

ORGANIZATIONAL ASSESSMENT

for the

**Mount Vernon
Fire Department**

by

**The Ohio Fire Chiefs' Association
Consulting Services**



PREMIER • PROFESSIONAL • PROACTIVE

August 2023

EXECUTIVE SUMMARY

The Ohio Fire Chiefs' Association (OFCA) was engaged to perform an organizational evaluation for the Mount Vernon Fire Department (MVFD). The study included a review of the department's policies, procedures, training, facilities, apparatus, equipment, and general department administrative and operational processes. A community risk assessment was completed as well as an analysis of the department's response performance. A written report was provided to the city of Mount (Mt.) Vernon safety services director and fire chief that identified administrative, operational, and technical areas of concern along with recommendations to improve overall system performance and comply with state and federal codes, guidelines, and industry best practices. Recommendations also included re-establishing the assistant fire chief position.

The city of Mt. Vernon is located approximately 45 miles northeast of Columbus, Ohio in Knox County. It has an area of 9.6 square miles and a population estimated at 16,956. MVFD provides fire protection, paramedic level emergency medical services, community risk reduction (CRR) services (i.e., code enforcement, fire prevention, public education, and fire investigations), disaster/emergency operations planning, and hazardous materials response. Besides the city, the MVFD also delivers of fire emergency medical, CRR services contractually to several contiguous townships, the Mt. Vernon Developmental Center, and the Knox County Airport. In 2022, the department responded to 6,250 emergency incidents, which was a 38.9% increase in demand over the past 10 years.

MVFD is a combination staffed department with a current staffing of 55 uniformed personnel and one civilian administrative staff. The roster includes the fire chief, three captains (shift commanders), six lieutenants, an EMS coordinator, a fire prevention officer, 33 full-time firefighter paramedics, nine part-time firefighters, and an executive secretary. The department operates from two fire stations with a daily maximum staffing of 17 and minimum of nine personnel. The department currently staffs the following emergency response vehicles: two engine companies, one ladder company, three advanced life support transport units, and an incident command unit.

A site visit was conducted to examine the department's current fleet of apparatus and equipment, and perform an inspection of the fire stations. The assessment team met with Fire Chief Chad Christopher and his staff and reviewed the department's response data, records, and current policies and procedures. Interviews with firefighters and officers were also conducted during the site visit to gain insight into organizational and operational issues and identify areas for improvement. As a result of the analysis, 24 recommendations were developed for the city and fire department's consideration as well as additional suggestions for improvement.

The following table lists the recommendations included in this report.

RECOMMENDATION NUMBER	RECOMMENDATIONS
	Fire and Emergency Services
1	Develop administrative and operational standard operating guidelines for all technical rescue operations.
	Community Risk Reduction
2	Consider an in-service company inspection program at residential, office, manufacturing, and retail business occupancy types throughout the city.
3	Provide appropriate training in conducting routine fire prevention inspections to all field personnel, particularly company officers who will be responsible for supervising these company programs.
4	Complete a comprehensive review of the city's actual costs for providing fire prevention services.
5	To fund the department's fire prevention and safety activities the city should consider the adoption of registration, inspection, and/or permit fees to offset the actual costs of providing community risk reduction services in the city.
	Staffing and Deployment
6	Consider reestablishing the assistant fire chief position to reduce the span of control for the fire chief and to clearly identify a second in command to ensure continuity of leadership in the fire chief's absence.
7	Consider creating the position of fire marshal to lead and represent the Fire Prevention Bureau.
	Employment
8	Ensure that all firefighters receive an annual medical evaluation consistent with National Fire Protection Association (NFPA) 1582, <i>Standard on Comprehensive Occupational Medical Program for Fire Departments</i> .
9	Develop policies, procedures, and job descriptions that addresses part-time firefighter positions.
10	Employ measures to gain insight into the strengths and weaknesses of department personnel in regard to its ability to execute a recruitment and retention plan.
11	Comply with Ohio Revised Code §146.01 – 146.19 Volunteer Firefighters' Dependent Fund for the benefit of those employed as part-time firefighters.
	Training
12	Make a concerted effort to send as many officers as possible to the National Fire Academy for fire officer and executive development.
13	Make it a priority to continue to develop and budget for a company fire officer training and development program that is competency-based on NFPA 1021, <i>Standard for Fire Officer Professional Qualifications</i> .
14	Develop competency task books/logs for firefighter, fire apparatus driver/operator, company officer, and shift commander positions.

15	Develop and institute written and practical skills testing and proficiency evaluations as part of the department's comprehensive fire training program.
16	Provide all companies and personnel with high-intensity training on various subjects, including periodic live fire training on at least a semi-annual basis at an appropriate location where appropriate training facilities, structures, and props are available.
17	The city of Mt. Vernon should make it a high priority to provide funding for the MVFD to procure an appropriate training facility where it can safely perform in compliance with NFPA 1403, <i>Standard on Live Fire Training Evolutions</i> for all personnel on at least a semi-annual basis.
	Critical Task Capabilities
18	Train and certify all captains and lieutenants as incident safety officers.
	Facilities
19	As a planning objective that, over a three-year period, the department should conduct a facility assessment of fire station facilities.
	Policies and Standard Operating Guidelines and Procedures
20	Consider appointing a policy and standards review committee responsible for the annual review and providing recommended revisions to departmental policies and standard operating guidelines/procedures.
	Fire Station Location Study
21	Consider long-range planning with locating a second fire station within the city's corporation limits in the recommended area as identified in the Fire Station Location Analysis.
	Additional Recommendations
22	Continue to expand and strengthen data tracking and records management system practices to support strategic initiatives.
23	Develop organizational performance goals.
24	Consider development of a written standards of cover for service.

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The Ohio Fire Chiefs' Association recognizes Fire Chief Chad Christopher and the staff of the Mount Vernon Fire Department for their cooperation and effort during this project. They were prompt, courteous, and professional in providing the background information and data necessary to conduct this assessment. Fire department personnel serve with pride and are committed to the delivery of quality service to the community. The Ohio Fire Chiefs' Association also recognizes Safety-Service Director Richard S. Dzik for his commitment to the project and providing information about the community, city operations, and future service delivery.



INTRODUCTION

At the request of the city of Mount (Mt.) Vernon, the Ohio Fire Chiefs' Association (OFCA) was contracted to perform a comprehensive organizational, effectiveness, and overall efficiency study of the city's fire, rescue, and emergency medical services (EMS) delivery system. The primary intent and goal of this project was to determine whether existing levels of staffing, facilities, equipment, and funding are adequate to provide a level of service within the city that is in line with generally accepted standards and benchmarks for public safety utilized by comparable fire departments in similar communities and based on standards and best practices for modern-day fire protection services currently in practice in state of Ohio and the United States (U.S.).

The overall goal of this project was to conduct an organizational assessment of the Mt. Vernon Fire Department (MVFD). All administrative and operational facets will be reviewed to determine efficiencies, compliance with local, state, and federal law, as well as industry best practices. The study will examine the current level of service, response performance, and future service needs of the community based on projected service demands, anticipated growth, and community risk. This report will provide city and department administrators the information to make informed mid-range and long-range plans in providing high quality yet cost-effective service to the community.

OVERVIEW

Mt. Vernon has an area of 9.60 square miles (sq. mi.) and serves as the county seat of Knox County. It is located approximately 45 miles northeast of the Columbus metropolitan area. The city includes a mix of residential and commercial development, as well as some manufacturing facilities. There is an industrial park in the southern area of the city along South Main Street (State Route 661). Companies such as Ariel Corporation, Jeld-Wen, International Paper, Knox Community Hospital, and the Mt. Vernon Nazarene University are some of the city's largest employers.

Mt. Vernon is known for its tree-lined streets and historic, quiet neighborhoods. The downtown area features small boutiques and shops, as well as the historic Woodward Opera House, an authentic 19th century theatre. The community offers several outdoor recreational opportunities. Ariel Foundation Park is a 252-acre property with trails and two ponds. Other neighborhood parks are located throughout the city as well as Heart of Ohio Trail and the Kokosing



Gap Trail, a 14-mile paved recreational trail between Mt. Vernon and Danville. Mt. Vernon received the Best Hometown Award from *Ohio Magazine* for 2017-2018.

The city is bordered by Clinton Township (Twp.) to the west and southwest, Morris Twp. to the north, Monroe Twp. to the northeast and east, and Pleasant Twp. to the east and southeast. A small area of Miller Twp. borders the city on the south. The city limits have a jigsaw appearance in some areas due to annexation, which has resulted in several “doughnut holes”, which are areas of the city that surround non-annexed township land. Main roadways include West High Street and Coshocton Avenue (U.S. Route 36), North Sandusky Street (State Route 13), Main Street, and East Gambier Street (State Route 229).

The Kokosing River meanders through the city east to west then turns north and runs along the west side of the city. The river serves as a dividing point between the north and south areas of the city. The Ohio Central Railroad operates a rail line from Newark north to Mt. Vernon. The rail line provides car service to International Paper and the Central Ohio Farmers Co-Op grain facility. Farmers Co-Op averages one train weekly prior to and during harvest season. Figure 1 is a map of Mt. Vernon.

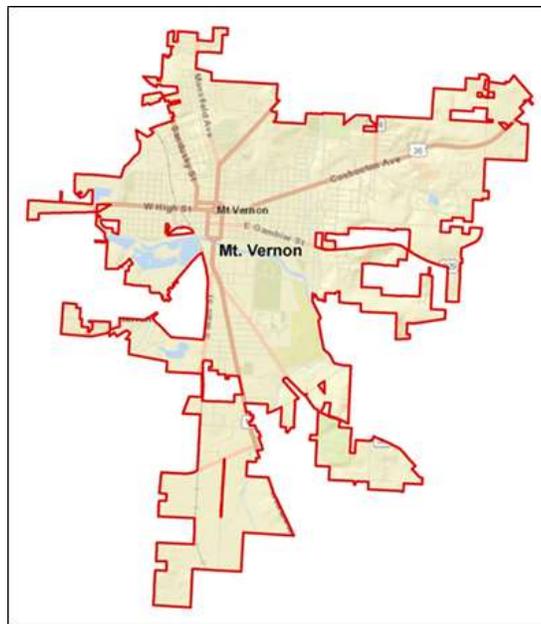


Figure 1: Map of Mt. Vernon and boundaries.

GOVERNANCE

The city of Mt. Vernon is a statutory form of government, as described in Ohio Revised Code (ORC) Title 7. Mt. Vernon is a mayor-council form of government as outlined in the city’s ordinances subject to the provisions of the Ohio Constitution. There are eight elected council members and an elected mayor. The law director and auditor are also elected positions. The

mayor appoints a safety-service director, who assists in directing the various functions and operations of the city. There are 14 city departments and several boards and commissions.

DEMOGRAPHICS

The city has a population estimated at 16,956, which reflects a 0.2% population decrease from the 2010 census.¹ The population is 91.2% White, 1.5% African American, and 0.6% Asian; mixed race and other ethnicities makeup the other 6.7% of the population. Nearly 18% of the population is over 65 years of age and 5.7% of the population is less than five years of age. This profile means that 23.6% of the population is in the vulnerable category based on age. A vulnerable population is anyone who is unable to anticipate, cope, or resist and recover from the impacts of some type of disaster. Vulnerable populations may include the economically disadvantaged, racial, and ethnic minorities, the uninsured, low-income children, the elderly, homeless, and those with chronic health conditions, including those with mental illness.² The city has 6,523 housing units and the median income is \$ 46,656.³ Since 1980, the city has experienced an overall 18% increase in population as displayed in Figure 2.

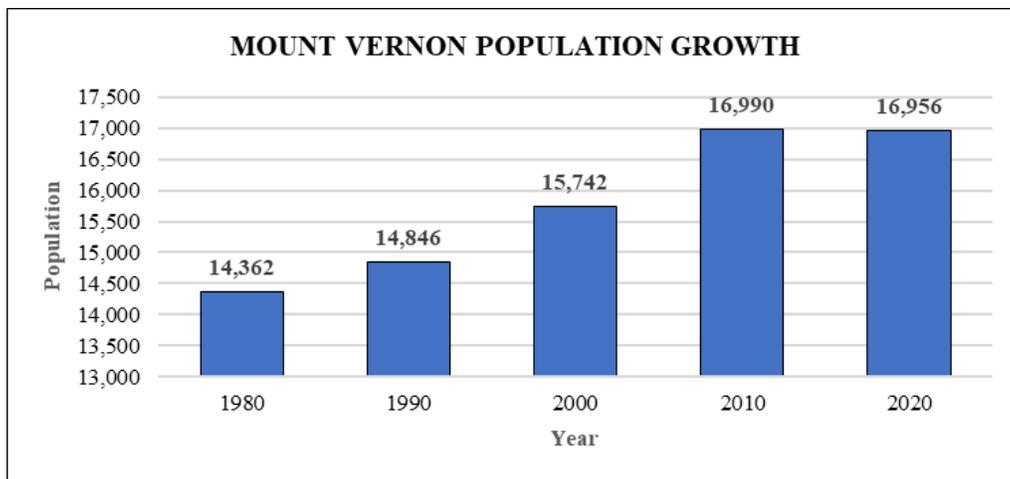


Figure 2: City of Mt. Vernon 40-year population growth.

Subsequently, the population has increased 7.7% since 2000. The city has positioned itself to accommodate growth in designated areas.

¹ Retrieved from: https://data.census.gov/cedsci/profile/Mount_Vernon_city,_Ohio?g=1600000US3953102

² Vulnerable Populations: Who Are They? The American Journal of Managed Care. 2006

³ Retrieved from: https://data.census.gov/cedsci/profile/Mount_Vernon_city,_Ohio?g=1600000US3953102

COMMUNITY DEVELOPMENT AND GROWTH

The continual changing landscape of Mt. Vernon discloses growth and resulting development patterns – demographics, residential real estate, mobility, infrastructure enhancements, and more have shifted in a big way compared to even just five years ago. This housing surge can be contributed to the Intel Corporation’s Central Ohio investment of an estimated \$20 billion in manufacturing facilities, which will produce semiconductor/computer chips while significantly impacting the communities in which it is located and those within its region. Residential development in the city means the construction of buildings, with the structures themselves being vulnerable to all hazards, as well as the building’s occupants within. This risk creates the potential for major loss to the areas served in terms of life safety, economic impact, and loss of tax revenue.

Planned (approved) and in-progress development projects are concentrated to the south, east, and northeast of the current fire station and Mt. Vernon’s core area. Within the city, investment in the communities has continued at a relatively steady pace in the form of new residential projects. Residential projects, which include single-family, duplexes and three- or four-family buildings, are projected to increase approximately five-percent over the next several years in the city.

Future developments include:

- Gilchrist Estates, a newly constructed 109-unit neighborhood development off of Upper Gilchrist Road. The development is situated on 73 acres of land. Phase 1 of the project encompasses 22 lots. Additional single-family detached residences and a condo development are planned for up to seven future phases.
- Liberty Crossing, an approved planned neighborhood development along Newark Road (Figure 3). The neighborhood calls for a mix of 477 housing units consisting of: 42 single-family patio homes, 112 townhouses, 230 multi-family residences, and 93 single-family homes on 102 acres.



Figure 3: Rendering of the Liberty Crossing planned neighborhood development along Newark Road.

Source: Bob Pepalis, The Mount Vernon News.

- Old Mulberry School, the 1939 school building that fronts 301 North Mulberry Street is being transformed and redeveloped into 102 residential units and 186 surface parking spaces on the 4.2-acre site (Figure 4). The old school and property will house 48 apartments, a six-unit townhouse building, and two garden-unit apartment buildings with 24 units each.



Figure 4: Rendition of the former Mt. Vernon Middle School at 301 North Mulberry Street.

Source: Bob Pepalis, The Mount Vernon News.

- The Pine Hill Independent Senior Living is under construction on the campus of The Ohio Eastern Star Home offering new condominium-style and apartment-style units in a secure neighborhood setting (Figure 5). The 96-unit community will be located on 60 acres just north of the main facility, at the intersection of Eastern Star Road and New

Gambier Road on the city's east end. It will include a building with 40 one- and two-bedroom apartments, located near the middle of the property, surrounded by 56 condominiums on the perimeter (these will be grouped into three- and four-unit cottages). Some condominiums will have an attached garage and range in size from approximately 800- square feet (sq. ft.) to 1,200-sq. ft. All units will be rentals.



Figure 5: The Ohio Eastern Star Home, an independent, senior living campus located at 1451 Gambier Road.

Source: Cramer and Associates.

- The Retreat at Mount Vernon, a planned multi-family housing development. Plans call for 496 units in the complex: 332 two-bedroom units and 164 one-bedroom units. There will be 26 residential buildings: 20 two-story and six three-story. The developer will build the complex in four phases. Phase 1 (11.47 acres, 152 units) on the southwestern side, entering off of Upper Gilchrist Road. Phase 2 will be the center “Central Park” section consisting of 8.9 acres and 112 units. Phase 3 will be 7.19 acres in the northwestern section comprising 120 units. Lastly, Phase 4 will be 7.93-acre, 128-unit eastern section entering off of Coshocton Road.

The city has two tax increment financing (TIF) districts. One is located along Coshocton Avenue east of Sychar Road and generates approximately \$1 million annually. A second TIF district has been established along Sandusky Street from the downtown area north to the city limits. Utilities have been extended into the township in this area. A city strategic plan is currently in development.

FIRE DEPARTMENT MISSION, VISION, AND VALUES

All organizations should have a mission statement. A carefully crafted mission statement describes an organization's purpose, function and services provided. This lays the foundation for the organization's direction and service goals. A mission statement often informs the vision statement, which describes where the organization aspires to be in the future. MVFD has clearly

developed mission and vision statements, along with defined core values that identify the organization's culture and belief system.

Mission Statement

The Mt. Vernon Fire Department is dedicated to protecting and serving our community with a commitment to professionalism and performance excellence.

Vision Statement

Provide the best service to every customer.

Core Values

Team: A group of individuals striving to reach a common goal.

Service: We protect and serve our entire community with a commitment to performance excellence.

Professionalism: We take pride in our work; communicate effectively, project a positive image, and delivery service at the highest standards every time, in every situation.

Integrity: We act ethically, honestly, and lead by example by having our actions reflect our word.

Compassion: Demonstrate kindness and empathy.

Leadership: Provide guidance and support throughout community and department.

Having clear mission and vision statements and core values provides personnel with the foundation of why the agency exists and where they are headed. While the development of these statements is important, they must be constantly communicated to ensure all personnel are operating from the same baseline information on what the purpose of the agency is so all personnel are working together to achieve the shared vision.

FIRE AND EMERGENCY SERVICES

From its earliest beginnings, the fire service in this country and around the world has developed from a response to one of nature's most destructive forces, uncontrolled fire, with a spirited dedication to public service, community involvement, and technology to minimize personal injury, loss of life, and property loss. Most fire departments in the early days were comprised of volunteer fire companies who worked for little or no pay to respond to fires in an effort to save communities, both property and people, from the ravages of fire losses. Rudimentary water supply distribution systems made of wood that were drilled or "tapped" from bored fire "plugs"

to obtain a water supply for firefighting, and steam pumping stood as the technology of the day during the development stages of the public safety infrastructure in our nation.

Logically rescue and medical assistance unrelated directly to fire events played an expanding role in the fire service development. The advent of dense urban and sprawling suburban environments introduced a wide variety of emergency response incidents that drove the planning and development of fire departments into specialized rescues in confined spaces, high elevation rescue, hazardous materials incidents, and water rescue which often were unrelated to fire events. In the 1970s, the advent of close partnerships with medical providers, hospitals, and state governments launched what is today the modern paramedic service, which sets the standard internationally for emergency medical care, on scene treatment, and emergency medical transport. Because of the complexity of the modern environment, many fire departments have set aside volunteer fire departments, and have created full-time career and part-time combination fire departments capable of dealing with the modern-day challenges and technologies required for successful fire, rescue, and EMS today.

MVFD began service to the community in 1849 as a volunteer organization with three hose companies. In 1891, the first paid firefighters were appointed to the department by city council. In 1914, two of the three hose companies were closed and the department responded out of the hose company building on North Gay Street. The department moved into a larger building on the northeast corner of the public square in 1918.

In 1965, the fire department moved into a former boathouse at 207 West Ohio Avenue, which was converted into a fire station. To meet the concerns of increased rail traffic, a second station was constructed in 1967 on Ames Street.

A major change in department operations occurred in the early 1980s when the department began providing EMS. Prior to this time, EMS was delivered by the Life Support Team operating from the local hospital. The city built the current main station on West Gambier Street in 2000. In 2014, Station 2 on Ames Street was closed to consolidate resources and equipment in the newer and larger main station. MVFD has continued to expand and evolve to meet the needs of the community. Currently, the department serves the community with 46 full-time uniformed personnel.

By 2021, the MVFD's delivery of fire and EMS expanded contractually to several contiguous townships, the Mt. Vernon Developmental Center, and the Knox County Airport. This expansion of service delivery included College Twp. Within the township is the village of Gambier and Kenyon College. Providing emergency services to College Twp. and Gambier afforded the MVFD the ability to operate from a second fire station (Station 492) located at 102 East Brooklyn Street in Gambier with three additional on-duty personnel consisting of one lieutenant, one full-time firefighter/paramedic, and one part-time firefighter/emergency medical technician (EMT).

Service Area

MVFD provides fire suppression response and EMS to all areas within the city corporation limits. The department also provides services to surrounding townships and special properties through contractual agreements. Fire protection response and EMS are provided to all of the village of Gambier, Clinton Twp., College Twp., Liberty Twp., Pleasant Twp., and approximately 35 % of Morris Twp.

The village of Gambier has an area of .94 sq. mi., a population of 2,213, and a total of 360 housing units according to the 2020 U.S. Census data.⁴ The village of Gambier is primarily known as the location of Kenyon College, one of the top liberal arts colleges in the country. The institution was founded in 1824, and stands on an 800-acre campus with excellent examples of Gothic collegiate architecture, as shown in Figure 6. It has an



Figure 6: Kenyon College campus Gothic architecture.

estimated enrollment of 1,600 students. The area is an attractive town full of natural beauty and historic architecture. Many of the homes and buildings in Gambier were created in the 19th century giving the small village a desirable charm. The area has an abundance of natural beauty that includes the 14-mile Kokosing Gap Trail that winds through Gambier and has end points in Mt. Vernon and Danville.

According to the 2020 U.S. Census Decennial data the following estimates are provided for each of the unincorporated areas:

- Clinton Twp. has an area of 14.6 sq. mi., a population estimated at 2,886, and a total of 1,250 housing units.⁵
- College Twp. encompasses an area of 6.4 sq. mi., has an estimated population of 2,553, and 503 housing units.⁶
- Liberty Twp. has an area of 25.8 sq. mi., a population estimated at 1,765, and 764 housing units.⁷

⁴ Retrieved from https://data.census.gov/profile/village_of_Gambier_village,_Ohio?g=1600000US3929246

⁵ Retrieved from https://data.census.gov/cedsci/profile/Clinton_township,_Knox_County,_Ohio?g=0600000US3908316140

⁶ Retrieved from <https://data.census.gov/cedsci/all?q=College%20township,%20Knox%20County,%20Ohio>

⁷ Retrieved from https://data.census.gov/cedsci/profile/Liberty_township,_Knox_County,_Ohio?g=0600000US3908343218

- Pleasant Twp. has an area of 18.2 sq. mi., a population estimated at 1,657, and 694 housing units.⁸
- The Morris Twp. service area is almost 7.35 sq. mi., an estimated population of 750, and nearly 350 housing units.⁹

The unincorporated contractual service areas are primarily rural in nature with largely light-density residential development and large areas of open spaces and farmland. There also are some light commercial and industrial properties. Figure 7 is a map of Knox County that identifies its municipal and township jurisdictions.

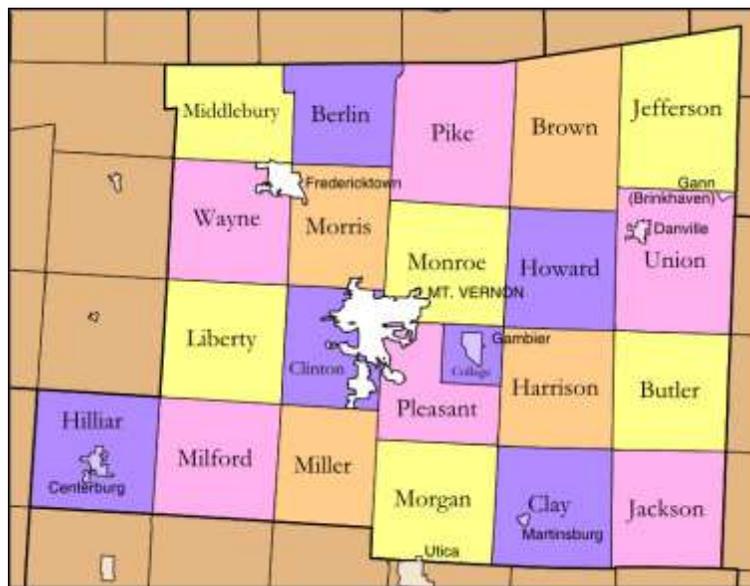


Figure 7: Map of Knox County with its municipal and township identities.
Source: The RadioReference Wiki

Fire protection response and EMS service is also provided to the Mt. Vernon Developmental Center (MVDC), located north of the city in Monroe Twp. and the Knox County Airport, located south of the city in Miller Twp. The MVDC is an intermediate care facility for individuals with intellectual disabilities and other related conditions that has a capacity of 78 licensed beds.

The Knox County Regional Airport (KCRA) serves the general aviation needs of the Knox County area. General aviation includes all aircraft not flown by the airlines or the military. KCRA is owned by the Knox County Regional Airport Authority and is located some four miles southwest of Mt. Vernon. Business aviation, one of the most important segments of general

⁸ Retrieved from https://data.census.gov/cedsci/profile/Pleasant_township,_Knox_County,_Ohio?g=0600000US3908363310

⁹ Retrieved from https://data.census.gov/cedsci/profile/Morris_township,_Knox_County,_Ohio?g=0600000US3908352290

aviation, consists of companies and individuals using aircraft as tools in the conduct of their business.

Service Demand

As stated previously, MVFD provides fire suppression response and EMS. The fire protection response includes responses to incidents that are non-fire such as carbon monoxide detector activation, a person stuck in a stalled elevator, gas or fuel leaks, or a technical rescue situation. The EMS is an advanced life support level (ALS) and transport model. ALS level is commonly referred to as paramedic level service. The department also provides a variety of community outreach and risk reduction services such as fire and life-safety prevention, fire safety education, and fire investigation.

MVFD has experienced a significant increase in calls for service over the past 10 years. In 2013, the department responded to 4,501 calls for service. By 2022, this number had increased to 6,250, which is a 39% increase. Note that a call for service is actually an incident count. If multiple companies respond to a fire, it counts as one incident or call for service. It should also be noted that service to Liberty Twp. began in 2017 and College Twp. and Gambier on June 9, 2021. The department's calls for service over the past 10 years are displayed graphically in Figure 8.

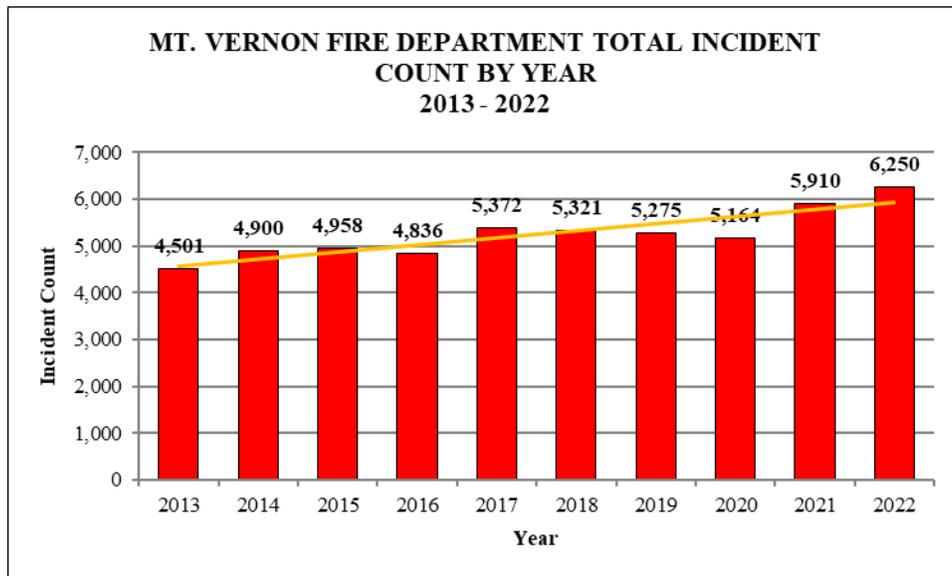


Figure 8: Annual calls for service from 2013 – 2022.

EMS incidents increased approximately 50% during this 10-year period. However, fire incidents decreased approximately 4.7% over the same 10-year period. In addition to building and auto fires, this number includes fire alarms, rescues, carbon monoxide calls, service calls, and other non-EMS responses. EMS responses include motor vehicle accidents. Overall, as stated

previously, there was an approximate 39% increase during 2013 – 2022 time period. Figure 9 shows a comparison of all fire and EMS responses over the past 10 years.

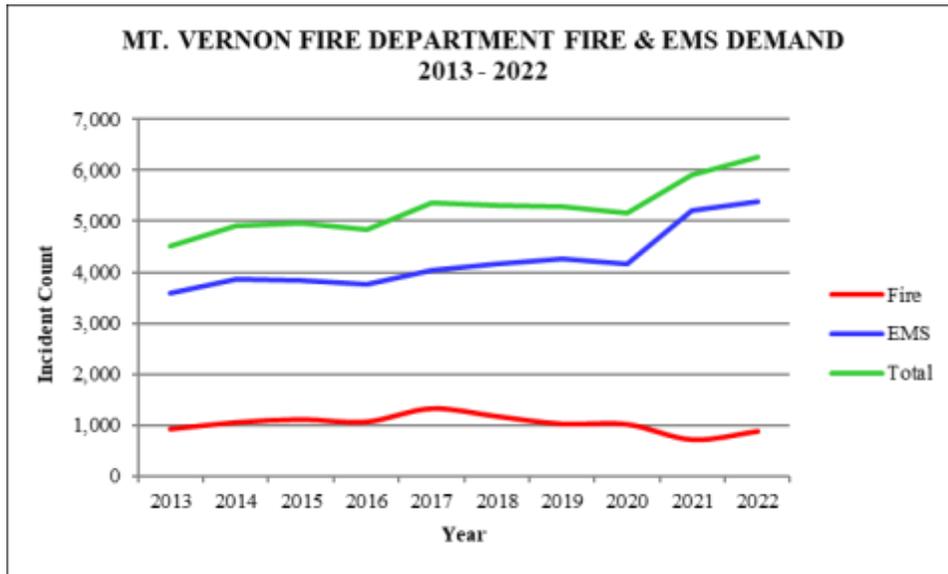


Figure 9: 10-year comparison of fire and EMS responses.

The contracted service areas add to the service demand on the department. The following list in Table 1 provides a breakdown of responses to the contract townships, special properties, and mutual-aid areas over the past nine years. In the table, KCRA refers to the Knox County Regional Airport, MVDC refers to the Mt. Vernon Developmental Center, and mutual-aid refers to incidents outside of the city and contracted areas.

YEAR	CITY OF MT. VERNON	CLINTON TWP.	COLLEGE TWP. *	KCRA	LIBERTY TWP.	MORRIS TWP.	MYDC	PLEASANT TWP.	CONTRACT SERVICE AREAS TOTAL	MUTUAL-AID TOTAL	ANNUAL TOTAL
2014	4,016	538		3		138	18	128	825	59	4,900
2015	4,091	490		3		154	15	140	802	65	4,958
2016	3,954	466		0		182	20	119	787	95	4,836
2017	4,227	561		5	134	187	22	154	1,063	82	5,372
2018	4,095	548		3	156	246	38	144	1,135	91	5,321
2019	4,246	423		0	167	213	35	125	963	66	5,275
2020	4,118	411		1	176	206	18	135	947	82	5,147
2021	4,578	430	181	1	190	209	35	112	1,158	156	5,892
2022	4,546	561	313	0	179	252	47	190	1,542	149	6,237
NINE-YEAR TOTAL:	37,871	4,428	494	16	1,002	1,787	248	1,247	9,222	845	47,938
PERCENT:	79.0%	9.2%	1.0%	0.03%	2.1%	3.7%	0.5%	2.6%	19.2%	1.8%	100%

Table 1: Summary of responses to contracted townships, special properties, and mutual-aid areas.

* Note – College Twp. includes the village of Gambier and Kenyon College.

Of the total calls for service during the years 2014 - 2022, 79% were in the city, 19% in the contracted areas, 2% were mutual-aid incidents. This is displayed graphically in Figure 10.

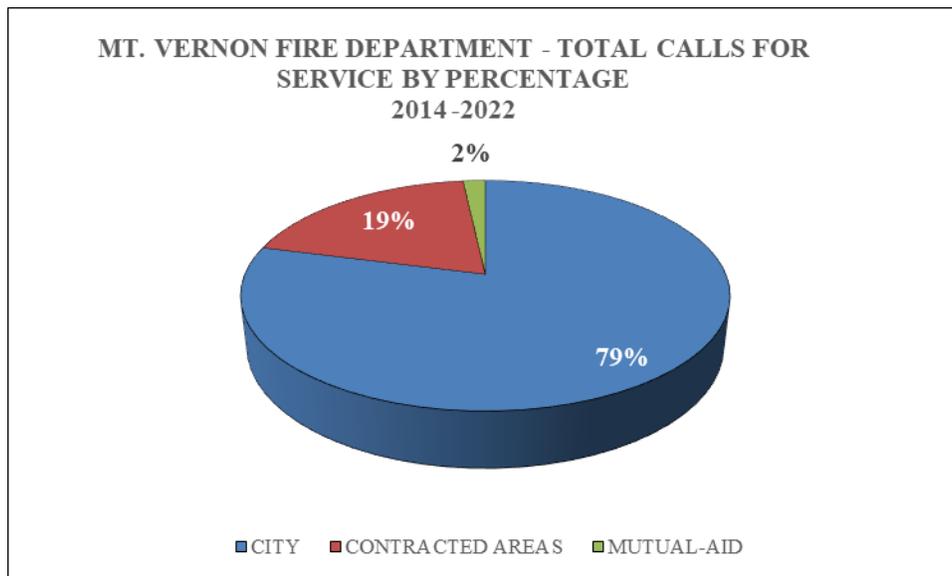


Figure 10: Summary of total calls for service for 2014-2022.

MVFD responses have increased 1.3% since 2014. From 2021 to 2022, responses increased by 1.1%. The scope of most fire department responsibilities has broadened over the years to include more medical aid and rescues, as well as a wider variety of service calls and more requests for mutual-aid. It also includes more false alarms.

There were also approximately two and a half times as many mutual-aid responses in 2022 (149) as the 59 in 2014. This category includes traditional case-by-case aid provided when specifically requested and aid automatically provided per a pre-arranged agreement. According to the organization Insurance Services Office, Inc. Mitigation, automatic-aid for structure fires must be dispatched with the initial alarm. In the years 2017 and 2020, mutual-aid responses fell 1.2% and 1.5% respectively. While mutual-aid accounted for 1.8% of fire department responses overall during the nine-year period.

While it is in the best interest of local government agencies to cooperate to achieve objectives of common interest. The MVFD has long recognized the concept of a functionally integrated fire protection system, involving Federal, State, and local government resources, as the most effective method of delivering fire protection and emergency medical services where life, property, and natural resources values are at risk.

Its recognized that the MVFD has more staffing, apparatus, or specialty training than its neighboring agencies, which could give the perspective there may be some one-sided aspects to mutual-aid, or perhaps even a growing feeling that others are taking advantage of the MVFD's resources.

To address the impact of mutual-aid on a community's fire and EMS delivery system, former Ohio Fire Marshal suggested in an article published in FireRescue1, *Automatic and mutual-aid: The response conundrum*,

For larger departments, one solution to always being the giver and hardly ever the receiver of... aid is to pre-agree that no more than perhaps two units will respond on... aid to an incident in a neighboring community, thus keeping an adequate number of your stations in service to cover your own jurisdiction. Retaining an adequate number of personnel and apparatus to handle most other emergencies usually avoids a negative impact on your own response time for services to the citizens within their own jurisdiction.¹⁰

Recorded Estimated Fire Loss

The recorded estimated fire loss has fluctuated over the past five years, as displayed in Table 2. Fire loss can be difficult to predict, as one large-loss event can skew any statistical analysis. The estimated fire loss was \$661,400 in 2018 and \$1,955,340 in 2022. In 2019, the estimated fire loss

¹⁰ Retrieved from: <https://www.firerescue1.com/fire-chief/articles/automatic-and-mutual-aid-the-response-conundrum-Y40MQY4MdkgI7k36/>

was \$464,520, where residential properties accounted for 100% of the reported estimated fire loss. In 2022, the estimated fire loss was \$1,955,340, and the commercial properties accounted for most of the reported estimated fire loss (68%). A five-year percentage perspective is exhibited in Figure 11.

YEAR	RESIDENTIAL FIRE LOSS	PERCENT	COMMERCIAL FIRE LOSS	PERCENT	OTHER FIRE LOSS	PERCENT	TOTAL FIRE LOSS
2018	\$481,400	73%	\$0	0%	\$180,000	27%	\$661,400
2019	\$464,520	100%	\$0	0%	\$0	0%	\$464,520
2020	\$272,000	87%	\$5,000	2%	\$36,500	12%	\$313,500
2021	\$238,940	19%	\$401,100	70%	\$64,000	11%	\$704,040
2022	\$612,840	32%	\$1,277,000	68%	\$65,500	3%	\$1,955,340
FIVE-YEAR EST. FIRE LOSS:	\$2,069,700		\$1,683,100		\$346,000		\$4,098,800

Table 2: Five-year estimated fire loss summary by year.

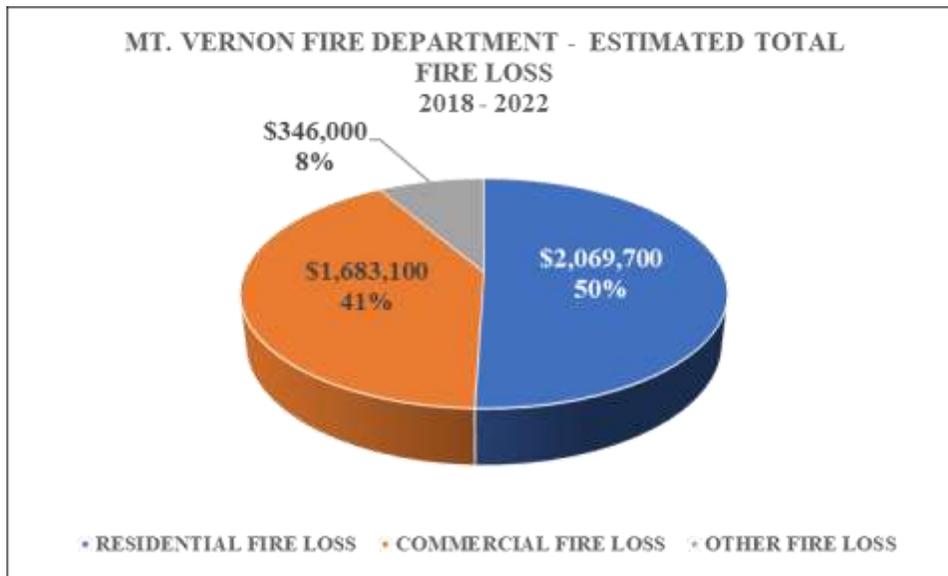


Figure 11: Five-year total estimated fire loss by percentage.

Fire Casualties and Fatalities

The department experienced one civilian fire fatality over the past five years; During the same period, there were two civilians injured as a result from exposure to fire by-products such as smoke or heat, or injuries received while attempting to escape from a fire.

Temporal Analysis

In addition to evaluating the types and frequency of emergency incidents that produce the service demand, the timing of these events is critical to understanding when service demand can most

likely be at its greatest. Data from these analyses are designed to identify trends, abnormalities, and baseline support for evidence derived. This information enables administrators to modify staffing plans to ensure staffing levels are sufficient, and aids in scheduling additional duties such as training, fire-safety inspections, and vehicle maintenance. Note that in each of the temporal analysis categories, the data presented is for the reporting period of September 8, 2021 through June 30, 2022 and the number of types of incidents reported.

Service Demand – Month of the Year

In Figure 12, the temporal analysis begins with an examination of service demand by month of the year. The fire and EMS service demand is fairly consistent by month, with higher EMS and fire demand in June.

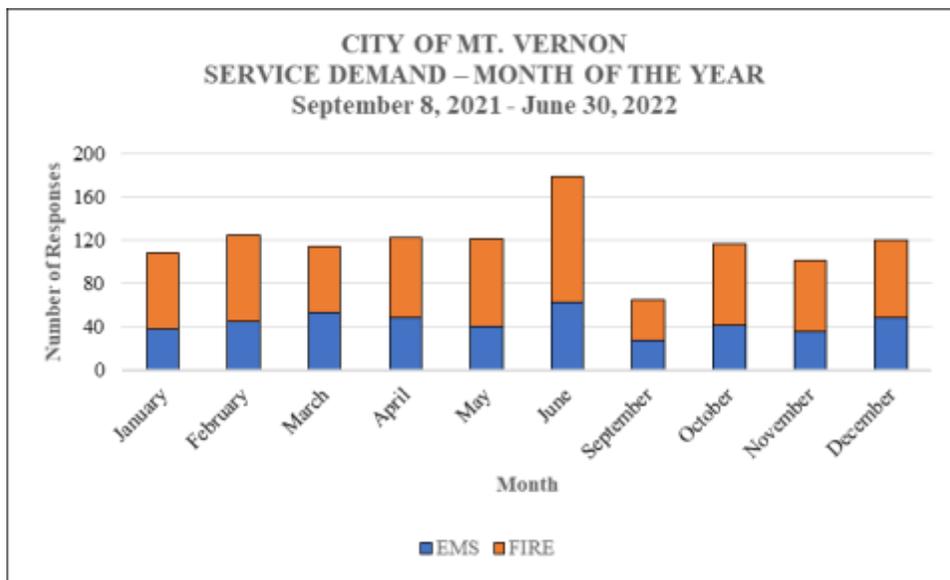


Figure 12: Service demand by moth of the year.

Service Demand – Day of the Week

Next in Figure 13, the temporal analysis continues with an examination of service demand by day of the week. In some areas, such as retail centers and areas with large employment centers, populations fluctuate by the day of the week. When these significant fluctuations occur, often the emergency incident call volume fluctuates similarly.

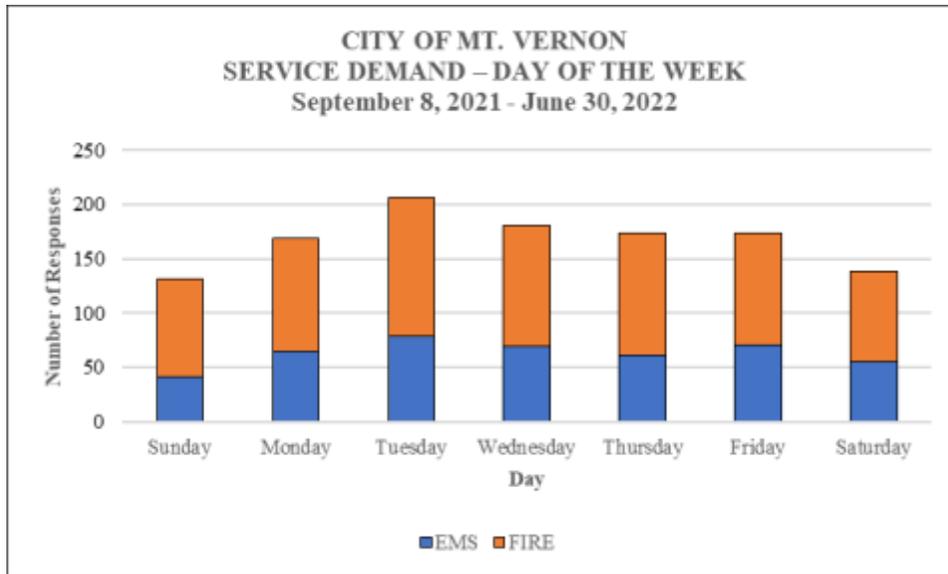


Figure 13: Service demand by day of the week.

In evaluating the annual emergency calls for service by their corresponding day of the week, the EMS and fire workload is steady during the workweek, which can be associated with the commercial workforce, healthcare options, retail opportunities, and the educational institutions. The overall service demand is slightly lower on Saturday and Sunday. Tuesday was the busiest day for EMS and fire incidents, with 18% greater EMS incidents and 17% greater fire incidents than the average of the other days of the week.

Service Demand – Hour of the Day

The final temporal analysis of service demand examines service demand by hour of day, as displayed in Figure 14.

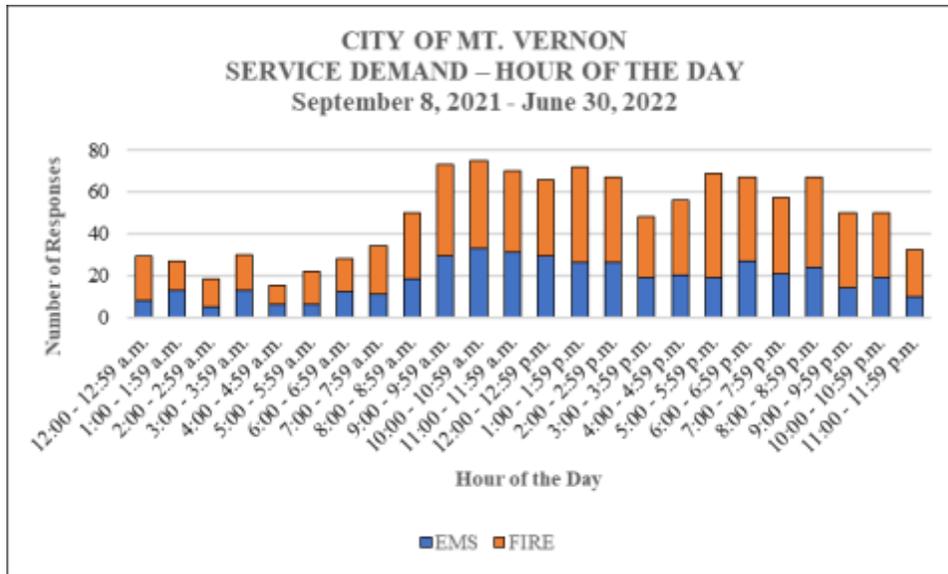


Figure 14: Service demand by hour of the day.

The analysis of service demand by hour of day can be related to the activities within the community where demand for service is higher during regular working hours and declines during the late afternoon and overnight hours. However, it increases during the early evening hours from 4:00 p.m. until 9:00 p.m. As presented by the data in Figure 14, 40% of the incidents occur between the seven-hour period of 8:00 a.m. and 3:00 p.m. and 35% between 4:00 p.m. and 11:00 p.m. The busiest single hour is 10:00 a.m. to 11:00 a.m. and the busiest eight hours of the overall day (8:00 a.m. to 4:00 p.m.) are within this period. These consecutive hours of the day account for slightly under one-half of the emergency incident responses of the entire 24-hour day.

Temporal analysis of each of the contracted areas are displayed in Appendices B through H

Technical Search and Rescue

Technical search and rescue are terms used to describe special response situations including vehicle and machinery extrication rescue, confined space rescue, rope rescue, trench rescue, swift-water rescue, static-water and ice rescue, structural collapse, and hazardous materials (hazmat) response. Technical search and rescue incidents are referred to as high-risk, low-frequency events that are dangerous to mitigate and involve a special set of skills, procedures, and equipment for each particular rescue situation. It is often very costly to implement and maintain proficiency in each technical response capability.

Due to the complexity and uniqueness of technical rescue operations, the National Fire Protection Association (NFPA) has developed specific operational levels for responders. NFPA 2500, *Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services*, requires written operational procedures consistent with the following operational levels or response capability for each technical rescue discipline commonly encountered by a response agency:

- *Awareness Level* – this level represents the minimum capability of organizations that provide response to technical search and rescue incidents.
- *Operations Level* – this level represents the capability of organizations to respond to technical search and rescue incidents and to identify hazards, use equipment, and apply limited techniques specified in NFPA 2500 to support and participate in technical search and rescue incidents.
- *Technician Level* – this level represents the capability of organizations to respond to technical search and rescue incidents and to identify hazards, use equipment, and apply advanced techniques specified in NFPA 2500 necessary to coordinate, perform, and supervise technical search and rescue incidents.

The National Fire Protection Association (NFPA) is a global self-funded nonprofit organization whose mission is to reduce death, injury, and economic loss due to fire, electrical and related hazards. In addition to research and training, NFPA has developed over 300 codes and standards through a consensus process and involvement of all disciplines in a particular subject area. NFPA standards are followed almost universally and establish the criteria from which fire apparatus are built and personal safety equipment is designed and manufactured. The most universally recognized standard is NFPA 70, which is the National Electric Code and adopted in all 50 states.

While a formal technical rescue assessment was not performed, the department’s response capability in each technical response area and applicable SOGs were reviewed.

Vehicle and Machinery Rescue – these types of incidents involve removing a vehicle or machinery equipment from around individuals who have been involved in a motor vehicle, industrial, or agricultural related accident, when conventional means of exit are impossible or inadvisable. A skilled and coordinated approach is needed to minimize further injury to a victim during the extrication process. These operations are usually accomplished by using cribbing and bracing for stabilization and hydraulic or battery-powered tools (sometimes generically referred to as the “Jaws of Life”) and high-pressure air bags. The agency has the equipment and personnel are trained to respond and handle these types of incidents.

Swift-Water Rescue – these incidents involve the rescue of a victim(s) from fast moving water such as a river or other large stream. Of special concern are low-head dams, which can create dangerous currents, especially when river water levels are elevated or during flood stage. The Kokosing River and other creeks run through the city but there are no low-head dams within the response area. The department has some rescue equipment for this type of response and two personnel are trained to the technician level.

Static-Water and Ice Rescue – these incidents involve the rescue of a victim(s) from a non-moving body of water such as ponds, quarries, or lakes. During winter, these types of incidents could involve surface ice. Each rescue involves a specific set of equipment and operating procedures. There are two dive teams in Knox County that can aid if an incident occurs within MVFD's service area.

Confined Space Rescue – includes incidents in which a victim(s) is trapped within an area that qualifies as a confined space. A confined space may be found in agricultural, industrial, and other settings as defined by the Occupational Safety and Health Administration (OSHA). The department does not have any equipment or training for this type of response.

Rope Rescue – includes incidents that are above grade (elevated) or below grade and require the use of rope rescue systems to reach and rescue victims. A rope rescue incident could be part of a confined space incident due to the location of the victim. The department does not have any equipment or training for this type of response.

Trench Rescue – these incidents are also referred to as trench “cave-in” incidents and involve an excavation trench or underground cave-in that traps a victim. The department does not have any equipment or training for this type of response.

Structural Collapse Rescue – these incidents are often associated with large-scale urban search and rescue operations following natural occurrences such as earthquakes or high-wind events. The MVFD will respond to an incident where structural collapse or instability will have to be managed. Examples of incidents where structural collapse has to be managed include: vehicles or aircraft versus buildings; unsafe structures as a result of a gas explosion or structure fire, building construction or renovation failures, or natural forces related to weather (e.g., rain or snow accumulations on roofs, tornados, etc.). In managing these incidents, it is often necessary to push, pull, cut, breach, lift, or tunnel through the materials that make up the collapsed structure. Agency personnel are trained in basic shoring and stabilization techniques for single-point responses. Multiple-point responses that are spread out over a larger area or involve many locations, and will require a larger resource pool, including outside agency support, large-scale incident management support, and technical expertise.

Hazardous Materials – All MVFD personnel are trained in hazardous materials response at the operations level. Operations level-trained personnel have the training and equipment to identify

hazardous material presence through various recognition factors such as placards and labels, container shapes and sizes, and hazardous materials sites in the response area. They also have the ability and equipment to undertake defensive type of actions and low-risk offensive operations such as placement of booms and absorbent pads, plugging, patching, diking, and other containment actions that help control or mitigate the incident. More advanced offensive operations that require the use of level “A” (completely encapsulated protective equipment) or acid splash suits require a technician level response. The department has some containment and spill equipment along with an operating procedure for a hazardous material response.

As the MVFD continues to adopt a more all-hazards response model, it recognizes that technical rescue training is paramount to performing successful technical rescue operations. Technical rescue incidents can push firefighters intellectual, physical, and emotional boundaries much further than our other disciplines because of the lack of consistent exposure and the requirement for advanced problem-solving. The consequences for improper solutions can be often swift and severe.

The MVFD maintains a minimal cache of rescue equipment and is currently training personnel to the technician level in the various aforementioned technical rescue disciplines. However, due to the amount of expensive equipment and the large number of trained personnel specialized rescues require, the department shares resources with neighboring communities for complex incidents. In the event of an overly complex, labor intensive incident, the department will request through the Knox County Emergency Management Agency (EMA) a technical rescue response from the Columbus region.

Recommendation #1: The assessment team recommends that the MVFD develop administrative and operational SOGs for all technical rescue operations. SOGs are an integral part of technical rescue mitigation and should complement the approved concepts of operations. Some fire departments choose to function without SOGs, but these are vital to have a safe and organized rescue operation. SOGs establish technical rescue organization, processes, and techniques before an emergency incident occurs. While the department may not routinely engage in all the aforementioned technical rescue disciplines, it should at minimum develop SOGs and train personnel to an awareness level to maintain the safety of initial responders and bystanders, and create a potentially survivable environment for the victim(s).

SOGs should answer questions such as who is in charge, what resources may be used, what techniques may be used, who is qualified to perform a technique, what is expected of each responding unit, and what staffing is required at a rescue incident. Most importantly, they provide a structure by which technical rescue resources can respond safely in an organized fashion to the chaos and uncertainty presented at almost any emergency incident.

Development of technical response SOGs can often prove challenging. The MVFD should consider forming two types of SOGs: administrative and operational. The guidelines and/or procedures should be fully integrated with the department's existing SOG system.

- Administrative SOGs provide the framework for the personnel structure of operation (i.e., applicable Federal and State statutes, required training, required certifications, and continuing education and training).
- Operational SOGs describe elements such as techniques and unit responsibilities that are used at an emergency incident.

COMMUNITY RISK REDUCTION

Community Risk Reduction (CRR) programs and activities are important undertakings of a modern-day fire department. A comprehensive risk reduction system in every jurisdiction should include, at a minimum, the key functions of fire prevention, code enforcement, inspections, and public education. Preventing fires and other types of accidental incidents before they occur, and limiting the impact of those that do, should be priority objectives of every fire department. Fire investigation is a mission-important function of fire departments, as this function serves to determine how a fire started and why the fire behaved the way it did, providing information that plays a significant role in fire prevention efforts. Educating the public about fire safety and teaching people 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 suppression and response, although necessary to protect property, have little impact on preventing fire deaths. Rather, it is public fire education, fire prevention, and built-in automatic fire protection systems that are essential elements in protecting citizens from death and injury due to fire, smoke inhalation, and carbon monoxide poisoning. The fire prevention mission is of utmost importance, as it is the only area of service delivery that dedicates 100% of its effort to the reduction of the incidence of fire.

Fire prevention is a key responsibility of every employee of the fire department, and fire prevention activities should include all personnel. On-duty personnel can be assigned the responsibility for "in-service" inspections to identify and mitigate fire hazards in buildings, to familiarize firefighters with the layout of buildings, identify risks that may be encountered during firefighting operations, and to develop pre-fire plans.

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

close interaction can often result in friction between personnel with overlapping authorities, and can allow important issues to “slip through the cracks.” It is critical that these important functions are coordinated with similar activities in a city’s building inspection or code enforcement and/or planning departments.

The MVFD Fire Prevention Division is managed by a fire prevention officer. The division is dedicated to CRR and preventing fires through public education, fire inspections, enforcement, and comprehensive fire investigations to make the city of Mt. Vernon and communities served a safe and healthy place to live, work, and visit through the preservation of life—both civilian and firefighter—and property. The division’s activities and objectives include:

- Enforcement of state, county, and local fire codes.
- Development review of new construction for compliance with adopted fire and life-safety codes.
- Perform field inspections to ensure buildings are constructed according to plans and all fire protection systems are operational.
- Public fire prevention and risk reduction education.
- Special event activities involving the fire department program and functions.
- Perform required inspections of multi-family dwellings, hotels, motels, lodging houses, dormitories, jails, and schools for fire code compliance.
- Investigate citizen reports of fire hazards.
- Investigate origin and cause of fire incidents.

The civilian casualty experience in MVFD’s service area is very good, which reflects the fire and life-safety inspection program and fire-safety education efforts. Over the past five years, MVFD recorded one civilian fatality and two civilian injuries resulting from exposure to fire by-products such as smoke or heat, or injuries received while attempting to escape from a fire. Records are maintained appropriately and contain sufficient information for data collection and management oversight.

Fire and Life-Safety Inspections

The fire prevention division focuses a concentrated and coordinated effort to perform fire-safety inspections in assembly; educational; health-care; dormitory, hotel, and lodging; and industrial occupancies. Risk reduction goals are to inspect places of assembly, schools and day-care facilities, hotels and college dormitories, large factory and industrial facilities annually. Inspections of high life-safety occupancies such as hotels, nursing homes, and the hospital are conducted by the MVFD inspector accompanied by the State Fire Marshal inspector during their annual inspection. Inspections of new construction and remodel projects are performed as required. Fire and life-safety inspections of all other occupancy types are conducted biennially.

In collaboration with the city's Development Services Department, Engineering Division, the fire prevention officer has responsibility to review new and remodel construction plans for code compliance, acceptance testing of new fire protection systems, and new construction built to approved plans for life safety features. Additionally, certificate-of-occupancy inspections are conducted with the engineering division for new facilities and upon change of use of a facility.

The aforementioned inspections are performed by state certified fire-safety inspectors under the direction of the fire prevention officer. Besides the fire prevention officer, there are 12 state certified fire-safety inspectors amongst the ranks of the department; however, only four actively perform fire inspection duties, conducting 10 – 12 inspections individually on an annual basis. Most of the inspection staff does not possess advanced training or certifications related to code enforcement, plans review, and public education, such as, National Fire Academy inspection and prevention coursework, Juvenile Fire Setters Program or Ohio Board of Building Standards or International Code Council certifications.

The MVFD enforces the Ohio Fire Code (OFC) as it relates to fire prevention and life safety. The OFC establishes the minimum standards for fire safety in the state of Ohio. In accordance with the City Charter, the OFC, as adopted by the State Fire Marshal, is adopted by the city every three years. The city has specific ordinances related to fire and safety that are intended to meet all requirements of the OFC, while imposing more restrictive requirements in some circumstances. The ordinances are consistent with nationally recognized good practices for providing a reasonable level of life safety and property protection from the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures and premises and provides safety to firefighters and emergency responders during emergency operations.

Many departments nationwide apply fees to recover the costs associated with providing fire prevention inspections, services and permitting activities. Departments require permits for special events, public assembly occupancies, storage or use of hazardous materials, hazardous operations such as hot work and spray finishing, storage of high-piled combustible materials, and a wide variety of other activities where a fire or life-safety hazard may exist. While OFC identifies operations, activities, and materials that require a permit, the MVFD does not require payment for permits.

Construction permitting and inspections for locations within the contractual township areas outside the city are the responsibility of the state of Ohio. Residential builders and contractors theoretically are to follow Ohio's residential building code. The townships have adopted the 2017 version of the OFC.

Public Education

The fire prevention division also provides fire and safety and risk reduction education to the citizens, businesses, local schools, daycare facilities, nursing homes, and churches. Prevention

and training programs include cardiopulmonary resuscitation (CPR) training, fire extinguisher training, fire brigade training (for warehouse and industrial facilities), and home safety. Annually, MVFD personnel also perform various activities during Fire Prevention Week and a department Open House in October during Fire Prevention Week. Part of these education efforts includes the disbursement of fire safety literature and materials for both children and adults. An important aspect of fire prevention and education is working smoke alarms. The department also provides smoke alarms to qualifying residences in partnership with the American Red Cross. Residents may also have their infant car seat installed by fire personnel who are trained technicians by scheduling an appointment. Inspector Davis occasionally is a guest on AM Knox County WMVO talk radio. Here he discusses MVFD happenings and fire prevention and life-safety topics and tips. Plus, he is given the opportunity for callers to call in and ask questions. According to the inspector, this venue has contributed to an increase in the department's interaction with the public in conducting fire-safety classes and attendance at special events.

Fire Investigation

MVFD conducts fire investigations of all fires that occur in the city and contractual service areas. The primary purpose of fire investigations is to determine the origin and cause of fires. The data collected during a fire investigation is of great significance since it can expose a serious crime like arson. It also provides valuable statistics on fire trends and experience – information essential in developing programs to reduce fire risk in the future.

The department has four fire scene investigators; one is certified and maintains an Ohio Peace Officer certification. Investigators receive their initial training at the Ohio Fire Academy with advanced and specialized training received regionally and around the state. Some in-service training is also available online. One investigator is International Association of Arson Investigators (IAAI) certified.

The department enjoys good working relationships with the Mt. Vernon Police Department and Knox County Sheriff's Office. While there are no countywide or regional fire investigation teams or arson task forces available for more complex or in-depth investigations, the MVFD can request assistance from the Ohio State Fire Marshal's office.

MVFD Community Risk Reduction Activity Review

As discussed, community risk reduction activities can be the most effective means for reducing loss of life and property due to fire. The MVFD's community risk reduction engagements during the period of 2019 - 2022 are summarized in Table 3. The number of undertakings in 2020 were down in most activities due to COVID-19 restrictions. Overall, there was a 27% increase in activities during the four-year. Most notably, the number initial inspections, follow-up inspections, and life safety assessments and system tests saw an 81% increase in actions.

CRR ACTIVITIES	2019	2020	2021	2022	TOTAL
Inspections	370	236	440	608	1,654
Follow-Up Inspections	81	20	38	146	285
Schools	13	13	14	15	55
Pre-schools	7	7	7	7	28
Residential (including foster homes and adoption)	47	18	12	25	102
Life Safety Inspections and System Test (e.g. fire alarm, fire suppression, etc.)	67	59	157	183	466
Fire Safety Classes and Presentations	20	2	4	68	94
Smoke Detector Installations	400	86	110	245	841
Complaints Investigated	14	10	30	12	66
Unauthorized, Illegal Burning	38	48	27	32	145
Fire Incident Investigations	16	24	15	18	73

Table 3: Summary of community risk reduction activities conducted during 2019 – 2022.

There are many reasons why existing buildings should 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. Some 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 (hospitals, nursing homes, etc.), 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 specific time frames. The fire inspectors must also witness tests of required fire protection systems and equipment. Conversely, many businesses are not required to have any type of periodic fire-safety inspections.

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/occupant as to the requirements, as well as the spirit and intent of the code can also attain positive benefits for fire- and life-safety.

With several hundred business located in Mt. Vernon, many of them large, along with numerous schools, multi-family residential complexes, and other hazards, the assessment team could not identify a consistent or comprehensive program that ensures that all businesses and commercial occupancies receive a routine “maintenance” fire prevention inspection on a regular, periodic basis.

In many departments, on-duty firefighters can be assigned with the responsibility for “in-service” inspections to identify and mitigate fire hazards in buildings, to identify risks that may be encountered during firefighting operations, and to develop pre-fire plans (which the MVFD already does). On-duty personnel in many departments are also assigned responsibility for permit inspections and public fire safety education activities. Fire department personnel are often able to recognize hazards or violations, whereas inspectors are often able to identify features of a specific property that could prove important during an emergency. Effective information sharing enhances the ability of the fire department to protect the community.

Performing complex, technical inspections can be a very time-consuming but necessary endeavor. Nationwide, communities that have proactive fire inspection and code enforcement programs in place often have a lower incidence of fire loss because many potential fire and life safety hazards are identified and corrected before they cause or contribute to a fire.

Of course, having sufficient personnel to perform fire prevention inspections can be a costly proposition. To help offset these costs, many jurisdictions are now assessing registration or inspection fees for businesses. The fees assessed often vary widely by jurisdiction. Some jurisdictions also assess a reinspection fee if an inspector must make a return visit to determine if code violations have been abated. At the time of the assessment team’s analysis, the MVFD did not have in place any significant fees for fire prevention and safety functions, and services.

Recommendation #2: The assessment team recommends that the MVFD consider an in-service company inspection program at residential, office, and retail business occupancy types throughout the city. Fire company code compliance inspections should be considered in limited and specific situations (i.e., low-hazard occupancies), as they can be worked into a more comprehensive prevention strategy. However, they will require some training to conduct them properly. Adding company inspections to that workload must be carefully considered and thoroughly thought out. SOGs/SOPs for conducting company inspections appropriately need to be crystal clear.

Recommendation #3: The assessment team recommends that the MVFD provide appropriate training in conducting routine fire prevention inspections to all field personnel, particularly company officers who will be responsible for supervising these company programs.

Recommendation #4: The assessment team recommends that the MVFD complete a comprehensive review of the city’s actual costs for providing fire prevention services. The review should include a full costing of providing all fire prevention services, reviewing the fire, building, and life safety codes, as well as a comparative analysis of the fees charged for similar services by other fire departments. The review should be designed to capture the full range of services provided and capture the full scope of the operational permits and certain inspections required as part of a comprehensive fire prevention program.

Recommendation #5: The assessment team recommends that to fund the MVFD’s fire prevention and safety activities the city should consider the adoption of registration, inspection, and/or permit fees to offset the actual costs of providing community risk reduction services in the city. These fees should include inspections conducted by in-service fire companies. Should the city/department choose to consider the aforementioned fees, the cost of the services shall be inclusive in the contract amount for the contractual political subdivisions.

One trend that is being seen in a growing number of fire departments is the replacement of many of the uniformed personnel assigned to fire prevention with part-time or civilian personnel. The use of the aforementioned personnel can make the fire prevention services more fiscally efficient to operate. Because there would still be a need for these personnel to have fire department experience so they can apply the code requirements with a practical understanding of the “hows” and “whys,” these positions might be an opportunity to continue to benefit from the experience of retired personnel who are still interested in serving but in a different capacity. As of the writing of this report, the city’s civil service commission approved the position of part-time fire-safety inspector and will fill in the future. The fire prevention division should continue to be commanded by an administrative officer.

INSURANCE SERVICES OFFICE - PUBLIC PROTECTION CLASSIFICATION

The Insurance Services Office, Inc. (ISO) is the leading supplier of statistical, underwriting, and actuarial information for the property and casualty insurance industry. ISO conducts field evaluations in an effort to rate communities and their relative ability to provide fire protection and mitigate fire risk. This evaluation allows ISO to determine and publish the Public Protection Classification (PPC™). The published classification is based on a scale of one through 10, with one being the highest rating and 10 indicating that the community’s fire suppression program does not meet ISO’s minimum criteria.

Mt. Vernon currently has a PPC rating of 03/3Y, which was effective September 1, 2022. The most current rating is an improved evaluation from the previous 04/4Y, which shows the efforts of the MVFD to better its service delivery and fire prevention activities. The lower score indicates a more favorable rating, which can translate into lower insurance premiums for the business owner and homeowner. This lower classification makes the community more attractive from an insurance risk perspective.

According to ISO, “Virtually all U.S. insurers of homes and business property use ISO’s PPC in calculating premiums. In general, the price of fire insurance in a community with a good PPC is substantially lower than in a community with a poor PPC, assuming all other factors are equal.”¹¹

¹¹ Retrieved from: <https://www.verisk.com/insurance/about/faq/the-public-protection-classification-ppc-program/>

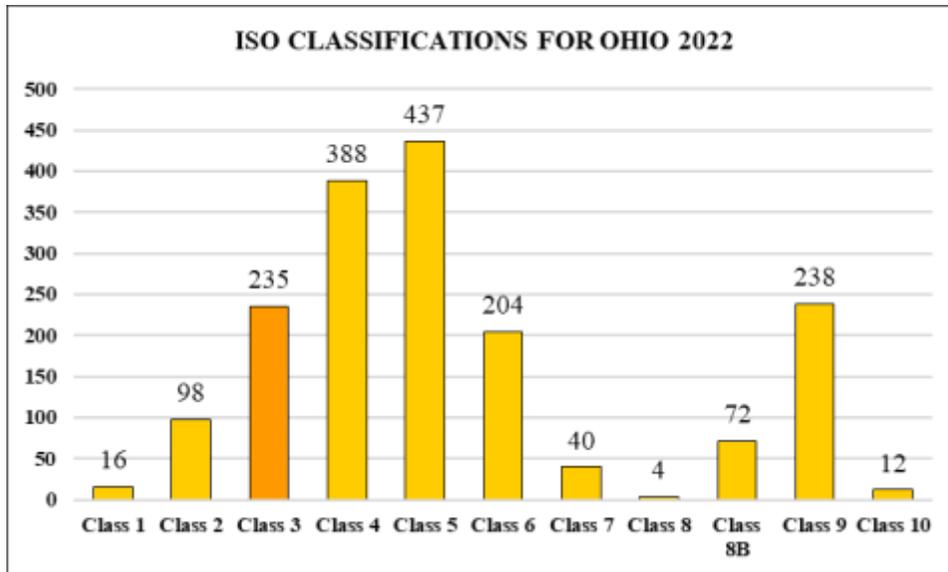


Figure 15: ISO ratings summary in the state of Ohio.

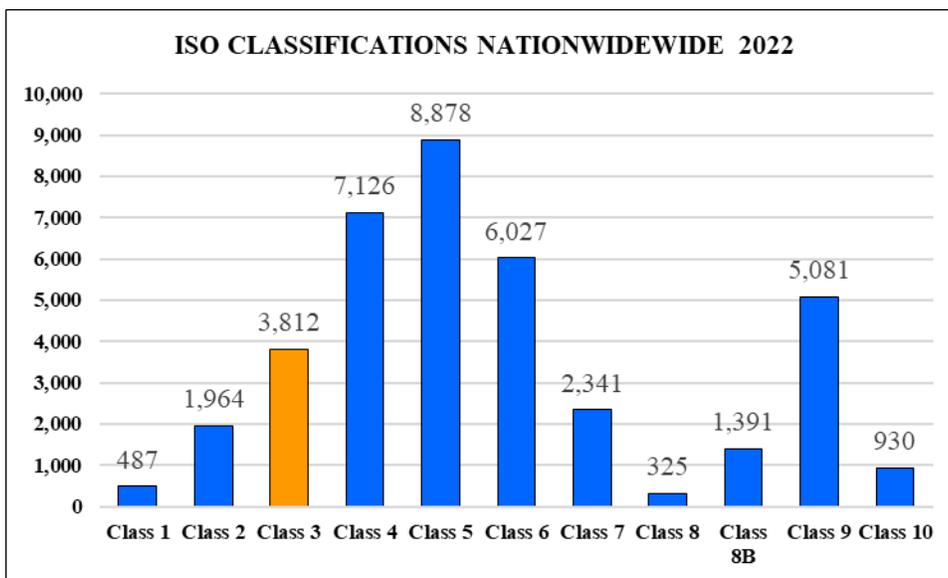


Figure 16: ISO ratings summary in the U.S.

As the charts above (Figures 15 and 16) illustrate, the achievement of a Class 3 rating places MVFD in an excellent category. Comparatively, the MVFD was among 13% of the fire departments evaluated in the state of Ohio and 10% of the fire departments evaluated in the U.S. with a Class 3 PPC. However, it should be noted that the capital costs associated with becoming a Class 1 rated community often outweigh any cost savings realized by the community, which can be why there are so few Class 1 agencies in the U.S.

How the PPC for each community affects business and homeowners can be somewhat complicated because each insurance underwriter is free to utilize the information, as they deem

appropriate. Most underwriters in Ohio utilize what is called in the industry, the “suburban rule.” In this case, the split rating identified for Mt. Vernon is a 03/3Y. What this means is that most businesses and residents in the city who are located within 1,000 feet (ft.) from a fire hydrant and not over five road miles from the fire station receive a rating of three. Those businesses and residents and businesses who are located more than 1,000 ft. from a fire hydrant but not over five road miles from the fire station receive a rating of 3Y, which previously was an 8B under the former rating system. The reason that the rating is generally not more favorable is due to the lack of sufficient water supply in some areas of city, primarily the northern and western sections, where the water main sizes are smaller. These smaller water mains may not produce sufficient water flow when required. When the ISO field evaluation is conducted in communities, the overall water system, including pumping capacity, storage capacity, distribution system and system maintenance, carries a weight of 40% of the total evaluation. Most underwriters consider properties over five miles from a recognized fire station a PCC of 10. In this situation, the property may be subject to higher premium rates for coverage.

The PPC program evaluates communities according to a uniform set of criteria defined in the Fire Suppression Rating Schedule. Using the rating schedule, ISO evaluates the fire suppression capabilities of each community in three major areas:

- Emergency Communications. This review accounts for 10% of the total classification. This section reviews the facilities provided for the general public to report fires and for the operator(s) on-duty at the communications center to dispatch fire department units to fires. MVFD received 7.99 points credit out of a total maximum credit of 10.
- Fire Department. This review accounts for 50% of the total classification and focuses upon engine and ladder-service companies, distribution of fire stations and fire companies, equipment carried on apparatus, pumping capacity, training, and available firefighters. MVFD received 33.13 points credit out of a total maximum credit of 50.00. This included 6.00 points credit out of a possible 6 points for in-service engine companies, 2.95 points credit out of possible 4 points for in-service ladder companies, 6.83 points credit out of a possible 10 points for deployment, 8.04 points credit out of a possible 15 points for on-duty company personnel, 3.91 points credit out of a possible 9 points for training, and 2.0 points credit out of a possible 2 for operational considerations, which includes standard operating guidelines/procedures (SOGs/SOPs) and the use of an incident management or command system.
- Water Supply System. This review accounts for 40% of the total classification. This component examines the water supply a community uses for fire suppression including water main size, distribution, and storage system. Also reviewed are hydrant size, type, and installation as well as the inspection frequency, maintenance, and condition of fire hydrants. Mt. Vernon received 31.57 points credit out of a total maximum credit of 40.00.

An additional factor now evaluated is the Community Risk Reduction section in which fire prevention, fire-safety education, and fire investigations are evaluated. The inclusion of this in the evaluation process provides recognition for those communities that employ effective fire prevention practices and allows for extra points in the grading process. Mt. Vernon benefited directly from this inclusion earning 4.04 additional evaluation points.

The notification letter and summary report from ISO advised the city’s PPC should serve as part of any planning document for future city development and fire safety protection improvement considerations as it relates to city residents.

BUDGET AND FUNDING

The MVFD operating budgets for fiscal year (FY) 2020, FY 2021, and FY 2022 approved budgets, are shown in the following table.

FY 2020 FINAL BUDGET	FY 2021 FINAL BUDGET	FY 2022 FINAL BUDGET
\$7,210,599.41	\$6,014,109.55	\$7,081,264.25

Table 4: MVFD Budget, FY 2020 through FY 2022.

Much like every other career fire department in the nation, the MVFD’s budget is primarily consumed by personnel costs. This includes salary, benefit, and retirement costs, as well as other customary costs in this budget area. For the MVFD, this budget area consistently represents approximately 90% to 95% of the total budget. The next largest budget areas are contractual services (largely for the operation and repair of facilities and equipment) and automotive operational/repair costs. This leaves little discretionary funding for day-to-day service delivery and other supplies, training and education, employee uniforms and protective clothing, station improvements, and overall new programs/improvements of the department.

The city of Mt. Vernon has a 2% income tax. The base 1% income tax helps fund the city’s general fund, which funds basic services and overall support of city operations. There also is an additional 1% income tax for public safety. This revenue is shared between police and fire department operations. This public safety tax was previously at .5% and was increased to a total 1% in 2018 by the voters. The public safety tax supports the fire department operating budget. The department also bills for EMS calls that result in the transportation of a patient to the hospital. Revenue generated has averaged \$949,111 annually over the past three years.

As noted previously, the fire department provides services to surrounding townships and special properties through contractual agreements. The annual payment collected from these contracts is estimated at \$1,300,722 in 2022. The contracts with the townships are based on millage of varying amounts, so the revenue collected will depend on the tax evaluation and the amount of revenue actually collected by the county. The exception is the contract for service for the Mt.

Vernon Developmental Center. This contract is a fixed amount and the contract to service the Knox County Airport is a nominal one dollar per year agreement. Revenue from the contracts is deposited into the city's general fund. The estimated annual contract fees for 2022 from each contract are as follows:

- Clinton Twp.: \$310,000.00
- College Twp.: \$500,000.00
- Morris Twp.: \$133,298.00
- Liberty Twp.: \$217,888.00
- Pleasant Twp.: \$122,958.00
- Mt. Vernon Developmental Center: \$16,578.00

STAFFING AND DEPLOYMENT

The MVFD is a “combination” staffed agency employing 46 full-time personnel, nine part-time personnel. In 2022, the department was the recipient of a U.S. Fire Administration's *Staffing for Adequate Fire and Emergency Response Grant*, also known as a SAFER grant, which added three full-time firefighters. The SAFER Grant was created to provide funding directly to fire departments to support an increase or maintaining of the number of trained, "front line" firefighters available in their communities. The current department roster includes the fire chief, three captains (shift commanders), six lieutenants, an EMS coordinator, a fire prevention officer, 42 firefighters, and an executive secretary. In addition to the fire chief, staff positions include an EMS coordinator/training lieutenant, and fire prevention officer. These three positions work a standard 40-hour workweek. There also is an executive assistant.

The majority of shift personnel work a standard three-platoon system with what is referred to as a 48-hour workweek (2,496 hours annually). With this type of schedule, personnel on each of the three shifts work 24 hours on-duty followed by 48 hours off-duty. Personnel receive one extra 24-hour shift off-duty during a 21-day work cycle, which is termed a “Kelly Day”. However, the most recent five full-time firefighter hires and those hired after July 1, 2022 will work a 56-hour workweek (2,916 hours annually) as negotiated in the most current labor agreement with no Kelly Day. Their work schedule is also 24 hours on-duty followed by 48 hours off-duty.

There are 17 personnel assigned to each of three shifts. Each shift has a captain - shift commander, two lieutenants and 11 firefighters (14 full-time and three part-time). The minimum daily staffing is nine full-time and per contract up to 11 with part-time. If a shift is short staffed due to an injury or illness, the vacancy is filled with off-duty personnel who receive overtime pay. An organizational chart of the department is described in Figure 17.

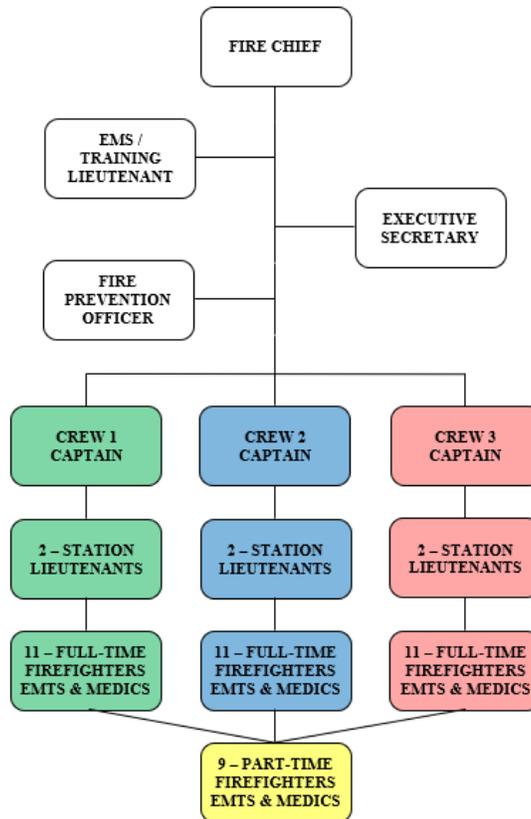


Figure 17: MVFD organizational structure.

In order to evaluate the organizational structure of the MVFD, the assessment team first had to identify the criteria by which the organizational structure would be judged. The sections, that follow, describe those criteria as well as describe what is meant by each of them:

- *Accountability and responsibility are clearly identified:* The organization must be consistent with the concept that clear lines of authority and decision making exist to achieve excellence and high-performance. Areas of responsibility are clearly delineated and points of accountability are readily identifiable.
- *Span of control or communication is optimal:* Effective organizations are structured so that lines of communication are identifiable and where there are multiple reporting relationships, responsibility for communication and control are clearly identified and understood.
- *There are essential checks and balances in place where necessary:* Checks and balances are necessary in both clinical (EMS) and operational areas to ensure staff performance is reviewed against established performance measures.

- *Structure is based on task requirements and work flow as opposed to specialized skills of individual personnel:* There is a tendency in some organizations to organize work patterns around the specific passions or skills of individual staff.
- *Similar titled positions have similar responsibilities and levels of accountability:* The organization should be structured such that decision-making authority and the ability of decisions to impact the organization in a strategic way are all found at similar levels of the hierarchy.
- *Support functions are logically grouped and do not, through this grouping, create additional layers of oversight:* Organizational structures should group support functions together, separated from operations, only when the scale and scope of the operation requires it.

The section, that follows, provides our analysis of the current organizational structure and opportunities for improvement.

Prior to 2011, the department employed an assistant fire chief. In 2011, the department was restructured to eliminate by means of attrition the authorized assistant fire chief position. The primary advantage of this structure is that it avoids overstaffing administration positions and establishes a single chain of command to the chief. However, several challenges have emerged that justify reexamining the department's senior management structure.

First, the fire chief's current span of control is six positions, including three captains, the EMS/training lieutenant, fire prevention officer, and executive secretary. While up to six direct reports are generally manageable in most municipal functions, in the specific context of the fire service, this arrangement of six can present unique and significant challenges. The three captains of operations work 24 hours on-duty and 48 hours off-duty alongside their shifts, while the remaining three administrative and division personnel supervised by the fire chief work a regular 40-hour week. Because the schedules worked by personnel are so different, fostering effective communication can require a sustained effort to ensure operations personnel (i.e., captains, lieutenants, and full-time and part-time firefighters) are continuously informed as they rotate on- and off-duty. In contrast, because the chief can engage the administration and division personnel each day as part of a regular 40-hour schedule, it is possible to communicate with and manage these personnel more readily than the operations personnel.

Second, the current arrangement effectively places the fire chief in charge of the department's day-to-day operations. This provides the chief with the capacity to strategically manage, evaluate, and organize the department and also streamlines senior-level reporting relationships. However, it can create a significant administrative workload for the chief, who must supervise other core functions, including training and certifications, fire prevention and community education, fire inspections, logistics and procurement, and the day-to-day operational considerations of each shift and its firefighters and requests for service. The breadth and depth of

this workload requires an assistant chief to attend to a wide variety of department concerns and provides focused oversight of critical functions. More importantly, the position clearly identifies a chief administrative employee as second in command to the fire chief, which acts in his absence, and ensures continuity of leadership.

The assistant chief can be better utilized overseeing and managing critical support functions in the department such as, administrative data, community risk reduction efforts, training and education, and specific areas of responsibility to ensure these functions perform at adequate levels and appropriate checks and balances are maintained.

Recommendation #6: The assessment team recommends that the city and MVFD consider reestablishing the assistant fire chief position to reduce the span of control for the fire chief and to clearly identify a second in command to ensure continuity of leadership in the fire chief's absence. The current structure potentially creates challenges regarding succession planning and preserving the department's institutional knowledge. Currently, the only senior management positions with broad responsibility for the department is the fire chief. This places the department at greater risk of losing critical management expertise should the position become vacant. By having two administrative chief officers, they can share responsibility for department-wide initiatives, such as the development and monitoring of strategic goals, budget preparation and oversight, and backfilling for the fire chief in the event of leave or absence.

Recommendation #7: The assessment team recommends that the city and MVFD consider creating the position of fire marshal. This position would lead the fire prevention bureau. The fire marshal is typically an administrative level position and traditionally is a direct report to the fire chief. This can be a more authoritative position when dealing with difficult and delicate inspection, development, and planning situations, and creates a career path for those personnel with fire prevention interests versus fire suppression. It also creates a method for the department to develop an individual with the necessary certifications for plans review, etc. By developing a well-defined job description, the department can identify individuals for this important position, including identifying qualifying and interested individuals within the MVFD as well as those from outside the department, if the *Rules and Regulations of the Municipal Civil Service Commission for the City of Mount Vernon* authorize. This can be a key position in meeting the growing needs of the Mt. Vernon community.

EMPLOYMENT

State and local government agencies have a standard process for hiring and promoting that has very defined stages, with a few variations based on the organization and position. Unlike the private sector, which may skip or re-order certain steps to fast track a hire or promotion, the public sector typically moves methodically through a series of prescriptive steps for every position it hires.

The Mt. Vernon Civil Service Commission administers and enforces the civil service laws of the state of Ohio, and the Rules and Regulations relative to civil service in the city of Mt. Vernon.¹² The Municipal Civil Service Commission is composed of three persons, who are appointed and serve in the manner provided for in Section 124.40 of the ORC. As stipulated in the ORC; the Municipal Civil Service Commission administers all appointments and promotions in the civil service of the city. They are made according to merit and fitness, to be ascertained, as far as practicable, by competitive examinations. Rules and regulations are passed providing for the enforcement of this provision.

Hiring and Promotion Examinations

The recruitment and selection process consist of a series of screening measures in order to select the most appropriate candidate for the position. These steps are:

Notice of Examination

Applications are accepted only for positions currently open. Notice of competitive *entrance* exams are given through the local newspapers, by posting notices conspicuously on the city hall bulletin boards, in the office of the Commission, on the city's website, and in other places as may be deemed advisable, not less than (2) two weeks prior to the last day on which the applications will be accepted for such exams.

Application materials are specified in each job announcement. Materials submitted by the candidates are reviewed and evaluated based on the requirements of the position applied for. Each applicant is notified in writing or by email of their status. Those accepted for further consideration continue in the selection process, which can include one or more of the following steps.

Notice of competitive *promotional* exams to be held are given by posting bulletins in conspicuous places in departments whose employees may be interested or may be by individual communications to the employees eligible for such a promotion.

Subjects and Weights

Exams are designed to fairly test the relative capacity of the persons examined to discharge the particular duties of the position for which the appointment is sought. Where minimum and/or maximum requirements are established for any exam, they are specified in the examination announcement. The Commission prescribes the subjects of each exam and the relative weights prior to the time of the exam. Competitors, with the exception of those being evaluated by an "assessment center", must receive a minimum score of 70% on an exam in order to pass.

¹² Retrieved from: <https://mountvernonohio.org/wp-content/uploads/2022/02/2022-CSC-Rules-and-Regulations.pdf>

Entrance exams may include an evaluation of such factors as education, training, capacity, knowledge, manual dexterity, and physical or psychological fitness. Exams will consist of one or more tests in any combination. Tests may be written, oral, physical, demonstration of skill, or an evaluation of training and experience.

Promotional exams may be in writing or in combination with oral "assessment centers". However, weights of 40% for the written section and 60% for assessment section will be given to examinations where assessment centers are used, if they are used in combination for promotion. As of January 23, 2020, assessment center exams are included in all promotional examinations for supervisors at any level in the fire department with the exception of fire lieutenants. Assessment centers for this rank are only be offered when an actual fire lieutenant's position is open and available. Exams are given in accordance with Section 124.31 of the ORC.

The notice of the holding of a promotional exam for a position or positions in the fire department is, unless waived by all persons eligible to participate, be published not less than 30 days prior to the exam and contain a description of the source material from which the exam questions are prepared. Such source material is readily accessible to the examinee. Failure to comply with this requirement will void the pursuant exam.

Written Exams

Written exams provide an objective basis for determining if the candidates have the necessary knowledge, skills, and abilities required for the position. The city of Mt. Vernon uses civil service tests to determine merit and to select those top performers for interviews. Most tests are multiple choice — but in some cases the city has also used an interview/assessment format based on need and the type of position that might not lend itself to this sort of exam.

Under Ohio civil service by-laws/codes, the city must list the subjects covered on each test that is given to applicants. The tests given through the Municipal Civil Service Commission of the city are not always like the “general” tests that each state has. The city’s tests are built using nationally normed questions that pertain to the position applied for—using the specific Mt. Vernon job description of each job as a starting point.

In the interest of helping prospective applicants prepare, a host of websites that offer an example of “free” questions to review and free “sample” tests to take is provided. However, these sample questions are rather general but are offered to help an applicant prepare—especially if they haven’t taken a multiple-choice test lately.

Special positions for firefighters

Within any rank, the municipal council may establish special positions having special duties with preferential pay as the council deems necessary, but the holding of any such special positions will not establish eligibility to the next higher rank to the exclusion of other persons in the same

rank who do not hold such special positions. No special position established by council within a rank in the fire department can be filled without promotional examination in the same manner as promotions from rank to rank.

Special credit for military service in entrance exams

When proper proof of acceptable service in the armed forces of the U.S., as defined in section 124.23 of the ORC is presented to the commission and such ex-servicemember being otherwise eligible has received a passing grade in any regular entrance exam, he or she is granted additional credit of 20% of such grade, thereby receiving a final grade of 20% higher in view of the above-mentioned service. As of September 2012, an applicant in good standing of the reserve component of the armed forces of the U.S. including the Ohio National Guard will receive 15% of a person's total passing grade given in the examination.

Seniority credit on promotional examinations

Personnel taking promotional exams receive credit for seniority, which is determined as follows: 0.1% of the total grade attainable in such exams for each of the first four years of service, and 0.6% of such total grade for each of the next ten (10) years of service. Any person taking a promotional exam must obtain a passing score before seniority credit is added.

Medical/Physical Examination

As part of the conditional offer of employment, part-time and full-time firefighter candidates are required to attend a pre-employment medical/physical examination provided by the city at no cost to the applicant. According to Ohio law, prospective full-time firefighters must undergo a comprehensive pre-employment physical prior to becoming a member of the pension system.¹³ The reason that this medical testing is required is because under Ohio law, an in-service disability that results from heart, cardiovascular, or respiratory disease is presumed to be duty-related (presumptive clause). Additionally, the required examination can detect physical or medical condition(s) that could adversely affect the employee's ability to safely perform his or her the essential job functions. This allows for the more effective evaluation of a disability case under the aforementioned circumstances if the firefighter has undergone a pre-employment health baseline that measures the presence or absence of these specified medical conditions.

Medical/physical examinations should be performed in accordance with NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments* by a physician/licensed health care professional. The NFPA 1582 standard provides guidance to fire departments on developing comprehensive occupational medical programs that are specifically tailored to the health risks associated with firefighting. The standard outlines the medical evaluations that firefighters should undergo to determine their fitness for duty. Ideally, this professional should

¹³ Retrieved from: <https://www.op-f.org/Files/employer%20manual%20for%20web.pdf>

be board certified in occupational medicine, internal medicine specializing in fields relevant to the fire service such as occupational toxicology, industrial hygiene, epidemiology, infectious disease, pulmonary, cardiology, critical care, orthopedics, and/or emergency medicine. The standard recognizes no difference between volunteer, paid on call, part-time, or full-time firefighters, as the firefighting essential job tasks outlined in NFPA 1582, Chapter 9 are the same.

Eligibility Lists

The commission prepares and maintains open to public inspection from the results of each exam, an eligible list of the persons who have passed the exam and are eligible for appointment. Such persons shall take rank upon the eligible list in the order of their relative grades. An eligibility list is what the department uses to fill vacant positions for specific job classifications.

The term of eligibility of each list and of the names appearing on the list fixed by the commission at not less than one nor more than two years. Any list that has been in effect for more than one year may, at the discretion of the commission, be terminated any time in the public interest, except fire department promotional list which remain in effect for two years.

Other Exams

Some positions require the completion of a background check provided by the city at no cost to the applicant.

Probationary Period

As part of the employment process, the probationary period is used to evaluate the work performance and conduct to ensure that it meets the job requirements. All original and promotional appointments are required to complete a probationary period of not less than one-year. No appointment or probation is final until the appointee has satisfactorily served his or her probationary period.

Article 14 of the labor agreement between the city of Mt. Vernon and the International Association of Firefighters (IAFF)/Ohio Association of Professional Firefighters (OAPFF) and the Mt. Vernon Firefighters and Paramedics Local 3712 addresses the probationary period served by new employees and promoted incumbent employees, as follows,

Every newly hired full-time employee will be required to successfully complete an initial probationary period. The new hire probationary period shall begin on the first day for which the employee receives compensation from the city and shall continue for a period of one year. Probationary employees may be removed without cause at any time during their initial probationary period and the probationary period removal shall not be grievable under the grievance and arbitration procedure nor appealable under civil service.

All newly promoted employees shall serve a promotional probationary period of one hundred eighty (180) days. An employee in a promotional probationary status may be removed without cause, subject to the chief's approval, from his promotional position, or he may request a demotion during the probationary period. However, the city shall place the employee so removed or demoted in a position in the classification he held immediately prior to the promotion.¹⁴

The agreement further addresses the one-year probationary period with a provision that is connected to minimum staffing levels while those new employees are being acclimated to their role and responsibilities with the department. According to the agreement,

14.4 Orientation Period/Minimum Staffing. Each newly-hired full-time employee will have an orientation period of twenty-seven (27) worked shifts beginning with his or her first day on active duty during which he or she will not be counted toward minimum staffing levels. The chief may reduce the orientation period of a newly-hired full time employee to no less than fifteen (15) worked shifts in consultation with the shift captain.

During their probationary period, employees are evaluated by their company officer although the frequency of the evaluations is not specified. At the conclusion of the probationary period, the company officer makes a recommendation to the fire chief for appointment to the department.

Training Reimbursement

Firefighters who voluntarily leave employment with the city of Mt. Vernon before 24 months of employment must reimburse the city of Mt. Vernon for all training paid for by the city.

According to Article 44 of the labor agreement, an employee "shall reimburse the city all monies expended by the city related to such... except that a member who resigns to begin receipt of disability benefits shall not be subject to this penalty...."¹⁵

Lateral Transfer Employment

The process of lateral entry has been established as a method for recruiting and hiring firefighter/paramedics who have been trained by other jurisdictions. This form of initial appointment meets the criteria of a non-competitive selection process into the classified civil service for firefighter/paramedics since it is recognized that trained firefighter/paramedics possess unique and exceptional qualifications and experience for which it is impracticable to ascertain the merit and fitness of applicants through competitive examinations. Qualifications which are impracticable to test for include, but are not limited to, past performance and behavior and demonstrated success as a firefighter/paramedic.

¹⁴ *Agreement between the City of Mt. Vernon and IAFF, OAPFF, Mt. Vernon Firefighters and Paramedics, Local 3712, July 1, 2022 to June 30, 2024.*

¹⁵ *Agreement between the City of Mt. Vernon and IAFF, OAPFF, Mt. Vernon Firefighters and Paramedics, Local 3712, July 1, 2022 to June 30, 2024.*

The city of Mt. Vernon's safety service director (SSD), in consultation with the civil service administrator and the fire chief establishes, at their discretion, the criteria required for a candidate to qualify for consideration and selection under a lateral entry process.

Positions filled through the lateral transfer procedures are exempt from a competitive examination but must complete the following requirements prior to selection:

1. Have prior fire department experience of no less than two years in a full-time capacity.
2. Successful background investigation including but not limited to:
 - Medical/physical exam,
 - Drug screen, and
 - Any other criteria established by the SSD, civil service administrator, and fire chief.

According to the career firefighter's labor agreement, Article 29,

The employer may laterally transfer certified firefighter/paramedics from another Ohio employer to a position as a firefighter/paramedic provided that the employee has a valid firefighter and EMT-paramedic certifications, is 41 years of age or less at time of employment, and have no less than two years of full-time service.¹⁶

New employees selected through the aforementioned process obtain and retain all other rights attributed to the classified service, following successful completion of the probationary period. This process is not intended to replace the competitive testing system and is only used in limited circumstances that best serve the city of Mt. Vernon.

Part-Time Employees

The review of policies and procedures discovered limited information regarding the employment of part-time firefighters. This information was found in the new position vacancy announcement when the position classification was introduced and in the labor agreement. The announcement contained: general information (i.e., position/classification title, immediate supervisor, hourly pay rate); functions, duties, and responsibilities; minimum requirements and qualifications; knowledge, skills, and abilities; and an overview of hiring selection process. Current hourly pay rates for part-time personnel depend on the level of EMS certification, as classified in Table 5.

¹⁶ *Agreement between the City of Mt. Vernon and IAFF, OAPFF, Mt. Vernon Firefighters and Paramedics, Local 3712, July 1, 2022 to June 30, 2024.*

CERTIFICATION	HOURLY PAY RATE
Firefighter/EMT	\$15.00/hour
Firefighter/Advanced EMT	\$16.00/hour
Firefighter/Paramedic	\$17.00/hour

Table 5: Part-time firefighter hourly pay rates.

Article 46 of the labor agreement identifies that part-time firefighters are not represented by Local 3712 or covered by the language in the agreement. However, according to the agreement,

46.1 Use of Part-Time Fighters Part-time firefighters are not members of the bargaining unit and are not covered by the terms of this Agreement. The City recognizes that on the points covered in this Article, the use of part-time firefighters can have an effect on the terms and conditions of employment of bargaining unit employees. Therefore, the following conditions will apply concerning the use of part-time firefighters.

- A. All part-time firefighters must be Firefighter I & II and EMT trained and certified at the time they begin work in the department.
- B. The ratio of part-time to full-time firefighters on daily staffing will not exceed 1:3.
- C. Part-time firefighters will not be assigned to ride in charge of fire apparatus.
- D. Part-time firefighters will not be counted towards minimum staffing requirements, although a part-time firefighter on-duty will count as personnel on station for purposes of emergency overtime call-in procedures.
- E. Overtime for part-time firefighters will occur only in situations when on-going emergency operations are not completed at the end of that person's scheduled shift.
- F. All new part-time firefighters must work 240 hours before they count for staffing. The Chief may reduce the orientation of a newly-hired part-time employee period to no less than 120 hours in consultation with the officers.¹⁷

Annual Job Performance Appraisals

Incumbent personnel receive annual job performance appraisals conducted by their immediate supervisor in accordance with department administrative policies and procedures and SOGs. Performance appraisals of line personnel are reviewed by their respective captains before review by the chief. Performance appraisals of captains and staff lieutenants are conducted by the chief. The department is encouraged to provide training for supervisory personnel who perform employee appraisals and performance reviews. This promotes a uniform and consistent approach

¹⁷ *Agreement between the City of Mt. Vernon and IAFF, OAPFF, Mt. Vernon Firefighters and Paramedics, Local 3712, July 1, 2022 to June 30, 2024.*

in the performance review process, and helps develop and maintain communication between employees and supervisors.

Promotions

The department has no specific procedures for promotions other than what is outlined in the *Rules and Regulations of the Municipal Civil Service Commission for the City of Mount Vernon*. The positions of lieutenant and captain area considered promoted ranks, while the position of fire chief is considered appointed positions at the discretion of city council. Required credentials and training are addressed in each position’s job description.

Attrition

The attrition rate experienced by an organization can be one significant factor in assessing the health of an organization. According to the *Oxford Dictionary* definition of attrition: “The gradual reduction in the size of a workforce as a result of resignation, retirement, or death; (now *esp.*) the process of reducing the size a workforce by not replacing employees who leave, rather than by enforced redundancies or dismissals.”¹⁸ A low employee attrition rate may be an indicator that employees are receiving fair compensation, the organization is well managed, and the general health of the organization is good. The attrition rate is the percentage of employees who separate from employment for any reason (e.g., retirement, resignation, termination, etc.).

Organizations typically can be more productive and efficient when they are able maintain their high-quality employees. A “normal” amount of turnover, or attrition, is healthy for an organization but excessive attrition over consecutive years is a drain on resources and an indication that improvements are needed. Fire departments that effectively train their new employees and enjoy a low attrition rate develop a stronger team and respond more effectively to emergencies as all personnel understand their role and function well as part of the effective response force to mitigate the emergency. Low turnover will also result in a higher average staffing levels on apparatus and reduced overtime to fill “minimum staffing” requirements. The following paragraphs present the 2017 – 2022 attrition rates for the MVFD.

The key goal for a fire department to maintain stability in their personnel resources should be to keep the attrition rate reasonably low over the long term. The attrition rate is one of the two primary factors that reduce staffing in field services and the skill level of the employees that are providing the services to the community. The second factor is use of accumulated leave time. The following table shows the number of employees who have separated from the MVFD over the last six years.

¹⁸ Retrieved from: <https://www.oed.com/viewdictionaryentry/Entry/12946>

CALENDAR YEAR	NUMBER SEPARATED	ATTRITION RATE
2017	2	4.8%
2018	1	2.4%
2019	2	4.8%
2020	2	4.8%
2021	3	7.2%
2022	4	9.8%
TOTAL:	14	
AVERAGE:	2.3	5.6%

Table 6: MVFD full-time employee attrition 2017-2022.

A total of 14 personnel separated from the MVFD over the six-year period for an average attrition rate of 5.6% as shown in above in Table 6. Of the 14 separations 11 were resignations, which may indicate this is an isolated occurrence of high turnover.

While it’s difficult to define a “good” attrition rate, the MVFD should generally aim for an attrition rate of five-percent or lower annually. Keep in mind, however, that this number will vary depending on the circumstances. Providing a competitive pay and benefit package to attract quality candidates and ensure their continued being of great significance or value is one factor ensuring the agency attracts and keeps high quality employees. The workplace for fire personnel includes the physical items such as the fire stations, apparatus, and the equipment used by personnel. As the stations also serve as “living quarters” for firefighters it is important that they function appropriately and offer comfortable accommodations. Other elements affecting turnover of fire personnel can include positive working relationships with their peers, the quality of the employee’s direct supervisor, and a feeling of belonging to the organization. If too many negative factors are present it can lead to serious consideration of whether or not to change employers. There are a wide variety of factors involved in keeping high quality employees and four specific employee needs have been identified and are listed here:

- The need for trust – expecting that the agency will deliver on its promises, be open and honest in its communication, invest in the employee, provide fair treatment and compensation.
- The need to have hope – ability to grow in the organization, develop skills and have opportunities for career progress or advancement.
- The need to feel a sense of worth – the employee’s confidence that hard work, competence, and commitment to the organization will lead to recognition and reward.
- The need to feel competent – the expectation that an employee’s skill level will be matched to assignments that use the skills and are challenging.

Fair compensation can be one of the incentive factors for employees to stay with their current employer. In Table 7, the listed comparable fire department agencies were used to contrast agencies that former MVFD firefighters had chosen to pursue employment prior to July 1, 2022. In Mt. Vernon, the compensation as provided in the *Agreement between the City of Mt. Vernon and IAFF, OAPFF, Mt. Vernon Firefighters and Paramedics, Local 3712, January 1, 2021 to June 31, 2022* offered was generally lower than that of other agencies provided in the table below.¹⁹ It must be noted that MVFD wage figures displayed are base salaries, as each employee's salary will vary based on EMS certification and longevity. Employees that have "dual certifications" (i.e., firefighter/paramedic) receive the following hourly pay supplement:

- 24/48 shift personnel - 71 cents per hour
- 40-hour staff - 85 cents per hour.

In addition, each employee receives an hourly longevity supplement of 5 cents per hour for each year of service with the city of Mt. Vernon beginning at the completion of their fifth year of employment. Beginning with the sixth year of service, the employee receives 25 cents per hour, and at the completion of each successive year, the employee receives an additional 5 cents per hour. Compensation rates from those fire departments in the central Ohio region were obtained from the Ohio State Employment Relations Board and the individual agencies as part of this study and are provided in the following table:

¹⁹ *Agreement between the City of Mt. Vernon and IAFF, OAPFF, Mt. Vernon Firefighters and Paramedics, Local 3712, January 1, 2021 to June 31, 2022.*

	MT. VERNON FIRE DEPARTMENT	CENTRAL OHIO JOINT FIRE DISTRICT	COLUMBUS FIRE DIVISION	NORWICH TWP. FIRE DEPARTMENT	MONROE TWP. FIRE DEPARTMENT	WEST LICKING JOINT FIRE DISTRICT	WORTHINGTON FIRE DEPARTMENT
POSITION/RANK	24/48 SHIFT PERSONNEL						
Firefighter - Training Period	\$50,019.84	—	—	—	\$53,813.76	\$59,987.20	—
Firefighter - Six Months	\$51,841.92	—	—	—	—	\$64,588.16	—
Firefighter: 1 yr.	\$54,013.44	—	—	—	—	—	—
Firefighter/Paramedic: Training Period	\$51,792.00	—	—	—	—	\$59,987.20	—
Firefighter/Paramedic: Six Months	\$53,614.08	—	—	—	—	\$64,588.16	—
Firefighter/Paramedic: 1 yr.	\$55,785.60	\$50,843.52	\$58,993.13	\$61,497.00	\$58,813.76	\$69,101.76	\$66,520.15
Firefighter/Paramedic: 2 yrs.	\$57,782.40	\$52,590.72	\$61,985.36	\$70,189.00	\$64,084.48	\$73,702.72	\$77,573.38
Firefighter/Paramedic: 3 yrs.	\$59,729.28	\$55,007.68	\$65,123.55	\$80,342.00	\$69,413.44	\$78,274.56	\$83,547.39
Firefighter/Paramedic: 4 yrs.	\$62,075.52	\$57,220.80	\$77,700.64	\$95,099.00	\$72,238.08	\$82,817.28	\$89,816.05
Firefighter/Paramedic: 5 yrs.	\$64,122.24	—	\$90,423.68	—	\$73,985.28	\$87,418.24	—
Fire Lieutenant	\$67,541.76	\$59,509.63	\$100,660.32	\$104,609.00	\$80,883.81	\$100,580.48	\$91,961.64
Fire Captain	\$71,635.20	\$61,890.02	—	\$115,070.00	\$84,333.07	\$106,550.08	—
Battalion Chief - Step 1	—	—	\$140,159.43	—	—	\$112,636.16	\$100,110.81
Battalion Chief - Step 2	—	—	—	—	—	—	\$105,888.37
	40-HOUR STAFF						
EMS/Training Coordinator	\$67,496.00	—	—	—	—	—	—
Fire Prevention Officer	\$68,848.00	—	—	—	\$85,000.00	\$74,230.77	\$63,838.92

Table 7: Comparison of annual compensation among regional fire departments that former MVFD employees have chosen to pursue employment.

The average annual salary for a MVFD year one firefighter/paramedics compared to the six other surveyed fire departments was 8.5% below the average salary and the average five-year salary was nearly 30.9% above the five-year MVFD firefighter/paramedic salary. The average company officer (i.e., lieutenant) salary amongst the six comparison fire departments was 32.8% above that of MVFD lieutenants. The average shift commanders (i.e., captain or battalion chief) annual salary amongst the six comparison fire departments was approximately 28.4% above that of MVFD captains.

As discussed in the Staffing and Deployment section on page 33, with the transition to the 56-hour workweek for newly hired full-time shift firefighters, these employees have no Kelly Day under the terms of the most recent labor agreement. However, all incumbent full-time shift firefighters hired prior to the effective date of the current agreement are grandfathered in and are not required to relinquish their Kelly Day prior to retirement or separation from the department. Although, beginning December 2023, full-time tenured firefighters can elect in writing by December 15th to work their Kelly Day for the following calendar year. This election takes effect on January 1st of the following year. Unless the employee informs the city in writing by November 30th of the year elected and year thereafter, the election will be continued for the following calendar year. For the 48-hour workweek firefighter's election to work Kelly Days in a given year, provides the opportunity for the employee to achieve the same annual base salary amount as that of the 56-hour workweek firefighter, as displayed later in this section. The city reserves the right to limit the number of employees volunteering to work Kelly Days each

calendar year based upon budget and operational constraints. Employees are granted their request to work Kelly Days based on seniority.

Management and labor unions both want the best for those they represent. This is not an easy task since each party has its own interests to protect and defend regarding issues such as wages, working conditions, and benefits. However, when management and unions meet with a collaboration mindset, it can clear a path to achieve mutual goals. Table 8 demonstrates the resulting partnership and efforts put forth by the firefighters/paramedics of Local 3712 and city leadership in negotiating competitive wages and benefits since 2021.

POSITION/RANK	LABOR AGREEMENT EFFECTIVE DATES					
	January 1, 2021	January 1, 2022	June 1, 2022	November 27, 2022	January 1, 2023	January 1, 2024
	24/48 SHIFT PERSONNEL					
Firefighter: Training Period*	\$49,021.44	\$49,520.64	\$50,019.84			
Firefighter: Six Months*	\$50,818.56	\$51,317.76	\$51,841.92			
Firefighter: 1 yr.*	\$52,965.12	\$53,489.28	\$54,013.44			
Firefighter: Training Period**				\$61,268.48	\$61,996.48	\$63,976.64
Firefighter: Six Months**				\$63,510.72	\$64,238.72	\$66,248.00
Firefighter: 1 yr.**				\$66,160.64	\$66,888.64	\$68,956.16
Firefighter/Paramedic: Training Period*	\$50,793.60	\$51,292.80	\$51,792.00	\$54,288.00	\$54,912.00	\$56,609.28
Firefighter/Paramedic: Six Months*	\$52,590.72	\$53,089.92	\$53,614.08	\$56,209.92	\$56,833.92	\$58,556.16
Firefighter/Paramedic: 1 yr.*	\$54,737.28	\$55,261.44	\$55,785.60	\$58,481.28	\$59,105.28	\$60,877.44
Firefighter/Paramedic: 2 yrs.*	\$56,684.16	\$57,233.28	\$57,782.40	\$60,577.92	\$61,201.92	\$63,024.00
Firefighter/Paramedic: 3 yrs.*	\$58,581.12	\$59,155.20	\$59,729.28	\$62,624.64	\$63,248.64	\$65,095.68
Firefighter/Paramedic: 4 yrs.*	\$60,877.44	\$61,476.48	\$62,075.52	\$65,095.68	\$65,719.68	\$67,616.64
Firefighter/Paramedic: 5 yrs.*	\$62,899.20	\$63,498.24	\$64,122.24	\$67,242.24	\$67,866.24	\$69,813.12
Firefighter/Paramedic: Training Period**				\$63,336.00	\$64,064.00	\$66,044.16
Firefighter/Paramedic: Six Months**				\$65,578.24	\$66,306.24	\$68,315.52
Firefighter/Paramedic: 1 yr.**				\$68,228.16	\$68,956.16	\$71,023.68
Firefighter/Paramedic: 2 yrs.**				\$70,674.24	\$71,402.24	\$73,528.00
Firefighter/Paramedic: 3 yrs.**				\$73,062.08	\$73,790.08	\$75,944.96
Firefighter/Paramedic: 4 yrs.**				\$75,944.96	\$76,672.96	\$78,886.08
Firefighter/Paramedic: 5 yrs.**				\$78,449.28	\$79,177.28	\$81,448.64
Fire Lieutenant*	\$66,243.84	\$66,817.92	\$67,541.76	\$71,460.48	\$71,460.48	\$73,482.24
Fire Captain*	\$70,262.40	\$70,936.32	\$71,635.20	\$75,753.60	\$75,753.60	\$77,850.24
	40-HOUR STAFF					
EMS Training Coordinator	\$66,206.40	\$66,851.20	\$67,496.00	\$70,782.40	\$71,302.40	\$73,195.20
Fire Prevention Officer	\$63,793.60	\$64,438.40	\$65,083.20	\$68,328.00	\$68,848.00	\$70,740.80

Table 8: MVFD negotiated salaries from January 2021 through December 31, 2024.

Legend: * - 48-hour workweek. ** - 56-hour workweek.

Recommendation #8: The assessment team recommends the MVFD ensure that all firefighters receive an annual medical evaluation consistent with NFPA 1582. In addition, the department should ensure firefighters are cleared for duty by a physician knowledgeable about the physical

demands of firefighting, the personal protective equipment used by firefighters, and the various components of NFPA 1582. Lastly, phase in a mandatory comprehensive wellness and fitness program for all firefighters.

There was no evidence that the MVFD requires annual medical evaluations for incumbent personnel but does perform respiratory fit test testing. Personnel are required to provide medical clearance from a personal physician following a serious injury or illness. The department has physical fitness training equipment at Station 491, and encourages personnel to complete 30 minutes of physical fitness while on-duty. All personnel complete a fitness assessment twice a year, which has had a history of 100% participation with a 100% completion meeting the department's physical fitness standard. The employee insurance offered through the city offers a wellness physical.

Adhering to NFPA 1582 offers numerous benefits for firefighters and fire departments, including:

- Protection of firefighter health and safety: Comprehensive occupational medical programs can help identify and address medical conditions that may impair a firefighter's ability to perform their duties safely. By ensuring that firefighters are healthy and fit for duty, fire departments can reduce the risk of injuries and fatalities.
- Compliance with legal and regulatory requirements: Fire departments are required to comply with various legal and regulatory requirements related to firefighter health and safety. Adhering to NFPA 1582 can help fire departments meet these requirements and avoid legal and regulatory penalties.
- Improved productivity and reduced absenteeism: By ensuring that firefighters are healthy and fit for duty, fire departments can improve productivity and reduce absenteeism. Healthy firefighters are more likely to be present and productive on the job, which can improve departmental performance and reduce costs associated with sick leave and disability.
- Enhanced reputation and community trust: Fire departments that prioritize firefighter health and safety are more likely to earn the trust and respect of their communities. By demonstrating a commitment to firefighter health and safety, fire departments can enhance their reputation and build stronger relationships with their communities.

Recommendation #9: The assessment team recommends that the MVFD develop policies, procedures, and job descriptions that addresses part-time firefighter positions. As identified previously, the MVFD is a combination fire department, meaning that alternative staffing means are utilized to supplement the full-time force. This mix of full-time and paid part-time employees collaboratively work together to achieve the same mission and vision. While the use of the part-time staffing model is only addressed in the labor agreement between the city and full-time firefighter/paramedics, the recommended development of the aforementioned documents should

provide an overview and purpose of the staffing model; identify and discuss but not limited to scheduling and shift hours, minimum and maximum hours worked in accordance with the Fair Labor Standard Act, medical/physical examinations, training requirements, and the issuance of uniforms and personal protective equipment (PPE).

Recommendation #10: The assessment team recommends that the MVFD employ measures to gain insight into the strengths and weaknesses of its personnel in regard to its ability to execute a recruitment and retention plan. Employee turnover or attrition can be expensive for fire departments. In many industries, the cost of losing quality talent is rising, thanks to increasingly competitive labor markets, and in general the fire service is no different. Whatever the average turnover rate may be, the most important thing is to recognize the why. Sometimes, attrition can be natural. But when an organization's attrition rate is high, it's key to focus on voluntary attrition because it can provide a perspective on areas within the organization that can be improved to create a better culture and to reduce personnel turnover.

To prevent turnover and promote employee retention in a fire department agency, the following strategies are offered:

- Maintain open, honest communication - communication is a two-way street. Give personnel ample opportunity to provide feedback. Implement an open-door policy where appropriate. Employees need to know that they can come forth with problems or concerns without the fear of retaliation. Make sure they understand that their opinions are valued and that those of authority are approachable.
- Create an inclusive environment - when employees don't feel comfortable in the workplace, they look for a way out. While the city or MVFD doesn't appear to have clear policies addressing diversity, equity, and inclusion (DEI), it is suggested that they create them. But policies aren't enough if the department doesn't follow through. It's important to get all of the leadership on-board as change is implemented to promote an inclusive workplace environment. DEI trainings and workshops should also be part of employee development and community involvement.
- Employers have the responsibility to keep the workplace safe and respectful by taking necessary measures to prevent all forms of harassment, bullying, and violence from occurring in the workplace. The state of Ohio does not have specific anti-harassment training requirements, but it is recommended. According to the Ohio Administrative Code (OAC) §4112-5-05(J)(7), employers are encouraged to prevent harassment from occurring by expressing strong disapproval against it, educating employees (i.e., new hires and incumbent) on their rights and complaint procedures, and developing methods to sensitize employees on illegal harassment.
- Encourage employee development - training is a great way to show that an organization is invested in its personnel. By showing that the department is invested in its employees'

professional and personal lives, the department is encouraging loyalty and engagement. Do they want additional responsibilities? A chance to work on special projects? A chance to work more closely with administration? Supervisors must communicate with subordinates are aware of their goals and motivations.

- Continue efforts to work towards a competitive salary structure - it's no secret that many employees look at pay as an indicator of their happiness at work. If an employee feels they're not getting enough support for financial wellness, they may consider looking for a new job. The city should consider establishing a compensation policy or practice for fire department employees to ensure salaries remain competitive with surrounding agencies.
- Conduct exit interviews - exit interviews can be a valuable opportunity to collect candid feedback. Even if opportunities have been afforded to foster an open and honest environment, not all incumbent employees will feel comfortable sharing constructive criticism. Departing employees may be more likely to be forthcoming. During an exit interview, there can be a discovery of any positives and negatives about the current workplace culture. Finally, one might find out the real reason the employee is leaving. All of this valuable insight will help the department implement changes that should lower the employee attrition rate.

Recommendation #11: The assessment team recommends city of Mt. Vernon and the MVFD comply with ORC §146.01 – 146.19 Volunteer Firefighters' Dependent Fund for the benefit of those employed as part-time firefighters. The Ohio Volunteer Firefighters' Dependents Fund provides benefits to surviving spouses and dependent children of volunteer firefighters killed in the line of duty. In the State of Ohio, firefighters may be employed in one of two ways. Career and meeting the standard of the Police & Fire Pension System or a "volunteer" or part-time, which means any other method, compensated or not, are considered volunteer firefighters. Volunteers must meet the requirements of ORC §505.38 and §737.222 on filing a copy of the firefighter's medical physical report with the local firefighter's dependency fund board prior to their appointment to the department. The ORC §146.01(B)(1)(a) defines "volunteer firefighter" as "any person who is employed as a firefighter in a part-time, reserve, or volunteer capacity by a fire department of a municipal corporation, township, fire district, or joint fire district and is not a member of the Public Employees Retirement System or Ohio Police and Fire Pension Fund."

Each political subdivision with a fire department that employs volunteer or part-time is a member of the Fund and each Fund member must establish a board to administer claims for the benefits from the Fund. Each board must have the following members:

- One member elected by the legislative authority of the Fund member that maintains the fire department.
- One member elected by the volunteer or part-time firefighters of the fire department (employed by the fire department).

- One member elected by the other two members (cannot be a public employee, member of the legislative authority, or firefighter for that department; must be a citizen registered to vote in that area.

One of the three board members must serve as a chairperson, and one shall serve as the secretary.

The Ohio State Fire Marshal is designated to oversee and collect annual payment for the local dependency's board based on a community's population and requires a copy of their annual organizational meeting be filed with the Fire Marshal's office. The Fire Marshal's office keeps a record of all established dependency boards and state auditors may review the official minutes required and payment history during their audits.

TRAINING

Professional development and training are, without question, one of the most important functions that a fire department should be performing on a regular basis. One could even make a sound argument that training is, in some ways, more important than emergency responses because a department that is not well-trained, prepared, and operationally ready can be unable to fulfill its emergency response obligations and mission statement. Professional development and training are vital at all levels of fire service operations to ensure that necessary functions can be completed safely, effectively, and efficiently. A comprehensive, diverse, and ongoing training program is critical to a fire department's level of success.

An effective and all-encompassing fire department training program must cover all the essential elements of a department's core missions and responsibilities. The level of training or professional development required, given a set of tasks, varies with the jobs to be performed. The program must include an appropriate combination of technical/classroom training, manipulative or hands-on/practical evolutions, and training assessment to gauge the effectiveness of these efforts. 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 national practices and standards that could be used as a benchmark to judge the department's operations for any number of reasons.

Certain OSHA regulations dictate that minimum training must be completed on an annual basis, covering various topics that include:

- a review of the respiratory protection standard, self-contained breathing apparatus (SCBA) refresher and user competency training, SCBA fit testing [29 Code of Federal Regulations (CFR) 1910.134];
- bloodborne 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 addition, NFPA standards contain recommendations for training on various topics such as a requirement for minimum structural firefighting training annually for each fire department employee. As well the ISO-Fire Suppression Rating System (ISO-FSRS) has certain training requirements for which fire departments receive credit during the ISO-FSRS review.

Since so much depends upon the ability of the emergency responder to effectively deal with an emergency, training and professional development must have a prominent attention within an emergency responder's schedule of activities when on-duty. Training and professional development programs also help to create the character of a fire service organization. Agencies that place a real emphasis on their training tend to be more proficient in carrying out day-to-day duties. The prioritization of training can also foster an image of professionalism and instills pride in the organization.

The MVFD has assigned one lieutenant to serve as the EMS coordinator/training officer for the department. The lieutenant is responsible to serve as the single point of responsibility for conducting all needs assessments relative to training, as well as program design, coordination, and evaluation. The value in this arrangement is that the training of all personnel is delivered in a consistent manner. This utilization of a single training officer is common among departments across the U.S.

For consistency, each shift captain monitors training for company level staff. The department hires only fire- and EMS-certified prospective employees. Minimum hiring requirements are Firefighter Level II in accordance with NFPA 1001, *Standard for Fire Fighter Professional Qualifications* training standards, and emergency medical technician, or paramedic in accordance with Ohio Department of Public Safety Division of EMS, and state statutes. As will be discussed later in this section, many personnel have earned additional certifications. The in-service training is usually topic-specific to either teach or practice important skills and/or to allow crews to work together in simulated emergency situations.

The MVFD has a training program that addresses fire, EMS, and technical rescue disciplines and responses that includes, but is certainly not limited to:

- Haz-mat materials training;
- Technical rescue (ice rescue, swift water rescue, vehicle extrication, grain bin rescue), both basic and advanced;
- On-going EMS basic and continuing education training; and
- Daily company in-service training.

During 2020 (despite the limitations imposed by the COVID-19 pandemic), the MVFD recorded 260 hours of training during the year. In 2021, the department completed 351 hours, and in 2022, the department conducted 536 hours. The completed training in 2022 was a 51% increase above 2020, and 35% increase from 2021. The MVFD is to be commended for this commitment to training, which the assessment team considers to be a “best practice”.

The training provided by the MVFD is intended to be a combination of the training that is assigned by the training division augmented by additional training on topics identified by the lieutenants and captains. This has resulted in more flexibility in the training that is completed. With any good fire department training program, at least 50% of the drills should include manipulative (hands on) training to allow for the development of proficiency and to review critical skills.

Trained personnel are vital to a competent fire suppression force. ISO evaluates training facilities and their use; company training at fire stations; training and certification of fire officers; driver/operator, hazardous materials, and recruit training; and building familiarization and pre-incident planning inspections. The most recent ISO report identified areas of deficiencies in the department’s current in-service training program. The department earned 1.76 points out of a possible 35.00 for training facilities, and their use; 6.66 points out of a possible 25 for company training at fire stations; 1.00 points out of a possible 5.00 for existing driver and operator training. Credit earned for each specific training area from the ISO field evaluation is listed in Table 9. Note: training requirements for the state of Ohio are found in Appendix I.

ISO TRAINING EVALUATION	EARNED CREDIT	CREDIT AVAILABLE
Facilities, and Use	1.76	35.00
Company Training	6.66	25.00
Classes for Officers	12.00	12.00
New Driver & Operator Training	5.00	5.00
Existing Driver & Operator Training	1.00	5.00
Training on Hazardous Materials	0.00	1.00
Recruit Training	5.00	5.00
Pre-Fire Planning Inspections	12.00	12.00
TOTAL:	43.42	100.00
ISO Awarded Credit 3.91 points		

Table 9: 2022 ISO PPC Report training summary.

Note: areas of deficiencies are noted in red font.

According to ISO, firefighters are expected to annually engage in 18 hours of facility training. Currently, due to a lack of a training facility, the MVFD fails to complete the expected time requirement of training at a fire facility. ISO suggests the following minimum elements to qualify as a fire training facility:

1. Live fire training structure, including smoke room;
2. Drill tower at three stories in height; and
3. Training area at least two acres in size.

Additional daily opportunities for training can be found during related activities such as, company and existing driver and operator training at fire stations including training using streets, buildings, and open areas. The focus should be on utilizing the equipment that the MVFD and mutual-aid departments operate during responses because familiarity builds muscle memory, so during an incident, all personnel can work more efficiently and safely. Suggested topics include: engine company disciplines (e.g., timed hydrant connections, drafting operations, fire flow calculations, hose line placement and advancement, apparatus placement, etc.), ladder company disciplines (e.g., aerial and ground ladder placement; power saw calisthenics; ventilation - natural, positive, and negative pressure, search and SCBA confidence skills, etc.), and rescue company disciplines (e.g., rapid intervention company equipment familiarization, extrication tool calisthenics, cribbing and stabilization skills, victim packaging skills, etc.). Additionally, daily/weekly apparatus and equipment inspections, building pre-planning activities; annual inspection and testing requirements such as for service testing of hose, pumps, hydrant flow testing can also provide additional training credits for personnel who participate. Training can

and should also be conducted during evening hours and on weekends. Detailed records should be maintained for evening training sessions, as ISO examines this element of a department's overall training. Failure to address and maintain can result in fewer "earned" credits or points affecting the overall diversion points given at the end of the evaluation.

On the EMS side of operations, the training programs and requirements are primarily driven by the mandatory nature of continuing education and recertification requirements for various levels of practitioners. If individual personnel or the agency were to not keep up with required training and/or certification requirements they could lose the ability to practice or provide the prescribed levels of service.

All levels of EMS training require continuing education credits on a multiyear cycle for recertification. Whenever possible, fire training should be tied into EMS continuing education credits, providing dual discipline benefit for personnel. As EMS incidents make up a large percentage of the department's responses, ensuring that these certifications continue to be maintained should remain a significant component and priority of the department's training focus.

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 Mt. Vernon, including those offered at various state and regional firefighting academies and at the National Fire Academy in Emmitsburg, Maryland. Beyond the practical benefits to be gained from personnel participating in outside training, encouraging personnel to earn and/or maintain various specialized certifications such as fire instructor, fire-safety inspector, or fire officer increases the positive professional perception of the organization and can help to demonstrate a commitment to continued excellence.

Beyond the establishment of requirements to achieve certain levels of certification for promotion, the department should consider the implementation of a formal professional development program for all department personnel. The program should attempt to strike an appropriate balance between technical/practical task books, simulator training, formal certifications, mentor relationship, and outside influences. Where practical, best practices identified by the NFPA, ISO, and the Center for Public Safety Excellence (CPSE) should be incorporated.

Recommendation #12: The assessment team recommends that the MVFD make a concerted effort to send as many officers as possible to the National Fire Academy (NFA) for fire officer and executive development. Any officer who meets the admissions criteria should be encouraged to enroll in the academy's Managing Fire Officer Program or Executive Fire Officer Program. It must be noted that at the time of this report, the NFA is not accepting applications for the Managing Officer Program at this time, as the curriculum is under review and study. In lieu of

the aforementioned NFA programs, the Ohio Fire & Emergency Services Foundation's *Ohio Fire Executive Program* (OFEP) should also be given strong consideration. The OFEP is an executive development program that assesses, enhances, and refines the leadership qualities of chief officers who are currently leading their organizations and develops 'bench strength' in high potential senior officers who can move into positions of greater responsibility.

Recommendation #13: The assessment team recommends the MVFD make it a priority to continue to develop and budget for a company fire officer training and development program that is competency-based on NFPA 1021, Standard for Fire Officer Professional Qualifications. The program should focus on contemporary fire service issues including community fire protection and emergency services delivery approaches, fire prevention practices, firefighter safety and risk management, and labor/staff relations; reviewing, approving, or preparing technical documents and specifications, departmental policies, SOGs/SOPs, and other formal internal communications; improving organizational performance through process improvement and best practices initiatives; and having a working knowledge of information management and technology systems.

Recommendation #14: The assessment team recommends the MVFD develop competency task books/logs for firefighter, fire apparatus driver/operator, company officer, and shift commander positions. Firefighters should be required to complete their book/log as part of their probationary period. For other ranks, all personnel aspiring for promotion to a higher rank should be required to successfully complete all elements of that rank's task book/log to be eligible to participate in the formal promotional testing process.

Recommendation #15: The assessment team recommends the MVFD develop, and institute written and practical skills testing and proficiency evaluations as part of the department's comprehensive fire training program. 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, MVFD operations and procedures.

Recommendation #16: The assessment team recommends that the MVFD provide all companies and personnel with high-intensity training on various subjects, including periodic live fire training on at least a semi-annual basis at an appropriate location where appropriate training facilities, structures, and props are available. With the number of actual structure fires decreasing nationally, scheduled live fire training exercises at a dedicated training facility must be conducted in order for personnel to maintain their skills proficiency.

Recommendation #17: The assessment team recommends that the city of Mt. Vernon should make it a high priority to provide funding for the MVFD to procure an appropriate training facility where it can safely perform in compliance with NFPA 1403, Standard on Live Fire Training Evolutions for all personnel on at least a semi-annual basis. While many

departments conduct training exercises in donated burn buildings or other existing structures, having a facility that's designed specifically for training can elevate a department's training opportunities. Training complexes are increasingly common, especially for departments that train a significant number of trainees annually, desire or need unlimited access to a training facility site within their municipal or first-due response area, and have the want to comply with ISO criteria for maximum credit (i.e., access to a drill tower and live fire training structure, use training facilities 18 hours per year per firefighter, and/or conduct company training evolutions at a training facility and /or fire station 16 hours per firefighter per month).²⁰ These comprehensive training sites can be designed and constructed to incorporate a variety of emergency situations that a firefighter might encounter. A fixed training structure can be a great investment for the department. Constructing a facility for the sole purpose of fire training will allow the MVFD to stage complete burns and ignitions countless times without damaging or destroying the building.

RISK ASSESSMENT

The concept of community risk assessment is an important tool in evaluating and planning for department services. Understanding the risk a community faces from a fire or rescue perspective, as well as some of the other natural, human caused, and technological-caused risks (i.e., fire, emergency medical, hazardous materials, and technical rescue) in the community, helps lay the groundwork for determining service objectives and the resources necessary to provide emergency services to the community.

The community risk assessment (CRA) tool was used to assess the property risk within the township. The assessment included identified "target hazards", which are described as any large manufacturing or commercial property that typically requires a larger number of resources than is normally deployed for residential and other common types of occupancies. Target hazards also would include buildings of public assembly of 100 or more people and apartment buildings of 12 units or more. Schools, hospitals, nursing homes, institutions, and larger industrial complexes that may contain high-hazard processes or hazardous materials on site would be included. Each property was assessed for the risk posed for each of the following elements:

- Life hazard,
- Community impact,
- Hazard index,
- Water supply,
- Building usage,
- Building construction type or methodology,

²⁰ Retrieved from: <https://www.isomitigation.com/ppc/technical/training/>

- Number of floors or stories, and
- Square footage.

Each of the aforementioned areas described received a rating score 1 to 3, with 1 equating to low risk or impact and 3 representing high risk or high impact. Each address was provided with a final CRA rating from 0 through 9 for the lowest risk properties and 21 through 24 for the highest risk (based on the eight rated categories). The following levels of identified risk were classified:

RISK	CRA SCORE
Maximum	21 - 24
Significant	16 - 20
Moderate	10 - 15
Low	0 - 9

The risk assessment survey was conducted with the assistance of the MVFD’s personnel and covered 343 target hazards in the communities served. Of the total properties analyzed, zero properties rated a maximum risk and 65 properties rated a significant risk. Table 10 summarizes each community’s property risk assessment.

RISK	MT. VERNON	CLINTON TWP.	COLLEGE TWP.	GAMBIER	KENYON COLLEGE	KNOX COUNTY AIRPORT	LIBERTY TWP.	MONROE TWP.	MORRIS TWP.	PLEASANT TWP.	PROPERTY RISK TOTALS
Maximum	0	0	0	0	0	0	0	0	0	0	0
Significant	46	9	2	0	1	0	0	1	3	3	65
Moderate	68	28	4	3	15	1	7	2	5	4	137
Low	13	5	0	5	109	0	2	4	1	1	140

Table 10: Summary of the MVFD’s risk assessment by community.

Each property assessed in the city of Mt. Vernon as a significant risk property were plotted using a blue dot on a map and are displayed in Figure 18.

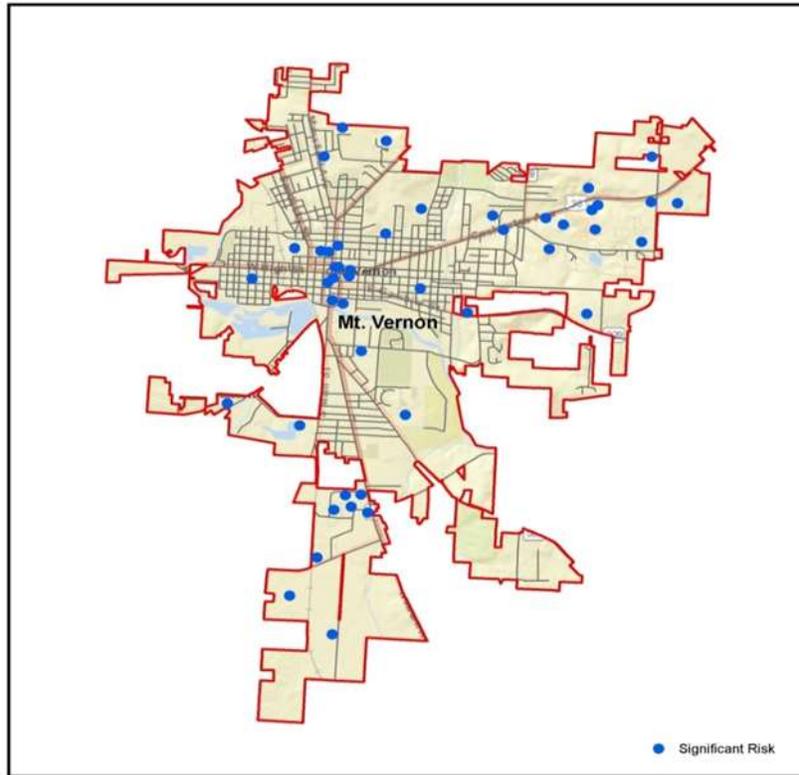


Figure 18: city of Mt. Vernon significant and maximum risk plotted properties.

In Mt. Vernon, the department faces typical occupancies normally found in a community of this size and history. However, the city has a large downtown area that contains numerous multi-story buildings, mixed-use occupancies, and small commercial occupancies as shown in Figure 19. Many of these properties individually would pose a moderate risk. However, with the age of the buildings and features of what is classified as “ordinary construction” methods, any fire gaining headway in one these buildings could endanger numerous adjacent structures. According to the NFPA 220, *Standard on Types of Building Construction*,

ordinary construction is one of the five types of construction methods. Ordinary construction features masonry or brick exterior walls with wood joist and interior structural components and can vary between two to six stories in height. These types of buildings are commonly existent in older downtown areas and are often referred to as “Main Street USA.” These building are rarely protected with automatic fire-sprinkler systems, have multiple concealed spaces, and often are constructed abutting other similar buildings.²¹

²¹ National Fire Protection Association. (2021). *Standard on Types of Building Construction*. (NFPA 220). Quincy, MA: Author.



Figure 19: Downtown Mt. Vernon ordinary constructed mixed-use buildings.

There are eight nursing home and assisted living facilities in the city:

- The Ohio Eastern Star Home is a multi-building complex located at 1451 Gambier Road. It has an 86-bed skilled nursing facility, assisted living, and rehabilitation unit.
- The Country Court Skilled Nursing Center is a 92-bed skilled nursing facility located at 1076 Coshocton Avenue.
- The Mt. Vernon Health and Rehab Center is located at 1135 East Gambier Street. It has a 44-bed skilled nursing facility and rehabilitation unit in two buildings.
- The Country Club Rehabilitation Campus is located at 1350 Yauger Road. It has a 76-bed skilled nursing facility, assisted living facility, and rehabilitation and continuing care unit.
- Brookdale Mount Vernon is a 95-unit assisted living facility located at 1615 Yauger Road. It also has a memory care unit.
- Whispering Hills Care Center is a 44-bed skilled nursing and rehabilitation center located at 416 Wooster Road.
- The Living Center is a 41-bed assisted living center located at 201 North Main Street.

All of the facilities have automatic fire protection sprinkler and monitored alarm systems. There is an 81-bed nursing facility currently under construction. EMS demand is also higher in nursing, assisted living, rehabilitation, and retirement facilities.

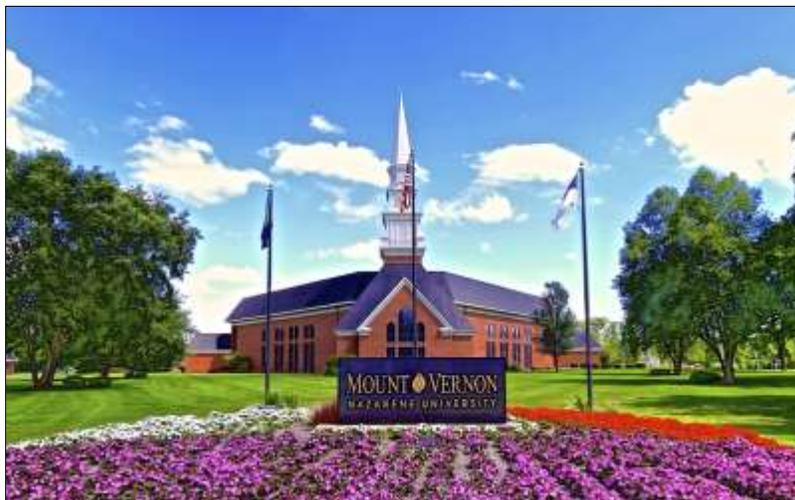
There are 17 apartment buildings of various sizes and arrangement in the city as shown in Figure 20. Many have multiple buildings and their configuration pose accessibility challenges for

responding fire apparatus. While many have smoke detectors, none is equipped with automatic fire protection sprinkler or standpipe systems.



Figure: 20 Mt. Vernon "multi-building" and "multi-floor" apartment buildings.

The Mt. Vernon Nazarene University is located in the southeastern part of the city along Martinsburg Road. This 346-acre campus features 15 classroom and residence buildings that serve an average enrollment of 1,600. The residence buildings have smoke detection and manual alarm systems, but no automatic fire protection sprinkler or standpipe systems.



The Mt. Vernon City School District (MVCSD) has six school facilities in Mt. Vernon: East Elementary, Pleasant Street Elementary, Dan Emmet Elementary, and the Mt. Vernon Middle and High Schools. Mt. Vernon St. Vincent de Paul School, a parochial K-8 school is also located in the city, along with the Knox County Career Center. Columbia Elementary School and Twin Oak Elementary School are part of the MVCSD system but their buildings are located in the MVFD's township service area. The Seventh Day Adventist School is also located in the

township service area. In addition, the Wiggin Street Elementary School in Gambier is part of the MVCSD. Although identified as significant risk properties, schools always pose a special challenge due to their size and number of occupants. There are 14 churches of various size located in the city and 21 churches in the township service areas.

Non-fire Risk Assessment Process

The city of Mt. Vernon is prone to and will continue to be exposed to certain environmental or natural hazards that may impact the community. These include extreme temperature (cold and hot), river flooding, thunderstorms (some severe), tornadoes, and winter storms. A detail of environmental risks includes:

- Because Mt. Vernon, like all other Midwestern cities, is exposed to eastern-moving fronts, it is prone to strong thunderstorms that produce heavy winds, rain, and lightning. Accompanying these storms is the potential for tornadic activity. The Ohio tornado season spans April through July, although a tornado can occur at any time if the conditions exist to produce these weather events.
- Flooding from heavy rain (urban flooding due to poor drainage), the melting of snow, and presence of rivers and creeks. Kokosing River with its many tributaries expose the city to these risks.
- Although not a high risk, Mt. Vernon is exposed to earthquakes and tremors. Ohio is on the periphery of the New Madrid Seismic Zone, an area in Missouri and adjacent states that was the site of the largest earthquake sequence to occur in historical times in the continental U.S. The largest risk is interruption to natural gas lines and the electric grid from earthquakes distant to the city.
- Severe winter storms that produce high winds, snow and drifting snow, ice, extreme low temperatures, as well as power outages and carbon monoxide emergencies.
- Extreme high temperatures causing dry brush, grass, and other vegetation which leads to outside brush fires.

EMERGENCY COMMUNICATIONS

The MVFD emergency communications are provided and supported by the Knox County 9-1-1 Communications Center. The communications center is located at 117 East High Street in Mt. Vernon. The communications center is governed by the Knox County Board of Commissioners.

Knox County 9-1-1 was formed in 1994 for the purpose of establishing a single common number to request emergency assistance for all residents of, and visitors to, Knox County. With the passage of a one-quarter percent sales tax to fund its operations, Knox County 9-1-1 assumed both the responsibility for and financial burden of handling all 9-1-1 calls for assistance. In addition, this organization assumed the responsibility for all law enforcement, fire, and EMS

dispatch and communications, including the oversight of the Law Enforcement Automated Data System (LEADS) for law enforcement agencies.

The Knox County 9-1-1 Center is the only Public Safety Answering Point (PSAP) in Knox County and is responsible for answering all 9-1-1 calls within the county. This includes wireless, wireline, voice over internet protocol, and text to 9-1-1. The Knox County 9-1-1 Center serves all or part of seven villages and 22 townships. Knox County 9-1-1 Center meets and adheres to the operating requirements in ORC 128 and the OAC §5507-Emergency Response.

The current hardware/software systems include Zuercher Computer Aided Dispatch (CAD), administrative call-taking system, and mapping integrated into an Automatic Number Identification (ANI)/ Automatic Location Identification (ALI) feed for real time 9-1-1 call locating, Telex radio consoles and National Academies of Emergency Dispatch/Priority Dispatch ProQA EMD software. Recording of 9-1-1/phone/radio transmissions are provided with Eventide logging systems at all sites. And the county subscribes to the Wireless Emergency Notification System (WENS), a public notification system for all residents, of which the 9-1-1 dispatchers are trained operators. The WENS system allows local government, especially the emergency services components of local government to communicate directly with its the citizens and visitors to provide timely information

Knox County's consolidated dispatch center designed with a vision of both redundancy and expansion. It is equipped with a 100-kilowatt (kW) generator and 30 kilo volt-amperes uninterruptable power supply (UPS). Backup heating and cooling for the dispatch floor and constant cooling for the data room ensuring that both the employees and their equipment can remain operational during almost any emergency. The 1,000 square foot dispatch floor, large data room and oversized backup power systems ensure a minimum future expansion to 10 positions.

Knox County 9-1-1 also maintains a backup communications center at the Knox County Sheriff's/EMA Office and by means of a mobile command vehicle ensuring that the service can continue operations even with a catastrophic loss to its primary location. Redundancy of the public safety radio communications systems is achieved with tower sites at Knox County 9-1-1 as well as the Knox County Sheriff's Department ensuring that the system remains a constant and reliable link for its public safety partners in all situations.

The geo-diverse 9-1-1 call taking system ensures that the communications center can continue to operate in any situation. 9-1-1 trunks and administrative phone lines are divided between the primary and backup facility and vehicle. In the event that the communications center loses the phone lines into one location it can access the lines from the other location without changing centers. Similarly, with two-independent, but connected, 9-1-1 servers the communications center is confident that a hardware failure or catastrophic loss of one site/server will not significantly interrupt its operations. In addition, this system makes Knox County 9-1-1 Next-

Generation capable of positioning it to receive 9-1-1 text messaging, video, picture, OnStar crash data when those services become available in the region.

MVFD operates on the Ohio Multiple Agency Radio Communication System (MARCS). MARCS is a state-operated 700/800 MHz radio and data network that utilizes state-of-the-art trunked technology to provide statewide inter-operability in digital clarity to its subscribers throughout Ohio and a 10-mile radius outside of Ohio. The MARCS system consists of approximately 300 towers located throughout Ohio and provides the infrastructure for connectivity to the MARCS communication system.

The department is equipped with mobile radios for all apparatus and vehicles, and portable radios for all riding positions plus all staff positions. The department currently uses a combination of Kenwood and Motorola mobile and portable radios. Department radios are serviced and maintained by Bender Communications of Columbus. Calls for service are transmitted over the radio frequency preceded by a station tone alert, displayed on computer-style monitors located in each station, and Active 911, an app with accompanying online portal that allows department personnel to receive alerts on their cellular phone from any CAD.

RESPONSE CONSIDERATIONS

In fire suppression as well as EMS, there are a number of recognized safety and response standards and guidelines that are considered when analyzing fire protection services. NFPA 1500, *Standard on Fire Department Occupational Safety and Health* is the safety standard for the fire service and deals with all aspects of fire department operational safety. Major components of the standard include personnel, apparatus, equipment, and incident management. The topics have general performance objectives, but the specific topic is generally more formally addressed in its own specific standard. Appendix B in NFPA 1500 contains a checklist that can be useful for departments to evaluate their overall safety and health program. While NFPA 1500 is non-binding, the OAC specifically addresses many similar aspects of firefighting and firefighting equipment.

In May 1996, OSHA established a national standard for fire ground staffing when engaged in structural firefighting. Although the directive is very detailed, it essentially states that before two properly trained and equipped firefighters can enter a structural fire there must be at least two or more properly trained and equipped firefighters ready to replace, rescue or assist the initial entry firefighters (29 CFR 1910.134 [g][4]). This standard is often referred to as the “2-in, 2-out” rule. This rule also is listed in §4123:1-2 OAC, which applies to firefighting operations in Ohio.

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Departments*, states that fire suppression companies should be staffed with four personnel, with one of them

being a supervisor.²² This staffing standard is based on fireground evolution studies and task analyses for a response to a 2,000 sq. ft. two-story single-family dwelling fire, commonly found in communities across America. NFPA 1710 is non-binding, but the staffing recommendation is considered an ideal or optimal staffing goal for communities. However, few communities across Ohio are able to achieve this staffing goal due to financial limitations.

NFPA 1561, *Standard on Emergency Service Incident Management System* also has some relevance. It states that an effective span of control shall be determined by the ability of each supervisory position to monitor the activities of assigned subordinates.²³ Span of control is a term to describe the number of workers that a supervisor can effectively manage. The range of span of control is considered to be three to seven, with an optimum of five. However, span of control is determined by the degree of complexity or danger of the task or activity. For example, a serious auto accident involving a difficult extrication procedure may require a span of control of three, while an officer may be able to effectively manage 10 water tenders (tankers) operating in a water shuttle at a rural fire.

Another critical factor in meeting service expectations is assuring that response crews are capable of performing the required tasks on arrival. The dispatching of a specific response with a minimum crew assignment is a concept that is widely supported by fire service literature and industry best practices. The NFPA’s *Fire Protection Handbook* provides recommendations for a minimum response to various structures. Table 11 outlines those recommendations.

<p><u>High-hazard occupancies</u> Schools, hospitals, nursing homes, explosives plants, refineries, high-rise buildings, and other high life hazard or large fire potential occupancies.</p>	<p>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 combustibles involved, not fewer than 24 fire fighters and 2 chief officers. One or more safety officers and a rapid intervention team(s) are also necessary.</p>
<p><u>Medium-hazard occupancies</u> Apartments, offices, mercantile and industrial occupancies not normally requiring extensive rescue or fire-fighting forces.</p>	<p>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 fewer than 15 fire fighters and 1 chief officer, plus a safety officer and a rapid intervention team.</p>

²² National Fire Protection Association. (2020). *Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. (NFPA 1710). Quincy, MA: Author.

²³ National Fire Protection Association. (2020). *Standard on Emergency Service Incident Management System*. (NFPA 1561). Quincy, MA: Author.

<p><u>Low-hazard occupancies</u></p> <p>One-, two-, or three-family dwellings and scattered small businesses and industrial occupancies.</p>	<p>At 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 fewer than 14 fire fighters and 1 chief officer, plus a safety officer and a rapid intervention team.</p>
<p><u>Rural operations</u></p> <p>Scattered dwellings, small businesses, and farm buildings.</p>	<p>At least 1 pumper with a large water tank (500 gal or more), one mobile water supply apparatus (1,000 gal or larger), and such other specialized apparatus as may be necessary to perform effective initial fire-fighting operations; at least 12 fire fighters and 1 chief officer, plus a safety officer and a rapid intervention team.</p>
<p><u>Additional alarms</u></p>	<p>At least the equivalent of that required for rural operations for second alarms. This may involve the immediate use of mutual-aid companies until local forces can be supplemented with additional off-duty personnel.</p>

Table 11: NFPA minimum response recommendations.

MVFD has developed response guidelines, which identifies the apparatus response for basic run types. The response resource guidelines outlined in the department’s operating procedures are listed below.

Motor Vehicle Accident

- Medic
- Engine with rescue equipment

Fire Alarms

Fire alarms are classified as either a fire alarm or smoke alarm activation, or the report of a fire or working fire. The response is further classified as either a residential or a commercial fire alarm.

Fire or Smoke Alarm

Residential

- Command vehicle
- Two engines or one engine and one aerial ladder

Commercial

- Command vehicle
- Two engines or one engine and one aerial ladder

Report of a fire or “working” fire

Residential

- Five engines or four engines and one aerial ladder (three engines from mutual-aid departments); response to be determined by officer-in-charge
- Two medics (one medic from a mutual-aid department)
- Water tanker from mutual-aid department will respond to areas without fire hydrants
- Command Vehicle

Commercial

- Five engines or four engines and one aerial ladder (three engines from mutual-aid departments); response to be determined by officer-in-charge
- Two medics (one medic from a mutual-aid department)
- Command vehicle
- Water tanker from mutual-aid department will respond to areas without fire hydrants

The number of personnel responding in a specific apparatus may vary depending on the number of personnel on duty. There are 17 personnel assigned to each shift (14 full-time and three part-time) with a nine-person minimum. Of the 17, 14 are assigned to Station 491 consisting one captain – shift commander, one lieutenant, and 12 firefighters. Station 492 in Gambier is staffed with one lieutenant and two firefighters.

The department has established response sectors for mutual-aid. This is referred to as a mutual-aid box alarm system (MABAS). These predetermined responses are based on geographic location and allows assistance to be received more quickly. The city has four response zones, which extend into the adjacent township service areas. However, Liberty Twp. has two response zones, north and south of New Delaware Road. MVFD is part of the Knox County mutual-aid agreement.

Using the MABAS framework, the department has established automatic mutual-aid response (AMR) procedures for structure fire responses in the city and township areas. This was previously identified with the response guidelines on page 67 of this section. As noted, township responses include a water tanker from a mutual-aid department to provide additional water in non-fire hydrant areas. Getting additional equipment and personnel on the incident scene more quickly helps the department achieve operational benchmarks in a more timely and effective manner, and results in a more positive outcome for the recipients of the department’s emergency services.

The department has a very detailed operating procedure that identifies specific tasks and tools for each riding position on the apparatus. These are commonly referred to as riding assignments.

THE SCIENCE OF FIRE AND NEED FOR RAPID RESPONSE TO AFFECT POSITIVE CHANGE

Because there is such a wide variation in the fire dynamics of each particular fire, it is imperative to find a common reference point, something that is common to all fires regardless of the risk-level of the structure, the material involved, or length of time the fire has burned. Such a reference point exists. Regardless of the speed of growth or length of burn time, all fires go through the same stages of growth. One stage in particular emerges as a very significant one because it marks a critical change in conditions; it is called *flashover*.

The flashover stage of a fire event marks a major turning point in fire conditions that increases the challenge to a fire department's resources. How and why this occurs is explained in the following descriptions of each stage of fire growth in a structural fire.

Incipient Stage

The smoldering stage is the first stage of any fire. When heat is applied to a combustible material, the heat oxidizes the material's surface into combustible gases. The oxidation process is exothermic, meaning that the oxidation process itself produces heat. The heat from the oxidation raises the temperature of other materials, which increases the rate of oxidation and begins a chemical chain reaction of heat-release and burning.

A fire progresses from the smoldering phase immediately or slowly depending upon the fuel, nearby combustibles, and the surrounding air. For example, a bundle or stack of newspapers will smolder only a few seconds before progressing to the next stage, but a couch with a burning cigarette may continue smoldering for an hour or more.

Growth Stage

When the temperature gets high enough visible flames can be seen. This is called the growth stage or open burning. The visible burning at this stage is still limited to the immediate area of origin. The combustion process continues to release more heat, which heats nearby objects to their ignition temperature and they begin burning.

Flashover/Fully Developed Stage

Not all of the combustible gases are consumed in the growth stage. They rise and form a superheated gas layer on the ceiling that can quickly reach 1,500°F (Fahrenheit). As the volume of this gas layer increases, it begins to bank down to the floor, heating all combustibles regardless of their proximity to the burning object. The gas layer is mostly carbon monoxide so the absence of oxygen prevents the heated objects from bursting into flame.

Oxygen gets introduced into the space in two ways. There is often enough available oxygen near floor level to start the open burning process when the gas layer reaches that level. Or, the high

heat breaks a window and the incoming oxygen allows the burning to begin. It should be noted that the room becomes untenable long before flashover. Even though open flaming may not be present until everything reaches 500°F and oxygen is introduced, the room becomes untenable for human survival at 212°F.

When flashover occurs, everything in the room ignites into open flame at once. This instantaneous eruption into flame generates a tremendous amount of heat, smoke, and pressure with enough force to push beyond the room of origin through doors and windows. The combustion process then speeds up because it has an even greater amount of heat to move to unburned objects.

Flashover is a critical stage of fire growth for two reasons. First, no living thing in the room of origin will survive, so the chance of saving lives drops dramatically. Second, flashover creates a quantum jump in the rate of combustion and a significantly greater amount of water is needed to reduce the burning material below its ignition temperature. A fire that has reached flashover means that it is too late to save anyone in the room of origin, and a significant increase in staffing is required to handle the larger hose streams necessary to extinguish the fire. A post-flashover fire burns hotter and moves faster, compounding the search and rescue problems in the remainder of the structure at the same time that more firefighters are needed for fire attack. See the information in Table 12.

PRE-FLASHEROVER	POST-FLASHOVER
Fire limited to room or area of origin. Requires small attack lines.	Fire spreads beyond room or origin. Requires more or larger attack lines.
Search and rescue efforts easier.	Compounds search and rescue efforts.
Requires fewer resources and can be handled by initial effective response force.	Requires additional resources (fire companies).

Table 12: Pre-flashover and post-flashover firefighting comparison.

It has long been known that the real killer in a structural fire is smoke, not the flame or heat. Smoke contains many toxic gases released as by-products of the combustion process. Carbon monoxide is one of these gases and the most prevalent. Test fires in residential structures have demonstrated the production of carbon monoxide in measurable amounts after 3½ minutes from the ignition of the fire.

The primary objective of fire operations is to provide enough firefighters and equipment in a strategic location so that an effective response force can respond to and reach fire scenes to mitigate the problem before flashover occurs. The “time-temperature curve” standard is based on data from NFPA and ISO that establishes that a typical point source of ignition in a residential house will flashover at some time between five and 30 minutes after ignition, turning a typical room and contents fire into a structural fire of some magnitude. The time-temperature curve

illustrated in Figure 21 comes from research efforts of the NFPA on smoke alarms and other detection equipment (2004). The illustration demonstrates the relationship between time and how a fire grows.

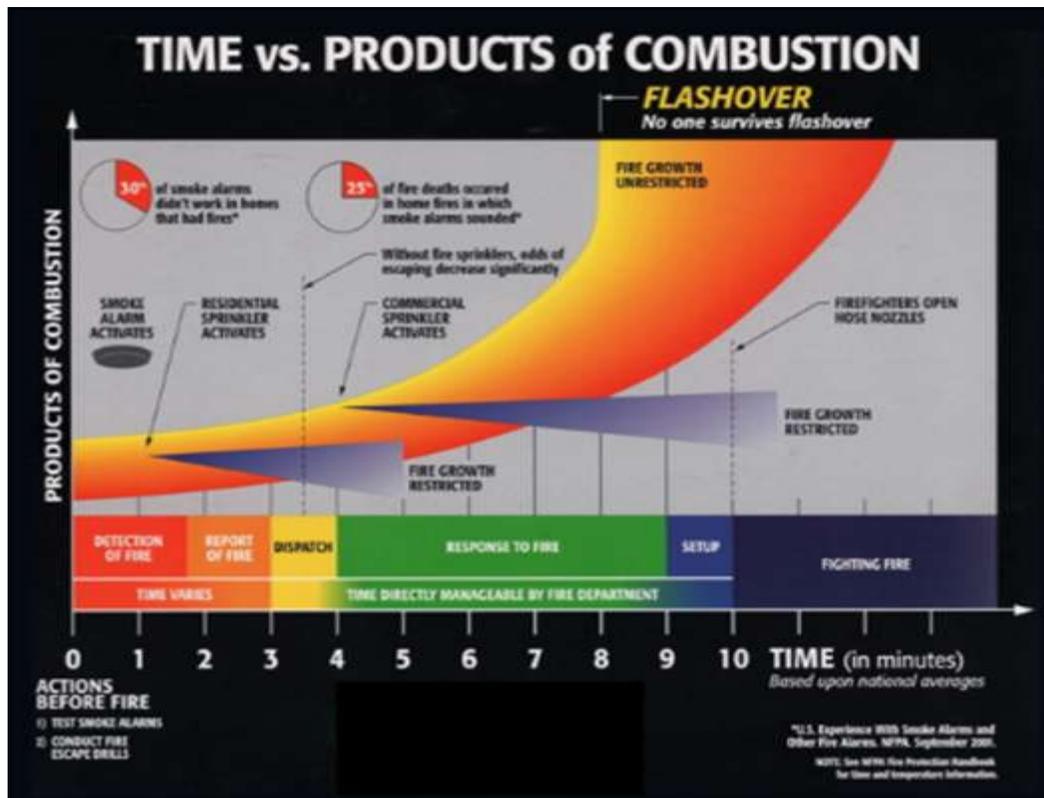


Figure 21: Time vs Products of Combustion.

Time requirements for EMS calls are comparable to fire incidents. The purpose of a quick response, especially in the most critical situation (cardiac arrest), is that the brain, deprived of oxygen and circulation begins to die within four to six minutes. Brain damage is normally irreversible after 10 minutes. Interventions include early CPR and electrical defibrillation. Previous studies show the time to deliver a shock (called defibrillation) to the patient in cardiac arrest to be three to six minutes. Current guidelines from the American Heart Association (AHA) plus additional guidelines from the American College of Emergency Physicians and the National Highway Traffic Safety Administration suggests a response time interval of not more than five minutes from alarm notification to scene arrival for responders capable of performing CPR and utilizing an automatic external defibrillator (AED).

An AED is a portable device that the first responder or trained civilian can use on a patient who is pulseless and not breathing. When the device is connected to the patient, it analyzes the patient's heart rhythm and automatically delivers electric shocks to the patient if needed. Furthermore, guidelines provide for no more than a 10-minute response interval for providers

capable of performing ALS level interventions, if that level of service is available. The importance of time of intervention in a cardiac arrest event is illustrated in Figure 22, which comes from the Arizona Heart Rhythm Center.

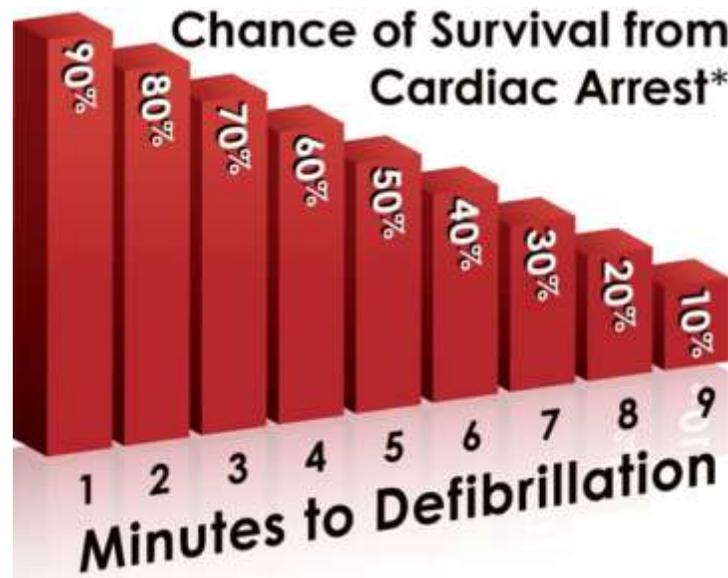


Figure 22: Chance of survival from sudden cardiac arrest.

STRUCTURAL FIREFIGHTING OPERATIONS

Understanding the structural fire dynamic is the key in any discussion of fireground evolutions or actions. Variables of fire growth dynamics and property and life risk combine to determine the fireground task that must be accomplished to mitigate loss. These tasks are interrelated, but can be separated into two basic types: fire flow and life safety. Fire flow tasks are those related to getting water on the fire. Life safety tasks are those related to finding trapped victims and safely removing them from the building.

Fire flow tasks can be accomplished with handheld hoses or master streams (i.e., nozzles usually attached to the engine or aerial ladder). Master streams take relatively fewer firefighters to operate because they are most often fixed to the apparatus or an appliance anchored to the ground.

The decision to use hand lines or master streams depends upon the stage of the fire and the threat to life safety. If the fire is in a pre-flashover stage, firefighters can make an offensive fire attack into the building by using smaller, more mobile handheld hose lines to attack the fire and shield trapped victims until they can be removed from the building. If the fire is in its post-flashover stage and has extended beyond the capacity or mobility of handheld hoses, or if structural damage is a threat to firefighters' safety, the structure is declared lost and master streams are deployed to extinguish the fire and keep it from advancing to surrounding exposures (i.e., other buildings or objects in close proximity). Initial arriving firefighters may use a transitional

“defensive to offensive” strategy to limit or remove an immediate danger to life or health (IDLH) threat while awaiting the arrival of additional resources. IDLH is a National Institute for Occupational Safety and Health (NIOSH) term used to describe an environment or atmosphere that because of contaminants, heat, or oxygen deficiency can cause death or serious injury to a worker if they are exposed to those conditions for even a short period without the proper level of protective equipment.

Life safety tasks are based upon the number of occupants, their location, their status (e.g. awake vs. sleeping), and their ability to take self-preserving action. For example, ambulatory adults need less assistance than non-ambulatory adults require; the elderly and small children always require more assistance. The key to a fire department’s success at a fire is adequate staffing and coordinated teamwork, regardless of whether the fireground tasks are all fire flow related or a combination of fire flow and life safety.

Before on-scene procedures can be established, the initial incident commander (IC) must select an appropriate initial strategy; offensive or defensive. An offensive strategy is an aggressive interior fire attack and is used whenever possible. The top priority is rescue of trapped victims. The department’s goals are to eliminate any or all fire-related deaths or injuries and contain fires to their room of origin. The first objective is to put a hose line between the victims and the fire and to rescue those victims by removing them from proximity to the hazard. The second objective is to contain the fire to the room or area of origin.

A defensive strategy is one that does not allow interior fire attack except as needed to rescue trapped firefighters. When opting for a defensive attack all victims are considered to have already expired because there are no tenable spaces. No attempts are made to retrieve bodies because fire and structural conditions do not warrant the risk to firefighters.

CRITICAL TASK CAPABILITIES

In order to effect positive change, agency personnel must be properly assigned, resources must be properly placed and equipped, and each individual must be assigned a critical task to complete. Consequently, those individuals must arrive within a timeframe which allows them a chance to use their skills to stop the loss or convert a potentially fatal medical condition. The following section will establish critical task assignments for fire and EMS responses and duties.

Structural Firefighting Critical Tasking

Single-family and two-family dwelling fires have been identified by the NFPA as the most frequent type of fire incident facing fire departments across the country. These types of buildings are where the majority of civilian fire fatalities and injuries occur. In 2021, 75% of the 3,800 lives lost and 76% of the 12,600 injuries occurred in a residential setting, including one- and

two-family dwellings and apartment units.²⁴ It is worth noting that a response to a structure fire in a residential setting is used by the NFPA as the basis for developing task and performance objectives in relative codes and standards.

Since the single-family and two-family dwelling fire is the most prevalent and most at risk for serious injury or death to the occupant, critical tasks are outlined for this type of response. These tasks must be completed in a timely manner by firefighters in order to control the fire prior to flashover or to extinguish the fire in an effective manner. The fire department is responsible for assuring that responding companies are capable of performing all of the described tasks in a prompt and proficient manner.

Attack hose line: a minimum of two firefighters are required to advance a 1¾-inch (in.) hose line that produces a fire stream of 150 to 200 gallons-per-minute (GPM) or a 2½-in. hose line that produces up to 250 GPM. Each engine carries a set of attack lines that are either pre-connected to the apparatus, folded in the hose bed, or in a special pack for carrying into high-rise buildings. The selection of which attack line to use depends on the type of structure, the distance to the seat of the fire and the size of the fire. The pre-connected lines are the fastest to use but are generally limited to fires within 200 to 250 feet (ft.) of the engine. When attack lines are needed beyond 250 ft., the line must be physically extended to a longer length. A 2½-in. attack line may be used when the fire is already beyond the flashover stage and threatens an unburned portion of a structure.

Search and Rescue: a minimum of two firefighters are assigned to search for living victims and remove them from danger while the attack crew moves between the victims and the fire to stop the fire from advancing. A two-person crew is normally sufficient for most moderate risk structures, but more crews are required in multi-story buildings or structures with people who are not capable of self-preservation (i.e. nursing homes and hospitals).

Ventilation Crew: a minimum of two firefighters may be required to open a horizontal or vertical ventilation channel when the attack crew is ready to enter the building. Vertical ventilation or ventilation of a multi-story building can require more than two firefighters. Ventilation removes superheated gases and obscuring smoke, preventing flashover, and allowing attack crews to see and work closer to the seat of the fire. It also gives the fire an exit route so that the attack crew can “guide” the fire out the opening they choose and keep it away from endangered people or unburned property.

Ventilation must be closely timed or coordinated with the fire attack. If it is performed too soon, the fire will get additional oxygen and grow. If performed too late, the attack crew cannot control the fire in the direction they want. Instead, the gases and smoke will be forced back toward the

²⁴ NFPA- Fire Loss in U.S. 2021

firefighters and their entry point, which endangers them, any victims they are protecting, and unburned property. The latest technical information is from Underwriter's Laboratories and other technical sources. That information recommends and outlines the actions necessary to control "flow-paths" within a structure during firefighting operations, especially as it relates to ventilation.

Backup hose line: a minimum of two firefighters are required to advance a 1¾-in. line that is taken in behind the attack crew to cover the attack crew in case the fire overwhelms them or a problem develops with the attack line. This backup team could also be assigned to temporarily assist the search and rescue team if needed. If 2½-in. lines are used, it doubles the staffing requirement.

Rapid Intervention Team (RIT): a minimum of two firefighters equipped with SCBA and select tools must be available near the entry point to enter the structure, perform search and rescue, or backup a suppression crew if something goes wrong. The RIT is an outcome of the "two-in and two-out" rule. This particular requirement is an OSHA rule that requires two firefighters to be suited up and ready to rescue firefighters who are assigned to interior firefighting operations and are in an IDLH environment should one of those firefighters become disabled (see pages 72-73).

Exposure hose line: a minimum 1¾-in. attack line may be taken above the fire in multi-story buildings to prevent fire extension, or used externally to protect nearby structures or objects from igniting from the radiant heat. In situations where the heat release is great such as a flammable or combustible liquid fire, a 2½-in. hand line or portable deluge monitor (deluge gun) could be used. If 2½-in. hand lines are used, it doubles the staffing requirement.

Pump operator: one firefighter must be assigned to operate the fire apparatus to establish and maintain the correct pump discharge pressures to the attack, backup, and exposure lines, monitor the pressure changes caused by changing flows on each line, and ensure that water hammer does not endanger any of the hose line crews. This firefighter also completes the hose connections to the correct discharges and completes the water supply connection to the correct intake. The pump operator can sometimes make the hydrant hookup alone if the pumping engine is near a hydrant, but the hydrant spacing for moderate risk fires normally precludes this.

Water supply: either the first-due or second-due engine must establish a reliable water supply by connecting a larger diameter (4 in. or 5 in. fire hose) "supply line" from a fire hydrant to the pumping engine. Once the connection is made, the fire hydrant is then turned on, allowing water to flow from the water distribution system into the intake side of the pump on the engine. Timing is a critical factor in establishing a continuous water supply for the fire. The flow of water on the fire can only be sustained based on the quantity of water carried by the apparatus until a water supply is established. Three of the department's front-line engines (Engines 491, 493, and 494) carry 1,000 gallons of water. Engine 492 carries 750 gallons of water and Ladder 491 carries 300 gallons of water. Using a scenario of an attack crew using one 1¾-in. hose line flowing 150

GPM, the engines carrying 1,000 gallons of water would have a little over six minutes of water for the attack crew; Engine 492 would have about five minutes of water for the attack crew; and Ladder 491 would have approximately two minutes of water for the attack crew.

Responding to an area without hydrants, a tanker task force can be requested by the IC, bringing tankers (sometimes called tenders) from neighboring mutual-aid departments to supplement the quantity of water carried on the MVFD's engines. For sustained incidents or those requiring a large volume of water, a water shuttle with tankers is used to establish a reliable water supply. This involves two or more tankers unloading water into portable reservoirs called "drop tanks." This initially would take several firefighters to set up the drop tanks and assist the pump operator in placing the necessary hoses and connections.

Patient/Victim Care and Firefighter Rehabilitation: two firefighter/EMTs (or paramedics) must be assigned to treat any victims of the fire who may be exposed to smoke or fire or who may become injured escaping the fire environment. This assignment is also responsible for treatment of firefighters who suffer injuries during fire attack. Once this task is completed the assignment shifts to monitoring the conditions of firefighters during rehabilitation periods which includes monitoring of vital signs, body cooling, and fluid replacement.

Safety Officer: one firefighter or officer is assigned to continuously monitor the scene for situations that could injure or kill firefighters. The safety officer monitors and evaluates changing fire conditions. The structural integrity of the building including roof, floor, and wall assemblies, are some of the areas evaluated. The safety officer works in concert with the IC to maintain a safety plan during the incident.

Incident Command: one officer is assigned to remain outside the structure to manage the overall incident by coordinating the attack, maintaining a constant evaluation of the scene, and making changes as necessary, planning for additional resources, and monitoring conditions that can jeopardize crew safety.

In managing many of the typical residential fires, departments are able to assign multiple tasks to some of the responding personnel. For example, after establishing a water supply, which is typically connecting a large diameter hose line from a hydrant to the on-scene pumping engine, personnel completing that task (two or three personnel on the second engine) can be given another task, such as utility control, search and rescue, or assistance with tasks such as ventilation. However, additional personnel also are needed to rotate, rehabilitate, and rest crews during active fireground operations, especially in extreme weather conditions. The number of personnel identified in the critical tasking in Table 13 provides a practical and common-sense approach to structural firefighting.

TASKS	PERSONNEL
Attack Hose Line	2
Backup Hose Line	2
Water Supply and Support	2
Search and Rescue	2
RIT Team	2
Ventilation and Utility Control	2
Victim Care and Rehabilitation	2
Pump Operator	1
Safety Officer - Aid to IC	1
Command	1
TOTAL:	17

Table 13: Structural firefighting critical tasks assignments.

When responding to a report of residential structure fire, MVFD can respond with as many as 16 personnel, assuming that all of the companies are not already committed on calls and are available. The potential exists for a reduced structural fire response if some of the department's companies are committed, especially medic units. If the department encounters this scenario and responds short-handed, it makes it difficult to accomplish multiple tasks simultaneously, which is a key to an effective fire suppression effort. It also makes successful rescue operations for any victims trapped very dangerous with minimal chance of success. It also increases the injury risk to personnel.

Response to incidents in large commercial or industrial complexes requires significantly more personnel as noted in Table 11 on pages 66 and 67. All MVFD and mutual-aid companies are needed to have sufficient numbers of personnel to meet the demands of the incident. However, mutual-aid companies will arrive later into the incident.

Emergency Medical Critical Tasking

Critical tasking analysis of EMS response is dependent on the type of call encountered. The standard response for the majority of EMS calls is one medic unit. One medic unit describes an ambulance that is equipped to provide ALS services and staffed with a minimum of two personnel with at least one of them being a paramedic. The tasking involved with emergency medical responses includes diagnosis and treatment of the patient, patient information collection, and patient transport to a medical facility. However, it should be noted that many ALS level calls require three or more personnel to manage the patient properly. Examples include cardiac arrest, gunshot or knife wound victims, falls greater than 10 ft., severe trauma, and some overdose patients.

The department’s standard response for a motor vehicle accident (MVA) with injury and entrapment is an engine-rescue (Engine 491 or 492) depending on location) with three personnel, a medic unit with two personnel and the captain. The purpose of the engine-rescue company is to provide trained personnel and specialized rescue tools such as the “Jaws of Life” or high-pressure air bags, cribbing, etc., which are used to stabilize, extricate, and remove entrapped victims. The engine company personnel also must address any fire or hazardous situation found at the scene or additional resources respond to the incident. The minimum critical tasking for an MVA with injured victims is described in Table 14. MVFD’s standard response is six personnel.

TASKS	PERSONNEL
Incident Command / Safety	1
Patient Care and Transport	2
Extrication	2
Hazard Suppression	2
TOTAL:	7

Table 14: MVA critical tasks assignments

Understanding critical tasking is important because it describes in a basic way why certain numbers of personnel are required for certain types of responses. It goes beyond standards and recommendations.

Recommendation #18: The assessment team recommends that the MVFD train and certify all captains and lieutenants as incident safety officers. Considering the dynamics involved in today’s emergency incident operations, it is easy to understand how it can become overwhelming and even compromised. Firefighters and emergency medical personnel are exposed to the most hazardous of situations and greatest risk activities during emergency scene operations. Regardless of the operation, to ensure that firefighters do not become victims, the health and safety officer must engage in the operations to recognize the hazards, address them in a proactive manner. This training can be attained through the Ohio Fire Academy, National Fire Academy, or Fire Department Safety Officers Association. The curriculum provides the fire officer the knowledge and skills compliant with NFPA 1521, *Standard for Fire Department Safety Officer Professional Qualifications* and addresses the skills necessary to monitor and act in maintaining the safety of fire, EMS, technical rescue, and hazardous materials scenes.

RESPONSE PERFORMANCE

Response goals are a local decision and are based on a variety of factors. Some of those factors include demographics and size of the response area, risk, demand volume, and public expectation. A number of efforts have been made to develop a consensus standard for response

time, unit staffing and deployment of resources. While there is no one consensus standard, there are several standards that provide guidance.

ISO provides some guidelines, but those are singularly focused on travel distance. There are two national publications that address response performance. One publication is NFPA 1710 (described on page 65) addresses functions and objectives of career fire department emergency service delivery, response capabilities, and resources.

Fire departments are classified as career departments, combination departments (a combination of career and “on-station” part-time paid or volunteer personnel), or volunteer departments. The response criteria in NFPA 1710 applies to career departments and combination departments staffed with part-time personnel. Absent established department or township response goals, the response performance objectives outlined in NFPA 1710 will be used to analyze MVFD’s current response performance.

Based on NFPA 1710 criteria, MVFD should meet the following response time objective: for 90% of all fire incidents, the first-due unit shall arrive within 7 minutes, 06 seconds total response time. This response objective includes 106 seconds (1:46) for call processing, 80 seconds (1:20) for turnout, and 240 seconds (4:00) for travel time. This response objective begins when the 9-1-1 call is received at the communications center.

Response criteria can also be found in the *Standards of Cover*, published by the Commission on Fire Accreditation International (CFAI), which is part of the Center for Public Safety Excellence. CFAI criterion refers to the NFPA 1710 standard for communities that have personnel on-station, regardless if the personnel are full-time or part-time, or the community is suburban or urban in nature.

The published response criteria are based on national fire behavior research and data collected on past EMS response in relationship to patient outcomes. This information and research were further discussed on pages 69-72 in the Science of Fire and the Need for Rapid Response to Affect Positive Change section of this report.

It is important to note however, that communities should establish their own response objectives that meet the expectations of its residents. The fire department’s response performance is detailed in the following section of the report.

Total Response Time Measurement

The concept of a response time continuum (sometimes referred to as cascade of events) has evolved from the standards set by NFPA and CFAI. Each component of the fire response time continuum was reviewed. This cascade of events is displayed in Figure 23.

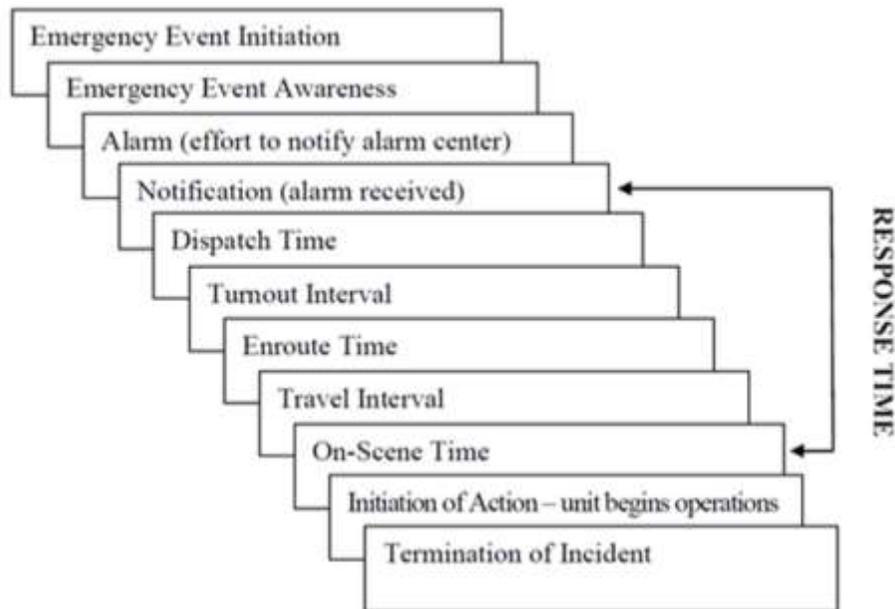


Figure 23: Cascade of events.

Call Processing Time

Call processing time is a component of the Knox County 9-1-1 communication system. The CAD system provides displays and tools that enable the dispatcher to handle calls for service as efficiently as possible.

Determining an acceptable amount of time to process an emergency call can be difficult because communication center systems vary from jurisdiction to jurisdiction. NFPA 1221, *Standard on Emergency Services Communications Systems* establishes various benchmarks for call handling depending on the system, type of call and level of caller assistance provided. For example, Knox County 9-1-1 dispatchers are trained in Emergency Medical Dispatch (EMD), which is an enhanced service to the public. EMD is where a properly trained dispatcher can provide medical assistance instructions to a 9-1-1 caller who is requesting emergency help. Examples would be bleeding control, emergency breathing and CPR instructions. With this enhanced level of service, EMS call processing and dispatching shall be completed within 120 seconds (2:00 minutes) 99% of the time. For fire calls, emergency call processing and dispatching shall be completed within 106 seconds (1:46) for at least 95% of the alarms. This call processing criteria is adopted by CFAI and included in the criteria listed in NFPA 1710. The total call handling time is measured from the time the 9-1-1 call is received to the time the emergency response agency is “toned out” for the call.

Turnout Time

Turnout time is measured from the time personnel are “toned out” or notified for an emergency response to the time the first unit marks “enroute” to the call. Turnout time is a measurement used for personnel who are typically “in-station”. The turnout time benchmark is 60 seconds (1:00) for EMS calls and 80 seconds (1:20) for fire responses.

Travel Time

Travel time is the time it takes for dispatched response units to arrive on scene at the emergency. Travel time is generally considered to encompass the distance and time traveled from the fire station housing the apparatus until it arrives on scene at the location of the emergency. However, several factors can affect travel time. Winter weather conditions as well as localized flooding can affect travel time during certain times of the year. Traffic patterns on heavily traveled roadways, especially during peak travel hours can affect the emergency response. To help reduce potential travel time delays, preemptive traffic signals have been installed at high-volume interchanges in the city. These signals interrupt normal traffic signal timing to provide a green light for approaching emergency vehicles.

Another problem that can increase travel time and ultimately responder response time is receiving multiple calls for services. When simultaneous emergencies occur and adequate resources are not available to respond, a condition occurs that is referred to as “call stacking.” When this occurs, units may need to respond from adjoining districts in an effort to provide the quickest and most reliable response to the incident. For example, if the Station 492 medic unit was committed to an emergency and a request for another ambulance occurs in Station 492’s response district, then the medic unit from Station 491 may become the primary response unit. Clearly, this would lengthen the travel time of the response unit because of the unavailability of the first response units in the district. The travel time benchmark is four minutes.

Total Response Time

Total reflex or response time is that time which totally encompasses the response event, from the time the call for service is initially received through the time dispatched units arrive on location. If the call handling time previously identified is taken into consideration, the total response time for fire emergencies is seven minutes, six seconds (7:06) for 90% of the incidents.

EMS Response Time

Time requirements for EMS calls are comparable to fire incidents and are based on research conducted on pre-hospital delivery of medical care and patient outcome and survivability. The purpose of a quick response, especially in the most critical situation (cardiac arrest) is that the brain, deprived of oxygen and circulation, begins to die within four to six minutes. Interventions include early CPR and electrical defibrillation.

For medical emergencies a prompt response is needed to relieve suffering and save lives, but few calls for service are true life or death emergencies. Again, a reasonable service goal is to be on scene soon enough to: 1) assess patients and prioritize to prevent death and disability; 2) intervene successfully in life-threatening emergencies; 3) stabilize patients to prevent additional suffering. The travel time benchmark is four minutes and the total response time is seven minutes, zero seconds (7:00) for 90% of the incidents.

Data Analysis

For response planning purposes, the fire department has divided the city into four response districts or response zones, and each contracted village, townships, and the MVDC into separate response districts or response zones. Data generated during the reporting period of September 15, 2021 through June 30, 2022, Table 15 shows the number of incidents and percentages indicating the calls for service in each MVFD district.

DISTRICT	NUMBER OF INCIDENTS		TOTAL INCIDENTS	PERCENTAGE OF TOTAL INCIDENTS
	FIRE	EMS		
Mt. Vernon – District 1	92	295	387	9.3%
Mt. Vernon – District 2	182	528	710	17.1%
Mt. Vernon – District 3	209	1,398	1,607	38.8%
Mt. Vernon – District 4	107	385	492	11.9%
Village of Gambier	4	24	28	0.7%
Clinton Twp.	99	271	370	8.9%
College Twp.	14	30	44	1.1%
College Twp. – Kenyon College	38	66	104	2.5%
Liberty Twp.	30	89	119	2.9%
Morris Twp.	29	128	157	3.8%
Pleasant Twp.	14	82	96	2.3%
MVDC	3	24	27	0.7%
TOTALS:	821	3,320	4,141	100.0%

Table 15: Number of incidents and percentages by MVFD district.

Response districts allow the department to predetermine response assignments and to track and manage response data. The department’s response districts are displayed in Figure 24.

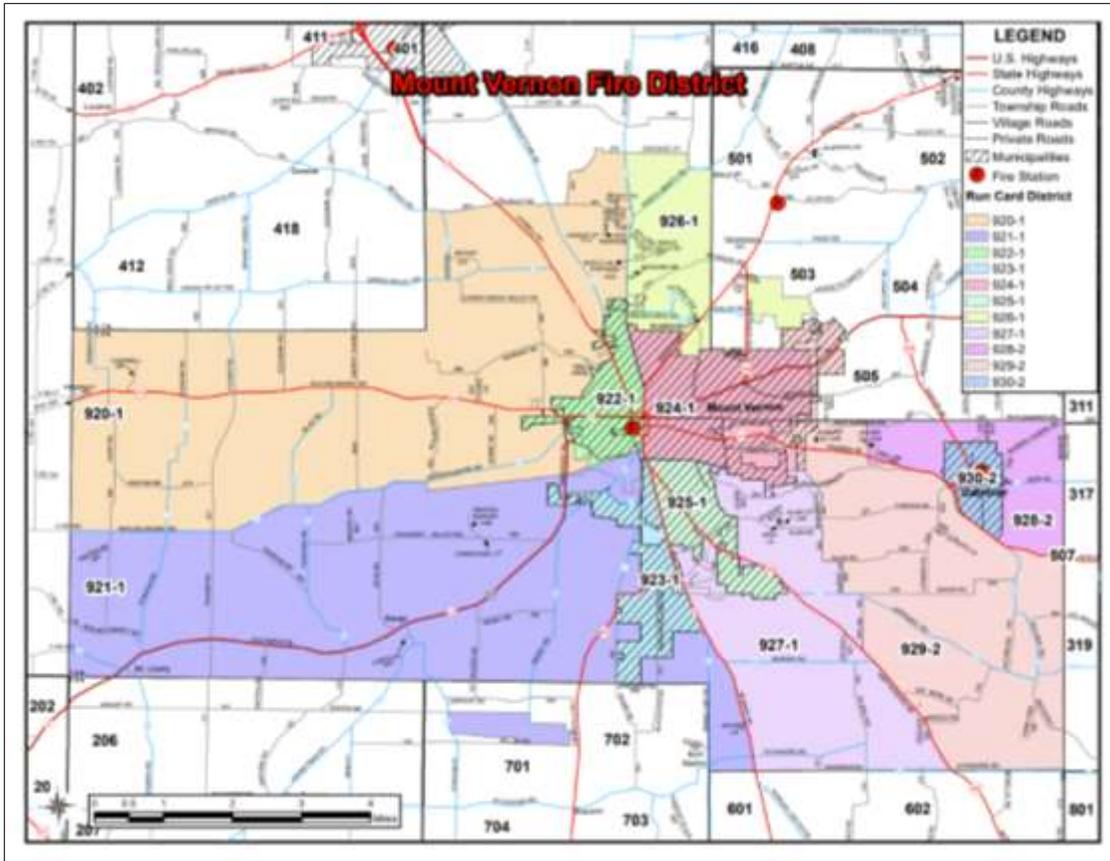


Figure 24: MVFD's response districts.

Data generated during the aforementioned reporting period was analyzed to determine actual response performance. False alarm responses where the responding units were canceled before arrival and mutual-aid responses were also excluded from the data set. In addition, the following response time elements in Table 16 were considered outliers and not included in the analysis.

CALL HANDLING	TURNOUT	TRAVEL	TOTAL RESPONSE
> 5 minutes	> 5 minutes	> 20 minutes	> 25 minutes

Table 16: Response data analysis parameters.

It is common for many organizations to use average response times in determining response performance. However, the use of averages and median measurements does not provide a true indication of performance. One or two “outliers” may adversely affect the response analysis, leading management, and citizens to an inaccurate and at times, unfair service expectation.

It is understood that no agency can meet a stated performance 100% of the time. Many factors can influence an agency's response including multiple calls, apparatus deployment, training assignments, traffic patterns, weather, human performance, and travel distance. NFPA and CFAI

have recognized the use of percentiles as the most accurate method to analyze and evaluate response performance.

The data in Tables 17 and 18 display the department’s overall response performance for fire and EMS responses within the city. The percentage column identifies the frequency the department meets the target-time benchmark. The 90th percentile column identifies the department’s actual segment or response time for 90% of the responses. For fire responses, the target-time benchmark is 95% for call handling and 90% for turnout time, travel time, and overall or total response time. Meeting the target-time benchmark for at least 70% of the responses is often considered the baseline or threshold measurement.

ELEMENT	TARGET TIME (MINUTES)	PERCENTAGE	90 th PERCENTILE	95 th PERCENTILE
Call processing time	1:46	81%		0:03:06
Turnout time	1:20	9%	0:03:38	
Travel time	4:00	62%	0:06:39	
Total response time	7:06	49%	0:10:54	

Table 17: Fire incident response performance.

For EMS responses, the target-time benchmark is 99% for call handling and 90% for turnout time, travel time, and overall response time. Meeting the target-time benchmark for at least 70% of the responses is often considered the baseline or threshold measurement.

ELEMENT	TARGET TIME (MINUTES)	PERCENTAGE	90 th PERCENTILE	99 th PERCENTILE
Call processing time	2:00	93%		0:03:44
Turnout time	1:00	4%	0:03:28	
Travel time	4:00	52%	0:06:01	
Total response time	7:00	46%	0:09:57	

Table 18: EMS incident response performance.

The travel times for city fire responses are below the 70% threshold and significantly below the 90% target. While the travel time was expected, the total response time was slightly less than the *Fire Station Location Analysis* data breakdown of 6:07. However, in looking at the call processing time, it showed a difference in the time from when the call was received by the communication center and the time of dispatch. In the fire station location study, it was recorded that the call-received time was the same as the dispatch time, which questioned the accuracy of some of the response data provided. The actual call processing time that added to the total response time can provide a reasonable explanation for the increased time. In addition, and of significance is the department is meeting the turnout time of 1:20 only 9% of the time. It should

be noted that at the time of this report, the MVFD acknowledged that the data did not accurately reflect their current turnout time. The MVFD and communications center are initiating measures to address discrepancies in logged data and taking actions to improve performance and data entry.

Analysis of the EMS response data shows performance gaps in all measured elements. The department is meeting the total response time benchmark of seven minutes 46% of the time. The department is meeting the four-minute travel time benchmark 52% of the time, which is similar to the fire response travel time performance of 62%. The turnout time benchmark of one minute for EMS responses is being met 4% of the time.

Table 19 displays the response performance for travel time and total response time for fire incidents in each response district.

ELEMENT	DISTRICT	TARGET	PERCENTAGE	90 th PERCENTILE
Travel Time	MV1	4:00	72%	0:07:13
Response Time	MV1	7:06	56%	0:11:45
Travel Time	MV2	4:00	74%	0:05:51
Response Time	MV2	7:06	56%	0:10:52
Travel Time	MV3	4:00	46%	0:06:57
Response Time	MV3	7:06	40%	0:10:51
Travel Time	MV4	4:00	62%	0:06:15
Response Time	MV4	7:06	44%	0:10:02

Table 19: Fire incident travel and total response time performance by city district.

Table 20 displays the response performance for travel time and total response time for EMS incidents in each response district.

ELEMENT	DISTRICT	TARGET	PERCENTAGE	90 th PERCENTILE
Travel Time	MV1	4:00	75%	0:05:13
Response Time	MV1	7:00	67%	0:08:58
Travel Time	MV2	4:00	75%	0:05:18
Response Time	MV2	7:00	65%	0:08:57
Travel Time	MV3	4:00	35%	0:06:13
Response Time	MV3	7:00	30%	0:10:13
Travel Time	MV4	4:00	65%	0:06:02
Response Time	MV4	7:00	58%	0:09:28

Table 20: EMS incident travel and total response time performance by city district.

FACILITIES

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

Personnel essentials in fire station facilities must enable performance of daily duties to support response operations. For personnel, fire station facilities must have provisions for apparatus and vehicle maintenance and repair; storage areas for critical equipment and supplies; office space and conveniences for administrative work, training, physical fitness, laundering (domestic and PPE), meal preparation, personal hygiene, and area(s) for comfort. For the fire department that is dedicated to minimizing “turnout time”, bunking facilities are provided.

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

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

National standards such as NFPA 1500, *Standard on Fire Department Occupational Safety, Health, and Wellness Programs*, outlines standards that transfer to facilities such as infection control, personnel and equipment decontamination, cancer prevention, storage of protective clothing, and employee fitness. NFPA 1851, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Firefighting and Proximity Fire Fighting*, further delineates

laundering standards for protective clothing and station wear. Laundry areas in fire station facilities continue to evolve and are being separated from living areas to reduce contamination.

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

Sound community fire-rescue protection requires the strategic distribution of fire station facilities to ensure that effective service area coverage is achieved, that predicted response travel times satisfy prevailing community goals and national best practices, and that the facilities are capable of supporting mission-critical personnel and vehicle-oriented requirements and needs.

Additionally, depending on a fire-rescue department's scope of services, size, and complexity, other facilities may be necessary to support emergency communications, personnel training, fleet and essential equipment maintenance and repair, and supply storage and distribution.

MVFD provides its services using a unique fire station model consisting of two stations separated by approximately 5.2 miles, with their primary fire station located at 200 West Gambier Street in Mt. Vernon and identified in the county's fire department numerical system as Station 491. Their second station is located, by contractual agreement with College Twp. Board of Trustees, at the College Twp.'s Service Center, 102 East Brooklyn Street in Gambier and designated as Station 492. Both facilities are staffed 24 hours a day and dispatched per predetermined running orders.

Station 491

Fire Station 491 was constructed in 2000 permitting the city to establish a single point facility for its fire and EMS. The building houses the fire department's headquarters for administrative staff, fire prevention bureau, training facility, living quarters for on-duty personnel, vehicle bays associated with the different apparatus required for the city's fire and emergency responses, and designated parking spaces for use by employees and the general public. The station is bound on a parcel of land between West Gambier Street on the north and West Ohio Avenue on the south, approximately 550 feet wide by 550 feet deep. The station faces West Gambier Street and is approximately 231 feet wide by 64 feet deep. As displayed in Figure 25, the facility is a split use building with a two-story center core containing different sections designated headquarters and living space while two wings occupy either side of the center section for apparatus bays that includes related storage segments and work areas. The facility is fully protected with an automatic fire sprinkler system with a central alarm system monitored by a third party.



Figure 25: Station 491, 200 West Gambier Street in Mt. Vernon.

The station is normally kept locked at all times and accessible by personnel using a combination lock system on designated entry doors. The general public is directed to enter the main entrance off West Gambier Street (Figure 26). Blacktop parking spaces are provided between the front aprons with dedicated sidewalks to the main door entrance. Immediately adjacent to the front door is a mounted speaker/talk box designed to activate all interior telephones in the station where on-duty personnel can speak directly with the individual at the main entrance. However, the alert system will not alert any other location if no staff members are in the station. There is a printed notice attached to the right-side door entrance window at this location advising if no one answers their activation of the alarm/talk box they are to call 9-1-1 or use the posted department's emergency 10-digit phone number for assistance. Upon gaining entry to the facility there is a foyer reception window that permits the public to speak with either the department's administrative assistant or one of the department personnel (Figure 26). The second floor is accessible by dual stairwells or elevator and reasonably compliant with the Americans with Disability Act (ADA).



Figure 26: Station 491 front main exterior entrance and interior foyer.

The exterior of the building faces north and permits the two 85-foot concrete aprons from the north bays to exit on to West Gambier Street. Figures 27 and 28 show the line of sight for either ramp providing ample visibility for drivers of fire and EMS units to visualize traffic flow as they leave the station, at the same time permitting the motoring public to observe exiting emergency apparatus and vehicles. There are no preempted traffic devices installed to control the street traffic flow and personnel indicated they have no difficulty accessing service streets under emergency conditions.



Figure 27: Station 491 exit line of sight to the west from apparatus apron.



Figure 28: Station 491 exit line of sight to the east from apparatus apron.

Figure 29 provides a rear view of the facility that has two, 124-ft. concrete aprons facing south to empty on to West Ohio Avenue permitting access and egress. Line of sight for the ramps is good, permitting apparatus and vehicle operators as well as the motoring public to observe each other in a safe manner. There are no preempted traffic devices installed to control the street traffic flow with no reported difficulty encountered leaving under emergency response.



Figure 29: Rear view of Station 491, 200 West Gambier Street in Mt. Vernon.

A larger blacktop parking lot is located between the rear aprons and used primarily by department personnel with access cement sidewalks provided to rear entry doors. The photos in

Figure 30 show the condition of the concrete aprons is showing numerous stress cracks and the beginning aspect of more serious deterioration as such cracking expands, enabling ground water to enter these points, potentially freeze and cause an accelerated decline to the cement. The blacktop parking areas have deteriorated sufficiently in recent years and display maintenance steps taken to seal both cracks and decaying sections. The current condition of the blacktop is showing “transverse cracking and alligating”, which will continue to deteriorate at a faster pace resulting in “breakout” section occurring and the loss of support base leading to open depressions identified as “potholes”.

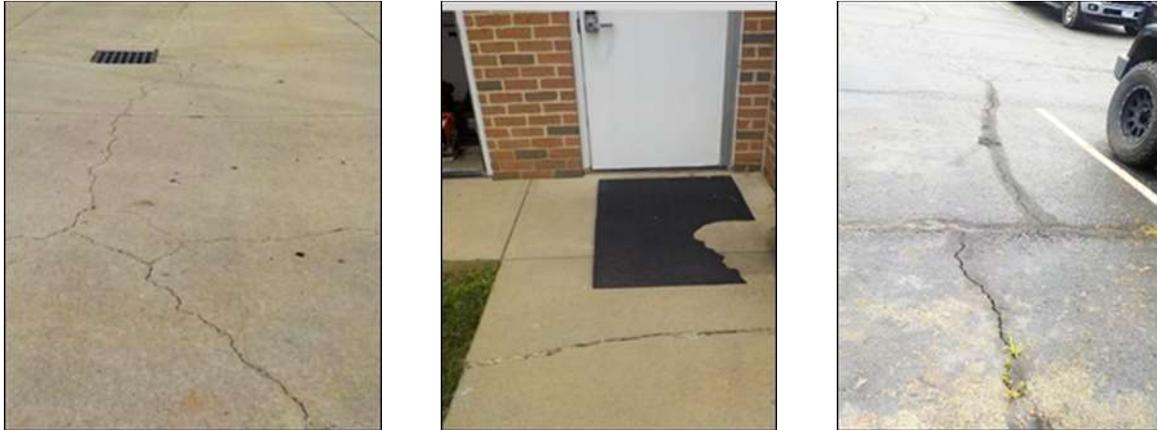


Figure 30: Deteriorating conditions of concrete and blacktop surfaces in the rear of Station 491.

The building has masonry (cement block) exterior walls with brick veneer and five pitched trussed metal roofs with fully installed snow rail guards. The interior cement block walls are painted, steel encasement exterior people doors equipped with automatic closers, panic door hardware (door hardware designed to provide building occupants fast and easy egress in an emergency), and appropriate exit lights. There is a fire rated wall and fire rated metal doors between the bays and the two-story portion of the complex. The bay floors have a very slight tapered slope from the access doors to the center core of the facility that may prevent the back flow of water, exhaust vapors, caustic particles, or fumes that can migrate towards the administration and living areas of the facility.

Gypsum board, also known as drywall covers the interior walls of the two-story administrative and living portion of the facility. The floors are covered with tile, and a suspended ceiling grid system is used to provide ceiling surfaces. Interior hallway doors are fire rated, wide steel doors mounted in steel encasements, using automatic closers, panic hardware, and appropriate exit signage.

The heating, ventilation, and air conditioning (HVAC) system installed for the center core portion of the facility is provided by natural gas fueled forced-air heating and cooling units that have been updated within the past five years. The units appeared well maintained and reported providing comfortable room atmosphere. However, this section of the structure does not provide

a positive pressure atmospheric condition with supplemented make-up air. The accepted operating concept for most light commercial structures is to place them under a positive pressure of +.02 inches to +.03 inches water column. Using these slight pressures can make a huge difference in building comfort, efficiency, air quality, and safety. Positive pressure controls ventilation into a building and keeps air from being pulled in from undesirable location such as the apparatus bays. Fresh make-up air pressurizes the building as it's introduced into the return side of the heating and cooling system. When the building reaches a steady state of condition where the building pressure is constant, the make-up air would be relatively small and the cost to heat or cool would be negligible; some buildings are pressurized with as little as 50 cubic feet per minute (cfm) of outside air per 1,000 sq. ft. of floor space. Most HVAC companies can conduct an evaluation test to determine the amount of outside cfm needed and modifications required to the existing HVAC system to accomplish this pressurization for a moderate cost.

Both apparatus bay sections of the building have steel frame roof construction, sealed cement floors and cement block walls. Both bay sides contain three 56 ft. deep bays that empty onto the front or rear aprons, dependent upon assigned vehicle placement.

Both west and east side bay areas have 14 ft. x 14 ft. insulated aluminum bay doors that contain a single row of "light" windows with appropriate floor level emergency release cords permitting opening in the event of a total power loss. All bay doors are equipped with electronic door sensors that would warn personnel of a partially open door or provide emergency stopping in the event an object is in the door passage when closing. External bollards (a strong, vertical post mounted in or in front of a facility that acts as a safety barrier to protect property from vehicle-into-building crashes) are installed to protect the building at all bay door openings. There is a minimum two-foot between the bay doors allowing ample interior space for personnel to open apparatus doors, remove equipment, and floor work area without blocking access between vehicles. The bay floors have painted lines for apparatus placement, a slide for rapid access to the bays from the second floor; and doorways to enclosed fire-rated hallways and stairwells that allow for passage through to the first-floor office area or stairwell to the second floor. The bay space is heated by a ceiling gas-fired, continuous infrared heating system; no cooling system is installed in the bay areas. Artificial lighting is furnished from overhead lighting and wall mounted light-emitting diode (LED) fixtures. Each individual bay has an installed trench drain covered with removable grates allowing for the extraction of debris and grit; the floor drains are attached to an oil interceptor.

The west bay has a room containing the facility's built-in standby electric generator, mobile hose storage racks, hose dryer, and cleaning supply storage. This area also has a PPE storage area which is open to the bay floor area and an extractor/dryer room for cleaning PPE. There is a fire rated passage to the building's center core and the second-floor slide access point empties onto the apparatus bay (Figure 31). The east bay provides similar storage rooms, identical three bay floor spacing using front and rear exit doors on to concrete aprons; similar lighting fixtures and

ceiling-mounted natural gas fueled, continuous infrared heating system, and an entrance to a fire rated stairwell to the second floor and first floor walk through to the administrative offices.

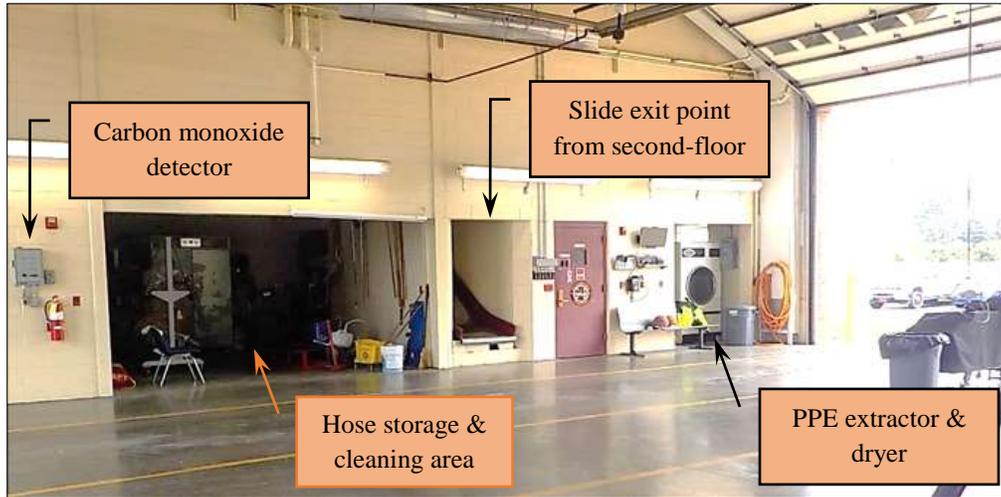


Figure 31: Station 491 west apparatus bay center-core wall area.

Currently both bay areas have an installed automatic carbon monoxide detection system that, when activated, evacuates unacceptable carbon monoxide vapors through wall-mounted duct systems; at the same time exterior wall-mounted automatic louvered vents open admitting fresh air into the bays (Figure 32). The system can also be activated manually. However, no reference was provided pertaining to the sensor detection system maintenance.



Figure 32: Automatic louvered fresh air intake to apparatus bays.

Additionally, all apparatus housed have been equipped with a MagneGrip[®] diesel exhaust capture system that controls exhaust at the point source (Figure 33). This system is designed to permit the starting and running of apparatus engines within the station while exhausting the engines' hazardous exhaust emissions directly to the exterior of the station when the exhaust hoses are properly attached. This improves interior air quality, provides a better health environment for occupants, and helps prevent contamination of equipment and electronics.



Figure 33: MagneGrip[®] diesel exhaust capture system that controls exhaust at the point source.

There is a decontamination area off the apparatus bay with a makeshift shower, which was modified during the COVID Pandemic for

personnel to shower upon returning from EMS runs when personnel may have been exposure to the COVID virus. The generator room contains a diesel-powered, three-phase 180-kW self-contained electric generator with a built-in transfer switch designed to disconnect from the power grid system and start the generator that will provide complete electrical needs for the building in the event of a power grid failure. The transfer switch is programmed to cycle weekly for 30 minutes; however, this weekly cycle does not place the generator under an electrical load. There is no central uninterruptible power supply (UPS) system that would protect such electronic units as computers, communication radios, digital telephones, routers, etc. from a voltage drop until the standby generator activates or provide limited battery power if the standby power system failed completely.

The bay floors are in good condition, well maintained, and painted with guidelines. Electrical outlets in the bays are properly placed; however, none observed were marked as ground fault circuit interrupter (GFCI) or explosion proof. A plumbed maintenance air system is installed in the bays, allowing quick and easy accessibility for use (Figure 34). These connections provide utility air for filling tires and operating pneumatic tools.



Figure 34: Utility air connections in the bays.

The two-story center core portion of the facility contains, on the first floor, the administrative general offices including the fire chief, fire prevention, EMS/training as well as an office for the shift captain, administrative assistant, and extra designated dorm rooms. There is a designated training room offering sufficient space to conduct full department meetings and furnished with modern technological amenities including internet, wide screen television monitor, projector, and electronic training programs.

The second-floor area is the living quarters for on-duty personnel and contains a kitchen with a commercial-grade range and oven with ventilation hood and protected by an automatic fire suppression system (Figure 35). However, there is no automatic disconnect to the cooking appliances that could be activated when an alarm is received. Immediately off the kitchen is the dayroom with furniture and television. There are designated restrooms as well as designated showers for both male and female personnel. There is a physical fitness workout room that



Figure 35: Kitchen area with commercial grade appliances and protected extinguishing hood system.

is well designed with an easy to maintain rubber floor covering (Figure 36); a large locker room off the physical fitness area, and a room that contains two laundry washers and dryers permitting on-duty personnel to launder their duty uniforms and bedding (Figure 37). In addition, there are sufficient dormitory rooms to accommodate the 24-hour duty shift assignments (Figure 38). Instead of the usual “fire pole” installed in most two-story fire houses, Mt. Vernon utilizes a “slide system” to permit rapid deployment from the second floor to the apparatus bays where fire and emergency vehicle are housed (Figure 39). The second-floor slides are accessible from either end of the common second-floor hallway to an enclosed fire rated housing adjacent to the fire rated stairs. This construction ensures the integration of the required fire walls between the bays and the center core section of the building.



Figure 36: Station 491 physical fitness training room.



Figure 37: Station 491, second-floor laundry room.



Figure 38: Station 491 standard dorm room.



Figure 39: Station 491 slide from second-floor to apparatus bay.

The east bay section of the building consists of the three drive-through bays and a secured EMS supply room located off the west wall of the bay, an enclosed stairwell and pass-through walkway from the first floor to the bays, a slide entry point from the second floor, two open PPE rooms into the bay, a maintenance room, and a room containing a 5,000 psi Bauer breathing air compressor with filtration, fragmentation deflector fill rack, and a cascade system of air cylinders. The air cylinders were properly secured.

MVFD requires all personnel reporting for duty to change into their department work uniform at the station and switch to civilian clothes upon completing their shift so potential contaminants are not transmitted between their home and other firefighters. Duty uniforms are cleaned at the station by on-duty personnel.

As noted in the “*Safety and Health Considerations for the Design of Fire and Emergency Medical Services Stations*” there are three major sources of contamination that are typically brought into a fire station; PPE, fire and rescue equipment, and vehicles (particularly the inside of cabs). Although the department’s current policy provides direction on the wearing and maintenance of PPE, the current PPE storage room configuration with open entrances to the locker room allows potential contamination of the PPE from residual diesel exhaust, caustic vapors and materials, and ultraviolet (UV) light degradation (Figure 40). Consideration should be given to fully enclosing these rooms with an isolated HVAC system designed to remove residual contaminants from direct exposure or off-gassing and humidity and UV light control.



Figure 40: Station 491 apparatus bay PPE and fire hose storage areas.

All the interior finishes appear to be in good condition. Carpeting showed normal wear but was well maintained. Floor tile was found to be in fair to good condition in the administrative, dormitory, and dayroom areas. The rubber matting in the workout room was in good condition and well maintained. Drywall was in good condition as well as the ceiling tiles. The appearance indicated personnel take pride in keeping their facility presentable, with appropriate supplies and equipment furnished for this goal.

Station 492

Fire station 492 is located at 102 East Brooklyn Street in the village of Gambier and dedicated as the College Township Service Center (Figure 41). It was formerly used by College Township for its own fire station until June of 2021 when the township entered into a contract with Mt. Vernon for fire and EMS services. As previously identified, this station is staffed with three personnel.



Figure 41: Station 492 at 102 East Brooklyn Street in the village of Gambier.

The building faces north and connects a 40 ft. by 115 ft. blacktop ramp to East Brooklyn Street providing ample visibility for emergency vehicle drivers to observe the motoring public on East Brooklyn Street and the public the ability to detect fire and EMS units exiting the station (Figures 42 and 43). There are no preempted traffic devices installed to control the street traffic flow and personnel indicated they have not encountered any safety issues exiting the station under emergency responses.



Figure 42: Station 492 exit line of sight to the west from apparatus apron.



Figure 43: Station 492 exit line of sight to the east from apparatus apron.

The facility is approximately 100 ft. wide x 76 ft. deep with five service bays situated on a parcel of land approximately 194 ft. x 132 ft. Both the building and land are owned by the College Township Board of Trustees. The existing building was constructed between 1978 and 1980 and is evident of the design concepts utilized more than 40 years ago. Some of these concepts include

14 ft. exterior walls, standard period lighting, and no bay floor slope. There also is limited separation between building areas that under modern design concepts and building code requirements would require greater fire wall separation and compartmentation. For example, building occupants in the living areas must pass through an area of greater hazardous classification to exit the building. The building also does not comply with the current building requirements of the Americans with Disability Act.

The exterior north wall consists of steel grid frame construction and brick veneer exterior covering while the east, west and south walls are steel grid framing with exterior vertical steel sheeting and insulated interior walls. It is configured in a five-bay, back-in-layout with all bays utilizing electrically operated 12 ft. wide x 12ft. high overhead aluminum insulated doors, each with a single row of “light” windows. Although the overhead doors are equipped with emergency release cables, they are short in length and are difficult to reach. This could result in a serious delay in response or unforeseen injury if total power was lost to the station and the incident occurred after dark causing the station to be totally blacked out. The emergency release cable for each door should be rerouted to the front of the bay door and positioned in such manner to allow immediate activation by personnel at floor level. None of the bay doors are equipped with electronic door sensors for emergency stopping or reversing direction nor a warning system designed to provide a visual or audible warning that a door has not fully opened. There are no protective bollards at the bay door openings. A central air line with a shut off connection for air lines is installed between the bay doors to facilitate tire maintenance needs. All vehicles have the ability to have an electrical shore line connected to maintain recharging of on-board battery powered electronic equipment or unit air compressor to maintain air brake operational pressures.

The distance between bays may somewhat limit personnel from removing items for service on the bay floor or limit the free flow of personnel to quickly travel through a bay for emergency responses. Every aspect of the space within the facility is fully used and appears disorganized from placing items wherever there is an open section for them as shown in Figures 44 and 45.



Figure 44: Station 492 company officer office.



Figure 45: Station 492 company officer office interior.

The size and space of the bays restricts the efficiency of the facility in being able to easily meet the needs of today's fire apparatus and EMS units, while permitting the protection of stored fire and EMS equipment such as an established area for maintenance or organized cleaning materials. At the same time the department needs to assure the ability to protect PPE using positive air flow and ventilation to prevent mildew, wet spots on floors, caustic fumes, and avoidance of UV rays destructive to sensitive fire and EMS equipment. This is more critical today than recognized in years past regarding the storage and protection of PPE in accordance with NFPA Standards 1500 and 1851; specifically, the use of a pressurized room, with exterior make-up air sufficient to permit the continuation of venting the room to the exterior of the building without seepage to the interior of the fire station. Numerous tools and equipment, such as fire hose, ropes, tarps, or hazardous containment items are also subject to the same exposure degrading as described for PPE.

The facility's electrical panel and communications punch down equipment is located on the south wall of the west bay, adjacent to the stairway to the storage section above the current bunk room. The installation is professional, well organized, and in good condition. However, it is not located in an enclosed room which leaves the board exposed to environmental elements of the apparatus bays and is easily accessible to anyone in the building. It has become a storage point for miscellaneous equipment, thus preventing the required 3 ft. separation of storage from electrical and communication boxes.

A washer and dryer are provided to permit personnel to wash their duty uniforms. All PPE is cleaned at Station 491 in Mt. Vernon. The kitchen is equipped with standard kitchen appliances and a protected hood system. There is an existing dual bunk room that provides limited space for fire personnel. The limited space presents further challenges for personnel to accommodate personnel items, extra clothing, and other related needs. This makes it more difficult for personnel to prevent cross-contamination of clothing and personal items, which could result in exposure and the transport of contaminated items to the employee's residence.

Heating and cooling to the living and administrative areas of the building is supplied by a natural gas-fueled, forced-air furnace and air conditioning unit. The apparatus bay area is heated by a ceiling-mounted, natural gas-fueled furnace. The HVAC system to the current living and administrative areas of the building does not provide a positive pressure atmospheric condition with supplemented make-up air as noted on pages 90 and 91 of this section regarding Station 491. Such supplemented make-up air would greatly improve air circulation for both heating and cooling efficiency and prevent vapors and fumes from a variety of sources from entering the living areas. This increased HVAC utilization has been recognized as a positive means of assuring increased safety and better air quality for those individuals assigned to the facility, especially in light of the now identified above cancer risk firefighters encounter in their daily job performance.

There are two access people doors, one in the north wall, west corner and the other on the south wall using paddle hardware. The roof is pitched with composite asphalt shingles that appear to be in fair condition. It was reported the township intends to do renovations to the structure including preliminary studding for construction of three new interior dorm rooms on the south wall with an enclosed hallway. The existing bunk room is scheduled to become the trustees' meeting room.

The remaining existing rooms on the west wall retain a unisex restroom with toilets, showers, and lockers; a kitchen with an attached dayroom, a room that is assessable from the bay, a radio room and office area. Currently, the back third of each bay is fully utilized for such needs as a breathing air compressor, a building air compressor, EMS metal storage cabinet, open storage, PPE lockers, and the facility's electrical service panel and electronic punch down board previously described. The apparatus bay floors contain what appear to be an updated 2 ft. concrete sloped area with slotted trench drains with the ability to remove the covers for cleaning purposes (Figure 46). The floor drains are connected to a holding tank located outside the building which is pumped out annually or as needed by the township. Ceiling-mounted electrical fluorescent fixtures provide artificial lighting.



Figure 46: Station 492 apparatus bay floor trench drainage.

The township has retained use of the east bay for storage of a township pickup truck with a utility trailer and limited space for storage of township equipment and materials. This bay contains numerous items required to support public maintenance duties of the township including highway barricades, service tools and tool storage, chain saw, certified flammable liquid storage cabinet, and road signage. Adjacent to this area is a small enclosed room containing a Bauer 4,500 psi, CFSII, dual-position full containment fill station, breathing air compressor, and cascade cylinder bank (Figure 47). The containment fill station is to protect the operator from over pressure and fragmentation. There was no intake noted that would provide make-up air from outside the building to this room when the compressor is operating, thus potentially drawing contaminated air from the bays and surrounding items such as PPE and fire equipment. NFPA 1989 *Standard on Breathing Air Quality for Emergency Services Respiratory Protection* requires source air from outside the building or an air quality monitor and sensor on the air compressor intake.



Figure 47: Station 492 breather air compressor and containment equipment.

The adjacent bay to the township's vehicle and equipment is under contract with Medflight of Ohio for the storage of a vehicle. Medflight is an air-and-ground critical care transportation company based in Ohio. The remaining three bays house MVFD fire and EMS units necessary to meet the response assignment the city has developed under their contract obligations. It should be noted that substantial space is being planned at the rear of the four bays to construct the dorm rooms and hallway that will greatly reduce the limited space available for routine fire department functions. At the time of this report, the township is waiting for permits to be issued that will enable this project to move forward.

An external storage area has been developed above the breathing air compressor for storage and is accessible from a wood-frame stair leading from the bay floor to the storage section. The area behind Medflight's unit and the area remaining behind Mt. Vernon's bay space is utilized to its fullest for fire department PPE lockers, storage of numerous fire related equipment consisting of fire hose to a portable grill and folding chairs. The west interior wall is cement block and used to complete the rooms associated on this side of the building. The current rooms are utilized for housing the on-duty crew from the Mt. Vernon. One of the west rooms designated as the township's official "meeting room" to conduct public meeting and township business. However, it was reported the township will hold larger public meetings in a bay area to accommodate the numbers in attendance, thus requiring fire/EMS units to be removed from the bay areas. A portion of the space area above the identified west wall rooms is used for storage and accessible by a staircase from the west bay. In addition, part of the area above the west rooms is utilized for HVAC operations. There are no smoke or carbon monoxide detection systems or fire protection systems installed above these room storage areas.

The facility has a permanently installed Generac 36-kW, natural gas-fired standby electric generator located on the exterior of the south wall (Figure 48). The generator is equipped with an automatic transfer switch that enables the generator to start and transfer building circuits to the emergency generator anytime the system senses the loss of normal electrical service. The fire chief is currently in discussions with College Twp. Trustees for the possibility to assign their township maintenance person to perform general generator maintenance, establish a programable weekly running cycles, and secure an annual inspection/service contract to assure the dependability of the emergency power unit. No central UPS exist that would protect such electronics as computers, communication radios, electronic telephones, routers etc., from a voltage drop until the standby generator could activate or provide limited battery power if public and standby electric service failed completely.



Figure 48: Station 492 36kW standby electric generator.

Considerations should be given to for the installation of a UPS system that contains a notice alarm designed to alert occupants, especially at night, that their electronic equipment is dependent on UPS battery supply.

The blacktop ramp is exhibiting limited longitudinal shrinkage, alligating (describes the distinctive appearance of an asphalt surface that has suffered fatigue damage), and beginning of raveling/graying as well as minor point deterioration where the blacktop is settling into base movements. It does not appear the ramp has been sealed in recent times (Figure 49).

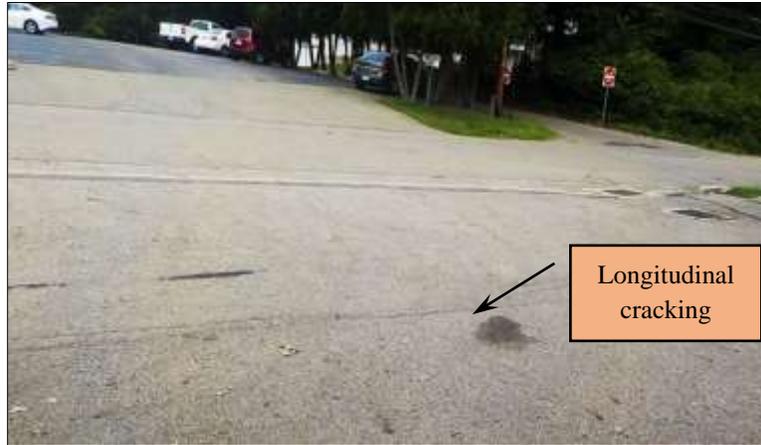


Figure 49: Station 492 apparatus bay apron surface condition.

Recommendation #19: *The assessment team recommends as a planning objective that, over a three-year period, the MVFD conduct a facility assessment of fire station facilities.* This recommended assessment should entail a comprehensive inspection of fire department facilities and should include all building system components for evidence of movement, deterioration, structural failure, probable useful life, need for repair and maintenance, need for replacement, and associated replacement costs. The assessment team further recommends the city and department retain a consultant to conduct a comprehensive review of MVFD facilities, and develop several options in a comprehensive fire department facility plan that will guide the officials of the city of Mt. Vernon and the MVFD in determining the necessity for improvements/component replacements over the next five to ten years. Included in this plan should be a budgetary and funding plan with the facility's mechanical system usefulness, size/space for personnel accommodations, and apparatus.

APPARATUS AND VEHICLE FLEET

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

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

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

NFPA 1901 serves as a guide to the manufacturers that build fire apparatus and the fire departments that purchase them. The document is updated every five years using input from the public/stakeholders through a formal review process. The committee membership is made up of representatives from the fire service, manufacturers, consultants, and special interest groups. The committee monitors various issues and problems that occur with fire apparatus and attempts to develop standards that address those issues. A primary interest of the committee over the years has been improving firefighter safety and reducing fire apparatus accidents.

The MVFD currently operates a fleet of front-line fire apparatus and EMS transport vehicles as outlined in Table 21.

APPARATUS/VEHICLE DESCRIPTION	YEAR	AGE (years)
Rosenbauer 75 ft. Aerial Ladder Platform	2018	5
Sutphen Pumper/Rescue	2011	12
HME Pumper/Rescue	2008	15
Sutphen Pumper	2006	17
Pierce Pumper	2000	23
McCoy Miller Ambulance	2019	4
Wheel Coach Ambulance	2016	7
Wheel Coach Ambulance	2015	8
McCoy Miller Ambulance	2012	11

Table 21: MVFD front-line and reserve fire apparatus and transport ambulances.

The MVFD also has an assortment of specialty response apparatus, and various command and light-response vehicles that include four staff vehicles, one all-terrain vehicle (ATV), and a rescue boat. The average age for their fire fleet is 15 years while their EMS units average 8 years of age.

The Annex Material in NFPA 1901 (2016) contains recommendations and work sheets to assist in decision-making in vehicle purchasing. With respect to recommended vehicle service life, the following excerpt is noteworthy:

It is recommended that apparatus greater than 15 years old that have been properly maintained and that are still in serviceable condition be placed in reserve status and upgraded in accordance with NFPA 1912, *Standard for Fire Apparatus Refurbishing (2016)*, to incorporate as many features as possible of the current fire apparatus standard. This will ensure that, while the apparatus might not totally comply with the current edition of the automotive fire apparatus standards, many improvements and upgrades required by the recent versions of the standards are available to the firefighters who use the apparatus.²⁵

A primary impetus for these recommended service life thresholds is continual advances in occupant safety. Despite good stewardship and maintenance of emergency vehicles in sound operating condition, there are many advances in occupant safety, such as fully enclosed cabs, enhanced rollover protection and air bags, three-point restraints, antilock brakes, higher visibility, cab noise abatement/hearing protection, and a host of other improvements as reflected in each revision of NFPA 1901. These improvements provide safer response vehicles for those providing emergency services within the community, as well those “sharing the road” with these responders.

The assessment team reviewed a single-page document that served as an apparatus/vehicle replacement schedule for the MVFD. Because the MVFD currently has a reserve engine apparatus that has exceeded 20 years of service and one that is within three years of the 20 years of service benchmark. In July 2022, the department contracted with Rosenbauer Fire Apparatus of Wyoming, Minnesota to design and build a new custom rescue pumper. The estimated completion of the replacement apparatus is July 2024.

Overall, the MVFD’s fleet and equipment appear to be in good condition and well maintained with personnel conducting daily readiness checks to assure front-line units are fully prepared for response assignments. Full inventories are maintained on all vehicles and reviewed periodically to assure accountability of such equipment. Annual NFPA standards established for testing and certification procedures are followed with appropriate records maintained denoting compliance

²⁵ National Fire Protection Association. (2016). *Standard for Automotive Fire Apparatus*. (NFPA 1901). Quincy, MA: Author.

with both ISO grading criteria used for community insurance ratings and NFPA standards established by the OAC for Ohio fire and EMS service.

In addition, the assessment team reviewed maintenance records for annual apparatus fire pump and aerial ladder service test documents which were found to be in order, meeting established standards. The assessment team used a five-point evaluation scale consisting of excellent, very good, good, fair, and poor in evaluating the overall efficiency status of Mt. Vernon's individual fire apparatus, ambulances, and staff vehicles.

Ladder 491

Ladder 491 is a 2018 Rosenbauer 75 ft. aerial ladder platform apparatus with a 2,000 GPM fire pump and carries 300 gallons of water (Figures 50 and 51). It carries a full complement of ground ladders and meets NFPA 1901 and its fire equipment requirements. The vehicle also features breathing air plumbed to the platform for personnel to connect their SCBA when working in a smoke environment when operating from the aerial device. There is also a pre-piped water way capable of delivering 1,000 GPM from an automatic master stream nozzle. The unit has 6,317 miles and is considered in excellent condition.



Figure 50: 2018 Rosenbauer 75 ft. aerial ladder platform apparatus.



Figure 51: Rear view of aerial ladder platform.

Engine 491

Engine 491 is a 2011 Sutphen pumper with a 1,500 GPM pump and carries 1,000 gallons of water (Figure 52). This apparatus is equipped with the necessary hose and equipment as required by NFPA 1901. This unit carries battery-powered rescue tools and other associated equipment used for auto extrication and other rescue situations. The



Figure 52: 2011 Sutphen pumper apparatus.

unit also has ALS EMS equipment and supplies including an AED. It has 49,296 miles and is considered in good condition.

Engine/Rescue 492

Engine/Rescue 492 is a 2008 HME pumper with a 1,250 GPM pump and carries 750 gallons of water (Figure 53). The apparatus is equipped with an assortment of hose and equipment as required by NFPA 1901. The unit also carries a hydraulic and assorted rescue tools. The unit is considered in fair condition with 47,156 miles.



Figure 53: 2008 HME pumper apparatus.

Engine 493

Engine 493 is a 2006 Sutphen pumper with a 1,500 GPM pump and carries 1,000 gallons of water (Figure 54). The apparatus is equipped with the required hose and fire equipment required by NFPA 1901. The unit also carries a hydraulic powered extrication tools and assorted rescue tools. It has 73,091 miles and is considered in fair condition.



Figure 54: 2006 Sutphen pumper apparatus.

Engine 494

Engine 494 is a 2000 Pierce pumper with a 1,500 GPM pump that carries 1,000 gallons of water and the required equipment to meet NFPA 1901 (Figure 55). The unit carries basic EMS equipment including an AED. This is the department's reserve engine with 45,507 miles and considered in fair condition. It will be replaced by a new apparatus currently under contract from Rosenbauer using a rescue body design.



Figure 55: 2000 Pierce pumper apparatus.

Medic F19

Medic F19 is a 2019 McCoy Miller ambulance mounted on a Ford 4x4 450 chassis (Figure 56). The vehicle is a fully equipped ALS unit that includes an updated Life Pack 15 platform and Stryker Power Load cot. The vehicle has 40,223 miles and is considered in very good condition.



Figure 56: 2019 McCoy Miller transport ambulance.

Medic F16

Medic F16 is a 2016 Wheeled Coach ambulance mounted on a 2016 4x4 Ford chassis as (Figure 57). The vehicle is a fully equipped ALS unit including an updated Life Pack 15 platform and Stryker Power Load cot. The vehicle has 74,101 miles and is considered in good condition.



Figure 57: 2016 Wheel Coach transport ambulance.

Medic F15

Medic F15 is a 2015 Wheeled Coach ambulance on a 2015 Ford 4x4 chassis (Figure 58). It is a fully equipped ALS unit that includes an updated Life Pack 15 platform and Stryker Power Load cot. The unit has 97,727 miles and is considered in good condition.



Figure 58: 2015 Wheel Coach transport ambulance.

Medic C12

Medic C12 is a 2012 McCoy Miller ambulance on a G4500 Chevrolet chassis (Figure 59). The vehicle is a fully equipped ALS unit including an updated Life Pack 15 platform and Stryker Power Load cot. The unit has 51,922 miles and is considered in fair condition.



Figure 59: 2012 McCoy Miller transport ambulance.

Grass 491

Grass 491 is a 2009 Dodge Ram 2500 heavy-duty, four-wheel drive pickup truck fitted with a skid-load (slide in) portable pump and 200 gallons of water designed for brush fires, with an assortment of fire extinguishers and scene lighting (Figure 60). It carries wildland and brush firefighting equipment. It is equipped for a snowplow attachment and is also used to pull utility trailers. It has 77,465 miles and is considered in fair condition.



Figure 60: 2009 Dodge Ram 2500 heavy-duty, four-wheel drive grass/wildland firefighting vehicle.

Grass 492

Grass Truck 492 is a 2003 Chevrolet Silverado 2500 heavy-duty, four-wheel drive pickup truck fitted with a skid-load portable pump and 200 gallons of water designed for brush fires (Figure 61). The vehicle is equipped with an assortment of fire extinguishers and scene lighting. It has 27,995 miles and is considered in fair condition.



Figure 61: 2003 Chevrolet Silverado 2500 heavy-duty, four-wheel drive grass/wildland firefighting vehicle.

Chief 491

Chief 491 is a 2010 Ford Explorer Sport Utility Vehicle (SUV) assigned to the fire chief (Figure 62). It carries basic equipment and supplies for incident command and management operations. The vehicle has 52,131 miles and is considered in good condition.



Figure 62: 2010 Ford Explorer SUV.

Captain 491

Captain 491 is a 2020 Chevrolet Tahoe SUV used by the duty shift captain as a command vehicle (Figure 63). It is equipped with basic life support (BLS) equipment, an AED, and hazardous material testing and monitoring equipment. It has 19,414 miles and is considered in excellent condition.



Figure 63: 2020 Chevrolet Tahoe SUV.

Fire Prevention 491

Fire Prevention 491 is a 2017 Ford Explorer SUV assigned to the fire prevention officer (Figure 64). The vehicle carries documents, equipment, and materials normally utilized during fire and life-safety inspections as well as fire education programs. The unit is considered in good condition.



Figure 64: 2017 Ford Explorer SUV.

EMS 491

EMS 491 is a 2016 Ford Explorer SUV assigned to the lieutenant assigned to EMS and Training (Figure 65). The vehicle carries basic equipment associated with responses and training activities. The vehicle has 37,327 miles and is considered in good condition.



Figure 65: 2016 Ford Explorer SUV

Gator 491

Gator 491 is a 2014 John Deere 4x4 All-Terrain Vehicle (Figure 66). The vehicle is equipped with four seats within a protective cage housing, vinyl removable doors, power wrench, and med transport bed for EMS patients and attendant seat. It will carry a variety of EMS equipment as the assignment may impose and is used for responses in the park system and other off-road situations. The unit has 536 engine hours and is considered in good condition.



Figure 66: 2014 John Deere 4x4 all-terrain vehicle

Boat 491

Boat 491 is a 14-ft. aluminum Sea Nymph Jon boat designed for water rescue operations the department may confront (Figure 67). It is powered by a 50 horsepower Mercury outboard gas motor and equipped with personal floatation devices and an assortment of ropes and rescue type devices.



Figure 67: 14-ft. aluminum Sea Nymph Jon boat.

Bike 491

Bike 491 is a Trek brand mountain bike (Figure 68). Its primary purpose is to provide a rapid response by fire department personnel functioning as a paramedic assessment unit. The bicycle unit gives mobility to the EMS provider. The EMS personnel can negotiate congested areas during large gatherings or special events.



Figure 68: Paramedic assessment unit mountain bike.

EQUIPMENT MAINTENANCE AND SERVICE TESTING

Because the lives of firefighters and fire victims often rely on the performance, without failure, of the valuable pieces of fire department equipment, equipment maintenance, and service testing is an extremely important subject, particularly if a department expects to operate equipment that is reliable and durable and wants the equipment to achieve its expected usefulness without catastrophic or costly failures. The NFPA's codes and standards are a major part of the MVFD's regulatory environment, as these standards of performance are critical.

Apparatus Fire Pumps

The department conducts annual fire pump testing on all apparatus. Testing is performed by Ohio CAT of Columbus, OH. Three years of service testing and maintenance records were reviewed and found to be well maintained and in order. NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles* and pump manufacturers recommend or require annual fire pump testing of all in-service fire department pumpers. OAC §4123:1-21-04[M] [4] also requires annual fire pump testing in accordance with NFPA recommendations. Every four years, annual testing should be expanded to include non-destructive chassis frame rail inspection and analysis. This testing looks for early signs of crack formation, delamination, and corrosion of frame rails, supports, and wheel rims. This helps assure the safe and proper operation of an apparatus during normal operation and emergency response. The assessment team reviewed apparatus pump test records for the years: 2019, 2020, and 2021. All pumps passed with no deficiencies.

Apparatus Aerial and Ground Ladders

Aerial ladder and ground ladder testing is also performed on an annual basis by Ohio CAT.

Annual non-destructive testing is required to assure safe operation in accordance with current NFPA standards and manufacturers' recommendations. OAC §4123:1-21-05 also requires annual ladder testing in accordance with NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles* and 1932, *Standard on Use, Maintenance, and Service Testing of In-Service Fire Department Ground Ladders* recommendations. The assessment team reviewed apparatus aerial platform and ground ladder test records for the years: 2020 and 2021. The aerial ladder passed with several deficiencies noted for recommended work repairs but none that required immediate repairs. All ground ladders passed with minimal noted deficiencies (i.e., clean and maintain ladders per manufacturers specifications, expected wear from usage and apparatus storage, and missing length labels).

Fire Hose

Annual hose and appliance testing is conducted "in-house" by MVFD personnel using a hose testing appliance. Hose testing follows manufacturers' recommendations and NFPA 1962, *Standard on Inspection, Care and Use of Fire Hose, Couplings, and Nozzles and Service Testing of Fire Hose*. OAC and ISO also require the proper testing and maintenance of fire hose. The assessment team reviewed fire hose service test records for the years: 2020 and 2021 and found to be in order. Hose inventory records are maintained electronically in Aladtec's record management system database.

The department was awarded a 2022 Federal Emergency Management Agency's Assistance to Firefighters Grant (AFG) for \$187,847 to help fund the replacement of the department's fire hose inventory. It was determined that fire hose are one of the most mission-critical components in firefighting, and in need of priority replacement. The federal funding for this project will help replace obsolete and non-compliant equipment, ultimately improving the safety of firefighters and efficiencies in the department's mission.

It was noted that unless under warranty, fire hose that fails testing is disposed of and removed from the hose inventory. The department should research the cost effectiveness and feasibility of repairing hose that has failed. Shortened hose lengths (10 ft. to 20 ft.) can be valuable for various uses including extending lines at pump panels and in hotel or "high-rise" packs. Other uses include shorter hose lengths, sometimes referred to as "pony" sections, for training.

Self-contained Breathing Apparatus

The department has 26 MSA G1, 45-minute, 5,500 psi SCBA. The SCBAs are distributed on the apparatus in compliance with NFPA standards along with spare cylinders. SCBA testing follows manufacturers' recommendations and NFPA 1852, *Standard on the Selection, Care, and Maintenance of Open-Circuit Breathing Apparatus*. The assessment team reviewed test records for the years: 2020 and 2021. Bench testing and repairs on SCBA units were performed by Fire

Safety Services, Huntsville, OH in accordance with NFPA, OAC, and manufacturers' recommendations.

Each firefighter is issued an individual MSA G1 facepiece. All firefighters receive an annual qualitative fit test that is documented and in accordance with NFPA and §4123:1-21-02 [P] [3] OAC. This assures a proper fit and seal of the facepiece. In addition, the OAC also requires that all personnel who may operate in a toxic vapor or oxygen deficient environment be approved annually by a physician, or a health assessment questionnaire must be completed and approved by a licensed health care professional prior to wearing a respirator or SCBA. NFPA 1500 also contains similar and related respiratory program guidelines. There was no evidence (i.e., policy or guidelines) that the department currently provides a complete medical examination annually, which includes pulmonary function testing and clearance for respirator use. Revising the program to meet these guidelines is a nationally accepted fire service best practice and provides the greatest degree of protection possible for firefighters working in hazardous and toxic work environments.

Also, according to NFPA 1852, all carbon fiber composite SCBA air cylinders should be hydrostatically tested every five years from the last hydrostatic test. A hydrostatic or pressure test is a method to validate the structural integrity and safety of a cylinder. Testing is essential to identify tank degradation, changes in shape, and leaks.

The department has two Bauer breathing air compressors and cascade systems with fill containment chambers to refill SCBA cylinders (i.e., one 5,000 psi at Station 491 and one 4,500 psi compressor at Station 492). Breathing Air Systems of Reynoldsburg, OH services and maintains the systems. Maintenance on each of the compressors includes semiannual preventative maintenance servicing and a quarterly air quality analysis. Appropriate records detailing service and air quality are properly maintained and available for inspection. Each air-filling station has a four-cylinder vertical cascade storage system that is installed with wall-mount brackets and safety chains.

Personal Protective Equipment

Each full-time firefighter is issued one set (pant and coat) of NFPA compliant PPE. NFPA 1851, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* provides guidelines on proper storage of protective clothing. Fire departments should use NFPA 1851 in developing SOGs/SOPs for special incidents. Each ensemble is utilized for a service-life of 10 years. Part-time personnel are issued a single set of PPE for their use. The department also maintains an inventory of extra PPE which can be issued in an emergency or on an "as-needed" basis.

While the assessment team was unable to inspect each firefighter's PPE, the following observations are based on what was available for inspection. In general, the majority of PPE is in

very good condition. PPE is stored in designated storage areas that can be easily accessible from the apparatus bays. The PPE is stored on hangers and racks to facilitate drying. The turnout gear ensembles were manufactured in accordance with NFPA requirements. The outer shells are a PBI composite and appear to be well-maintained.

Currently, the PPE is inspected and cleaned per manufacturer recommendations “in-house” by MVFD personnel. Repairs are contracted out through Phoenix Safety Outfitters of Springfield, OH. The department has commercial turnout gear washers/extractors located at each station for use in maintaining PPE. All PPE is on a 10-year replacement schedule, which meets NFPA 1851 recommendations.

Personnel are also issued certified ANSI (American National Standards Institute) reflective traffic safety vests for highway/roadway wear when operating in the area of vehicular traffic. SOG 1003.00, *Traffic Safety Vests* addresses the required use and care of the safety vest equipment. The guideline is designed to meet the intent of NFPA 1500 (2007 edition), U.S Department of Transportation, 23 CFR Part 634, and the *Manual of Uniform Traffic Control Devices*. Body armor or ballistic vest are available to all personnel. At the start of every shift, personnel are required to remove his or her body armor from the PPE storage areas and place at their assigned riding seats on medic units and fire apparatus. SOG 516.00, *Body Armor, Use of* addresses the required use and care of the body armor equipment.

Fire department personnel perform minor maintenance for small engines, hand tools, and other small equipment. The department has LIFEPAK 15 heart monitor and defibrillators that are carried on each of the department’s ambulances. The department also has AEDs located on fire apparatus and staff vehicles. The LIFEPAK 15s and AEDs are serviced under a maintenance agreement with the manufacturer, Physio-Control.

POLICIES AND STANDARD OPERATING GUIDELINES AND PROCEDURES

The MVFD operates under the direction of a detailed set of administrative policies and procedures and operational standard operating guidelines (SOGs), which provide guidance on the organizational structure, personnel, roles and responsibilities, expected functions, and training requirements. Critical policies and guidelines examined by the assessment team appeared to be timely and in line with what is expected in policy, procedural, and SOG documents for a modern and progressive fire department.

City and department policies, procedures, and SOGs are accessible by all employees by means of PowerDMS. PowerDMS is a digital document management system that provides features like electronic signature capture, revision tracking, audit trails, collaboration, content management, and self-assessments.

The policies, procedures, and SOGs are developed, amended, and reviewed by the fire chief and officers for both accuracy and content. According to interviews there is some involvement of line staff in the development and maintenance of departmental policies. In order to ensure that policies, procedures, and SOGs remain timely and meet the needs of the department and community, an annual review of policies should be conducted by personnel at all levels of the organization to allow input and to determine if revisions are required. By involving staff at all levels of the organization, personnel would have a better understanding of how the policies, procedures and guidelines are developed and reasons for certain requirements. It would also allow command staff to hear from line personnel areas of concern with current policies from an operational perspective.

Administrative Policies

The department's comprehensive policy and procedure manual serves three purposes:

1. Summary of departmental policies.
2. Summary of city policies, practices, and benefits as a city employee.
3. Summary of personnel practices and operational directions.

It covers many important topics applicable to all city employees (including fire department personnel) including sexual harassment, drug-free workplace, computer use, occupational injury leave, and employee discipline.

Standard Operating Guidelines

SOGs, which are sometimes referred to as SOPs, provide guidance to personnel responding to and operating at emergency incidents, as well as other non-emergency matters pertaining to operations and service delivery within the department. Well-developed SOGs increase the effectiveness of the firefighting and EMS team and set safety and operational priorities. SOGs also provide the vehicle to establish and publish non-emergency procedures that are important support functions in developing and maintaining operational readiness. A review of the department's SOGs noted a comprehensive and detailed set of guidelines. This included incident management procedures that cover basic incident command concepts, sectoring, and terminology. Detailed procedures are provided for the first- and second-due fire companies as well as the ladder company and medic unit(s). Key safety response guidelines were also reviewed for accountability, Mayday, lost firefighter, emergency evacuation, on-deck and RIT operations. The department also has a specific procedure covering infection and disease control and equipment cleaning. The procedures had effective dates spanning from 2012 to 2021.

Other SOGs include vehicle accidents, grooming standards, general conduct, and personnel evaluations. Key EMS SOGs included a guideline for response to an active violence incident and the Health Insurance Portability and Accountability Act (HIPAA). The guideline also includes

specific actions if a breach of a patient's protected health information occurs. However, no guidelines for accountability of controlled substances or medications was identified.

The SOGs also included a procedure that identifies risk management as it addresses the safety of personnel operating within the department's incident management plan for an incident. This ensures that the risks associated with emergency and non-emergency operations of the fire department are identified and effectively managed. This is compliant with §4123:1-21-07 of the OAC that requires that "activities that present a significant risk to the safety of members shall be limited to situations where there is a potential to save endangered lives."

The department is encouraged to expand their existing SOGs to include detailed procedures for the most common types of structure fires and other emergencies that the department may face. As an example, an SOG should be developed that describes the specific hazards of handling basement fires to include water application, ingress/egress points, and the potential for flashover, rollover, and structural collapse.

Policies, procedures, and SOGs in the MVFD are comprehensive and appear to meet industry standards, but the process for reviewing and updating can be improved.

Recommendation #20: The assessment team recommends the MVFD consider appointing a policy and standards review committee responsible for the annual review and providing recommended revisions to departmental policies and standard operating guidelines/procedures. SOGs/SOPs are not static documents, as they they should be regularly reviewed and updated. This is not to suggest that every SOG/SOP should always be changed annually but that each one should be evaluated for updating, correcting, fine-tuning, or otherwise revising if necessary. Evaluating department policies and SOGs/SOPs can simply answer the question, "Are we doing the right thing?" The practice of having the SOGs/SOPs reviewed and revised is more important than how many SOGs/SOPs are changed. Change just for the sake of change is not recommended. This practice can allow personnel to become more familiar and comfortable operating under established guidelines/ procedures. This committee should meet annually to ensure the review of policies and standards occurs on a set schedule.

INTERVIEW SUMMARIES

One of the methodologies utilized to fully understand and analyze the operation of the department was structured interviews with firefighters and officers. A common theme of those interviewed was the quality and professionalism of the department personnel. Also mentioned was the exceptional EMS delivered on a consistent basis and the department's in-service training program. There appears to be a good camaraderie among the personnel and real compassion for the Mt. Vernon community. This was demonstrated by several examples of fire department personnel going above and beyond to serve the needs of the residents.

During the course of the interviews, several significant issues were identified. The most common issue raised by the personnel was staffing. Personnel were concerned about expansion of the response district and the increasing call volume. From their view, staffing has not kept up with the call volume. However, three additional firefighters have been added to the MVFD's roster (one assigned to each 24-hour shift) since the assessment team's site visit and interviews. The recent addition of part-time personnel was also a concern. Most felt the part-time staffing was a hindrance more than a help, based on the current standards and on-boarding process. It was pointed out that a part-time firefighter could fill a position but only be certified as an EMT versus paramedic. The other concern was that new part-time personnel only need to work five shifts and then can be approved to be counted as staffing, which was addressed in Article 40 of the most recent full-time labor agreement stating "All new part-time employees must work 240 hours before they count towards staffing."²⁶

Communications and the flow of information up and down the chain of command appears to be good, although some felt the officers could influence information flow upward. However, most felt that communication between the shifts could be improved.

Future challenges appear to be the city's continued growth and retention of personnel. Many felt the department was behind in wages, which has contributed to turnover of younger personnel over the past five years. Increasing EMS call volume and no rotation off of a medic unit also was mentioned as contributing factors. This factor has also been addressed as of the writing of this report by means tracking medic unit assignments and rotations by means of Aladtec's scheduling software.

FIRE STATION LOCATION STUDY

The OFCA's previous report, *Fire Station Location Analysis for the City of Mount Vernon Fire Department*, was published in September 2020. The study's goal was to determine optimal locations for future fire stations before substantial investments were made. In analyzing the MVFD's response performance during 2018 and 2019, it disclosed that a performance gap existed in the city for fire and EMS travel times, while the total response time was slightly less than the response time criteria established by the NFPA. The report concluded that the department continue using Station 491's existing location on West Gambier Street in the downtown area of Mt. Vernon. A second fire station location was recommended near the intersection of Coshocton Avenue and Vernonview Drive, as it provides the best location to improve travel times and ultimately overall response performance in the community.

²⁶ *Agreement between the City of Mt. Vernon and IAFF, OAPFF, Mt. Vernon Firefighters and Paramedics, Local 3712, July 1, 2022 to June 30, 2024.*

Recommendation #21: The department should consider long-range planning with locating a second fire station within the city's corporation limits in the recommended area as identified in the Fire Station Location Analysis. While it is recognized by the assessment team that the MVFD is currently under contract to provide fire and EMS to the village of Gambier and College Twp. and each community's elected representatives and citizenry are satisfied with the department's current services and performance, the department should consider long-range planning with locating a second fire station within the city's corporation limits. Currently, the travel distance between Station 492 on East Brooklyn Street in Gambier and the identified second fire station location is approximately 5.3 miles with an approximate travel time of 10 minutes. As the potential exists for any contractual agreement to have an end date for any reason, the department should have a contingency plan in place in the event the agreement is terminated. Secondly, while Station 492 is currently being renovated to provide sleeping accommodations for the firefighters, it still lacks many of the modern features and characteristics to comfortably and safely accommodate firefighters as outlined in the building code and NFPA as a critical infrastructure facility.

ADDITIONAL RECOMMENDATIONS

The assessment team has also identified other recommendations for consideration. These are aimed at further developing the department's high level of service to the community and providing for a continuous focus on improvement, including self-analysis and review.

Recommendation #22: The assessment team recommends the MVFD continue to expand and strengthen data tracking and records management system practices to support strategic initiatives. Successful management of department planning efforts and evaluating operations requires meticulous and accurate data collection practices. The department currently collects a broad range of workload and performance indicators using ESO Software, a records management system designed to support fire department operations. ESO records information about emergency incidents, including the date, type, turnout and travel times, units dispatched, and district, which the department uses to evaluate call patterns and response times. CRR staff and leadership also track public education, fire prevention, and inspections activities in ESO.

As the department develops and formalizes strategic initiatives, it is important to identify how progress and success can be measured for each initiative. Wherever possible, the department should continue to leverage existing data collection practices; however, if additional data is necessary, the department should identify specific criteria for success and track relevant indicators. To ensure accurate information is captured and to enhance the department's performance reporting, it is essential to ensure that personnel responsible for accessing these systems know how to collect and retrieve data. Personnel should be provided with appropriate SOPs and training to ensure data is collected and analyzed as accurately as possible. The

necessity of data collection, analysis and reporting cannot be overstated. While quite challenging, department leadership must fortify and leverage available data in their emergency response system, including the CAD, to articulate the fire department's value in a quantifiable manner.

Recommendation #23: The assessment team recommends that the MVFD develop organizational performance goals. Working together, the city's leadership and fire department should develop organizational performance goals. Response performance goals can also be developed separately for fire and EMS incidents, as well as for later arriving fire companies as part of an Effective Response Force. Response performance goals can also be developed for each individual response sector, which have already been established by the department, including if the number of response sectors is expanded. In developing the overall organizational response performance goals, specific performance targets can be established for each element; call processing, turnout time, and travel time.

As an example, turnout time goals and corresponding policies can be developed to improve turnout time performance. The existing station alerting system could also be reviewed to determine if there are technological options available to help streamline alerting and improving turnout time. Some departments have installed a turnout timer (digital clock) prominently displayed in the station apparatus room. The turnout timer provides a visual readout of the time elapsed since the call was received at the fire station. The timer can be used to assist firefighters in decreasing turnout times and getting out of the station quickly, which will contribute towards improving the department's overall response times.

Fire administration should routinely monitor established performance measurement criteria standards, response time standards, and related performance measurement criteria for both fire and EMS response times. Further, regular reporting and review of the response times should be established to assist in identifying weaknesses within each response time element on a quarterly basis.

Recommendation #24: The assessment team recommends that the MVFD consider development of a written standards of cover for service. A standards of cover document is a systematic way of looking at the basic service provided by an emergency services agency. The purpose of a standards of cover document is to provide a system that assists the agency with: assessing community risks, defining baseline and benchmark emergency response performance objectives, planning future station locations, determining apparatus and staffing patterns, evaluating workload and ideal unit utilization, measuring service delivery performance, and supporting strategic planning and policy development relative to resource procurement and allocation.

While standards exist within the MVFD, it is the commitment and resources of the community that must come to bear against the threat of community risks. Community risk is more than just

fire risk; it encompasses technical rescue, EMS, and disaster response. This report examined the community fire risk with a macro view. The standard of cover allows the agency to analyze community risk with a micro view. The assessment team was impressed with the engagement, acumen, and professionalism of the fire department staff. They clearly have the capability to complete such an undertaking if given sufficient time to complete the assignment. Criteria for completing a standard of cover document is available from the Commission on Fire Service Accreditation, a subsidiary service of the CFAI. Workshops for developing and completing a standard of cover are regularly offered by CFAI.

SUMMARY

During the course of this study, the assessment team observed a highly functional fire and EMS organization that strives to provide an exceptional level of service to the city of Mt. Vernon and the communities served by means of contractual agreement. The public can feel confident that the department's firefighters and paramedics can effectively perform their duties. However, the MVFD is confronted by many of the challenges that are facing fire service organizations across the U.S. These challenges include:

- Economic pressures impacting public safety departments;
- Expanded all-hazards responses and risk reduction services;
- Increasing technical expectations;
- An increasing focus on documentation, training, and certification of personnel;
- Recruitment and retention;
- Expanded focus on firefighter occupational health and wellness;
- Enhancing fire department communication;
- Competitive compensation and benefits; and
- Delivery service models that can be expected to evolve and change.

This report has identified potential areas for improvement to ensure compliance with State and Federal laws, regulations, and nationally accepted best industry practices. These are in the form of specific recommendations or suggestions for consideration by the MVFD and city of Mt. Vernon. These recommendations and suggestions have been developed with a focus on the health and safety of the employees, effectiveness and efficiencies of administration and operations, as well as the safety and welfare of the city of Mt. Vernon's residents, businesses, and visitors.

Additionally, the city experienced 7.7% population growth from 2000 to 2020, and an 18% population growth since 1980. With the current and planned development within the city, it is expected that the growth trend will continue. Many of the recommendations, if implemented,

will increase the annual operating cost of the department. The assessment team is fully aware of the financial impact of adding personnel. However, the recommendations can help address the department's current and future service demands, improve response capacity and performance, and allow the department to plan and implement changes to meet the community's current and future public safety needs.

MVFD is clearly an advanced and respected organization, with a solid leadership team and workforce. The fire department is commended for their efforts in providing quality service to the city and its contracted communities. The OFCA hopes this review will help continue that effort.

Appendix A

MT. VERNON FIRE DEPARTMENT SERVICE AREAS: U.S. CENSUS 2020 DECENNIAL DATA

	AREA (SQ. MILES)	POPULATION	POPULATION DENSITY (sq. mi.)	HOUSING UNITS	MEDIAN INCOME	HOUSEHOLDS
City of Mt. Vernon	9.6	16,956	1,766	7,662	\$46,656	6,523
Village of Gambier	0.94	2,213	2,354	360	\$78,864	332
Clinton Twp.	14.6	2,886	198	1,250	\$45,417	1,353
College Twp.	6.4	2,553	399	503	\$80,684	554
Liberty Twp.	25.8	1,906	74	764	\$92,283	774
Morris Twp.	7.35	2,098	285	816	\$84,868	772
Pleasant Twp.	18.2	1,657	91	694	\$60,455	608
TOTAL:	82.89	30,269	365	12,049	\$78,864	10,916

	WHITE		AFRICAN AMERICAN		HISPANIC or LATINO		ASIAN		OTHER RACES		TWO OR MORE RACES	
	Population	Percentage	Population	Percentage	Population	Percentage	Population	Percentage	Population	Percentage	Population	Percentage
City of Mt. Vernon	15,471	91.2%	250	1.5%	0	0.0%	98	0.6%	249	1.5%	888	5.2%
Village of Gambier	1,730	78.2%	79	3.6%	154	7.0%	128	5.8%	84	3.8%	73	3.3%
Clinton Twp.	2,676	92.7%	26	0.9%	0	0.0%	27	0.9%	36	1.2%	121	4.2%
College Twp.	2,062	80.8%	81	3.2%	0	0.0%	128	5.0%	214	8.4%	68	2.7%
Liberty Twp.	1,783	93.5%	20	1.0%	0	0.0%	7	0.4%	14	0.7%	82	4.3%
Morris Twp.	1,960	93.4%	13	0.6%	0	0.0%	19	0.9%	20	1.0%	86	4.1%
Pleasant Twp.	1,606	96.9%	4	0.2%	0	0.0%	4	0.2%	11	0.7%	32	1.9%
TOTAL:	27,288	90.2%	473	1.6%	154	0.5%	411	1.4%	628	2.1%	1,350	4.5%

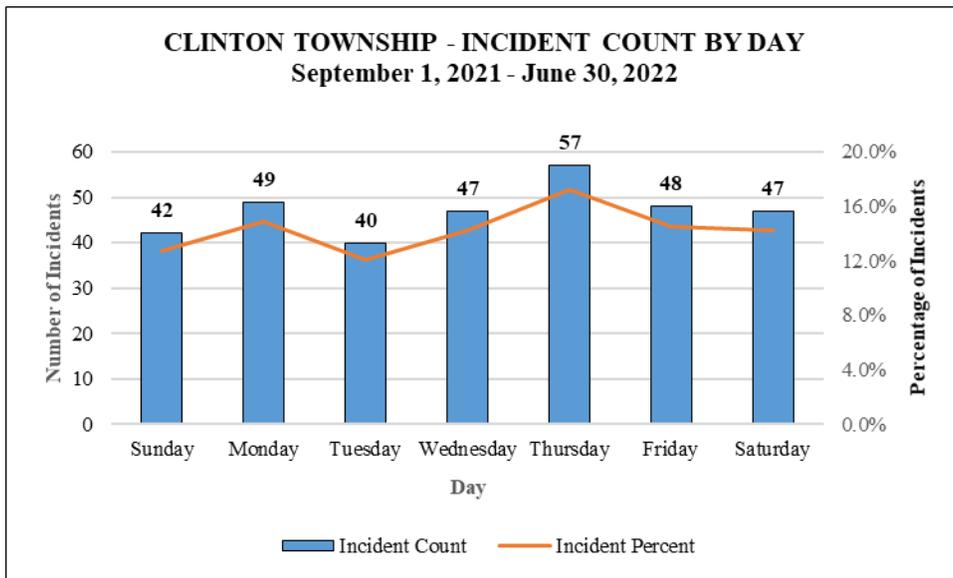
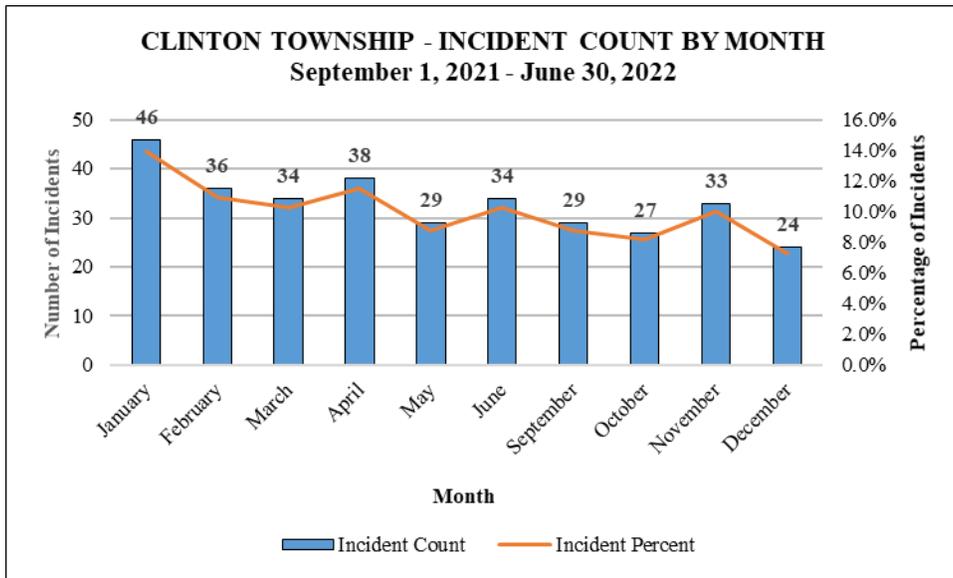
Appendix A continued

	< 5 - YEARS			> 65-YEARS	
	Population	Percentage		Population	Percentage
City of Mt. Vernon	968	5.7%		3,037	17.9%
Village of Gambier	25	1.1%		138	6.2%
Clinton Twp.	42	1.5%		718	24.9%
College Twp.	110	4.3%		192	7.5%
Liberty Twp.	143	7.5%		282	14.8%
Morris Twp.	59	2.8%		628	29.9%
Pleasant Twp.	100	6.0%		496	29.9%
TOTAL:	1,447	4.8%		5,491	18.1%

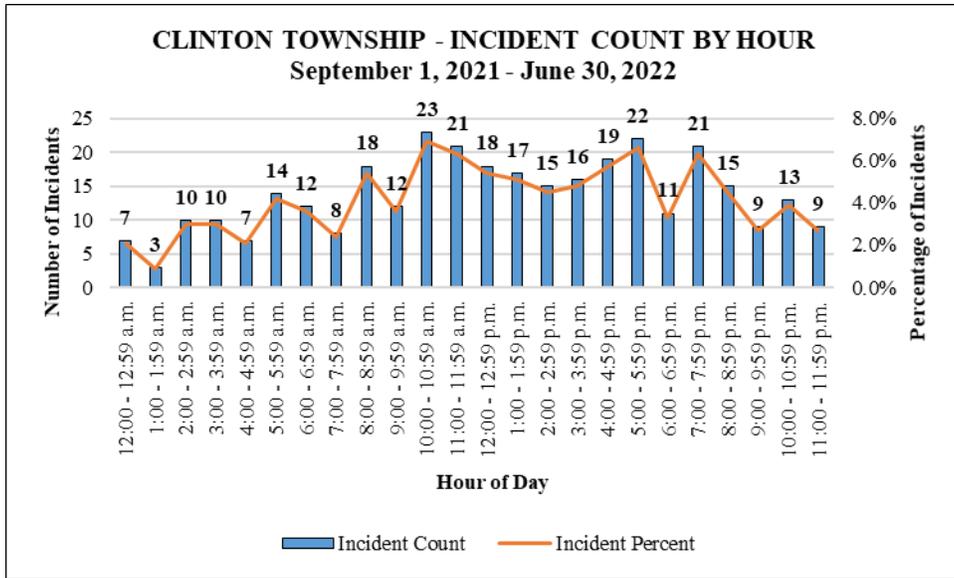
Appendix B

CLINTON TOWNSHIP TEMPORAL INCIDENT DATA

Reporting Period Total Fire and EMS Incidents: 330



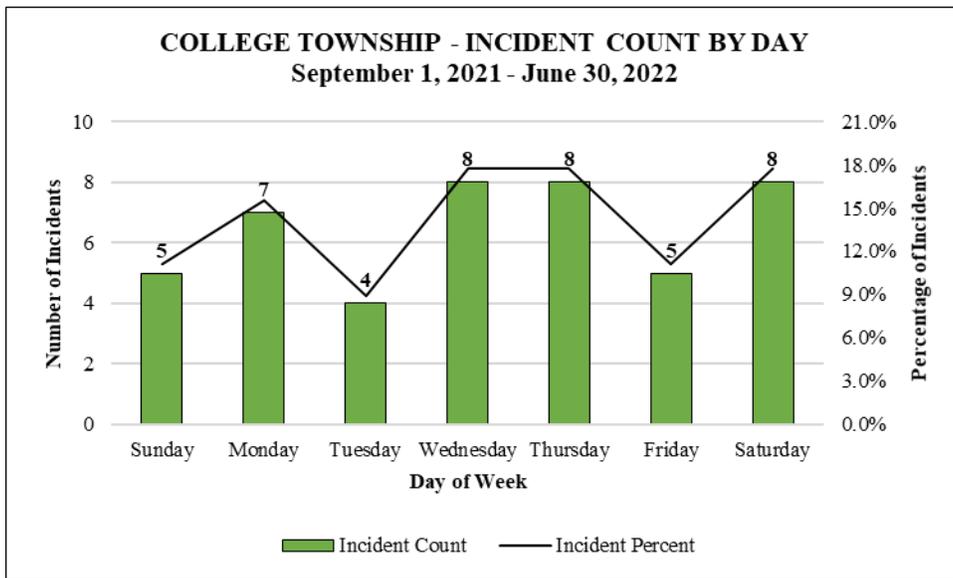
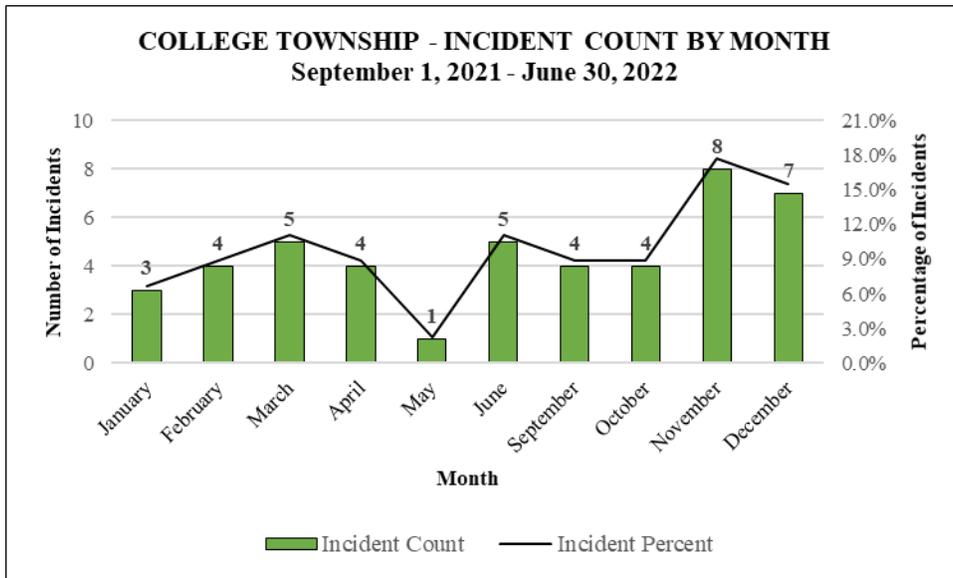
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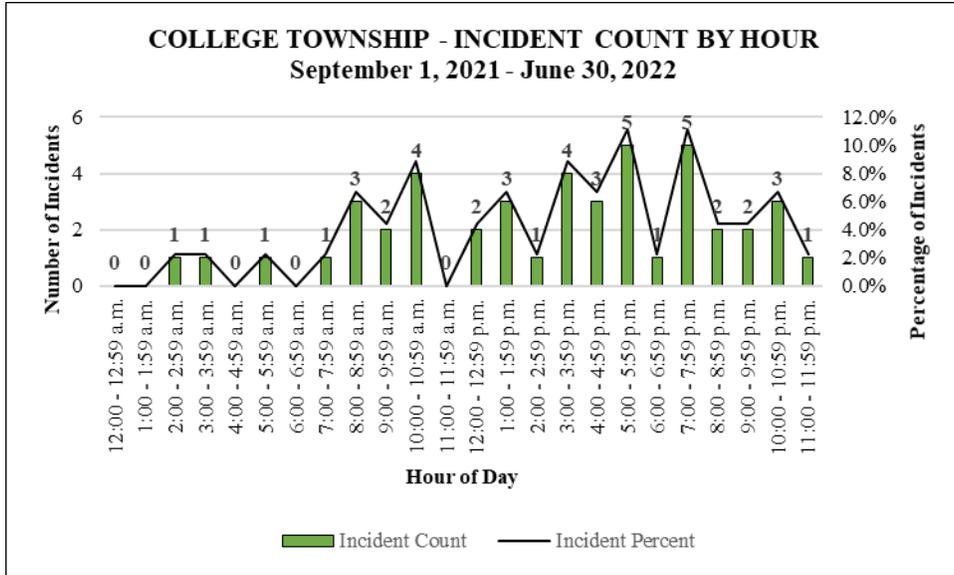
Appendix C

COLLEGE TOWNSHIP TEMPORAL INCIDENT DATA

Reporting Period Total Fire and EMS Incidents: 45



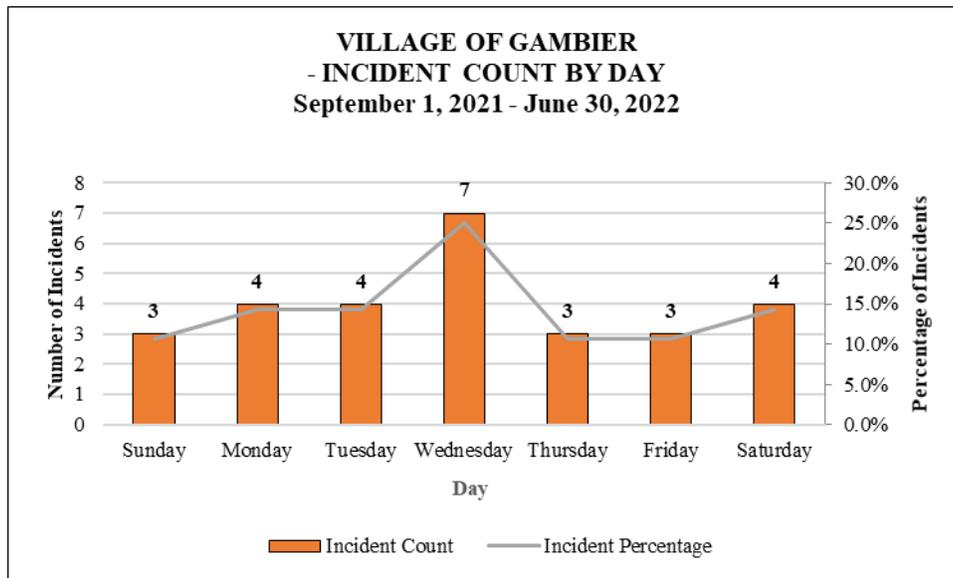
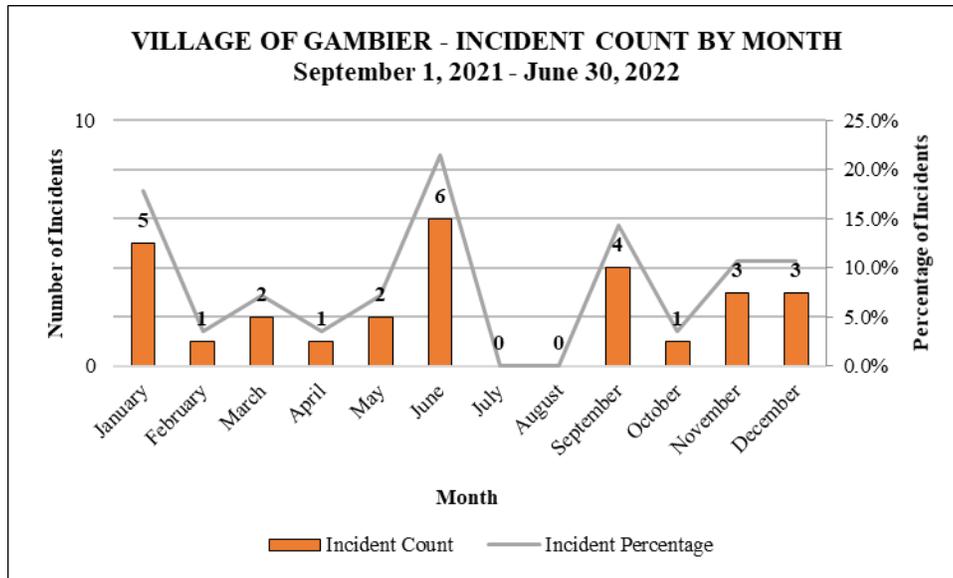
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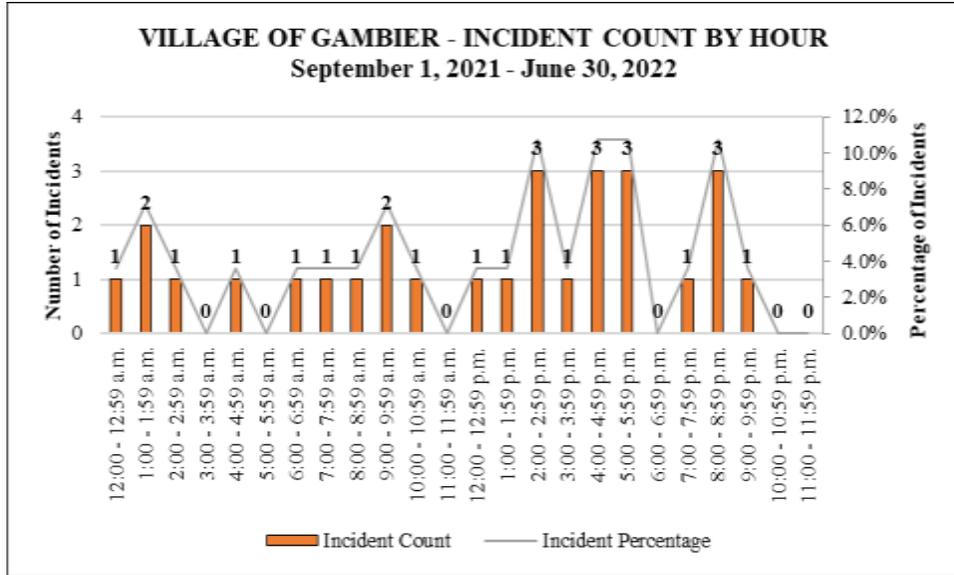
Appendix D

VILLAGE OF GAMBIER TEMPORAL INCIDENT DATA

Reporting Period Total Fire and EMS Incidents: 28



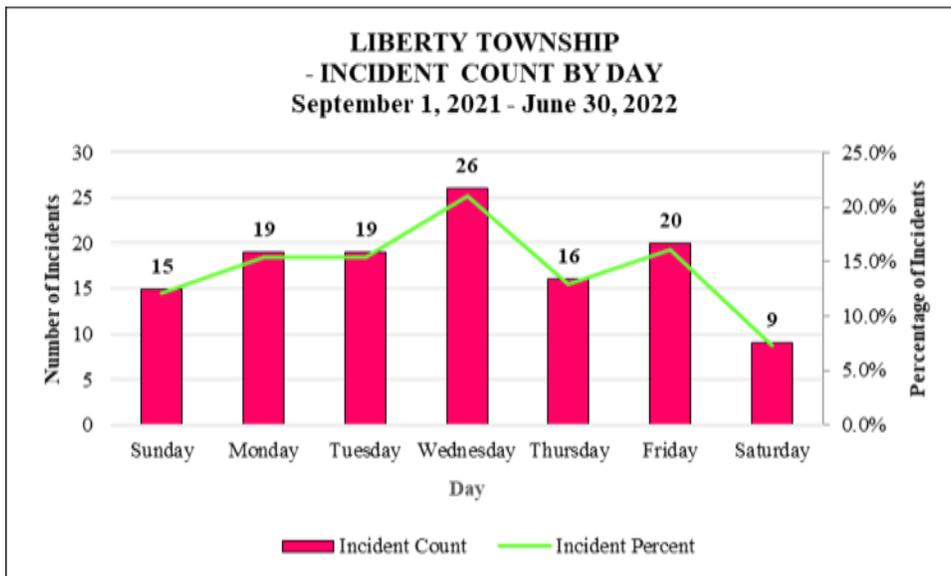
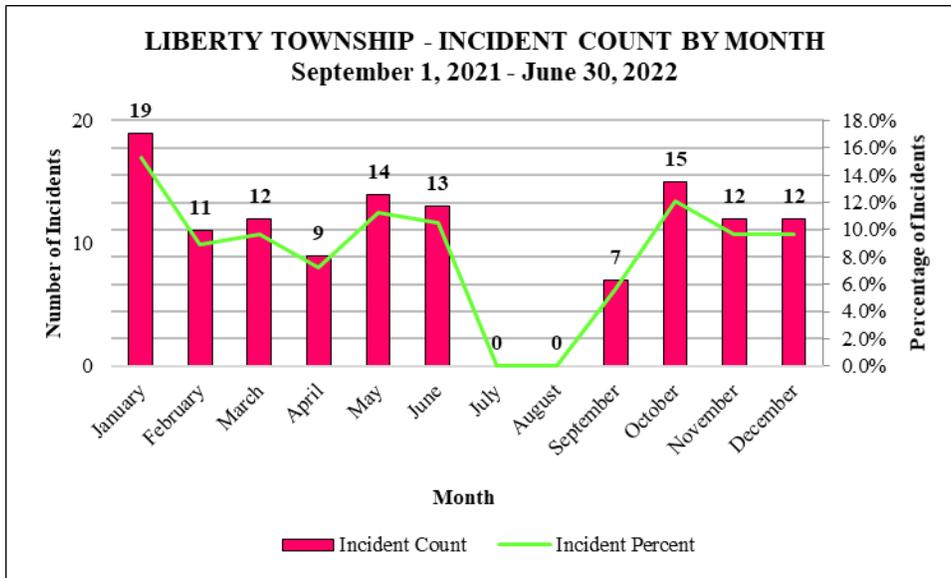
Appendix D continued



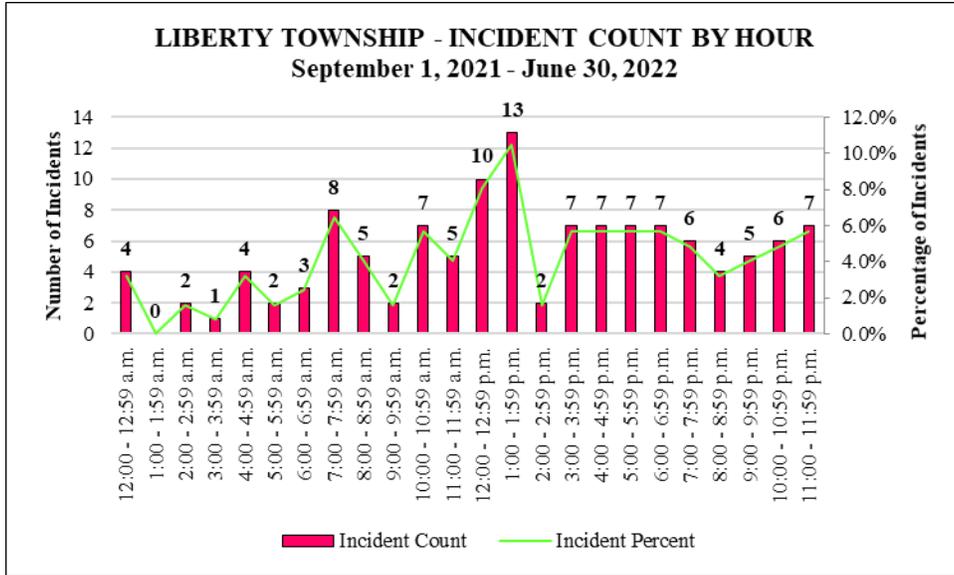
Appendix E

LIBERTY TOWNSHIP TEMPORAL INCIDENT DATA

Reporting Period Total Fire and EMS Incidents: 124



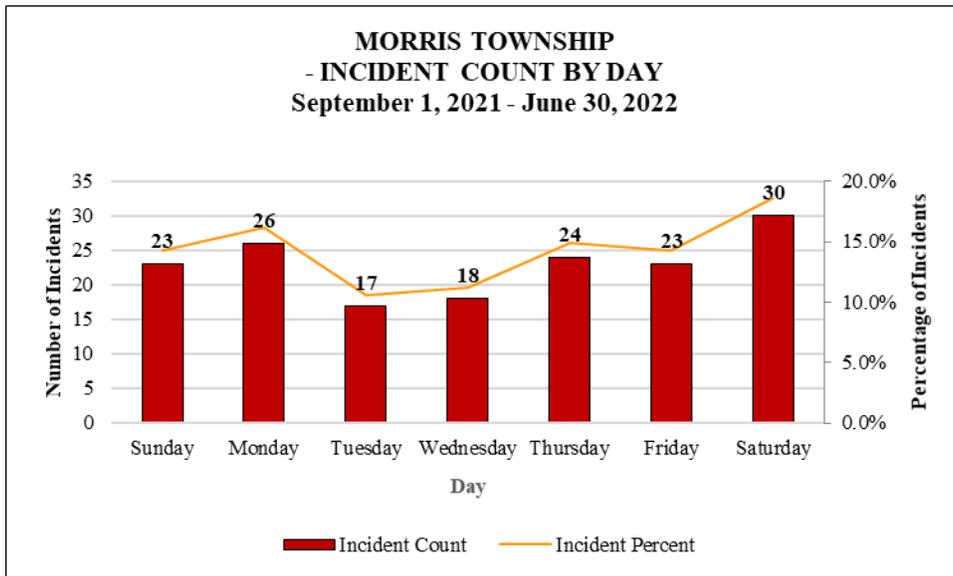
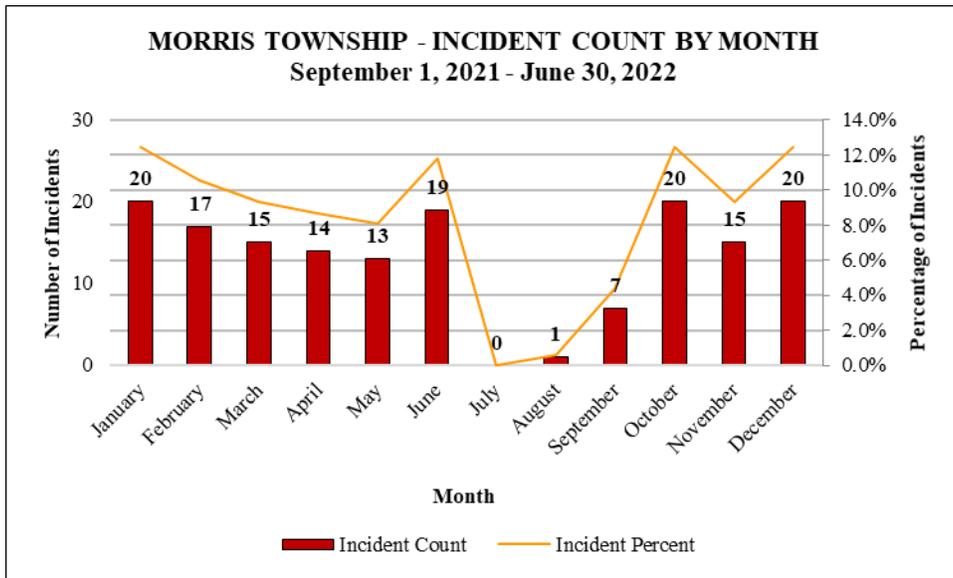
Appendix E continued



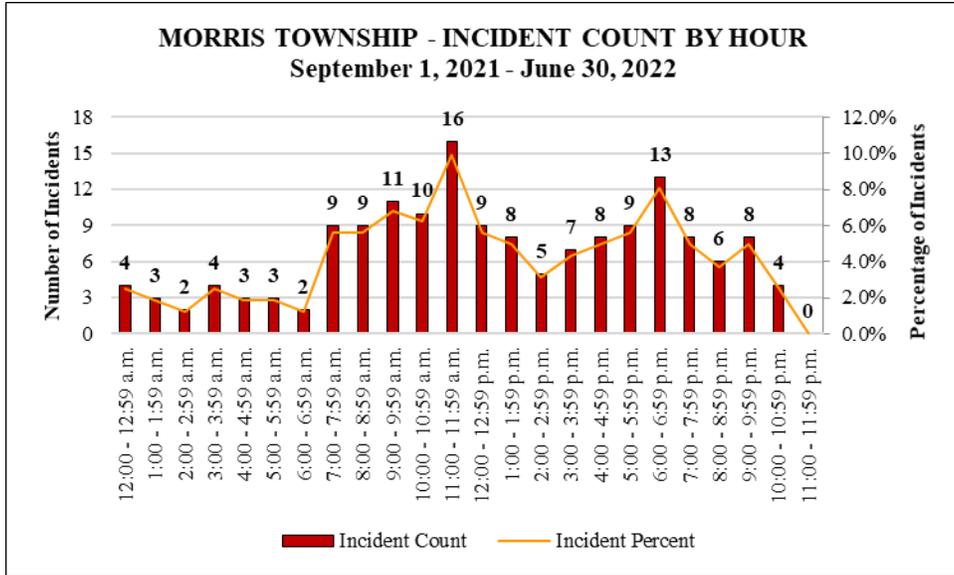
Appendix F

MORRIS TOWNSHIP TEMPORAL INCIDENT DATA

Reporting Period Total Fire and EMS Incidents: 161



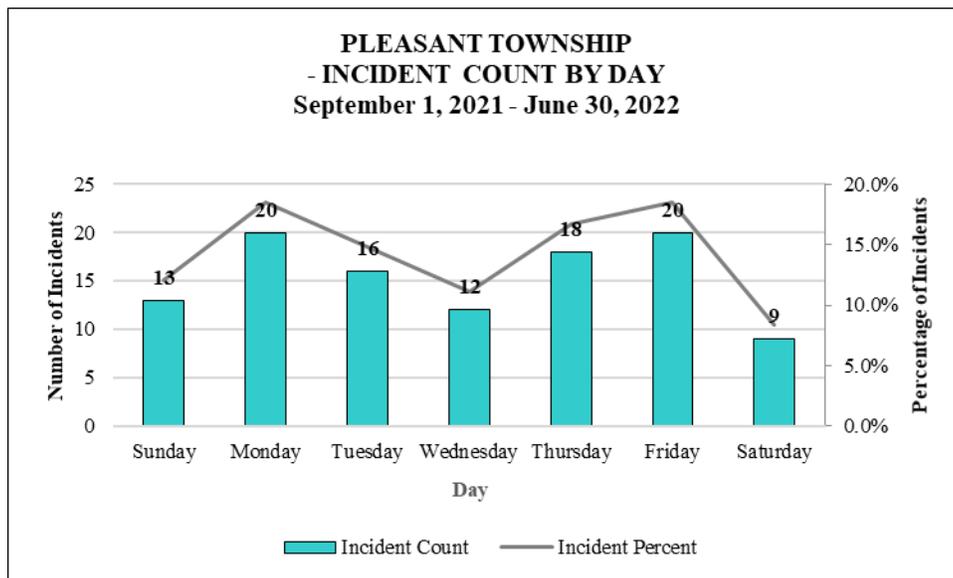
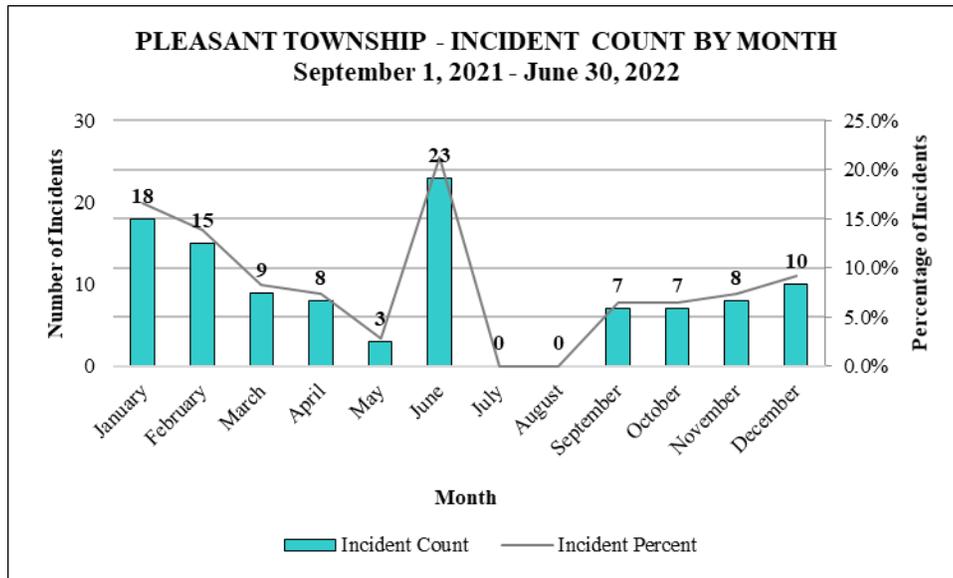
Appendix F continued



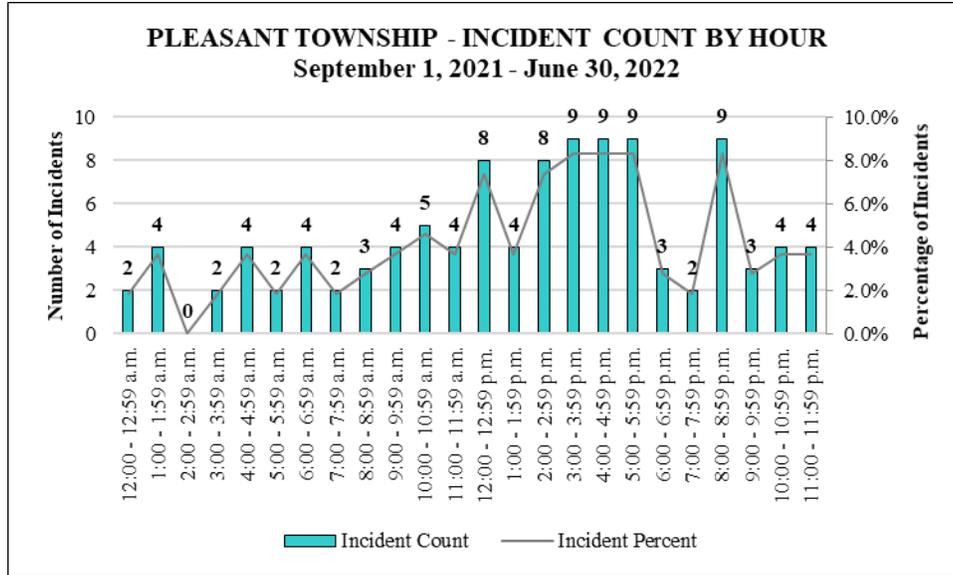
Appendix G

PLEASANT TOWNSHIP TEMPORAL INCIDENT DATA

Reporting Period Total Fire and EMS Incidents: 108



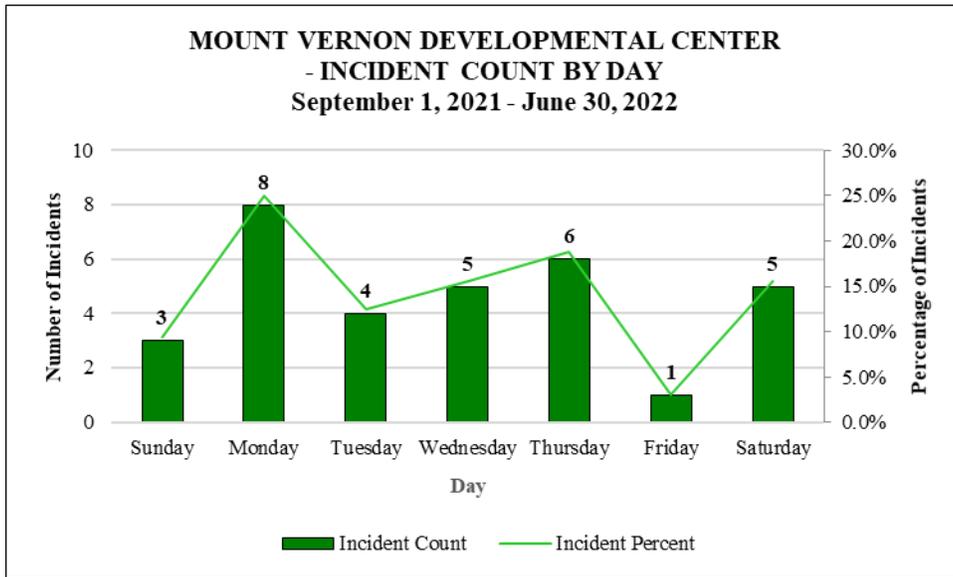
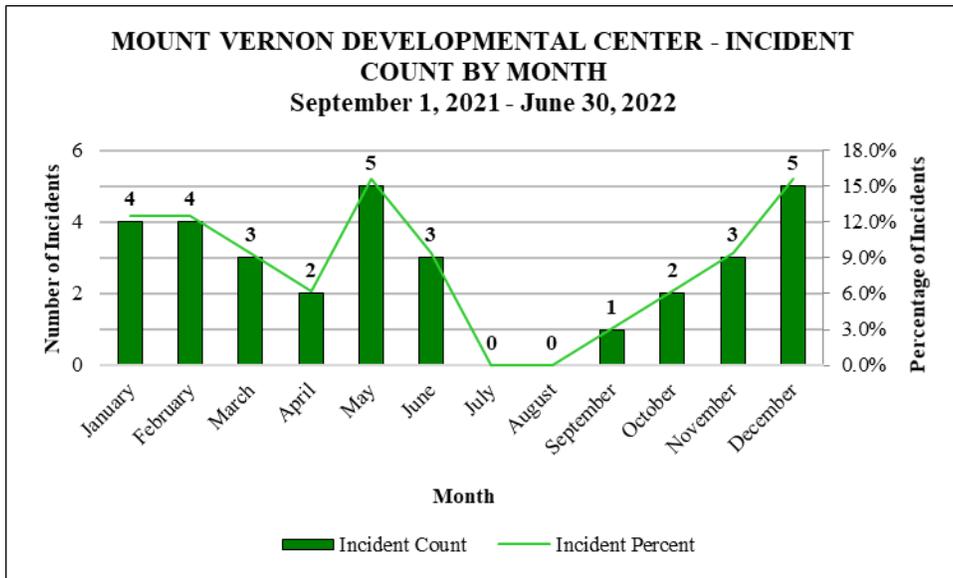
Appendix G continued



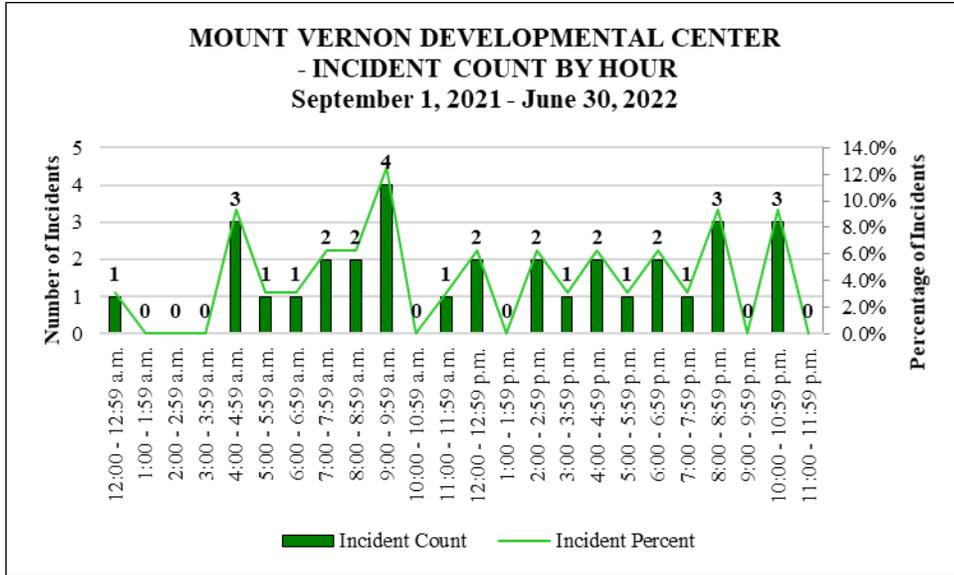
Appendix H

MOUNT VERNON DEVELOPMENTAL CENTER TEMPORAL INCIDENT DATA

Reporting Period Total Fire and EMS Incidents: 32



Appendix H continued



APPENDIX I

STATE OF OHIO TRAINING AND CONTINUING EDUCATION REQUIREMENTS

In the state of Ohio, the Ohio Division of EMS is responsible for all the laws governing EMS. These laws are listed in §4765 of the ORC [<http://codes.ohio.gov/orc/4765>]. Each level of certification is based on the National EMS Scope of Practice, which has been incorporated into the ORC. This outlines exactly what procedures can be performed by each certification level. A basic EMT requires a minimum of 150 hours of initial training and at least 40 hours of continuing education every three years. An advanced EMT requires an additional 200 hours of training above that of an EMT-Basic and at least 60 hours of continuing education every three years. Advanced EMTs are able to perform many ALS procedures and administer certain medications to patients. To advance to the paramedic level, a person must possess EMT certification and is required to attend nearly 900 additional hours of clinical and didactic training, which allows them to perform even more life-saving procedures and administer additional medications. Examples of these procedures would be performing cardio-version, heart pacing, heart defibrillation (shocks to the heart) and advanced invasive procedures such as chest decompression and needle cricothyroidotomy. The paramedic must obtain 86 hours of continuing education every three years, which includes maintaining advanced cardiac life support certification offered through the AHA.

In firefighting, training and certification has three distinct levels. Volunteer firefighting is the basic level and is limited by law to 36 hours of initial training. It is the minimum level required to perform the duties of a volunteer firefighter. This level of training is also the minimum required by law to serve as a part-time firefighter unless additional training is required by the local fire agency.

The next level of firefighter training is Firefighter I. This level requires an additional 104 hours of training beyond the volunteer course level. This level of training also requires the demonstration of competency in several specific areas such as proper use of SCBA. The highest level of training is Firefighter II. This includes 240 - 260 hours of training in a variety of subject matter and the ability to demonstrate competency in several required areas. Full-time firefighters in Ohio are required by law to achieve certification at this level to work in their position. All certification levels require personnel to obtain 54 hours of continuing education every three years for certification renewal.

REFERENCES

- American Journal of Managed Care. (2006). *Vulnerable Populations: Who Are They*, 12(13), 348-352. Retrieved from: <https://www.ajmc.com/view/nov06-2390ps348-s352>
- Arizona Heart Rhythm Center. (n.d.). What is Sudden Cardiac Arrest? Retrieved from <http://azheartrhythmcenter.com/patient-education/what-is-sudden-cardiac-arrest/>
- City of Mt. Vernon Civil Service Commission. (2021, August 23). *Rules and Regulations of the Municipal Civil Service Commission for the City of Mount Vernon, Knox County, Ohio*. Author. <https://mountvernonohio.org/wp-content/uploads/2022/02/2022-CSC-Rules-and-Regulations.pdf>
- City of Mt. Vernon and Mt. Vernon Firefighters and Paramedics, Local 3712. (2021). *Agreement between The City of Mount Vernon and the IAFF Ohio Professional of Professional Firefighters, Mt. Vernon Firefighters and Paramedics, Local 3712, January 1, 2021 to June 31, 2022*.
- City of Mt. Vernon and Mt. Vernon Firefighters and Paramedics, Local 3712. (2022). *Agreement between The City of Mount Vernon and the IAFF Ohio Professional of Professional Firefighters, Mt. Vernon Firefighters and Paramedics, Local 3712, July 1, 2022 to June 30, 2024*.
- Commission on Fire Accreditation International. (2016). *Standards of Cover*. Chantilly, VA: Author.
- Cramer and Associates. (n.d.). Retrieved from: <https://www.cramerphilanthropy.com/case-studies/ohio-eastern-star-home/>
- Insurance Services Office. (2022). *Mount Vernon Public Protection Classification Summary*. Marlton, NJ: Author.
- Mt. Vernon Fire Department. (2022). *The Mount Vernon Fire Department 2021 Annual Report*. Mt. Vernon, OH: Author.
- Mt. Vernon Fire Department. (2023). *The Mount Vernon Fire Department 2022 Annual Report*. Mt. Vernon, OH: Author.
- National Fire Protection Association. (2021). *Fire Loss in the United States 2020*. Quincy, MA: Author.
- National Fire Protection Association. (2008). *Fire Protection Handbook* (20th Ed.). Quincy, MA: Author.
- National Fire Protection Association (2021). *Standard on Types of Building Construction*. (NFPA 220). Quincy, MA: Author.
- National Fire Protection Association. (2019). *Standard for Firefighter Professional Qualifications*. (NFPA 1001). Quincy, MA: Author.

REFERENCES

- National Fire Protection Association. (2020). *Standard for Fire Officer Professional Qualifications*. (NFPA 1021). Quincy, MA: Author.
- National Fire Protection Association. (2019). *Standard for the Installation, Maintenance, and Use of Emergency Services Communications*. (NFPA 1221). Quincy, MA: Author.
- National Fire Protection Association. (2021). *Standard on Fire Department Occupational Safety and Health*. (NFPA 1500). Quincy, MA: Author.
- National Fire Protection Association. (2020). *Standard on Emergency Service Incident Management System*. (NFPA 1561). Quincy, MA: Author.
- National Fire Protection Association. (2020). *Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. (NFPA 1710). Quincy, MA: Author.
- National Fire Protection Association. (2020). *Standard on the Selection, Care and Maintenance of Protective Ensembles for Structural Firefighting and Proximity Fire Firefighting*. (NFPA 1851). Quincy, MA: Author.
- National Fire Protection Association. (2019). *Standard on Selection, Care and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)*. (NFPA 1852). Quincy, MA: Author.
- National Fire Protection Association. (2016). *Standard for Automotive Fire Apparatus*. (NFPA 1901). Quincy, MA: Author.
- National Fire Protection Association. (2017). *Standard for Inspection, Maintenance, Testing and Retirement of In-Service Emergency Vehicles*. (NFPA 1911). Quincy, MA: Author.
- National Fire Protection Association. (2020). *Standard on Use, Maintenance, and Service Testing of In-Service Fire Department Ground Ladders*. (NFPA 1932). Quincy, MA: Author.
- National Fire Protection Association. (2018). *Standard on the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and Service Testing of Fire Hose*. (NFPA 1962). Quincy, MA: Author.
- National Fire Protection Association. (2019). *Standard for Breathing Air Quality for Emergency Services Respiratory Protection*. (NFPA 1989). Quincy, MA: Author.
- National Fire Protection Association. (2022). *Standard for Operations and Training for Technical Search and Rescue Incidents and Life Safety Rope and Equipment for Emergency Services*. (NFPA 2500). Quincy, MA: Author.
- Ohio Administrative Code. (2023). *Rule 4112-5.5. Sex discrimination*. Columbus, OH.
- Ohio Administrative Code. (2015). *Chapter 4123:1-21. Firefighting*. Columbus, OH.

REFERENCES

- Ohio Police & Fire Pension Fund (2023, April). *Employer Manual*. <https://www.opf.org/Files/employer%20manual%20for%20web.pdf>
- Ohio Revised Code §124.23. (2020). *Examinations*.
- Ohio Revised Code §124.31. (2006). *Promotions*.
- Ohio Revised Code §124.40. (2007). *Civil service commissions in municipalities and townships*.
- Ohio Revised Code §146.01. (2003). *Volunteer fire fighters' dependents fund definitions*.
- Ohio Revised Code §505.38. (2007). *Appointment of firefighting personnel*.
- Ohio Revised Code §737.222. (2007). *Employee status of volunteer firefighter*.
- Oxford English Dictionary. (2014 June 1,). *OED Oxford English Dictionary*. Author. https://www.oed.com/dictionary/attrition_n
- Pepalis, B. February 18, 2021. Old Mulberry School property use permit, variances approved by Mount Vernon boards. *The Mount Vernon News*. <https://mountvernonnews.com/stories/574396873-old-mulberry-school-property-use-permit-variances-approved-by-mount-vernon-boards>
- Pepalis, B. January 17, 2023. Planning Commission recommends approval for Newark Road development plan. *The Mount Vernon News*. <https://mountvernonnews.com/stories/638809774-planning-commission-recommends-approval-for-newark-road-development-plan>
- Rielage, R. (2018). *Automatic and mutual aid: The response conundrum*. <https://www.firerescue1.com/fire-chief/articles/automatic-and-mutual-aid-the-response-conundrum-Y40MQY4MdkgI7k36/>
- The RadioReference Wiki. Retrieved from [https://wiki.radioreference.com/index.php/Knox_County_\(OH\)](https://wiki.radioreference.com/index.php/Knox_County_(OH))
- U.S. Census Bureau. (2021). *2020 Decennial Census*. Retrieved from https://data.census.gov/cedsci/profile/Clinton_township,_Knox_County,_Ohio?g=0600000US3908316140
- U.S. Census Bureau. (2021). *2020 Decennial Census*. Retrieved from <https://data.census.gov/cedsci/all?q=College%20township,%20Knox%20County,%20Ohio>
- U.S. Census Bureau. (2021). *2020 Decennial Census*. Retrieved from https://data.census.gov/cedsci/profile/Liberty_township,_Knox_County,_Ohio?g=0600000US3908343218
- U.S. Census Bureau. (2021). *2020 Decennial Census*. Retrieved from: https://data.census.gov/cedsci/profile/Mount_Vernon_city,_Ohio?g=1600000US3953102

REFERENCES

- U.S. Census Bureau. (2021). *2020 Decennial Census*. Retrieved from https://data.census.gov/cedsci/profile/Morris_township,_Knox_County,_Ohio?g=0600000US3908352290
- U.S. Census Bureau. (2021). *2020 Decennial Census*. Retrieved from https://data.census.gov/cedsci/profile/Pleasant_township,_Knox_County,_Ohio?g=0600000US3908363310
- U.S. Census Bureau. (2021). *2020 Decennial Census*. Retrieved from: https://data.census.gov/profile/village_of_Gambier_village,_Ohio?g=1600000US3929246
- U.S. Code of Federal Regulations. *Bloodborne Pathogens*. Title 29, Part 1910.1030 (1992, revised 2012).
- U.S. Code of Federal Regulations. *Respiratory Protection Standard*. Title 29, Part 1910.134 (g)(4).
- U.S. Code of Federal Regulations. *Hazardous Waste Operations and Emergency Response*. Title 29, Part 1910.120 (1989, revised 2006).
- U.S. Code of Federal Regulations. *Health Insurance Portability and Accountability Act General Administration Requirements*. Title 45 Parts 160 and 164 (1991).
- U.S. Code of Federal Regulations. *Occupational Safety and Health*. Title 29 Section 1910.134 (2002).
- Verisk. (n.d.). *Public Protection Classification (PPC)*. <https://www.verisk.com/insurance/about/faq/the-public-protection-classification-ppc-program/>
- Verisk. (n.d.). *Training*. <https://www.isomitigation.com/ppc/technical/training/>