emergency services, commenced in response to a community void that was filled by the local citizens. This protection was often targeted to very small, specific areas, with little to no consideration given to the larger area or the "big picture". In other cases, multiple fire companies (more so than

ambulance or EMS squads) were formed in the same community due to political splits within the original organization or even due to long ago discrimination against certain ethnic or racial groups. In many cases, the traditional deployment of resources and provision of services have not kept pace with the changing and evolving needs of the community, particularly those that have experienced significant growth or other major changes in their demographics.

Within each municipality, the powers and privileges designated by the state are exercised by a governing body elected by the people. Municipal government is basically the response of the state government to the individualized local need for certain public services (*i.e.,* waste disposal, police and fire protection, water supply, health services, etc.) in addition to what is available from the state and/or county. The municipal governing body is the one which is tasked with providing emergency services or designating which entity, or entities, are authorized to provide them on their behalf. As permitted by statue, Parkesburg, Highland, Sadsbury, and West Sadsbury have traditionally delegated the provision of fire and EMS services in their respective municipalities to the independent fire companies in their areas, all of which have a long tradition of protecting the community. However, Act 7 of P.L 47, The Second Class Township Code, *Establishment of Fire and Emergency Medical Services*, approved in March 2008, states that although the township shall consult with fire and emergency services to discuss the emergency needs of the township, ***"The township shall be responsible for ensuring that fire and emergency medical services are provided within the township by the means and to the extent determined by the township, including the appropriate financial and administrative assistance for these services."***

Robert McCoy, Chief of the York Area United Fire and Rescue, shares simple advice for any local departments that are considering consolidation: "Put public safety before monetary concerns and be prepared for a long, drawn-out consolidation process. I fully, truly believe in the concept of regionalization and the concept of shared services, as long as the safety of residents comes first". In addition, when dealing with volunteer emergency services personnel, the governing bodies need to be certain to include them in every step of the process, and be aware of the potential ramifications of making changes they do not fully support or buy into. **While the governing body should not be held "hostage" by threats to quit if the decision does not go their way**, they do need to understand that volunteers have a much different level of investment than career staff, and thus it is more difficult to mandate changes, such as a forced regionalization or consolidation.

When automatic and mutual aid become an integral and in fact mission critical component of daily operations, it is probably time to consider what the next logical step is to better integrate what those operations are. Such is the case in both Sadsbury and Highland Townships where although only portions of each municipality are included in the Keystone Valley Regional Fire District, the KVFD actually provides mission critical ladder response, as well as EMS, to the entire township. It also provides the rescue response for all of Sadsbury Township. This situation begs the question, why? It seems the only plausible explanation is an unwillingness by

the governing bodies of those townships to exert their authority, as granted under Act 7, and make the politically unpopular decision to designate their entire municipalities as part of the KVFD. In the case of Sadsbury Township, this would also mandate that Sadsburyville Fire Company join the KVFD.

The reluctance of local officials to cede control, and/or show leadership by making politically unpopular decisions, are two of the primary reasons that steps toward consolidation of services and regionalization have been slow to catch on in many places in the northeast. However, Pennsylvania has made some inroads in that regard, particularly with emergency services. The legislative report *"The Feasibility of Regionalizing Pennsylvania's Fire Companies"* noted that between January 1997 and December 2004, a total of 23 successful mergers and consolidations, involving 58 volunteer fire companies, in 34 different municipalities occurred. There were also additional efforts being considered that involved 188 fire companies, in 104 municipalities[21]. There have been numerous ones since then, including the York Area United Fire and Rescue in 2008, Garden Spot Fire Rescue in 2012, and of course, the Keystone Valley Fire Department in 2013.

The legislative report notes, "Mergers, consolidations, and other forms of regionalization of fire services are feasible and have significant potential to do much to enhance and perpetuate the volunteer fire system in Pennsylvania, and could go a long way toward addressing many of the issues and challenges currently facing volunteer fire companies". We believe that the companies who consolidated to form Keystone Valley have achieved those goals, although they still continue to work on many of them. It is the belief of the MRI study team that Chester County as a whole, but for the narrower focus of this study, western Chester and even eastern Lancaster County could definitely benefit from an expansion of the regional approach to service delivery being provided by Keystone Valley. We believe that Keystone Valley has demonstrated that fewer, more strategically placed resources, with better staffing and training, can make more effective use (not necessarily reducing) of financial resources, which can ultimately result in improvements and enhancements to existing service levels.

The various municipalities in the area around Keystone Valley already participate in a number of other regional or shared services endeavors. For instance, the Parkesburg Police Department also provides coverage to Highland Township and Avondale. The Octorara Area School District serves Parkesburg, Atglen, Christiana, West Sadsbury Township, Sadsbury Township , West Fallowfield Township, Highland Township, and Londonderry Township. The same reasons that most likely drove these endeavors, the ability to provide better services in a more fiscally responsible manner, should also drive further consolidations of the fire and emergency services.

[21] http://www.newpa.com/download/feasibility-of-regionalizing-pa-volunteer-fire-companies-house-resolution-148/?wpdmdl=56795

Scarce tax dollars which have been stretched to the limit are now in real danger of tearing or breaking. Smaller communities which have far fewer resources and options than their larger neighbors will find it especially difficult to cope within the limitations imposed by the new financial reality. This situation was recently illustrated in Sadsbury Township when the township committee recently voted to award all of the township's relief funding for equipment to Sadsburyville Fire Company, rather than splitting it with the KVFD as has been the past practice. The stated reason was the need for Sadsburyville to purchase new SCBA and no other funding was available. The continuing trend of declining volunteerism will create simultaneous challenges that will stretch the provision of emergency services in many communities even farther.

Small communities have traditionally gotten a great value from their volunteer fire and EMS services. In addition to the fact that their personnel costs are extremely low, in many cases the local municipality provides only a fraction of the amount of funding necessary for the department to operate effectively. The expectation, perhaps driven by long established fund raising traditions in the volunteer services and the communities they serve, continues to this day. In 2010, during the preliminary discussions on the formation of the KVFD, a DCED representative noted that the three departments slated to consolidate, Atglen, Parkesburg, and Pomeroy, had annual budgets totally over $400,000. Yet the four municipalities involved, Parkesburg, Sadsbury, Highland, and West Sadsbury, contributed a combined $177,000, or about 34%, leaving the departments to raise the remainder through other fund raising endeavors. He estimated that the average volunteer spends about 80% of their time commitment to the fire department raising funds rather than training or responding to emergencies.

Even with the formation of the KVFD, the participating municipalities do not seem to be paying what would be considered to be a fair share for the services that are provided, particularly Highland and Sadsbury Townships considering the various services the department provides to each of them.

	MUNICIPAL CONTRIBUTION 2015*	% OF MUNICIPAL FUNDING 2015	TOTAL NUMBER OF INCIDENTS 2015	% OF TOTAL INCIDENTS 2015	COST PER INCIDENT 2015
PARKESBURG BOROUGH	$81,604	24.9%	530	40.5%	$153.97
HIGHLAND TOWNSHIP	$35,554	10.8%	98	7.5%	$362.80
SADSBURY TOWNSHIP	$30,859	9.4%	403	30.8%	$76.57
WEST SADSBURY TOWNSHIP	$179,828	54.9%	276	21.2%	$651.55

* Source: KVFD 2015 financial review.

Municipal Resources

At the present time, the amount each municipality contributes is predicated upon its assessed valuation with the KVFD. As is illustrated in table 8-1, there is a significant disparity in the cost per incident in each of the municipalities based upon their annual contribution. While assessed valuation can be one method to determine the funding formula, there are probably more equitable ones that would provide a better barometer. One possible one would utilize a formula that takes into account assessed valuation, population, and number of incidents. In any case, we believe the municipalities should contribute additional funding to this very cost effective regional endeavor.

The district also has two restricted capital accounts that it maintains for the fire department. As of the end of 2015, the restricted truck fund contained $210,507, while the restricted building fund had a balance of $82,792. It should be noted that these balances were prior to the sales of the Atglen fire station, which combined, netted the district $115,000 in revenue.

In conclusion, the citizens of the Keystone Valley Regional Fire District should feel confident that the Keystone Valley Fire Department is a professional public safety organization that is providing a high quality level of service to the community. We continue to be impressed with the dedication and commitment of its members. The MRI study team further believes that the Keystone Valley Fire Department has the skills, capabilities, and motivation to continue to be an effective, highly trained, and motivated organization that meets or exceeds nationally recognized standards for operational readiness. We believe it can be a model for the success of carefully planned out organizational consolidations that improve the levels or service available, and do so both effectively and economically. There are challenges to be sure, but we are also quite confident the membership will rise to the occasion. We hope that the municipality governing bodies will do the same, by making long-term commitments to the fire district, supporting the expansion of the fire district by further consolidations that are not currently participants, and by providing adequate funding that allows department personnel to concentrate their efforts on training and emergency response, while simultaneously being confident they will have the fiscal resources they need to effectively, efficiently, and safely perform their duties.

RECOMMENDATIONS

8.1 The Keystone Valley Regional Fire District should take steps to attempt to obtain long-term commitments from its members in order to allow the department to develop long-range plans for the district and the fire department. If possible, this should be done prior to the automatic 5-year renewal of the fire district ICA.

8.2 The Keystone Valley Fire Department should seek additional partners to consolidate with to expand the fire district and fire department's operational areas to further streamline emergency services operations in the area.

8.3 **The Keystone Valley Regional Fire District should, with its member municipalities, explore the feasibility of developing and implementing a more equitable funding formula to balance the cost per incident between municipalities. One possible formula could use assessed value, population, and call volume to determine funding.**

8.4 **The Keystone Valley Regional Fire District should attempt to negotiate for increased levels of funding, particularly capital funding, from the participating municipalities in order to adequately fund long-term capital projects of the department.**

8.5 **The Keystone Valley Fire Department should continue to explore alternative sources of funding for the department such as grants, public/private partnerships, etc.**

8.6 **In conjunction with the governing bodies of the various municipalities involved, the Keystone Valley Fire Department should have an ongoing, open, and honest dialogue with a number of its surrounding fire and EMS companies in order to repair the dysfunctional relationship that exists between them.**

8.7 **The Keystone Valley Fire Department should improve its efforts to market itself to its member (and other) municipalities to ensure they are fully aware of the benefits the department and its operations are providing to the community.**

8.8 **The Keystone Valley Fire Department should make an effort to reverse perceptions that the department is Parkesburg centric.**