Town of Warminster

Bucks County, PA

FIRE SERVICES AGENCY EVALUATION

ESCI Emergency Services Consulting International

Providing Expertise and Guidance that Enhances Community Safety

June 2019

Acknowledgments

Emergency Services Consulting International would like to thank the following individuals and groups for their input and assistance in completing this project.

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Executive Summary

In September 2018, Warminster Township, Pennsylvania contracted ESCI to conduct a Fire Services Agency Evaluation. Immediately before this evaluation was commissioned, the Warminster Fire Company No. 1 had provided written notification to the Warminster Township Manager that it was not able to guarantee a response to daytime calls. The Hartsville Fire Company was being added during dispatch to cover the daytime Warminster Fire Company No. 1 calls, but its officers and members were concerned about the long-term impacts of this arrangement.

Fire Services Agency Evaluation

In evaluating the staffing of the fire services within the Warminster Township, ESCI applied five of the "Indicators for Change" that were identified by the Volunteer and Combination Officers Section of the International Association of Fire Chiefs in its 2005 *Red Ribbon Report: Leading the Transition in Volunteer and Combination Fire Departments.*

While there is no established rule about when a community should consider hiring paid firefighters, these Indicators do provide guidance for when a community should begin to consider transitioning from a volunteer fire service to a combination or paid fire service.

Four out of the five IAFC Indicators for Change indicate that the Warminster Township should begin considering making changes to the current staffing of its fire services.

As the Fire Services within the Warminster Township evolve, changes will have to occur. Effectively managing these changes will require a new level of commitment, planning, and consideration. Now is the time for the Warminster Township to commence discussions about hiring paid firefighters to work during the day. Ideally, these discussions should be part of the process of developing a Fire Services Master and Strategic Plan for the Warminster Township.

Summary Findings

Figure 1: Warminster Township Fire Services Indicators for Change Assessment

IAFC Indicators for Change	Description	Warminster Township Fire Services
Operational Area: Organizational Overview		
1. **Community Growth**	A history of community growth and projected increases in demand can help forecast and plan for changes in the delivery of emergency services.	The population of the Warminster Township has historically been relatively flat. Data projections indicate that this trend can be expected to continue.
2. **Community Aging**	A fire department's ability to recruit new members is in part dependent on the supply of new, younger people who can be tapped for service. A community's age profile can be an indicator of potential volunteer firefighter recruitment problems ahead.	The overall population in Warminster Township is increasing in age. Data projections indicate that this trend can be expected to continue.
Operational Area: Staffing		
3. **Reduced Staffing**	Units responding with fewer than the required number of people needed to perform that unit's functions pose a serious problem for the safety of citizens and the responders.	This assessment was compromised by a lack of valid data. Indications are that fire units within the Warminster Township are responding with fewer than the required number of people to perform the unit's functions, most frequently during weekday hours.
Operational Area: Service Delivery		
4. **Extended Response Times**	When units regularly fail to get out of the fire station in a timely manner because of inadequate staffing resources, the community is endangered and fire department managers have a reliability problem.	This assessment was compromised by a lack of valid data. Indications are that there are increasingly more frequent instances of first due fire stations not responding to emergencies.

IAFC Indicators for Change	Description	Warminster Township Fire Services
5. **Missed Calls**	When an emergency call goes unanswered, the fire department has a serious problem, not just because life and property are at stake, but also because it is a failure highly visible to the public.	This assessment was compromised by a lack of valid data. Indications are that there are increasingly more frequent instances of the first due fire station not responding to emergencies.

Current Conditions

Organizational Overview

Community Growth

Detailed Population History and Growth Projections for the Warminster Township are included in Appendix M: Future System Demand Projections.

ESCI examined data from the U.S. Census as well as projections from the Delaware Valley Regional Planning Commission as part of the evaluation of the Warminster Township Community Growth. According to the census, the population of Warminster was 34,900 in 1970. By 2010, the population in Warminster Township has decreased seven percent to 32,578. The U.S. Census estimated 32,548 as the Township's population in 2017.[1]

Using the linear projection formula, a population of 32,596 is forecasted. Using the average growth formula, a population of 32,518 is predicted.

In addition to the census-based projections described above, ESCI also reviewed the population projections found in the County and Municipal-Level Population Forecasts, 2015–2045, from the Delaware Valley Regional Planning Commission.[2] This report projected an estimated population in 2020 of 33,035, and in 2025 of 33,473. While this forecast is slightly higher than that described from Census data above, both prediction methodologies produce a relatively flat forecast population change for the Warminster Township during the next six years.

Understanding the population changes within the community is significant relative to understanding future service demands. One of the most common factors influencing service demand is the population of a community. As a result of this relatively flat population change—it is reasonable to expect the demand for service to remain relatively flat in the Warminster Township.

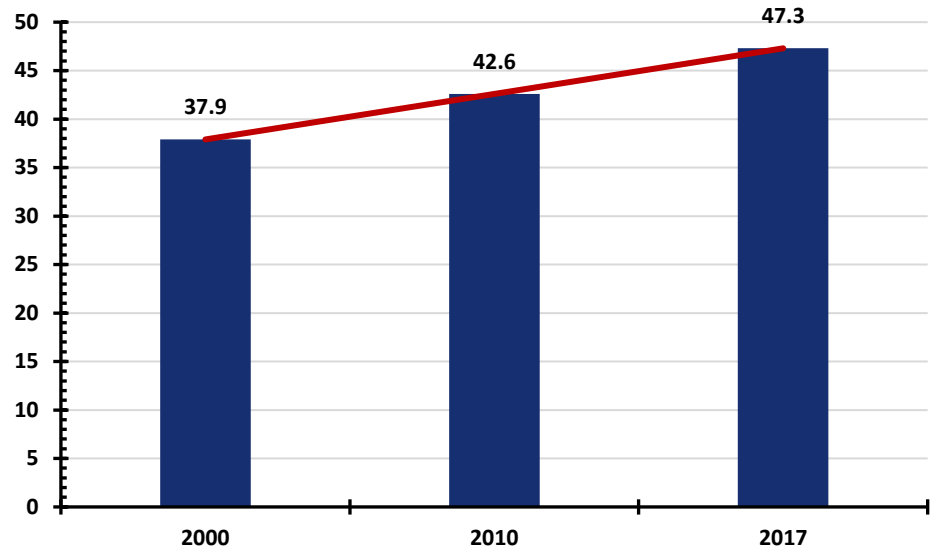
Community Aging

The average age of the population of the Warminster Township appears to be on the rise.

The following figure shows that in 2000, the average age of a Warminster Township resident was 37.9 years. In 2010, the average age had increased to 42.6 years old, and in 2017, the average age of a Warminster Township resident had increased to 43.3 years.

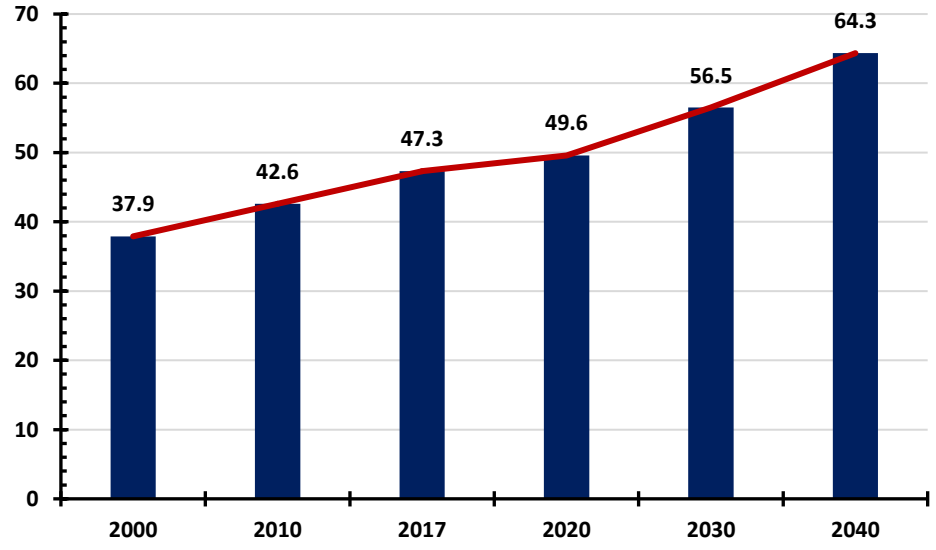
[1] *U.S. Census, 2013–2017 American Community Survey 5-Year Estimates.*
[2] *Retrieved From: https://www.dvrpc.org/Reports/ADR022.pdf*

Figure 2: Warminster Township Compound Annual Growth Rate by Age, 2000–2017



ESCI applied a 1.3 percent Annual Growth Rate to the 2000–2017 historical data and created age projections for the average age of Warminster Township residents through 2040. The projected average age in the Warminster Township rises to 49.6 years old in 2020, 56.5 years old in 2030, and 64.3 years old in 2040. This trend is illustrated in the next figure.

Figure 3: Warminster Township Community Age Projections



2000–2017: Historical Data
2020–2014: Projected Data Based on a 1.3% Annual Growth Rate

A fire department's ability to recruit new members is in part dependent on the supply of new, younger people who can be tapped for service. A community's age profile can be an indicator of potential volunteer firefighter recruitment problems ahead. The overall population in Warminster Township is increasing in age. Data projections indicate that this trend can be expected to continue. The fire departments in the Warminster Township have struggled to recruit and retain new volunteer firefighters in recent years. These projections indicate that recruiting volunteer firefighters in the Warminster Township will become increasingly more challenging.

STAFFING

The detailed Staffing Evaluation for Warminster Township is included in Appendix F: Staffing.

It is critical to note that ESCI's interviews with leaders from the Hartsville and Warminster Fire Companies, as well as with appointed and elected officials from the Warminster Township, all unanimously identified an ongoing challenge in assuring a response from volunteer firefighters for calls occurring Monday through Friday between the hours of 6 am and 6 pm.

NFPA Standard 1720: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, specifies a minimum of four firefighters on the scene before an interior attack on a structure is initiated. This is commonly referred to as "Two In/Two Out." The two (or more) outside firefighters are in place to provide a rapid intervention team (rescue team) in support of the entry team. A two-person safety team is referred to as a rapid intervention crew (RIC), while a four-person team is designated as a rapid intervention team (RIT). The ability of a fire department to have the "Two-In/Two-Out" team in place prior to beginning interior firefighting operations is a key factor in conducting a realistic risk assessment.

Operational staffing may best be considered from the perspective of staffing on each responding fire apparatus (engines, trucks, and rescue vehicles). Ensuring that an apparatus is properly or minimally staffed, prior to responding, is the most effective manner of guaranteeing that a sufficient firefighting force is on-scene before fire attack begins.

Recognizing that sufficient staffing may be challenged by a volunteer workforce, time of day, and day of week, some mechanism for response, with less than minimum staffing should be considered, particularly after waiting for additional personnel to respond to the fire station. For example, after a predetermined time frame, a less than fully staffed apparatus may respond, but will be required to notify dispatch of (below normal) staffing by broadcasting a message such as "Engine 'X' responding with 'Y' firefighters."

The need to staff apparatus with a minimum crew of four firefighters is further ingrained in the volunteer fire companies in Warminster because they both give and receive mutual aid within Bucks County. Apparatus responding into Warminster to provide mutual aid are expected to do so with four firefighters, and firefighters from Warminster who provide mutual aid to neighboring response areas expect to respond with a crew of at least four firefighters as well.

While industry standard recommends crews of four firefighters in order to initiate interior firefighting, the assembly of four firefighters can take on a variety of different appearances. Firefighters can be on shift at the fire station, be assigned to respond to the fire station during specific shifts, or carry pagers and respond when activated. It is common for fire departments to assemble a crew of four firefighters using two or more of these approaches.

ESCI would typically recommend a phased-in approach to staff paid firefighters. In the case of Warminster Township, staffing two paid firefighters during the day to support the current efforts of the volunteer firefighters would put in place half of the crew required to meet the NFPA 1720 Standard while allowing the Township the opportunity to incrementally build paid firefighters into its budget.

ESCI's interviews with the volunteer firefighters and leadership of the volunteer fire companies consistently revealed a desire by the firefighters to see the Township staff four firefighters on an engine on weekdays to relieve them of the burden of weekday response. If the Township chooses to staff less than four firefighters, there must be a plan in place to assure that response of the firefighters that are required to complete the crew. This will require ongoing communication and monitoring on the part of the Township.

Reduced Staffing

Reduced Staffing is the third IAFC Indicator for Change. Reduced staffing becomes a concern when the fire apparatus is responding with fewer than the required number of people needed to perform that unit's function. This creates a potentially serious problem for the safety of citizens and the responders.

This assessment was compromised by a lack of valid data as ESCI was not able to validate how many trained firefighters responded on apparatus to certain types of calls over any period of historical significance. As such, ESCI is not able to identify any specific trends other than to cite that interviews with the leadership of both fire companies identified staffing—especially daytime staffing—as a critical concern within the Warminster Township. That the Warminster Fire Company has taken the added step of adding Hartsville to its calls during weekdays is a further significant indicator that this issue should be a cause for concern for the Warminster Township.

Service Delivery

The detailed Service Delivery Evaluation for the Warminster Township is included in Appendix H: Service Delivery. Valid data was a limiting factor in ESCI's ability to evaluate the Service Delivery within the Warminster Township.

ESCI reviewed current and historical service demand by incident type and temporal variations for Warminster Township. GIS software was used to provide a geographic display of demand within the study area. National Fire Incident Records System (NFIRS) data and Computer Aided Dispatch (CAD) data provided by the departments was used in this section of the report. ESCI used the most appropriate source of data for the analysis.

The NFIRS data provided by the two departments included the years 2015 through 2017 for WFC, and 2015 through 2018 for HFC. For consistency with WFC, only the years 2015 through 2017 were used from HFC records.

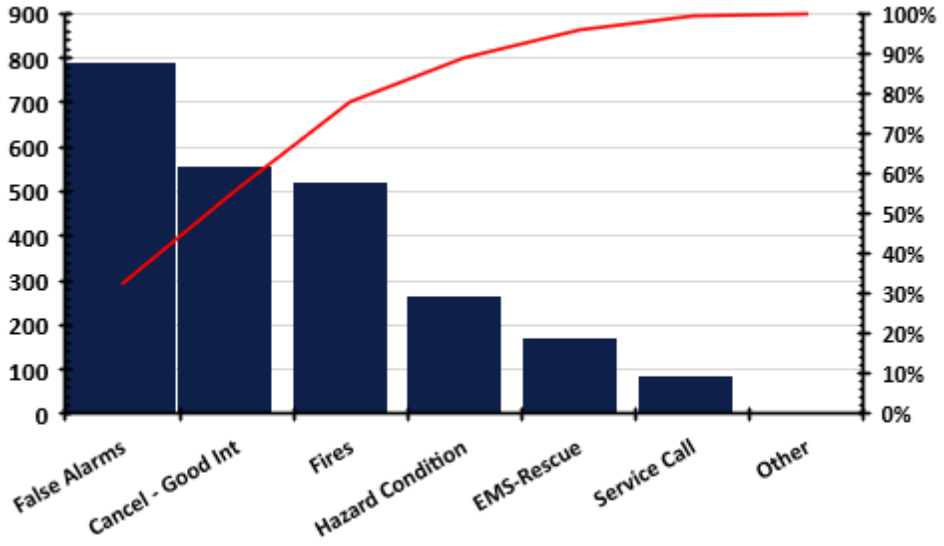
For the 36-month study period 2015 through 2017, a total of 2,732 records were submitted. Of these, 1,935 were from the WFC and 797 from HFC based on the FDID number. Records were further filtered for incidents that occurred within the Township of Warminster. After this adjustment, there were 2,411 total records for evaluation, 1,651 from WFC and 760 from the HFC.

Data from the Bucks County Department of Communications CAD data included 2,910 records for Warminster (municipality code 74). These records included a record for each unit that responded to an incident for the time period January 1, 2016, to September 30, 2018. As this data contained multiple records for each incident, ESCI calculated best performance time for each record and then removed duplicate records. With duplicate records removed, 1,553 records remained for the analysis that required single records.

Demand Summary

The following figure illustrates the aggregate service demand for both the Warminster and Hartsville fire departments for incidents occurring only in Warminster. False alarms account for the highest number of incidents followed by good intent and then fires. Nearly 80 percent of the incidents fall within these three categories.

Figure 4: Historical Service Demand WFC and HFC in Warminster Only by Type of Incident (NFIRS 2015–2017)



Temporal Variation

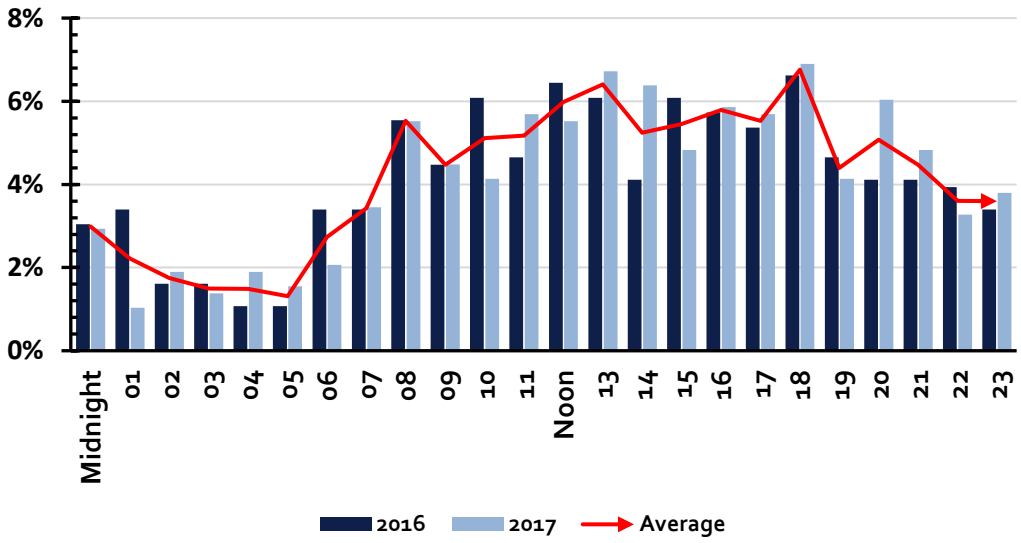
It is useful to evaluate service demand temporally in order to understand any trending that occurs during certain periods where staffing can be modified to better fit the demand. The following figures display 2016 to 2017 service demand within the Warminster Township by the time of day.

Service demand directly correlates with the activity of people, with workload increasing during daytime hours and decreasing during nighttime hours. In Warminster, there is some variation between the percentage of demand by the hour of day in 2016 vs. 2017, but the variation is small.

Average incident activity in Warminster begins to increase at 6:00 am, continues to increase until 8:00 am, followed by slight increases and decreases until a high at 6:00 pm. Aside from a spike at 8:00 pm, there is a gradual decline through the evening and into the night reaching a low at 5:00 am.

Examining the hours of 7:00 am to 5:00 pm—a common workday—this time period counts for nearly 60 percent of calls for service. This demand is a challenge for volunteer personnel who are often committed to work during the weekday hours. The Warminster Township Fire service demand by the time of day is illustrated in the following figure.

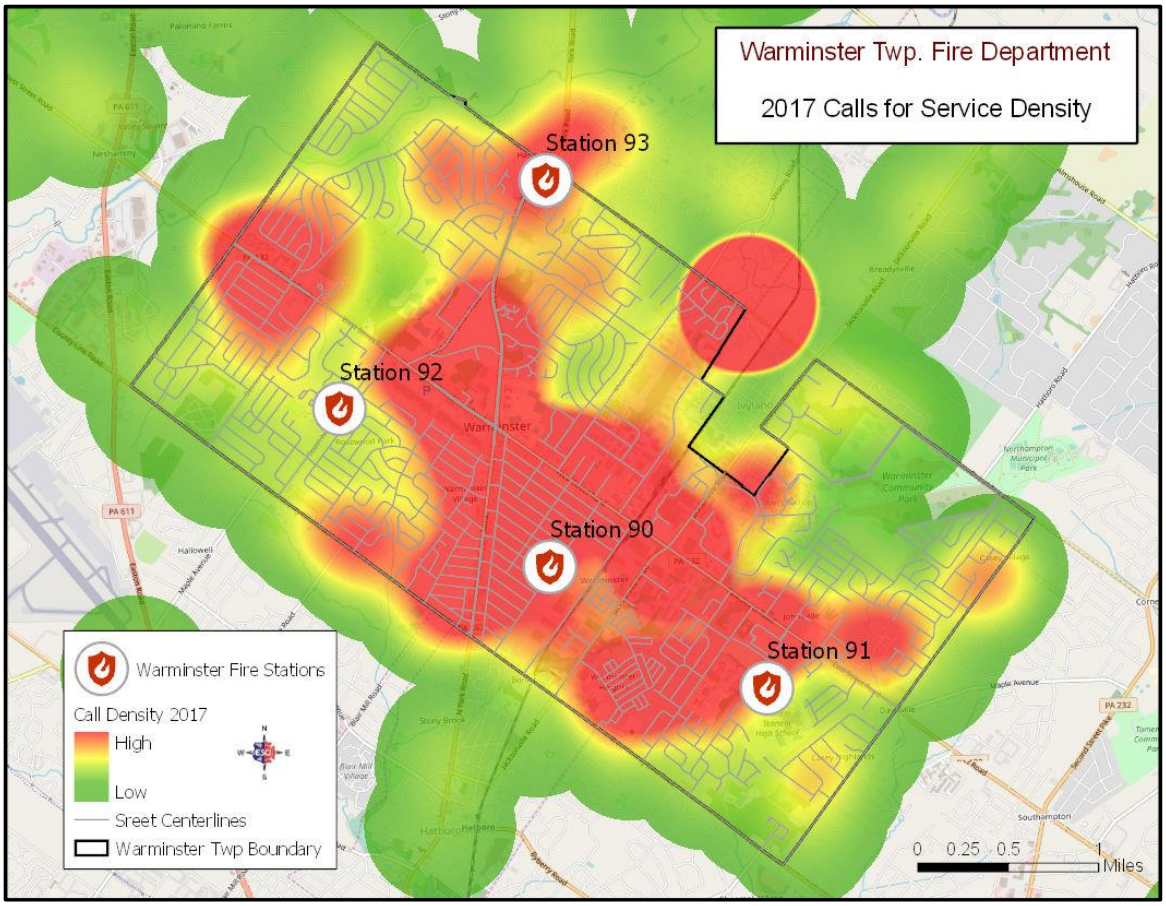
Figure 5: Service Demand by Time of Day (CAD 2016–2017)



Geographic Service Demand

In addition to temporal analysis, it is useful to examine the geographic distribution of service demand. Using CAD data, ESCI plotted the incident locations and calculated the mathematical density of service demand in the Warminster Township service area during 2017.

Figure 6: Warminster Incident Density, 2017

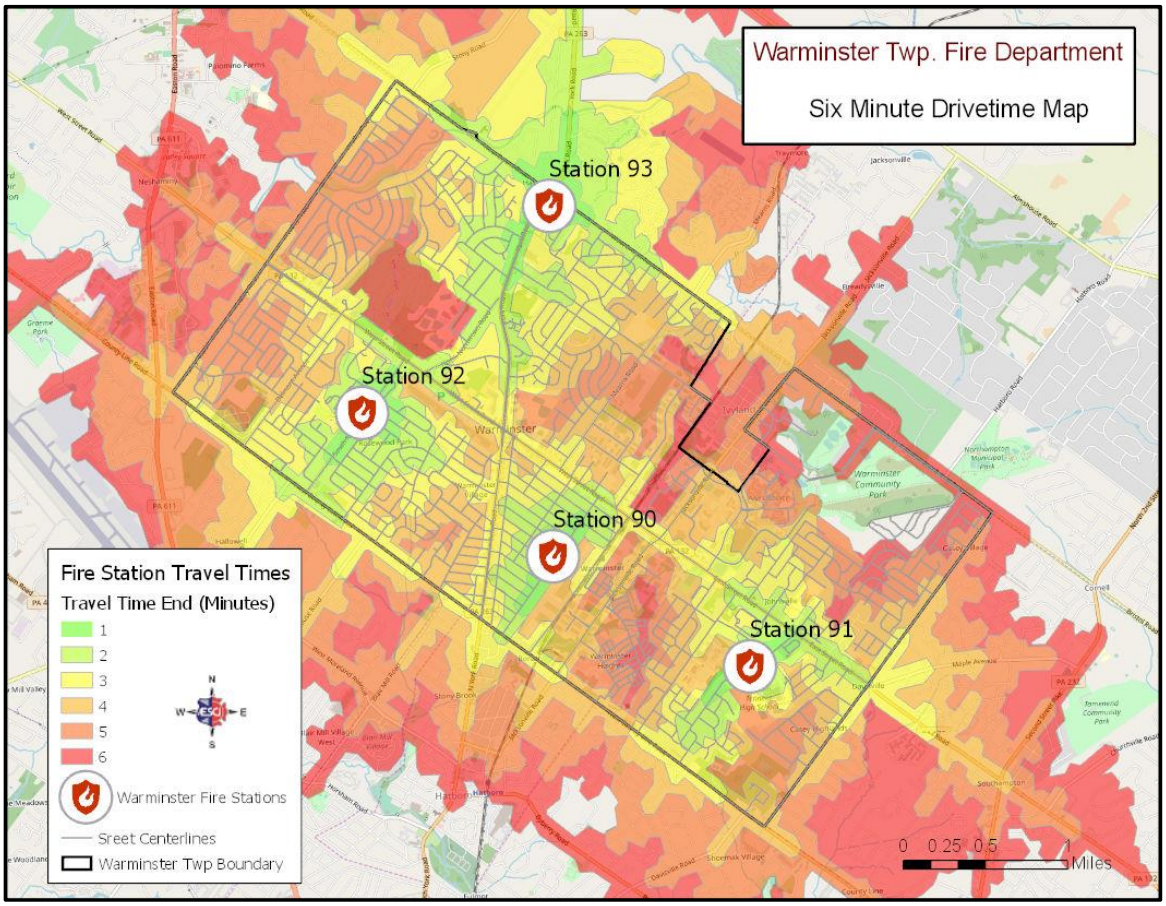


As illustrated in Figure 6, the incident density varies throughout the Township. Three of the higher density areas include Stations 90, 91, and 93. This graphic generally implies that the call volume within the Township is distributed relatively evenly.

Concentration

Accepted firefighting procedures call for the arrival of the entire initial assignment or effective firefighting force (sufficient apparatus and personnel to effectively deal with an emergency based on its level of risk) within a reasonable amount of time. This is to ensure that enough personnel and equipment arrive in a timely manner to safely control a fire or mitigate an emergency before there is substantial damage or injury. In this analysis, ESCI examined the ability of the departments serving Warminster Township to assemble multiple resources across the study area. It is important to note that in a volunteer system in which emergency responders must return to the station to then respond to an emergency, there are many variables to the response structures for each station and its respectively assigned staff. The following figure illustrates the predicted travel time for the WFC and HFC stations at six minutes. Aside from a small area near the community park—the entire area is covered in six minutes' travel time.

Figure 7: Predicted Six-Minute Travel Time



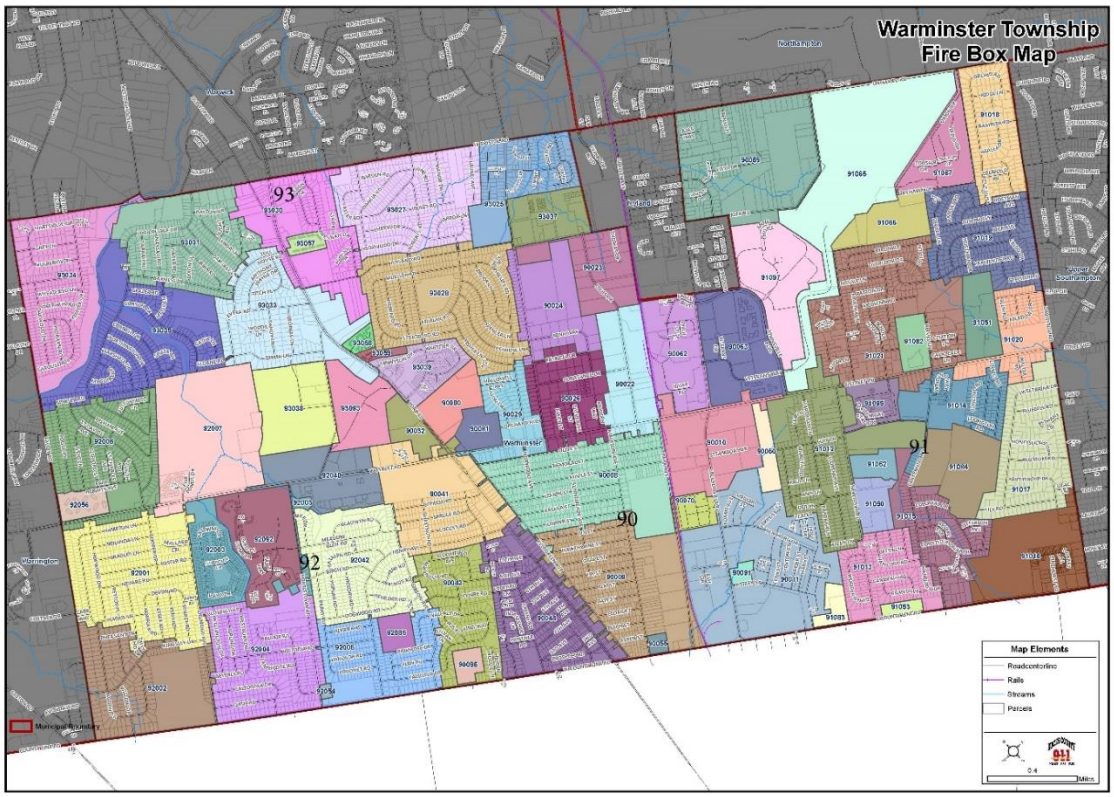
Mutual and Automatic Aid Systems

There are existing mutual aid/automatic aid agreements in place between fire agencies within the Bucks County area. Mutual aid is employed using predetermined box cards. This allows for—depending on the location and type of incident—the appropriate apparatus to be dispatched by the 911 center.

Automatic aid agreements differ from mutual aid agreements in that under certain mutually agreed upon criteria, resources from the assisting agency are automatically dispatched as part of the initial response. These agreements facilitate closest unit dispatch to emergencies in boundary areas and allow for the dispatch of additional apparatus and personnel to specific predefined emergencies.

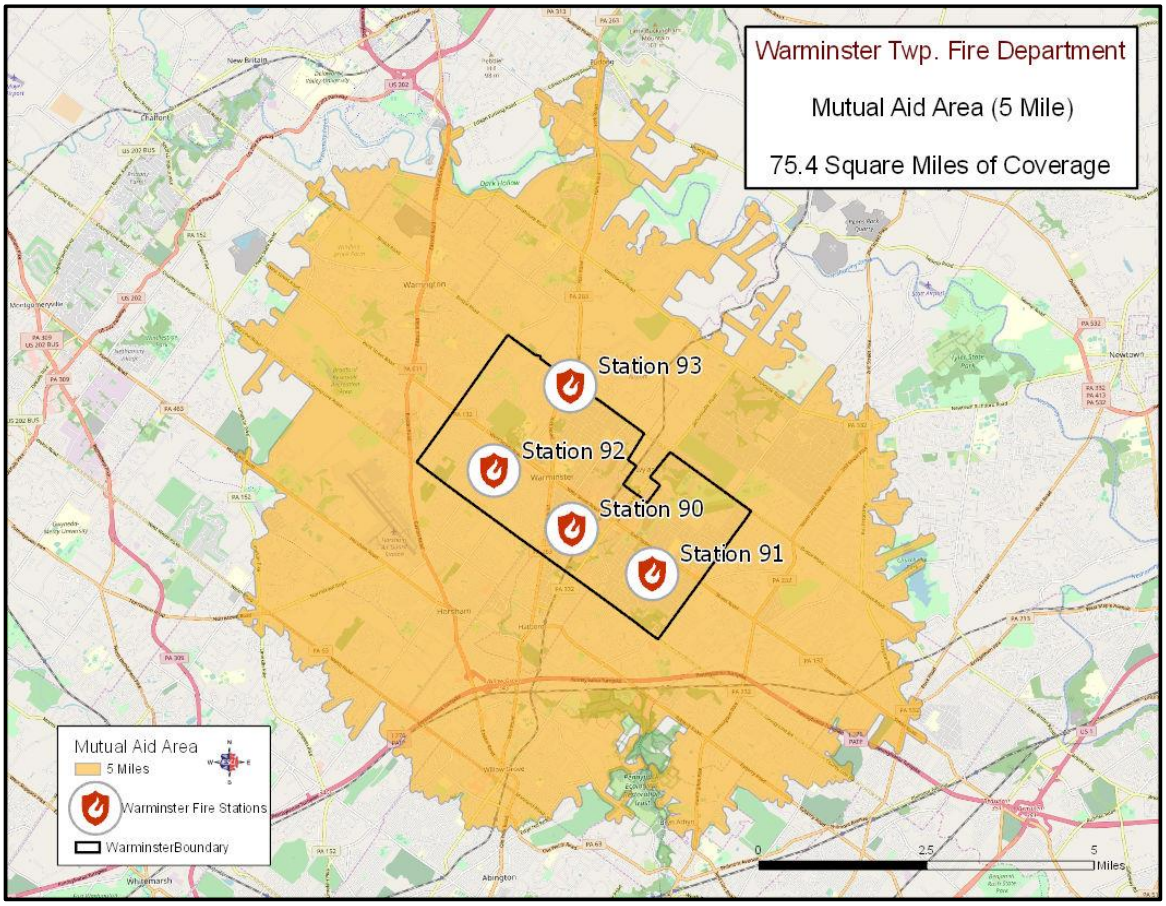
The following figure illustrates the box cards for the areas in Warminster Township.

Figure 8: Mutual Aid Box Cards



As both the WFC and HFC participate in the box card response program, the next figure displays the portions of the surrounding jurisdictions, for example, that are within a five-mile travel distance from WFC or HFC stations. ESCI utilized GIS software to project the travel time from the four stations within the Township. This analysis is accomplished using the posted speed limits provided by Esri. This is intended to show relative distances that are within five miles—not to indicate the only area were responses occur.

Figure 9: Five-Mile Coverage Area Outside Warminster



Extended Response Times

The next IAFC Indicator for Change is Extended Response Times. This is perhaps the most publicly visible component of an emergency services delivery system is that of response performance. Citizens and policymakers alike want to know how quickly they can expect to receive services.

In the performance summary, ESCI examined emergency response performance for the Warminster Township service area using the incident data from Bucks County Communications Center. Nonemergency incidents, mutual or auto aid incidents outside the service area, data outliers, and invalid data were removed from the data set whenever possible.

The benchmark for staffing and deployment applicable to both the WFC and HFC is found in NFPA 1720 and summarized in the following figure.

Figure 10: NFPA 1720 Staffing/Deployment Matrix

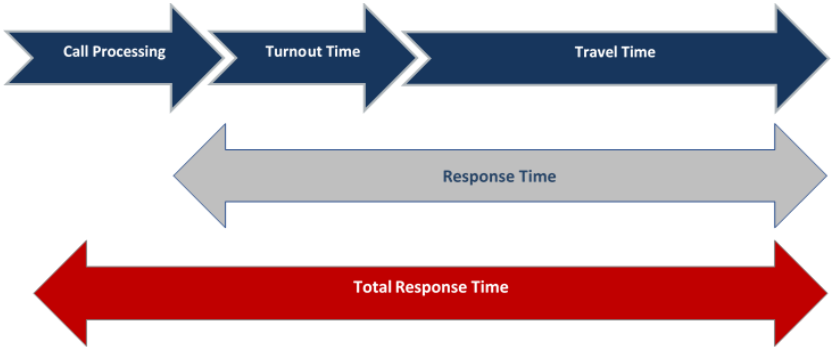
Demand Zones	Demographics	Min. Staff to Respond	Response Time (minutes)	Performance Objective
Urban	More than 1,000 people per sq. mi.	15	9	90%
Suburban	500 to 1,000 people per sq. mi.	10	10	80%
Rural	Less than 500 people per sq. mi.	6	14	80%
Remote	Travel distance 8 miles or more	4	Dependent upon travel distance	90%
Special Risk	AHJ determines	Based on risk	AHJ determined	90%

While the response time described in this figure measures *response time* only—the components defined below include all times related to *total response time* being comprised of several different components:

- **Call Processing Time**—The amount of time between when a dispatcher answers the 911 call and when resources are dispatched.
- **Turnout Time**—The time interval between when units are notified of the incident and when the apparatus are enroute.
- **Travel Time**—The amount of time the responding unit spends traveling to the incident.
- **Response Time**—A combination of turnout time and travel time. The most commonly used measure of fire department response performance. Defined in NFPA 1720 as beginning upon completion of the dispatch notification and ends on arrival at the scene.
- **Total Response Time**—Total Response Time equals the combination of "Processing Time," "Turnout Time," and "Travel Time."

The following figure is an illustration of the total response time continuum.

Figure 11: Summary of Response Time Components



The *average* measure is a commonly used descriptive statistic also called the mean of a data set. The most important reason for not using the *average* for performance standards is that it may not accurately reflect the performance for the entire data set and may be skewed by data outliers, especially in small data sets. One extremely good or bad value can skew the *average* for the entire data set. Percentile measurements are a better measure of performance since they show that most of the data set has achieved a particular level of performance. The 90th percentile means that 10 percent of the values are greater than the value stated, and all other data is at or below this level. This can be compared to the desired performance objective to determine the degree of success in achieving the goal.

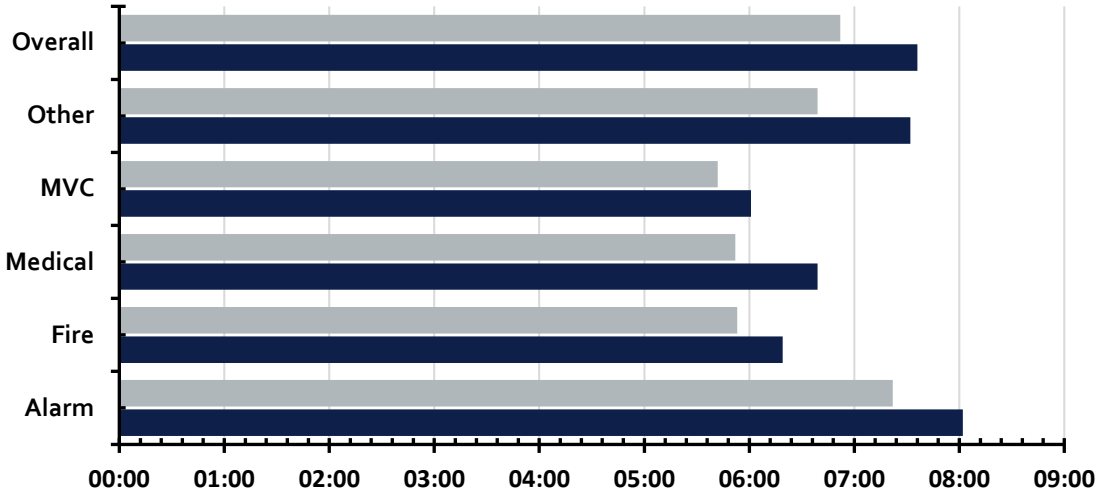
As described previously, for the measurement of performance based on NFPA 1720, the benchmark for an urban community will be used for Warminster as the population density is just over 2,100 people per square mile. Specifically, performance is based on the 90th percentile with a benchmark of nine minutes for response time and a minimum staff of 15.

Although response time is the only component WFC and HFC would measure themselves against the NFPA 1720 benchmark, ESCI included other performance—in which data was available—in this section for comparison and information for the departments.

Turnout Time

The second component of the response continuum, and one that is directly affected by response personnel, is turnout time. Turnout time is the time it takes personnel to receive the dispatch information, move to the appropriate apparatus and begin responding to the incident. Both 80th and 90th percentile performance is illustrated. Again, in a volunteer system where members must first respond to the station, there are numerous variables that can impact turnout time.

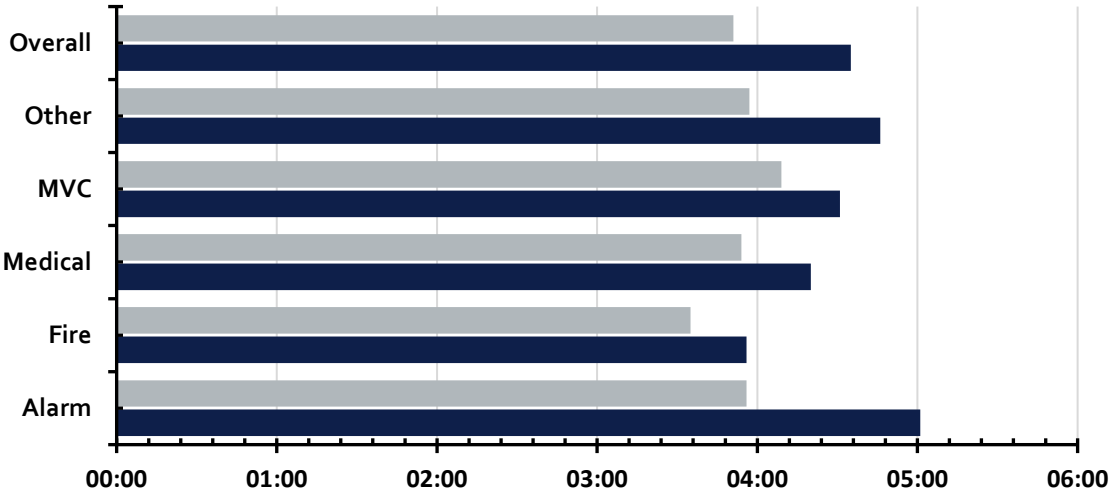
Figure 12: Summary of Turnout Time (CAD 2016–2017)



	Alarm	Fire	Medical	MVC	Other	Overall
80th Percentile	07:22	05:53	05:52	05:42	06:39	06:52
90th Percentile	08:02	06:19	06:39	06:01	07:32	07:36

The next figure illustrates travel time. Again, this is not a measurement required by NFPA 1720 but is provided here at both 80th and 90th percentiles as information.

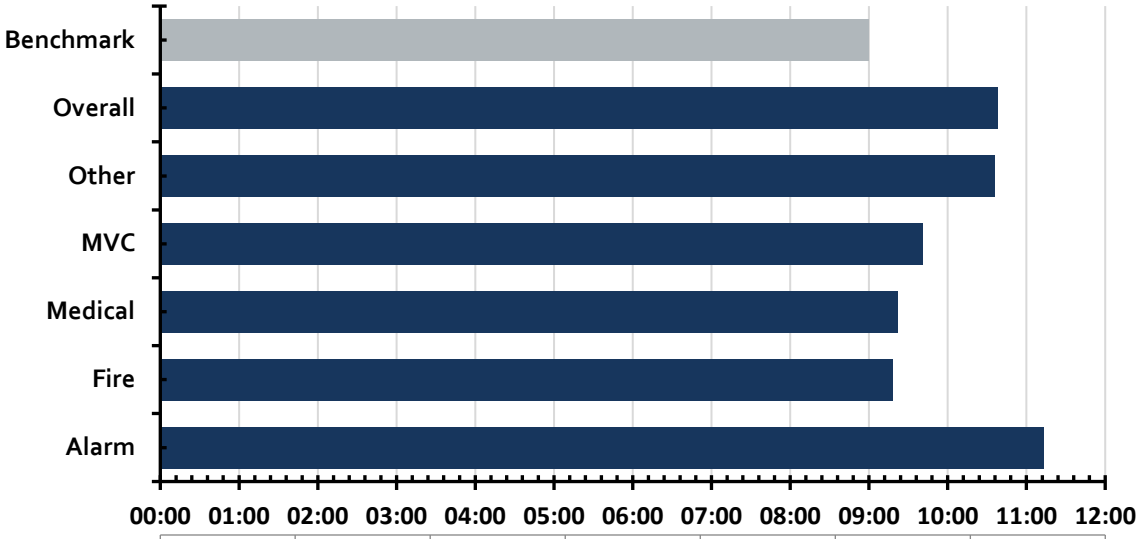
Figure 13: Summary of Travel Time (CAD 2016–2017)



	Alarm	Fire	Medical	MVC	Other	Overall
80th Percentile	03:56	03:35	03:54	04:09	03:57	03:51
90th Percentile	05:01	03:56	04:20	04:31	04:46	04:35

To measure the performance of the WFC and HFC—and to compare it to the requirements of NFPA 1720—ESCI measured response time from the time of dispatch of the alarm to when the first apparatus arrived on the scene of the emergency. ESCI calculated the 90th percentile data for these emergency incidents. The use of percentile measurement of total response time performance follows the recommendations of the NFPA standards and the Center for Public Safety Excellence (CPSE/CFAI) Standards of Cover document.

Figure 14: Summary of Response Time (CAD 2016–2017)



	Alarm	Fire	Medical	MVC	Other	Overall	Benchmark
90th Percentile	11:13	09:18	09:22	09:41	10:36	10:38	09:00

Overall performance exceeds the benchmark by 1 minute, 38 seconds. Response performance to fires comes closest to the benchmark at just 18 seconds above. Alarms have the worst individual incident type performance at 2 minutes, 13 seconds above the nine-minute target. It should be noted that for some incidents, units may have responded in a non-emergency mode are also included here as the CAD data allows for the removal of them.

Data was a limiting factor in ESCI's ability to accurately identify extended response times and any trends that may be emerging within those response times, but interviews with the leadership of both fire departments indicate that extended response times do happen and likely require additional evaluation within the Warminster Township.

Missed Calls

The fifth IAFC Indicator for Change is Missed Calls. When an emergency call goes unanswered, the fire department has a serious problem. Due to the lack of available data, ESCI's ability to accurately identify missed calls and any trends that may be emerging within those missed calls was compromised, but interviews with the leadership of both fire departments indicate that missed calls do happen and likely require additional evaluation within the Warminster Township.

Recommendations

Four out of the five IAFC Indicators for Change indicate that the Warminster Township should begin considering making changes to the current staffing of its fire services.

The complete Fire Services Agency Evaluation of the Warminster Township, included in this report as Appendices A–M, is a comprehensive report with specific recommendations.

ESCI provides the following summary of the major recommendations to be used as a starting place for discussions within the Township regarding the next steps. The following figure includes:

Short-Term Recommendations: 0–12 months: Immediate actions that can be taken to begin to address the staffing challenges that currently exist within Warminster Township.

Mid-Term Recommendations: 1–3 years: Actions that will not have an immediate impact on the staffing challenges in the Warminster Township but will likely contribute to a positive outcome in the coming years.

Long-Term Recommendations: > 3 years: Actions that will likely contribute positively toward the staffing challenges faced by the Warminster Township more than 3 years into the future.

Figure 15: Recommendations For The Warminster Township Fire Services

Duration	Recommendations
Short Term **0–12 Months** *Immediate actions that can be taken to begin to address the staffing challenges that currently exist within Warminster Township.*	1. Review automatic aid agreements with all surrounding fire departments for "structure" fire calls to ensure adequate personnel are available. 2. Host the IAFC *Member and Leadership Collaboration (MLC) for Combination/Volunteer Departments* in Warminster Township to work toward establishing a stronger relationship between the volunteer fire companies and Township officials. 3. Establish performance criteria in accordance with NFPA 1720: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments* to effectively meet the needs of the community.
Mid Term **1–3 Years** *Actions that will not have an immediate impact on the staffing challenges in the Warminster Township but will likely contribute to a positive outcome in the coming months and years.*	1. Warminster Township should engage in a Master and Strategic Planning Process that coordinates the current efforts of the Hartsville Fire Company, the Warminster Fire Company No. 1, and the Warminster Township. 2. Expand the day-to-day duties of the Fire Marshal position to include administrative leadership and coordination of the volunteer fire companies and to supervise paid firefighters that are hired by the Township to augment the response of the volunteer fire companies. 3. Allow Warminster Township personnel who desire to become Firefighter II certified to respond to "structure" fire calls Monday through Friday to augment volunteer response. 4. Implement a community risk reduction program utilizing career personnel to serve as Fire Inspector/Public Education Technicians. These individuals should be certified at the Firefighter II and Emergency Medical Technician levels to allow for the response to emergency calls Monday through Friday when limited volunteer response is available. 5. Implement industry "best practices" in preventing firefighter exposure to carcinogens.
Long Term **> 3 Years** *Actions that will likely contribute positively toward the staffing challenges faced by the Warminster Township several years into the future.*	1. Warminster Township should engage in a long-range Master Planning Process. 2. Take an active role in advocating for programs and legislation at the federal and state levels that will improve the likelihood of a sustainable volunteer fire service. 3. Actively work with Bucks County to ensure compliance with NFPA 1221: *Standard for the Installation, Maintenance, and Use of Emergency Services Communications System.*

Conclusion

NFPA 1720, 4.1 specifies that "Fire suppression operations shall be organized to ensure that the fire department's fire suppression capability includes sufficient personnel, equipment, and other resources to deploy fire suppression resources efficiently, effectively, and safely." While NFPA standards are consensus standards and not law, they are the industry standard for best practice in the fire service. ESCI's report has benchmarked the current level of fire service protection delivered within the Warminster Township during the study period, and to date, this level of service has been acceptable within the Warminster Township.

The announcement from the Warminster Fire Company No. 1 that it is not able to guarantee a response to daytime demands suddenly calls into question the ability for fire service to continue to be delivered to the residents of Warminster Township "efficiently, effectively, and safely" as specified by NFPA 1720. The Second Class Township Code of the Commonwealth of Pennsylvania charges the Township with the responsibility for ensuring that fire and emergency medical services are provided within the jurisdiction. As such, it is the recommendation of ESCI that the volunteer fire service in Warminster Township should now begin to be augmented by career personnel in order to assure an adequate firefighter response in accordance with established performance metrics to all emergency calls that occur within the Warminster Township. These metrics should be focused on the ability of the fire departments to place initial arriving units on the scene of an emergency in a timely manner as well as the ability to assemble enough personnel to mitigate an emergency incident.

The ESCI project team began collecting information concerning this Agency Evaluation in September 2018. The team members recognize this report contains a large amount of information and ESCI would like to thank the Warminster Township Staff, Elected Officials, members of the Hartsville Fire Company, and members of the Warminster Fire Company No. 1 for bringing this project to fruition. ESCI would also like to thank the various individuals and external organizations for their input, opinions, and candid conversations throughout this process. It is ESCI's sincere hope the information contained in this report is used to its fullest extent and the emergency services provided to the citizens of Warminster and the surrounding area will be improved by its implementation.

Appendix A: Organizational Overview

Stakeholder Meetings

The beginning is the most important part of the work.

In order to dedicate time, energy, and resources to the functions that are most desired by its customers, Warminster Township must understand the customers' priorities and expectations. As part of this project, ESCI conducted interviews with elected officials, Township staff, volunteer firefighters, and mutual aid partners to obtain community perspective regarding fire services provided to the Township. These interviews focused on stakeholder areas of concern, areas of strength, expectations, and response times. The following figures represent the data collected from the external stakeholder groups.

Figure 16: Stakeholder Interview Results

Areas of Concern
Firefighters being drained (quite busy).
Is the number of fire stations correct?
Don't know exactly how funds are being spent.
Not typically, but at times don't want to talk about new things and programs.
Other fire departments paying per call will have an impact on Warminster departments.
Is the current number of firefighters enough?
Does the community need to maintain more than one fire department?
Departments are having difficulty getting volunteers out during the day.
Houses have burned waiting for firefighters to come during the day.
Other departments drive excessive speeds coming into Township to help.
Companies/businesses don't allow employees to run calls as much anymore.
Four stations may not be necessary.
The length of time it takes to become a firefighter.
Areas of Strength (Pride)
Firefighters are highly trained.
Very experienced fire departments.
High expectations of each other.
Training is considered to be valuable.
Extra stuff the departments do for the community/being community oriented.
Great fleet of apparatus, great people, good buildings.
Well trained and well equipped.
Community respects them.
They make people feel calm when they show up.
Good training and good equipment.
Firefighters are dedicated.
Lots of outreach by the fire departments to the community.
Community loves the fire departments.

Expectations
Good response times.
To have a cultural willingness to look at out of the box answers and not just shut down new ideas because it hasn't been done before.
To not be resistive to change.
To seriously explore new methods for identifying the recruitment of volunteers.

ORGANIZATIONAL OVERVIEW

The Organizational Overview component provides a review of the organization, discussing the agency's configuration and the services that it provides. Data provided by the Warminster Fire Company No. 1, Hartsville Fire Company, Township Manager's Office, and Bucks County Communications Center was combined with information collected in the course of ESCI's fieldwork to develop the following overview.

The following graphic depicts the Warminster Township fire stations. Station 93 is the Hartsville Fire Company, and Stations 90, 91, and 92 are operated by Warminster Fire Company No. 1.

Figure 17: Warminster Township Fire Stations

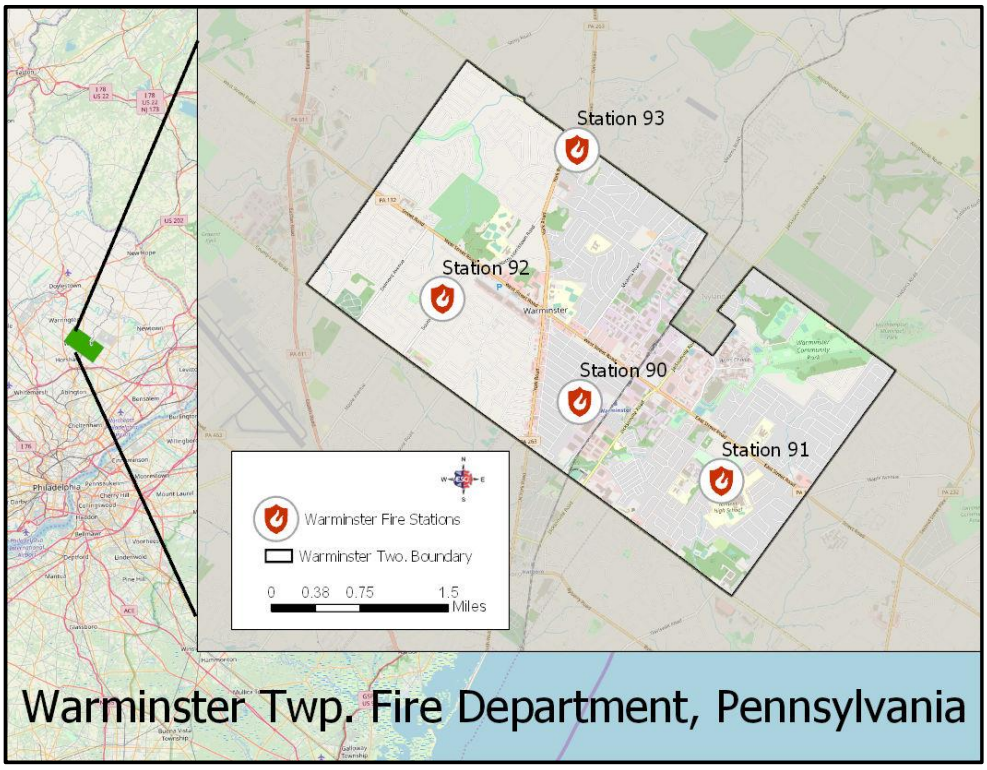
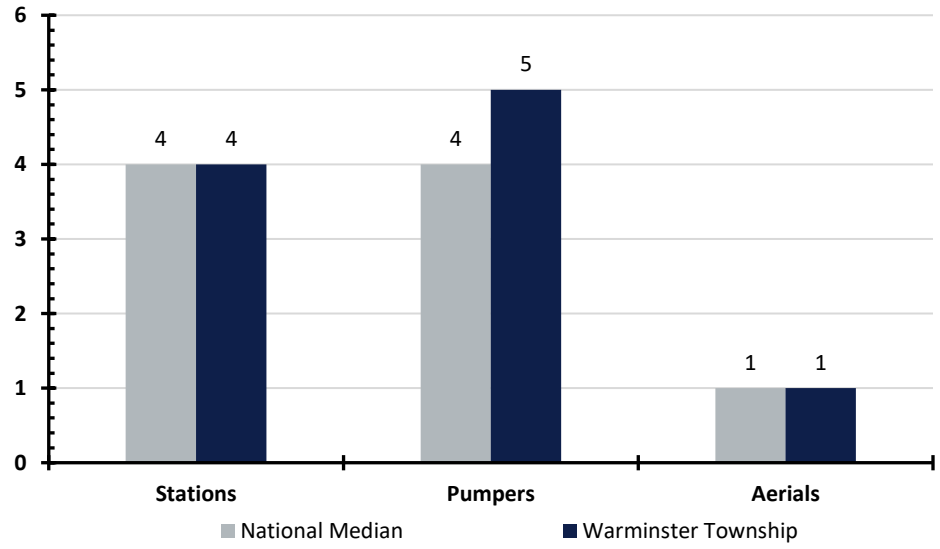


Figure 18: Populations Served by Municipality[3]

Age	Percent
< 5 years	5.0%
5 to 18 years	18.8%
19 to 64	50.2%
> 65 years	26.0%
Race	**Percent**
White alone	90.0%
Black or African American alone	3.3%
American Indian and Alaska Native alone	0.1%
Asian alone	2.6%
Two or More Races	1.5%
Hispanic or Latino	8.4%

Slightly more than half of the population in Warminster Township are between the age of 18 and 65 years in age. This places a significant amount of the population in the "working" category. Of specific concern are the age populations generally considered to be more "at risk." This group accounts for slightly more than 30 percent of the Township's population. It is commonly understood that young and senior population groups are more susceptible to diseases, accidents, and injuries. Understanding these demographics is critical to the provision of emergency services to the citizens of Warminster Township. Any significant health-related impacts on these groups can reasonably be expected to have a correlating impact on the services provided by Warminster Township and Bucks County.

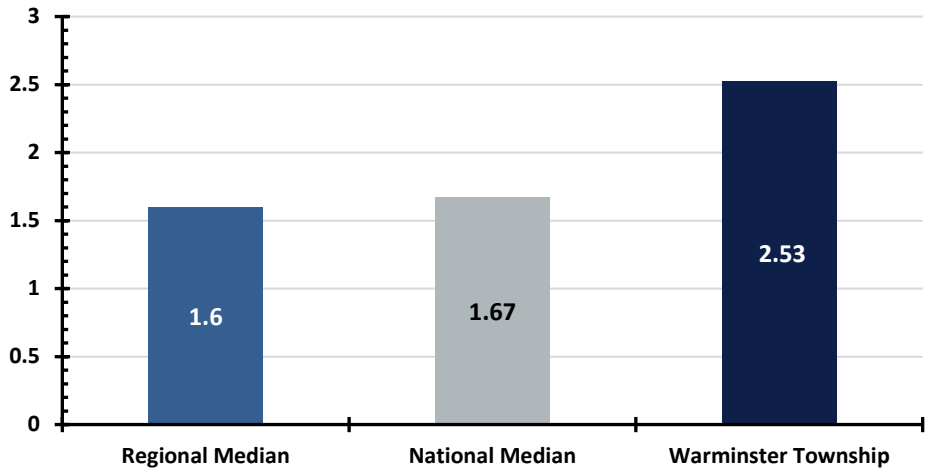
Figure 19: Comparison of Physical Resources to NFPA Data[4]



[3] *U.S. Census Bureau.*
[4] *Michael J. Karter, Jr. and Gary P. Stein, National Fire Protection Association, U.S. Fire Department Profile through 2010, October 2011.*

Generally speaking, similar sized communities utilize four fire stations, with four fire engines and one aerial (ladder) unit to serve their communities. There are a variety of factors that typically establish the number of stations a community utilizes to provide fire protection services. More often than not, the inventory of fire stations and associated fleet have evolved over a period of time where different volunteer fire departments have existed and eventually morphed into a common system. In these types of situations, no data analysis has been conducted to determine the number or location of fire stations. Without supporting data analysis, policymakers have been reluctant to reduce or even reallocate the number of stations necessary to provide services.

Figure 20: Comparison of Firefighters Personnel per 1,000 Population[5]



Warminster Township is served by two fire departments operating from four fire stations. These fire departments both operate systems entirely of volunteer firefighters. Similar to volunteer fire departments across the United States, personnel "respond" when alerted by a paging system and often respond from their homes or places of employment. Once the call is complete, these individuals return to their place of residence or work. The system has worked well for the community but is beginning to experience challenges with consistently "turning-out" firefighters during daytime hours when firefighters are at work. Historically, employers allowed the personnel to respond in support of fire department operations. Unfortunately, as society has begun to change this is no longer a normal practice. As call volumes begin to increase, employees are being called away from work more often and for longer periods of time. Additionally, many volunteer firefighters no longer work within their communities and are too far away to be of assistance. When compared to other fire departments within the region and on a national level, Warminster Township enjoys a higher number of firefighters per 1,000 in population than many fire departments. This figure is only intended to serve as a snapshot of the current situation and is not intended to serve as a definitive indicator of Warminster's and Hartsville's ability to recruit and retain quality volunteer members. Interviews with both fire departments highlighted the fact that both agencies are experiencing challenges with recruiting new members. This is a common theme in volunteer fire departments across the United States.

[5] *ESCI independent research of each respective organization's websites and published budget documents.*

Governance and Lines of Authority

Located in central Bucks County, Pennsylvania, Warminster Township occupies 10.2 square miles and has a population of 32,682 per the 2010 U.S. Census. Warminster Township was formally established in 1711 and later organized as a Second-Class Township. The designation of a Second-Class Township outlines the powers granted by the Commonwealth of Pennsylvania to the Township. Warminster's authority is restricted to those powers specifically authorized by the Commonwealth.

In Pennsylvania, every citizen lives in a school district, a county, and a municipality. School districts are charged with providing education. The county is charged with elections, social services, the court system, emergency management, and land use planning. Municipalities, which include Townships of the first and second class, boroughs, cities, home rule municipalities, and a town, are primarily responsible for public infrastructures such as roads and water systems. Municipalities are also the primary providers of public safety services, including emergency management and response, and police, fire, and ambulance service.

The Second Class Township Code is the commonwealth law that creates Townships of the second-class, sets out this form of government, and delegates certain mandatory responsibilities to Townships, as well as the authority to provide optional services and enact certain regulations. In 2008, the Second Class Township Code was amended to clarify that the Board of Supervisors is responsible to ensure that fire protection is provided within the Township.

Second Class Township Code, Act 69 of 1933

Section 1553. Emergency Services.—(a) The Township shall be responsible for ensuring that fire and emergency medical services are provided within the Township by the means and to the extent determined by the Township, including the appropriate financial and administrative assistance for these services.

(b) The Township shall consult with fire and emergency medical services providers to discuss the emergency services needs of the Township.

(c) The Township shall require any emergency services organizations receiving Township funds to provide to the Township an annual itemized listing of all expenditures of these funds before the Township may consider budgeting additional funding to the organization.

(1553 added Mar. 17, 2008, P.L.47, No.7)

As it relates to Fire Protection, the Second Class Township Code provides for the following:

Section 1801. Authority of Board of Supervisors.—The Board of Supervisors may provide for fire protection within the Township.

1803. Fire Companies, Facilities and Training.—(a) The Board of Supervisors may appropriate moneys for the use of the Township or to fire companies located in the Township for the operation and maintenance of fire companies, for the purchase and maintenance of fire apparatus, for the construction, repair and maintenance of fire company houses, for training of fire company personnel and, as set forth in this section, for fire training schools or centers in order to secure fire protection for the inhabitants of the Township. The fire companies shall submit to the Board of Supervisors an annual report of the use of the appropriated moneys for each completed year of the Township before any further payments may be made to the fire companies for the current year.

(b) The Board of Supervisors may by ordinance make rules and regulations for the government of fire companies which are located within the Township and their officers.

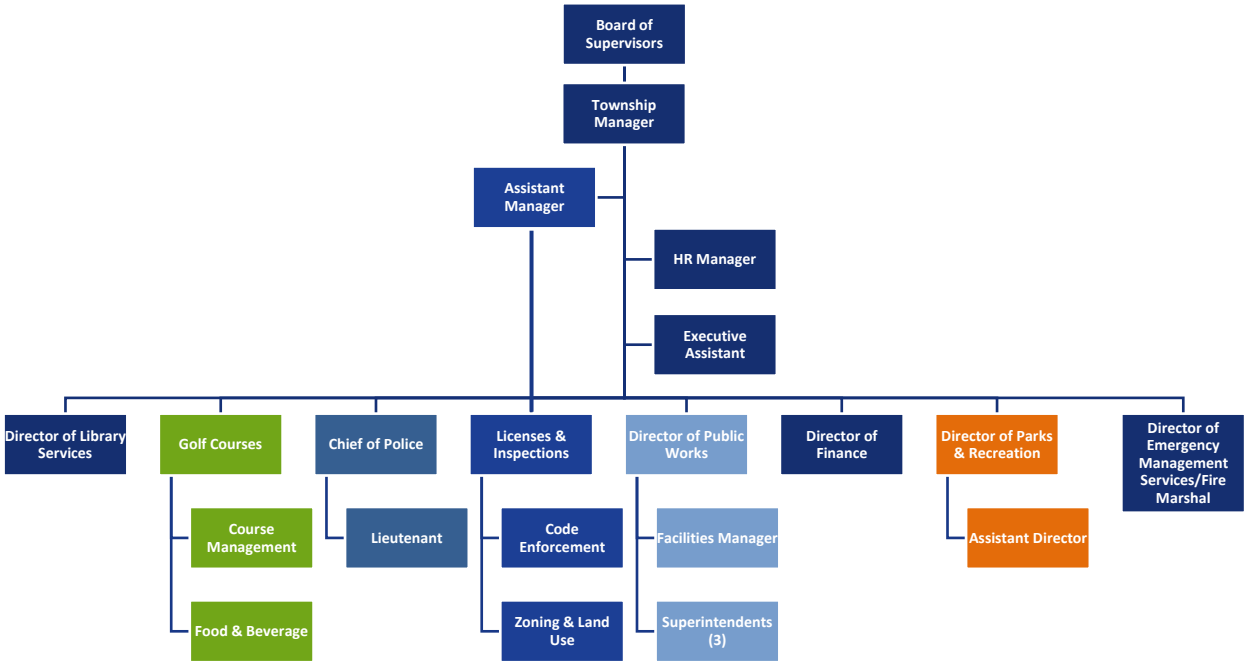
(c) The Board of Supervisors may contract with or make grants to near or adjacent municipal corporations or volunteer fire companies therein for fire protection in the Township.

(d) No volunteer fire company not in existence in the Township before the effective date of this act may organize or operate unless the establishment or organization is approved by resolution of the Board of Supervisors.

(e) The Board of Supervisors may annually appropriate funds to fire companies located within the Township for the training of its personnel and to lawfully organized or incorporated county or regional firemen's associations or an entity created pursuant to the act of July 12, 1972 (P.L.762, No.180), referred to as the Intergovernmental Cooperation Law, to establish, equip, maintain and operate fire training schools or centers for the purpose of giving instruction and practical training in the prevention, control and fighting of fire and related fire department emergencies to the members of fire departments and volunteer fire companies in any city, borough, town or Township within this Commonwealth.

The Warminster Township governance is established per Code of the Township of Warminster. The Township contracts with the Hartsville Fire Company and Warminster Fire Company No. 1 to provide fire protection, so those organizations are not included in the hierarchy of the Warminster Township organizational chart. The Township governance as it applies to the Director of Emergency Management Services/Fire Marshal is included in this hierarchy.

Figure 21: Warminster Township Organizational Chart



It is relevant to note that Chapter 1, Part 1, Article D of the Warminster Township Code establishes the powers and duties of the Fire Marshal. The Fire Marshal is a Township employee. The powers and duties of that position as provided for by Township Code as are follows:

1-133 Powers and Duties

[Ord. 279, 2/3/1975, § 2:320; as amended by Ord. 578, 6/13/2002, § 1; Ord. 737, 1/19/2017]

The Fire Marshal shall have the rights and duties as both Fire Code Official and Fire Chief, as set forth in the Fire Code enacted contemporaneously herewith. The Fire Marshal shall have full authority to inspect all premises for the existence of fire hazards, to order the abatement of the same, and to proceed in accordance with the Fire Code in order to eliminate such hazardous conditions. The Fire Marshal shall have authority to inspect all premises on which fires have occurred and to investigate the same in order to determine the origin and cause.

The formal relationship between Warminster Township, the Hartsville Fire Company, and the Warminster Fire Company No. 1 is that the Township provides funding to the fire companies and the fire companies deliver fire and emergency services to the community.

Warminster Township Code *Part 4, Volunteer Firemen's Relief Association*, establishes that fire protection in the Township of Warminster is provided for by two volunteer fire companies.

§ 1-401. Recognition of associations providing services. [Ord. 578, 6/13/2002, § 1]

The following associations are hereby recognized as actively engaged in providing fire protection and/or emergency services in the Township:

A. *Warminster Fire Company No. 1 Relief Association*
B. *The relief association for the Hartsville Fire Company, Inc.*

The Warminster Fire Company No. 1 Relief Association and the Relief Association for the Hartsville Fire Company, Inc. are both incorporated as a 501c3 organizations.

The arrangement between the Township and the fire companies is set forth a document titled "Agreement" that was signed by representatives of the Township, Warminster Fire Company No. 1, and Hartsville Fire Company on June 30, 2005. There is no specific end date for the agreement except that "This agreement may be canceled by either party at the end of a year by giving the other party sixty (60) days written notice of their intention to terminate the agreement by hand delivery or certified mail."

The agreement stipulates that the Warminster Township will collect "funds" in the amount of 5 mills each year and allocates said funds to the Fire Companies on April 30, August 30, and December 30 annually. All bills which are incurred by the Township on behalf of the fire companies such as fuel are billed to the fire companies by the Township.

Incentive Program Funds from the Township are to be paid in full to the Fire Companies on May 15 of each year. Sixty-nine percent (69%) of the funds are paid to the Warminster Fire Company No. 1 and 31 percent to the Hartsville Fire Company. Incentive Program Funding is guaranteed by the Township for the duration of the agreement and shall not be less than $41,250.

Real Estate Taxes and the Foreign Casualty Tax are both dispersed: 67 percent to the Warminster Fire Company No. 1 and 33 percent to the Hartsville Fire Company.

While not specified in the agreement, the Township reported that it covers property/crime/auto liability/public officials' liability insurance for the fire departments and pays for both the mowing and trash collection at the four fire department properties.

In accordance with the agreement, each of the fire companies will provide an income and expense statement for the preceding four months on May 31, September 30, and January 31 and a copy of each annual review no later than June 30.

Each fire company is governed by its own individual by-laws and operating procedures. This is significant because the Warminster Board of Supervisors and Township Manager are responsible for establishing the strategic direction for the Township through the establishment of policies and budgets. This process is independent of the planning and operational policies that occur within the volunteer fire companies.

While the Township has contracted with the two volunteer fire companies to provide fire and emergency services to the community, it is important to note in accordance with the Second Class Township Code, the Township is ultimately responsible for ensuring fire protection is provided within its jurisdiction.

Organizational Design

The Hartsville and Warminster fire companies are both staffed entirely by volunteer firefighters.

In accordance with their bylaws, Hartsville elects a Chief for a term of two years. The Chief appoints a Deputy Chief, Assistant Chief, Captain, two Lieutenants, a Chief Engineer, and three Engineers. Hartsville Executive Officers include a President, Vice President, Secretary, Treasurer, and three Trustees, and the Relief Association has a President, Vice President, Secretary, and Treasurer. The Hartsville Fire Company website lists 52 active members, including officers and administrative personnel.

The Warminster Fire Company No. 1 also elects its own Fire Chief in accordance with its established bylaws. Warminster's hierarchy includes a Deputy Chief, two Battalion Chiefs, a Safety Officer, three Captains, and two Lieutenants. Executive Officers include the President, Treasurer, Board of Directors Chairman, Vice Chairman, Secretary, and six members. The Relief Association has a President, Secretary, and three Trustees.

Emergency Response Type and Frequency

From 2015 to 2017, the Warminster Fire Company No. 1 and Hartsville Fire Company responded to 2,727 incidents. Of these calls, 320 were the result of mutual aid provided to other fire departments.

Figure 22: Incident by Type (2015 to 2017)

Call Type	2015	2016	2017
Fires	152	221	149
EMS/Rescue	45	53	75
Hazardous condition	92	83	92
Service call	45	24	17
Cancelled	177	190	193
False call	256	263	272
Other	2	5	1
Total (In-District)	**769**	**839**	**799**
Out-of-District	**142**	**91**	**87**
Total Activity	**911**	**930**	**886**

KEY RECOMMENDATION:

- The 2005 contract between Warminster Township, Hartsville Fire Company, and Warminster Fire Company should be updated and formally approved by all three entities.

Appendix B: Financial Analysis

Historical Revenue and Expense

Considerable financial information and background data was provided to ESCI by the staff of several organizations including the Township of Warminster (WTWP). The Hartsville Fire Company, the Warminster Fire Company No. 1 (WFC), the Warminster Fire Company No. 1 Relief Association (WFCRA) and the Hartsville Fire Company Relief Association (HFCRA) also provided information. The Relief Associations are 501(C)(3) organizations and file federal non-profit returns. All of these organizations are separate legal entities.

Fire services are provided to the citizens of Warminster by both the Hartsville Fire Company and the Warminster Fire Company No. 1. These are both volunteer departments. The Township collects property taxes from its citizens and then redistributes the funds to the two Fire Companies.

Additionally, the State of Pennsylvania assesses a two percent tax on insurance premiums on out-of-state insurers for casualty and fire insurance policies sold in Pennsylvania. This is recorded by Warminster as Foreign Fire/Casualty Tax. The State Treasurer distributes the funds to the various municipalities to be further distributed to volunteer relief associations. These funds are used for the purchase of equipment, training, insurance, and provides for death benefits for volunteer firefighters.

The financial information in this analysis comes from the Township, both Fire Companies, and the Relief Associations.

While the Township's fire fund has a significant, dedicated revenue stream, the Township does transfer approximately $41,250 of general fund dollars each year.

Revenue

The table in the following figure shows the Township's fire fund-specific revenue sources. Policy-makers can assess the total impact of the fire service provided to the Township. Included in these sources are real estate taxes, foreign (out-of-state) fire and casualty insurers two percent fee, and the transfer from the general fund.

Figure 23: Fire Fund-Specific Revenue Sources, FY 2015–Projected FY 2019

Revenue	Actual 2015	Actual 2016	Actual 2017	Adopted Budget 2018	Adopted Budget 2019
Real Estate Taxes	$ 428,501	$ 425,566	$ 424,534	$ 428,155	$ 428,183
Foreign Fire/Casualty Tax	$ 250,063	$ 248,376	$ 219,238	$ 198,568	$ 175,000
Transfer from General Fund	$ 41,250	$ 41,250	$ 41,250	$ 41,250	$ 41,250
Total Revenue	**$ 719,814**	**$ 715,192**	**$ 685,022**	**$ 667,973**	**$ 644,433**

In reviewing the total revenue for the period of 2015 through 2018, the amount for fire services has stayed consistently declined during the last four years. Adopted funds in 2019 were 14 percent less than in 2015.

Figure 24: Recurring Revenue by Year

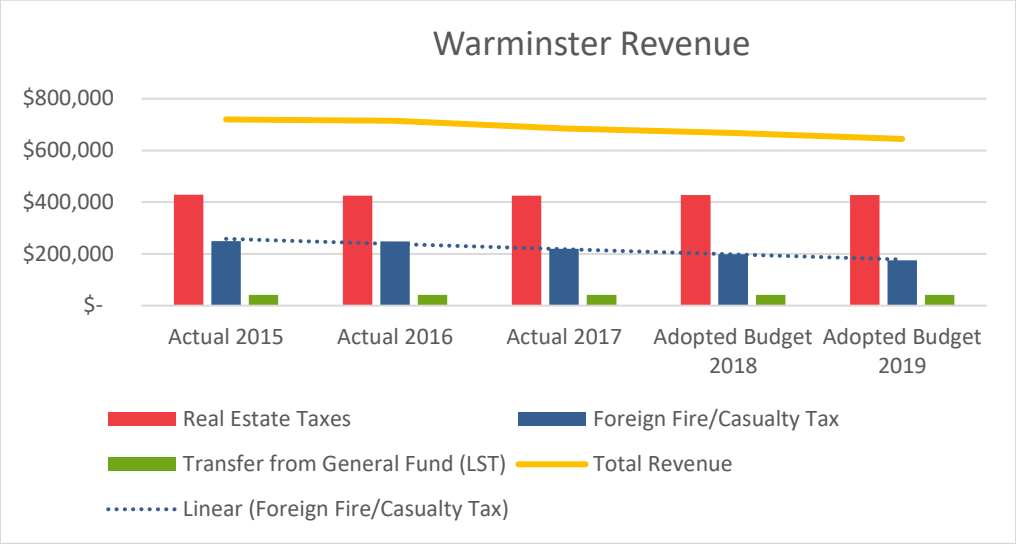


Figure 24 shows the historical trend of real estate taxes, foreign fire/casualty tax, and the transfer from general fund. The Township did not receive as much in foreign fire/casualty tax in FY 2017 or FY 2018. The state has changed its distribution and is now steadily decreasing the funding over several years.

The figure also shows the relative stability of total revenue by year for the Township. The amount received from the state's foreign fire/casualty tax is declining.

Transfers to Other Agencies and Non-Profits

The table in the following figure shows the transfers Warminster Township made to the WFCRA, the WFC, the HFC, and the HFCRA. The HFC owes the Township for construction for an addition to its fire station. While the Township allocates the funds to the HFC, the funds are not directly distributed to the department. The Township withholds the payment from the tax payment and applies it to the loan balance.

Figure 25: Fire Fund Transfers to Other Organizations

Transfers by the Township	Actual 2015	Actual 2016	Actual 2017	Adopted Budget 2018	Adopted Budget 2019
Fire Relief Aid—Warminster Fire Company	$ 187,057	$ 167,542	$ 146,890	$ 167,500	$ 133,040
Fire Relief Aid—Hartsville Fire Company	$ 82,521	$ 82,964	$ 72,349	$ 82,500	$ 65,527
Contribution to Warminster Fire Company	$ 295,913	$ 312,616	$ 307,138	$ 314,502	$ 314,502
Contribution to Hartsville Fire Company	$ 138,631	$ 150,887	$ 136,716	$ 139,406	$ 139,406
Transfer to Debt Service—Hartsville	$ 15,498	$ 15,498	$ 15,498	$ 15,498	$ 15,498
Total Transfers	**$ 719,620**	**$ 729,507**	**$ 678,591**	**$ 719,406**	**$ 667,973**

WFCRA's foreign fire/casualty tax has decreased from a high in FY 2015 of $187,057 to a low of $146,890 in FY 2017. This is a 21.473 percent decrease. The 2018 adopted budget shows a return to FY 2016 level while the adopted 2019 budget shows a further decrease. HFCRA's also is experiencing a decrease in funds transferred from the fire/casualty tax but not as great of a decrease. The decrease is 12.326 percent for FY 2017. While the funds from the fire/casualty tax have been decreasing, the funds from the Township's property taxes increased slightly in FY 2016. The FY 2017 and projected FY 2018 and FY 2019 property taxes remain fairly constant.

Figure 26: Fire Fund Transfers to Relief Associations and Fire Companies

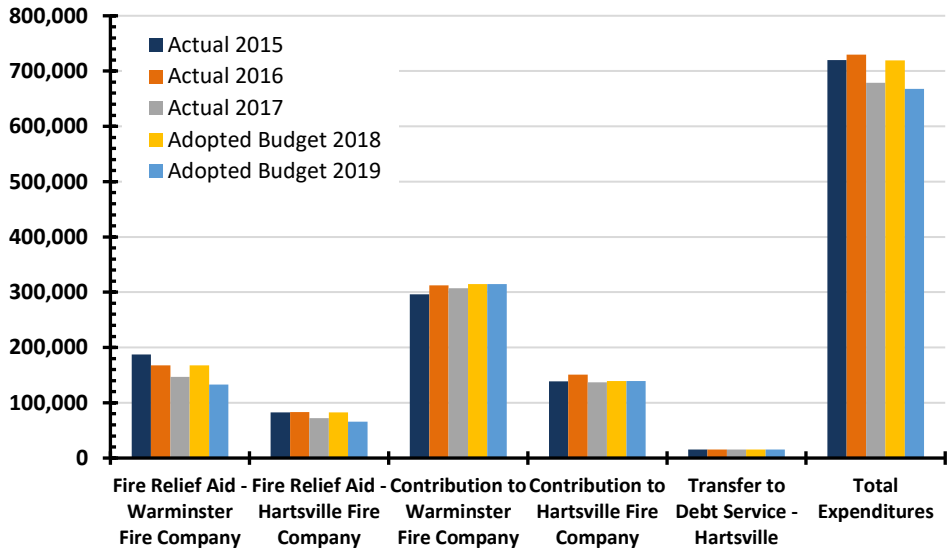


Figure 26 shows the declining fire relief aid to both the WFCRA and the HFCRA since FY 2015. The graph shows the relative stability of real property taxes for both fire companies between FY 2015 and projected FY 2019.

Appendix C: Management Components

Effective fire department management is a common challenge for fire service leaders. Today's fire departments must address management complexities that include an effective organizational structure, adequacy of response, maintenance of competencies, a qualified workforce, and financial sustainability for the future.

To be effective, the management of a fire department needs to be based on several components. One of the most significant management tools is the creation of a master plan. The plan is a roadmap for the future. It helps policymakers decide where the department desires to be in the long term. It is a strategic view that must be accepted and approved by the elected officials of Warminster Township. At the time of this report, the Township has not completed a formal master plan relative to the delivery of emergency services within its area of responsibility. This gives the Township leadership information and options that can be used to decide the direction the fire departments should take for the future.

In the following report section, ESCI examines each of the fire department's current efforts to manage their respective organizations. These sections will also identify measures and best practices recommended as the department continues into the future.

Foundational Management Elements

The development of baseline management components in an organization enables each department to move forward in an organized and effective manner. In the absence of these foundational management elements, the department will tend to operate in a random and generally ineffective manner. This section reviews the collective baseline management components of the two fire departments.

At the time of this report, Hartsville Fire Company had developed an official mission statement that was formally adopted and posted on the department's website. Hartsville has not adopted vision and values statements, nor does it have an established code of conduct. The department does have established goals and objectives. Warminster Fire Company No. 1 had also developed a written mission statement which is posted in the fire stations. Warminster has also adopted formal vision and values statements for the organization but had not posted them in a location visible to all members. Warminster also has established goals and objectives.

Management Documents and Processes

An organization should establish appropriate documentation, policies, procedures, and identification of internal and external issues that affect the agency. Processes must be established to address the flow of information and communication within each of the fire departments, as well as with their various constituents. These documents and processes also go beyond simple implementation but must include regular review and revision as part of their normal operations.

The Hartsville and Warminster Fire Companies, as emergency services organizations, by necessity and mission must function in a paramilitary manner. Consistent service delivery is dependent on standardized rules, regulations, and policies that guide appropriate behavior and accountability. These guiding documents are vital for success in providing services at all levels and meeting the expectations of the citizens served by the two fire departments. ESCI recommends the two fire departments continue working to standardize all management processes and documents to ensure consistency in the operations of the fire departments.

Both Hartsville and Warminster Fire Companies have established rules, regulations, and standard operating guidelines (SOGs). The departments also have established processes to regularly review and revise these documents to ensure currency, and all documents were available for review at the time of the site visit. Additionally, both agencies include the information within their policies and procedures as part of their respective training programs. Prior to this study, the two fire departments had begun the process of establishing joint SOGs. ESCI recommends both agencies continue efforts to establish common rules, regulations, and standard operating guidelines to ensure consistency in operations wherever possible.

Internal and External Communications

Internally, each of the organizations has established processes and procedures through which they communicate with their respective members. Both organizations utilize email as a means to ensure all members receive critical information and conduct regular meetings at which members can receive information and ask questions. Additionally, the leadership team of both organizations indicated the presence of an open-door policy and feel it is readily utilized by their members. ESCI recommends both organizations work collaboratively to establish common mission, vision, and values statements to be utilized in serving the citizens of Warminster Township.

Externally, each of the departments utilize either a website or "newsletter" to actively provide information to the citizens of Warminster Township. Neither of the departments have established a citizen advisory board or citizen survey to ensure constituent feedback is proactively obtained. ESCI recommends the departments establish a common citizen advisory board and customer feedback tool to improve the opportunities for constituents to provide feedback directly to the fire departments and Township leaders.

Record Keeping and Documentation

In any organization, the documentation and reporting of all activities is of paramount concern. Successful organizations consistently demonstrate the ability to effectively collect data and use that same data in its decision-making processes. These same organizations also use this data in a proactive manner to inform constituents and policymakers of their operations and outcomes. ESCI recommends that the departments establish a common annual report to be presented to the citizens of Warminster Township.

Both of the fire departments maintain all service records for critical pieces of equipment. These include self-contained breathing apparatus, hose, ladders, and pump tests. The fire departments also utilize third-party contractors to service and maintain those records for documentation purposes. These records are maintained and available for review.

Application and Recruitment

Both Hartsville and Warminster Fire Companies have established processes and procedures utilized whenever interested individuals desire to become a member. In general, the procedures utilized are relatively similar. It is recommended the departments continue to refine these processes and procedures to ensure consistency across the agencies.

Recruitment and retention of quality personnel were identified as one of the most significant issues facing the organizations. It is recommended the departments evaluate current recruitment and retention efforts and implement industry "best practices" as identified. This will be an ongoing issue for the departments but will prove to be highly beneficial as long as the community expects the departments to operate a volunteer system.

Additionally, the National Volunteer Fire Council (NVFC) has a portal dedicated to the recruitment of volunteer firefighters. The portal is accessible at: https://portal.nvfc.org. The NVFC portal, along with other state and national resources, should be consulted as part of a recruitment and retention strategy.

KEY RECOMMENDATIONS:

- Work to establish common mission, vision, and values statements.
- Standardize all management processes and documents to ensure consistency in the operations of both departments.
- Establish a citizen's advisory board to ensure citizen feedback is obtain in a pro-active manner.
- Establish the usage of a citizen "customer survey" to improve citizen feedback.
- Establish a common written annual report to be presented to the Township Council and citizens of Warminster Township.
- Incorporate performance criteria within the annual report to Warminster Township and citizens.
- Evaluate current recruitment and retention efforts and implement industry "best practices" as identified.
- Consider utilizing Town Fire Marshal to conduct quality assurance of all "fire" reports.

Appendix D: Organization Planning Processes

The planning process in Warminster has satisfied the Township's needs to date. While the community has grown and developed, the volunteer fire companies were consistently able to provide the level of service desired by the community. Planning for fire service delivery has historically occurred in three separate arenas—within the Hartsville Fire Company, within the Warminster Fire Company No. 1, and within Warminster Township. The three planning efforts intersected when negotiating the Agreement between the two fire companies and the Township.

Warminster Township is now facing several challenges related to the delivery of fire service within the community that will require the planning efforts of the two fire companies and the Township be more formally integrated. The announcement by the Warminster Fire Company No. 1 that they can no longer guarantee a response between 6 am and 6 pm elevates fire department staffing in Warminster to a now critical issue. Discussions with the Township Manager and two Fire Chiefs reveal that all have the same unanswered questions: Where does Warminster's current service delivery stand in relation to the needs of the community, what should the fire department look like in 5 and 10 years, and how do "we" get from here to there?

Internal Assessment of Critical Issues

The leadership of both fire departments has identified the issue of the daytime response of fire department personnel as the most critical issue facing the organizations. At the time of this report, the fire departments had both identified Monday – Friday between the hours of 6 am and 6 pm as the time period that was most challenging to assure a volunteer firefighter response. Secondly, the departments have established the recruitment and retention of volunteers as critical issues facing both organizations. Both organizations have been negatively impacted by the ability to recruit and retain quality volunteers. Third among the critical issues facing the departments is the concern of financial sustainability.

Internal Assessment of Future Challenges

There is a strong desire among the current volunteer firefighters to maintain the volunteer system, however, everyone who spoke with ESCI verbalized that recent recruitment efforts by both departments in the Township have not been fruitful.

At the time of interviews with ESCI, the Warminster Fire Company No. 1 had announced that it was not able to guarantee a response to daytime calls. The Hartsville Fire Company was being added during dispatch to cover the daytime Warminster Fire Company No. 1 calls, but their officers and members were concerned about the long-term impacts of this arrangement. All parties understood that this added responsibility would create a burden on Hartsville's volunteer firefighters. Hartsville's leadership further verbalized an awareness that their ability to cover the daytime calls was because of their volunteer firefighters' current family and job responsibilities. The Hartsville leadership suggested that their fire company was only a handful of firefighters having "life changes" away not being able to answer daytime calls for service. There was a unanimous consensus from meetings with members and officers of both fire companies that the time has come to hire firefighters to staff the weekday hours when volunteer firefighters have the biggest challenge responding to calls.

Planning for the Future

To be truly effective, an emergency services agency must consider planning on five distinct levels:

Figure 27: Essential Planning Descriptions

Planning Level	Description
1. **Tactical Planning**	The development of strategies for potential emergency incidents.
2. **Operational Planning**	The organization of day-to-day activities, as primarily outlined by a department's standard operating guidelines and procedures. This includes the integration of the agency into other local, regional, or national response networks.
3. **Master Planning**	Preparation for the long-term effectiveness of the agency as the operating environment changes over time.
4. **Strategic Planning**	The process of identifying an organization's mission, vision, and values and prioritizing goals and objectives for things that need to be accomplished in the near future.
5. **Emergency Management Planning**	The process of identifying potential critical risks and threats facing a community with the intent to mitigate their impacts and positively influencing recovery.

Each of the volunteer fire companies, as well as the Township, have fundamental, short-term planning activities in the form of their own annual budget development process, which is used to define the activities and priorities identified for the upcoming year. Establishing a long-term planning perspective that seamlessly integrates the Hartsville Fire Company, Warminster Fire Company No. 1, and Warminster Township is critical as the organizations move forward. Without effective planning, it is impossible for any of these organizations to understand when they are reaching milestones or providing exceptional services to its constituency.

Tactical Planning

Normally, a firefighter's first visit to a building typically occurs when the building is involved in a fire or another emergency. This is also the point in time where the internal environment is at its worst. Contrary to movie portrayals of the inside of a building on fire, visibility is at or near zero due to smoke. A lack of familiarity with a building can easily lead a firefighter to become disoriented or injured by an unfamiliar internal layout, or by equipment or other hazards that might be encountered.

It is critically important that firefighters and command staff have comprehensive, accurate information readily at hand to identify hazards, direct operations, and use built-in fire-resistive features. This can only be accomplished by building familiarization tours, developing pre-fire plans, and conducting exercises, either on-site or by tabletop simulation.

The Warminster Township Fire Inspection Program is developed and managed by the Emergency Management/Services Department. During the inspections, the Township's third-party vendor staff does collect emergency contact information which is then filed with the Emergency Communications Center to assure that all emergency services have access to that information. Special construction features or serious fire code violations are forwarded to the Fire Chiefs of the volunteer fire companies.

While fire inspections are conducted annually in the Warminster Township for the purpose of fire code enforcement, the information collected during these site visits is not used to create pre-plans for the fire departments to reference during emergency response and training. During the most recent site visit, ISO granted Warminster Township .49 out of 12 possible points for Pre-Planning Inspections. For maximum credit, ISO recommends that all occupancies except for residential dwellings that house one to four families be inspected annually by company members.

During ESCI's site visit, the Fire Marshal's Office did report that they are in the process of conducting site-specific (higher hazard) pre-planning and will be sharing the developed plans with all emergency services. While pre-planning target hazards is a good first step, ESCI recommends that Warminster Township develop and formally adopt a pre-plan program for all occupancies in the jurisdiction excluding single to four-family residential occupancies.

Pre-incident plans should be easy to use, quick reference tools, for company officers and command staff. At a minimum, a pre-incident plan should include information such as:

- Building construction
- Occupant characteristics
- Incorporated fire protection systems
- Capabilities of public or industrial responding personnel
- Water supply
- Exposure factors
- Facility layouts

Operational Planning

Operational planning includes the establishment of minimum staffing policies, standardized response plans or protocols, regional incident command planning, mutual aid and automatic aid planning (locally and regionally), resource identification and planning, and disaster planning.

Within an agency, operational plans should be in place that assure that adequate volumes of the appropriate types of resources are deployed to an emergency. Doing so involves:

- Identification of potential risk types;
- Determination of resources needed to mitigate an incident affecting the particular risk type; and
- A methodology of assuring that adequate resources are dispatched to an incident via 911 center protocols.

Looking outside of the agency's own resources, operational plans need to address the timely implementation of mutual and automatic aid. To do so, the identified risk exposures and resource needs are incorporated into mutual aid agreements. Further, of significant importance, automatic activation of mutual aid deployment is seamlessly incorporated into the 911 center's Computer Aided Dispatch (CAD) systems.

Mutual aid agreements are authorized under Pennsylvania Act 93 of 2008 (the "Act"). The Purpose of The Act is to create a system of intrastate mutual aid between participating political subdivisions within this Commonwealth, where each participating political subdivision recognizes that emergencies transcend the boundaries of a political subdivision and that intergovernmental coordination is essential for the protection of lives and property and for the best use of available public and private assets. Both the Warminster and Hartsville Fire Companies actively give and receive mutual aid. These efforts are coordinated by the Bucks County Emergency Services Communications division.

Locally, the Hartsville Fire Company has established Standard Operating Procedures and the Warminster Fire Company No. 1 has established Standard Operating Guidelines. While not identical, the Hartsville Fire Company and Warminster Fire Company No. 1 documents are similar in nature and both address the respective agency's expectations of personnel during emergency incident operations.

It is recommended that Hartsville Fire Company, Warminster Fire Company No. 1, and Warminster Township continue efforts to establish a single set of policies applicable to all firefighters who volunteer or work in Warminster Township. It is understood that the three separate agencies will all have to follow their own established processes to implement these unified policies within each of their organizations. The establishment of a single set of policies that are adopted and followed by both fire companies and the Township will assure that all firefighters, whether they are Hartsville Volunteers, Warminster Volunteers, or Warminster Township employees, operate in unison. This will make for easier integration of paid firefighters that may be employed by the Township in the future. It is further recommended that once these policies are in place, that a formal process for the regular review and update of these policies be established.

Master Planning

Various leaders from the two fire companies and the Township have all articulated the need for a stronger planning process. Warminster Township would benefit significantly by engaging in a long-range Master Planning Process that answers the following three questions:

- Where is the organization today?
- Where will we need to be in the future? and,
- How will we get there?

A master plan is particularly essential in a community undergoing change or growth, and is important to effectively identify needs and planning for an emergency response agency's future. An effective master plan will provide a view of the organization in a 15-year time frame. Implementation of a master plan's findings should be accomplished by way of an implemented strategic plan. Historically, Warminster has not involved citizens or business owners in planning processes. It is an industry "best practice" to involve community constituent groups in the master planning process. Should the department choose at some point in the future to work toward international accreditation from the Center for Public Safety Excellence the presence of a community-based master plan will be a significant consideration. ESCI recommends that the Town of Warminster actively work to involve constituent groups in departmental planning activities.

Strategic Planning

A strategic plan addresses a three to five-year planning window and establishes prioritized goals and objectives for the organization. This planning approach is particularly important when a master plan has been completed. The reason is that the master plan identifies multiple recommendations and future strategies, which are then evaluated and prioritized via the strategic plan.

Establishing a strategic plan accomplishes the following:

- Development of a mission statement, giving careful attention to the services currently provided and which logically can be provided in the future.
- Development of statement of the agency's vision for moving forward.
- Establish the values of the employees of the agency.
- Identification of the strengths, weaknesses, opportunities, and challenges of the agency.
- Determination of the community's service priorities.
- Understanding the community's expectations of the agency.
- Establishment of realistic goals and objectives for the future.
- Identifications of implementation tasks for each objective.
- Definition of service outcomes in the form of measurable performance objectives and targets.

Strategic Planning efforts that have been undertaken have historically occurred independently within each the Hartsville Fire Company, Warminster Fire Company No. 1, and Warminster Township. Second Class Township Code, Act 69 of 1933 assigns to the Township the responsibility for ensuring fire and emergency services are provided within the Township. While the Hartsville and Warminster Fire Companies have provided this service to the Township, it is incumbent upon the Township to take the lead in strategic planning efforts to support the volunteer fire companies in their ongoing efforts to provide fire and emergency response. If either, or both, volunteer fire companies were to stop responding to fire and emergency calls, the Township would be responsible for implementing an alternate service delivery method.

Emergency Management Planning

Pennsylvania's Emergency Management Services Code (35 Pa. C. S. Section 7101-7707) became law in 1978 and replaced the State Council of Civil Defense Act of 1951. This state law requires that every county and municipal government develop and maintain an emergency management program consistent with the State and Federal Emergency Management Program.

An Emergency Management Coordinator who is appointed by the Governor based upon the recommendation of the county or municipal elected officials administers each county and municipal program. The Coordinator is an employee of the county or municipality and is responsible for implementing the program.

The Warminster Emergency Management/Services Department is staffed by one full-time Director who is an employee of the Warminster Township. Warminster's Emergency Management Director also serves as the Township's Fire Marshal. The Director is responsible for developing the Township's emergency operation plans and standard operating procedures for disaster relief. The Director is also responsible for conducting inspections of damaged areas and coordinating response efforts following a disaster. As Fire Marshal, this individual is also responsible for conducting fire and life safety inspections and fire cause and origin investigations.

The Superfund Amendment and Reauthorization Act, found in Title III of the Federal Code (SARA Title III), defines requirements for the tracking of extremely hazardous substances (EHS) used in fixed facilities and establishes requirements for emergency response planning. The department should be involved with the Local Emergency Planning Committee (LEPC) in place at the county level. The LEPC is charged with the responsibility to identify and collect information on the use of hazardous materials by private and public entities. Information collected includes the type of material, quantity, and location at each site. Additionally, the LEPC is charged with ensuring local response plans are adequate based on potential risk. All Tier II reports are filed with the Director's Office where they are uploaded to Google Drive and available to the volunteer fire companies.

No one in the Township directly participates with the county LEPC, but at the quarterly Emergency Management Association meetings, issues related to the LEPC are discussed. It is important that each department confirm all EHS facilities within its service area have been identified, and ensure that the County's Emergency Operations Plan has been developed in a manner in which Warminster's operations have been appropriately included. ESCI recommends that Warminster Township assure that it maintains an active role in the development of emergency management planning with the County, as well as internally.

KEY RECOMMENDATIONS:

- The Hartsville Fire Company, Warminster Fire Company No. 1, and the Warminster Township should continue to collaborate to establish a single set of policies that apply to all firefighters who volunteer or work in Warminster Township.
- Warminster Township should engage in a long-range Master Planning Process.
- Warminster Township should engage in a short-term Strategic Planning Process that coordinates the current efforts of the Hartsville Fire Company, the Warminster Fire Company No. 1, and the Warminster Township.

Appendix E: Personnel Management

Policies and Regulations

Effective personnel management is critical to the success of an emergency services organization. The personnel that delivers emergency services require appropriate supervision as well as administrative support to consistently perform satisfactorily.

Membership Policies and Regulations

An organization's single greatest asset is its people. While the purchase of capital equipment can appear to be expensive when viewed as a one-time expense, personnel costs for a full-time paid fire department typically account for more than 70 percent of the organization's expenses. Warminster Township has historically been spared this expense as a result of the willingness of people within the community so serve as volunteer firefighters. This is a substantial savings for the Township. While there are still people in Warminster that are willing to serve as volunteer firefighters, the number of volunteer firefighters in the community is trending downward.

Special attention must be given to managing personnel in a manner that achieves maximum productivity while ensuring a high level of job satisfaction for the individual. This includes policies for hiring, promoting, and disciplining firefighters. Consistent management practices combined with a safe working environment, equitable treatment, opportunity for input, and recognition of the workforce's commitment and sacrifice all directly impact employee job satisfaction.

It has been noted throughout this report that the Hartsville Fire Company, Warminster Fire Company No. 1, and Warminster Township each have their own policies. Interviews with personnel from all three agencies do not indicate that the three separate policies are contributing in any way to the decline of volunteer firefighters in Warminster Township. ESCI recommends the establishment of a single set of policies governing all firefighters within Warminster Township because it will simplify integration of paid firefighters that may be employed by the Township in the future. It is further recommended that once these policies are in place, that a formal process for the regular review and update of these policies be established.

Reports and Recordkeeping

Each of the agencies within Warminster Township has established procedures for managing the records used in their respective department's operation. These procedures are different from agency to agency and have varying degrees of effectiveness. It is recommended the three agencies work to establish common processes and procedures to ensure consistency in the maintenance of relevant reports and records.

The *National Fire Incident Reporting System* (NFIRS) is a voluntary reporting system designed to capture incident-related information and then make estimates of the U.S. fire problem. The NFIRS systems, managed by the U.S. Fire Administration (USFA), is the most robust fire-based data collection system, with over two-thirds of all U.S. fire departments reporting their fire data via the NFIRS system.

PennFIRS, the Pennsylvania Fire Information Reporting System, is the commonwealth's system that fire departments use to report and manage the flow of incidents into the National Fire Incident Reporting System (NFIRS). The Office of the State Fire Commissioner (OSFC) reports all incidents to the United States Fire Administration's National Fire Data Center.

These reports are then used to gather information on such items as the numbers and types of fires, number of EMS calls, causes of fires, numbers of civilian injuries and deaths related to fires, fire service injuries and deaths, and much more. Participation in the National Fire Incident Reporting System (NFIRS) and the PennFIRS gives the fire departments the ability to apply for a variety of grants within the Assistance to Firefighters Grant (AFG) Program. This is important because when the Township makes the decision to hire career firefighters, the Staffing for Adequate Fire and Emergency Response (SAFER) can help offset the initial costs of hiring additional personnel.

In any organization, the documentation and reporting of all activities are of paramount concern. Successful organizations consistently demonstrate the ability to effectively collect data and use that same data in its decision-making processes. These same organizations also use this data in a proactive manner to inform their constituents and policymakers of their operations and outcomes.

ESCI recommends that the fire companies and the Township establish a common quality assurance program to verify that each of the organizations is collecting and reporting their activities consistently. ESCI further recommends that the three agencies establish a regular meeting schedule (i.e., quarterly) to review the collected information, identify trends, and discuss potential impacts on fire department operations.

COMPENSATION

Volunteer firefighters are not paid Warminster Township employees. The volunteer fire companies do, however, provide limited incentives to their members including uniforms, awards banquets, and other special recognition. ESCI's interviews with the officers and members of both departments consistently indicated that current members are of the opinion that incentives including offering a paid stipend per call might encourage current members to remain active, but that they would likely not attract new members who were not otherwise already interested in becoming a volunteer firefighter.

The volunteer fire companies have made a significant financial and time investment in the current volunteer firefighting force in the Warminster Township. As it is ultimately the responsibility of the Township to assure the delivery of fire and emergency services within its jurisdiction, it would be in the best interest of the Township to work with the volunteer fire companies to establish an incentive program for current volunteer firefighters to remain active. While there will be a cost to the Township to implement an incentive program, the cost will be much less than staffing a full-time fire department.

Labor-Management Relationships

Each of the volunteer fire companies has a volunteer Fire Chief that is elected by its members. The Township has a Township Manager that is appointed by the Board of Supervisors.

ESCI's interviews with various members of the volunteer fire companies revealed that while labor-management relations appear to be positive within each of the volunteer fire companies, there is not a strong relationship or an associated level of trust between the volunteer fire companies and the Township. This is not to say that the relationship between the volunteer fire companies and the Township is bad, but rather to point out that because of the "contract" relationship with the volunteer fire companies, the Township and the volunteer fire companies each operate relatively independently of one another. Coupled with the fact that the Township has had a series of new Managers within the last five years, the volunteer fire companies do not have a close working relationship with the Township Administration. While this current labor-management relationship is not a direct cause of the current staffing challenges faced by the volunteer fire companies, it would serve the Township well to invest in strengthening the working relationship between the Township and the volunteer fire companies to make for an easier integration of paid firefighters that may be employed by the Township in the future.

ESCI suggests that the leadership of the Hartsville and Warminster Fire Companies, together with the Warminster Township leadership may benefit by bringing the International Association of Fire Chiefs' new program *Member and Leadership Collaboration (MLC) for Combination/Volunteer Departments* to Warminster Township. This program is focused on leveraging behavioral analysis to manage group dysfunction through understanding DISC behavioral styles.

The program begins with a comprehensive personality assessment and is designed for emergency services organizations facing the challenges of service delivery in a combination or volunteer system. The workshop is specifically designed to open lines of communication and focus the organization on common goals to provide the highest level of service. Experienced combination and volunteer Chief Officers serve as facilitators to deliver this interactive program on-site which includes:

- Assisting department key leadership personnel in gaining an understanding of the unique challenges facing their organization.
- Allowing input from external and internal stakeholders through an in-depth analysis based on local and national trends and needs of the organization.
- Establishing organizational and personal goals that recognize and support the value of the volunteer, part-time, and career components of the organization.

The MLC is administered over two days with two facilitators. Requesting agencies are required to pay a flat fee for the workshop which includes all facilitator travel and custom behavioral style reports for up to 10 key leadership personnel. This program can be contracted through the International Association of Fire Chiefs Volunteer and Combination Officer Section and may, if desired by the Township, be facilitated by all or part of the ESCI team that conducted the Warminster Township site visit.

Counseling Services

Our nation's firefighters are faced with emotional needs that are very different and unique to their occupation. The percentage of firefighters struggling with career-related stress is very high with suicide rates climbing each year. These issues manifest themselves through higher divorce rates and addictions such as alcohol, drugs, or gambling. Recent studies are increasingly citing Post Traumatic Stress Disorder (PTSD) as a threat to the wellness of firefighters. As these symptoms occur, employees need a support system in place that is readily accessible from someone who is qualified and truly understands his/her circumstances.

Several programs can provide assistance. Critical Incident Stress Management, Employee Assistance Programs, and Intervention Programs, to name a few. Warminster Township should strive to develop a structured Critical Incident Stress Debriefing program for its members. This program should be communicated to make each member aware of the availability of resources.

Health and Wellness Programs

National Fire Protection Association (NFPA) 1500: *Standard on Fire Department Occupational Safety, Health, and Wellness Program* is the industry standard for development and administration of a fire department safety program. The Hartsville Fire Company has a formal policy adopting NFPA 1500 as their guideline to establish an effective program for their members. ESCI did not identify a similar policy within the Warminster Fire Company No. 1.

The establishment and empowerment of a safety committee can be one of the best tools to increase the safety of firefighters. ESCI strongly encourages the two fire departments and the Township to work together to ensure that all activities of the safety committee are in alignment with Chapter 4 of NFPA 1500. To be effective, safety committees must be diverse in their representation from across the department, ensuring representation by shift, rank, function, and interest, and including representation from non-uniformed and staff members as well.

The committee, once established, should meet monthly and include in its mission raising awareness and modifying member behaviors that will result in a safe work environment. Additionally, the committee should review all accidents, injuries, near-miss incidents, and workplace safety suggestions. The committee should analyze the information before them and report the findings to the Fire Chiefs. As opposed to being reactionary through the development of additional rules, it is recommended that the committee should work to implement member safety education programs and encourage members' safety self-awareness. The committee should maintain regular and open meeting times and locations; minutes of the meetings should be recorded and posted for all members of the department to review. A diverse representation of command staff and labor representatives should constitute the committee, as is appropriate, and minutes are taken at the meetings. ESCI underscores the importance of maintaining a functioning safety committee.

It is important to note that the leadership of both fire departments have identified the issue of cancer as one of the most significant dangers facing their memberships. It is recommended the leadership teams of the departments and the Township work to implement industry "best practices" in preventing firefighter exposure to carcinogens. There are a number of approaches to mitigating firefighter exposure to carcinogens and a "one-size fits all" solution does not exist.

The most important first step toward reducing exposure is to promote practices that reduce exposure, and some of the least complicated initiatives are most effective. For example, instituting an on-scene gross decontamination procedure, use of personal cleaning wipes, and limiting exposure to contaminated gear while on the firetruck and back in the station will effectively reduce exposure. Additional steps to reduce exposure should include regular cleaning of turnout gear, showering and changing clothes/uniforms immediately upon returning to quarters, and storing turnout gear to minimize exposure to the member (i.e., not storing contaminated gear in a member's personal vehicle). These suggestions are not necessarily recommendations but are rather examples of relatively simple procedures that will reduce exposure risks to members. It is recommended that the fire departments and Township work together to develop solutions which protect personnel from undue risk; effective programs and procedures are not cost-prohibitive.

KEY RECOMMENDATIONS:

- Establish a single set of policies governing all firefighters within the Township.
- Establish a common quality assurance program to verify that each of the organizations is collecting and reporting their activities consistently.
- Establish an incentive program for volunteer firefighters.
- Host the IAFC Member and Leadership Collaboration (MLC) for Combination/Volunteer Departments in Warminster Township to work toward establishing a stronger relationship between the volunteer fire companies and Township officials.

Appendix F: Staffing

ESCI's interviews with leaders from the Hartsville and Warminster Fire Companies, as well as with appointed and elected officials from the Warminster Township, unanimously identified an ongoing challenge in assuring a response from volunteer firefighters for calls occurring Monday through Friday between the hours of 6 am and 6 pm.

ESCI's assessment of the staffing of the volunteer fire companies within the Warminster Township followed a "bottom-up" approach. After conducting interviews and research at the Township Level, ESCI then evaluated the situation at both the Commonwealth and National Levels.

The Commonwealth of Pennsylvania released the report "SR6" in November 2018. "SR6" refers to "Senate Resolution 6" which established a 39-member Commission comprised of fire and EMS leaders from throughout the commonwealth "…to recommend improvements to the delivery of emergency services in this Commonwealth and develop and promote legislation in furtherance of its recommendations." SR6 Commission findings and recommendations focused on six areas: Emergency Medical Services, Government Support, Innovation, Recruiting and Retention, Regulations and Codes, and Training and Operations.

SR6 revealed that the challenges of maintaining predominately volunteer fire companies are not new to the Commonwealth. In 2004, the Senate Resolution 60 Commission outlined many of the same issues that are presented in SR6. Many of these issues were even identified in the 1976 report "Pennsylvania Burning." SR6 states that "the delay or failure to take appropriate action has continued to extend and expand the challenges facing Pennsylvania emergency services."

SR6 paints a bleak picture of the future of volunteer fire fighting within the Commonwealth. According to the report, "Fire and EMS **are** in crisis—right now." SR6 reports that the number of volunteer firefighters within the Commonwealth has declined from approximately 300,000 in the 1970s to 60,000 in the early 2000s and then to 38,000 in 2018. SR6's conclusion is that "the significant drop in the number of volunteer emergency services ranks can be directly attributed to the fact that (in addition to fighting fires and responding to every other imaginable emergency around the clock), our volunteer emergency service responders are often the same individuals who must raise the funds to pay for their own training, in many cases provide for their own equipment, conduct administrative services and support, and maintain equipment and facilities. Taken together, the many tasks performed by a decreasing number of volunteers only exacerbates the problem and overwhelms those who remain active."

SR6 includes 92 recommendations that range from providing incentives and additional funding streams to revising legislation in response to this self-proclaimed crisis. The SR6 "Commission recommends that the General Assembly act as expeditiously as possible to enact a series of incentives to stem the decline in emergency service volunteerism, to help retain the dedicated volunteers we still have, and to attract the next generation of recruits in the proud neighbor-helping-neighbor tradition of our volunteer emergency service organizations."

Nationally, the International Association of Fire Chiefs, Volunteer Combination Officers Section, released the report "A Call for Action, The Blue-Ribbon Report, Preserving and Improving the Future of the Volunteer Fire Service" in 2004. The report suggests that recruiting and retaining volunteer firefighters is not limited to Warminster Township or even the Commonwealth of Pennsylvania but in fact a national concern. "While volunteer firefighters and emergency workers provide a tremendous contribution to our country, they are often under-funded and ill-equipped. Lacking cohesive national leadership, efforts to correct these problems are often fragmented and ineffective."

The IAFC report puts forth recommendations preserving and improving the future of the volunteer service at the federal, state, and local levels of government. The big picture of volunteer firefighter issues in other states as well as from the national perspective mirrors those in Pennsylvania and specifically Warminster Township.

Figure 28: IAFC Recommendations for Improving the Volunteer Fire Service

Level of Government	IAFC Recommendations For Improving the Volunteer Fire Service
1. Federal	• Work to produce a national climate, encouraging individuals to volunteer within their local communities.
2. State	• Emphasize the importance of the state government in developing and promoting disaster planning. • Certify fire and emergency medical services (EMS) personnel to comply with basic training standards. • Promote regional service delivery where local capabilities and technical expertise are weak. • Provide statewide volunteer benefit programs to protect both the firefighter and employer from the risks associated with volunteer fire service.
3. Local	• Emphasize the importance of local support for this basic community service. • Provide appropriate levels of funding for necessary safety gear and training. • Engage in strategic planning that emphasizes volunteer retention. • Use mutual aid to offset service and technical deficiencies. • Use uniform incident management systems. • Use performance measurement to measure and analyze response times, firefighting effectiveness, training, and retention rates of volunteer fire departments.

ESCI suggests that the IAFC recommendations for federal, state, and local levels could all benefit Warminster Township. Federal and even state level governments are not always able to produce immediate results, however, and with the announcement from the Warminster Fire Company No. 1 that they cannot guarantee a response to all weekday calls, Warminster Township must take action now.

The reality is that while Warminster Township could unveil the most creative and flashy recruitment campaign, the likelihood of achieving any long-term volunteer firefighter recruitment and retention success is minimal without the state and local governments enacting legislation and programs to support these efforts. ESCI recommends that Warminster Township take an active role in advocating for programs and legislation at the federal and state levels that will improve the likelihood of a sustainable volunteer fire service while simultaneously taking immediate steps to assure an adequate firefighter response in accordance with established response performance metrics to all emergency calls that occur within the Warminster Township.

Administrative and Support Staffing

It is the recommendation of ESCI that the volunteer fire service in Warminster Township should now begin to be augmented by career personnel in order to assure an adequate firefighter response in accordance with established performance metrics to all emergency calls that occur within the Warminster Township. It is also important to point out that these career personnel should have duties and responsibilities encompassing more than responding to fires. The inclusion of community risk reductions activities for these positions will have a positive impact on improving the safety of the Township's citizens.

It is incumbent upon the Township to design a plan that provides for an orderly transition from an all-volunteer to a combination fire department that is staffed by volunteer firefighters who are augmented by career firefighters. Prior to hiring any career firefighters, critical issues such as pay rates, job descriptions, duties, responsibilities, positions, and status authority for career and volunteer personnel must be examined.

Chapter 1, Part 1, Article D, Section 1-133 of the Warminster Township Code establishes the powers and duties of the Fire Marshal. Specifically, "The Fire Marshal shall have the rights and duties as both Fire Code Official and Fire Chief, as set forth in the Fire Code enacted contemporaneously herewith."

As the Warminster Township Code already grants the powers and duties of Fire Chief to the Fire Marshal, ESCI recommends the expansion of the day-to-day duties of the Fire Marshal position to include administrative leadership and coordination of the volunteer fire companies. This arrangement would position the Township to support the volunteer fire companies in their service delivery while simultaneously putting in place a command structure to supervise career firefighters. The number of career firefighters can be expanded as the needs of the Township and/or the response of the volunteer fire companies change.

In order for this structure to be successful in Warminster Township, ESCI recommends that the Township and the volunteer fire companies meet to determine the specific authority of this position and its integration with the volunteer fire companies. The details of this structure should then be reduced to writing, approved by the Township and both volunteer fire companies, and then clearly communicated to all volunteer firefighters before implementation.

Warminster Township's Director of Emergency Management and Services also serves as the Township Fire Marshal. While the Warminster Township Code also gives him the authority of the Fire Chief, those duties are not currently part of his daily work plan. ESCI recommends that the role of Community Outreach Coordinator be established if the decision is made to have the Director of Emergency Management Services take on the daily responsibilities of Fire Chief. Staffing the Community Outreach Coordinator will simultaneously allow the Township to be pro-active in Community Risk Reduction efforts while also providing assistance and a second in command to the Director as he takes on additional responsibilities.

Emergency Response Staffing

NFPA Standard 1720: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments, specifies a minimum of four firefighters on-scene before an interior attack on a structure is initiated. This is commonly referred to as "Two In/Two Out." The two (or more) outside firefighters are in place to provide a rapid intervention team (rescue team) in support of the entry team. A two-person safety team is referred to as a rapid intervention crew (RIC), while a four-person team is designated as a rapid intervention team (RIT). The ability of a fire department to have the "Two-In/Two-Out" team in place prior to beginning interior firefighting operations is a key factor in conducting a realistic risk assessment.

Operational staffing may best be considered from the perspective of staffing on each responding fire apparatus (engines, trucks, and rescue vehicles). Ensuring that an apparatus is properly or minimally staffed, prior to responding, is the most effective manner to ensuring that a sufficient firefighting force is on-scene before fire attack begins.

Recognizing that sufficient staffing may be challenged by a volunteer workforce, time of day, and day of week, some mechanism for response, with less than minimum staffing should be considered, particularly after waiting for additional personnel to respond to the fire station. For example, after a predetermined time frame, a less than fully staffed apparatus may respond, but will be required to notify dispatch of (below normal) staffing by broadcasting a message such as "Engine 'X' responding with 'Y' firefighters."

The need to staff apparatus with a minimum crew of four firefighters is further ingrained in the volunteer fire companies in Warminster because they both give and receive mutual aid within Bucks County. Apparatus responding into Warminster to provide mutual aid are expected to do so with four firefighters, and firefighters from Warminster who provide mutual aid to neighboring response areas expect to respond with a crew of at least four firefighters as well.

While industry standard does recommend crews of four firefighters in order to initiate interior firefighting, the assembly of four firefighters can take on a variety of different appearances. Firefighters can be on shift at the fire station, be assigned to respond to the fire station during cover specific shifts, or carry pagers and respond when activated. It is common for fire departments to assemble a crew of four fighters using two or more of these approaches.

ESCI would typically recommend a phased-in approach to staff paid firefighters. In the case of Warminster Township, staffing two paid firefighters during the day to support the current efforts of the volunteer firefighters would put in place half of the crew required to meet the NFPA 1720 Standard while allowing the Township the opportunity to incrementally build paid firefighters into its budget.

ESCI's interviews with the volunteer firefighters and leadership of the volunteer fire companies consistently revealed a desire by the firefighters to see the Township staff four firefighters on an engine on weekdays to relieve them of the burden of weekday response. If the Township chooses to staff less than four firefighters, there must be a plan in place to assure that response of the firefighters that are required to complete the crew. This will require ongoing communication and monitoring on the part of the Township.

In 2018, Warminster Township paid a third-party vendor to provide annual fire inspection services in the amount of $90,000. ESCI recommends this program be brought back "in-house," and the savings be used to fund the hiring of career firefighters in Warminster Township. The current Warminster Township call volume allows adequate time during the day for paid firefighters to complete inspections. These individuals could also be utilized as part of a formalized community risk reduction program. This model fits into the proposed Warminster Township chain of command as firefighters who are assigned fire inspection responsibilities would report to Director of Emergency Management Services who would be responsible for both the duties of the Fire Marshal and the Fire Chief.

During the most recent ISO Review, Warminster Township earned 3.06 out of 15 possible points for Company Personnel. Implementing the proposed staffing recommendations will reflect positively in Warminster Township's next ISO Review.

Central Bucks Ambulance and Rescue Unit is the nonprofit service that provides Emergency Medical Services within Warminster Township. ESCI met with staff from Central Bucks Ambulance and Rescue Unit in addition to interviewing Warminster Township Staff and leadership from both volunteer fire companies to assess the feasibility of integrating operations between the fire companies and rescue unit in Warminster Township. Due to the complexities of managing an advanced life support ambulance transport agency including recruitment challenges, medical control oversight, and funding streams that are impacted by insurance companies, Medicare, and Medicaid, ESCI recommends that any efforts that would change EMS delivery in Warminster Township should be explored in detail as part of a master planning process. The current delivery of EMS in Warminster Township is satisfactory to the residents, the fire departments, and Township representatives. Warminster Township must take immediate steps to address daytime fire response within the community and should not complicate the issue with EMS delivery at this time.

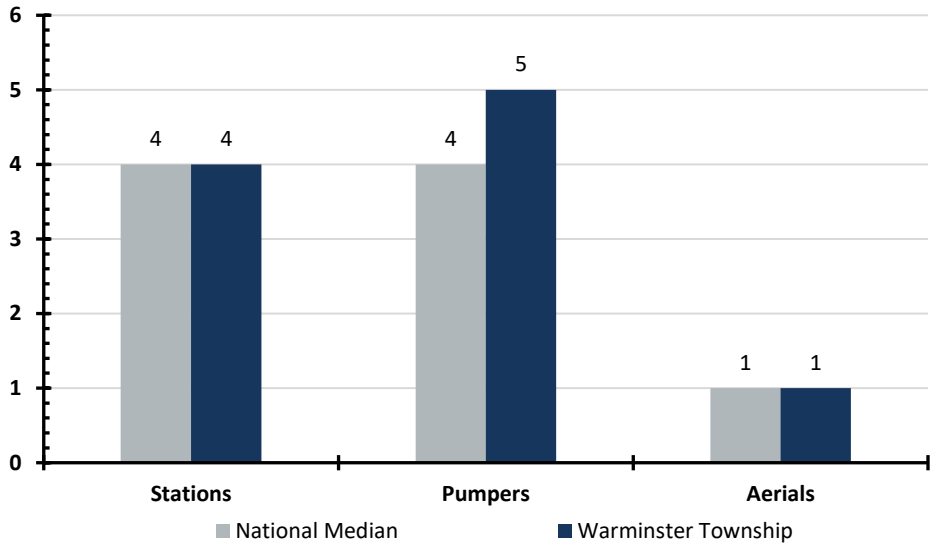
KEY RECOMMENDATIONS:

- Warminster Township should take an active role in advocating for programs and legislation at the federal and state levels that will improve the likelihood of a sustainable volunteer fire service while simultaneously taking immediate steps to assure an adequate firefighter response in accordance with established response performance metrics to all emergency calls that occur within the Warminster Township.
- The volunteer fire service in Warminster Township should now begin to be augmented by paid personnel in order to assure an adequate firefighter response in accordance with established response performance metrics to all emergency calls that occur within the Warminster Township.
- Prior to hiring any paid firefighters, critical issues such as pay rates, job descriptions, duties, responsibilities, positions, and status authority for career and volunteer personnel must be examined.
- Expansion of the day-to-day duties of the Fire Marshal position to include administrative leadership and coordination of the volunteer fire companies.
- ESCI recommends that the role of Community Outreach Coordinator be established if the decision is made to have the Director of Emergency Management Services take on the daily responsibilities of Fire Chief. Staffing the Community Outreach Coordinator will simultaneously allow the Township to be pro-active in Community Risk Reduction efforts while also providing assistance and a second in command to the Director as he takes on additional responsibilities.
- Warminster Township must establish a plan to staff or assemble four firefighters to respond to emergency calls during weekdays.
- ESCI recommends that the $90,000 that was paid last year by Warminster Township to a third-party vendor be considered as a way to offset the cost of hiring firefighters. The current Warminster Township call volume leaves adequate time during the day for paid firefighters to complete inspections.
- ESCI does not recommend any changes to the EMS delivery provided by Central Bucks Ambulance and Rescue Unit in Warminster Township.

Appendix G: Capital Assets and Capital Improvements

Regardless of an emergency service agency's financial condition, if appropriate capital equipment is not available for the use by responders, it is impossible for a fire department to deliver services effectively. The two primary capital assets that are essential to the provision of emergency response are facilities and apparatus (response vehicles). Hartsville and Warminster both maintain a balance of three basic resources that are needed to carry out its emergency mission: People, equipment, and facilities. Because emergency response and firefighting are an extremely physical pursuit, the adequacy of personnel resources is a primary concern; but no matter how competent or numerous the firefighters are, the department will fail to execute its mission if it lacks sufficient response apparatus distributed in an efficient manner. Collectively the two fire departments maintain four fire stations and millions of dollars worth of capital assets. These assets are necessary to provide service and must be maintained and replaced as needed. The following figures outline the observations of the facilities and apparatus for both Hartsville and Warminster.

Figure 29: Comparison of Stations and Apparatus



Comparable to similar sized communities in the United States, Warminster Township has four fire stations and four fire engines. Additionally, the Township is served by two aerial units as compared to one typically seen in other communities. It is important to understand that this figure is not intended to serve as a definitive indicator of the number of stations and apparatus the Township should maintain, but should allow for a general understanding of the numbers of resources other communities maintain in comparison. There are a number of factors that drive the number of resources a community maintains and operates. In a volunteer system, additional emergency vehicles must be maintained to allow for firefighting personnel to respond to an emergency incident. Without these additional units, emergency response personnel who are not able to ride the initial responding fire engines would ultimately respond to the emergency incident in their personal vehicles. The introduction of personal vehicles responding to emergency incidents is considered a significant risk to the Town as the potential for a serious accident increases significantly.

FACILITIES

Appropriately designed and maintained facilities are critical to a fire department's ability to provide services in a timely manner and with the appropriate deployment of assets. ESCI observed and reviewed the fire stations operated by each of the agencies. The findings are summarized in the following pages and any areas of concern observed are identified.

Figure 30: Warminster/Bucks County Station 90

300 Madison Ave
Warminster, PA 18974

Structure				
Construction Type	Block – Wood Truss			
Date of Construction	2005			
Seismic Protection	Yes			
Auxiliary Power	Yes			
General Condition	Excellent			
Apparatus Bays	2	Drive-through bays	1	Back-in bays
Special considerations (ADA, etc.)	ADA			
Facilities Available				
Separate Rooms/Dormitory/Other	2	Bedrooms	10	Beds in dormitory
Maximum Station Staffing Capability	10–15			
Exercise/Workout Facilities	Yes			
Kitchen/Dormitory	Yes			
Individual Lockers/Storage Assigned	Yes			
Shower Facilities	Yes			
Training/Meeting Rooms	Yes			
Washer/Dryer	Yes			
Safety & Security				
Sprinklers and/or Smoke Detection	Yes			
Decontamination/Biohazard Disposal	Yes			
Security	Yes			
Apparatus Exhaust System	Yes			

Assigned Apparatus/Vehicles

Apparatus Call Sign	Minimum Staffing*	Comments
Rescue 90	4–6	
Ladder 90	4–6	

Figure 31: Warminster/Bucks County Station 91

400 Centennial Rd
Warminster, PA 18974

Structure				
Construction Type	Block/Wood Truss			
Date of Construction	1974			
Seismic Protection	Yes			
Auxiliary Power	Yes			
General Condition	Good			
Apparatus Bays	0	Drive-through bays	2	Back-in bays
Special considerations (ADA, etc.)				
Facilities Available				
Separate Rooms/Dormitory/Other	No	Bedrooms	0	Beds in dormitory
Maximum Station Staffing Capability	10			
Exercise/Workout Facilities	No			
Kitchen/Dormitory	Kitchen – Yes/Dormitory – No			
Storage Assigned	Yes			
Shower Facilities	Yes			
Training/Meeting Rooms	No			
Washer/Dryer	Yes			
Safety & Security				
Sprinklers and/or Smoke Detection	Sprinkler – No/Smoke Detectors – Yes			
Decontamination/Biohazard Disposal	No			
Security	Yes			
Apparatus Exhaust System	No			

Assigned Apparatus/Vehicles

Apparatus Call Sign	Minimum Staffing*	Comments
Engine 91	4–6	
Special Service 91	4	

Figure 32: Warminster/Bucks County Station 92

200 Norristown Rd.
Warminster, PA 18974

Structure				
Construction Type	Block – Wood Truss			
Date of Construction	1970			
Seismic Protection	Yes			
Auxiliary Power	Yes			
General Condition	Good			
Apparatus Bays	0	Drive-through bays	2	Back-in bays
Special considerations (ADA, etc.)	Yes			
Facilities Available				
Separate Rooms/Dormitory/Other	0	Bedrooms	0	Beds in dormitory
Maximum Station Staffing Capability	12			
Exercise/Workout Facilities	No			
Kitchen	Yes			
Storage Assigned	Yes			
Shower Facilities	Yes			
Training/Meeting Rooms	No			
Washer/Dryer	Yes			
Safety & Security				
Sprinklers and/or Smoke Detection	Sprinklers – No/Smoke Detectors – Yes			
Decontamination/Biohazard Disposal	No			
Security	Yes			
Apparatus Exhaust System	No			

Assigned Apparatus/Vehicles		
Apparatus Call Sign	**Minimum Staffing***	**Comments**
Engine 92	4	
Special Services 92	4	

Figure 33: Hartsville Volunteer Fire Co. No. 1/Bucks County Station 93

1195 York Rd.
Warminster, PA 18974

Structure				
Construction Type	Type 2/Type 3			
Date of Construction	1972 (1993 addition)			
Seismic Protection	No			
Auxiliary Power	Yes			
General Condition	Good			
Apparatus Bays	1	Drive-through bays	2	Back-in bays
Special considerations (ADA, etc.)	Meeting room, lounge and kitchen on the 1st floor			
Facilities Available				
Separate Rooms/Dormitory/Other	2	Bedrooms	12	Beds in dormitory
Maximum Station Staffing Capability	Unlimited			
Exercise/Workout Facilities	Yes			
Kitchen/Dormitory	Yes			
Individual Lockers/Storage Assigned	No			
Shower Facilities	Yes			
Training/Meeting Rooms	Yes			
Washer/Dryer	Yes			
Safety & Security				
Sprinklers and/or Smoke Detection	Yes – both			
Decontamination/Biohazard Disposal	External			
Security	Yes			
Apparatus Exhaust System	Partial			

Assigned Apparatus/Vehicles

Apparatus Call Sign	Minimum Staffing*	Comments
Squirt 93	4	65' articulating boom
Engine 93	4	Limited rescue tools
Special Service 93	4	Air compressor and cascade, RIT truck

Discussion

ESCI observed the four stations serving the Township to be well-maintained considering the ages of specific facilities. Two of the fire stations utilized to serve Warminster Township are 45 and 50 years in age and do not have a vehicle exhaust system. Additionally, these two stations have "back-in" bays which are considered to be a serious safety concern as many firefighter injuries and accidents occur when emergency vehicles are being backed into the fire station. Neither of these stations has acceptable sleeping facilities to allow the departments to utilize "duty crews" during evening hours. The usage of the duty crew concept allows for volunteer and paid-on-call fire departments to improve turnout times and total response times as the initial response crews are located at the station when the call for service is dispatched.

APPARATUS

Collectively the two fire departments serving Warminster Township maintain a sizeable fleet of response vehicles that are generally newer and clearly well maintained. The overall condition of the fleet was found to be very good to excellent generally. An inventory of fire apparatus, configuration, and condition is provided in the following figures.

Figure 34: Warminster Fire Company No. 1 Fleet Inventory

Apparatus Designation	Type	Year
Rescue 90	Engine	2017
Engine 91	Engine	2010
Engine 92	Engine	2016
Ladder 90	Aerial	2005
Chief 90	Command	2018
Deputy 90	Command	2010
Battalion 91	Command	2016
Battalion 92	Command	2016
Special Services 90	Support	2005
Special Services 91	Support	2001
Special Services 92	Support	2001

Figure 35: Hartsville Fire Company Fleet Inventory

Apparatus Designation	Type	Year
Engine 93	Engine	2018
Squirt 93	Aerial	2010
Special Services 93	Support	2006
Chief 93	Command	2014
Deputy 93	Command	2014

Discussion

Each of the fire stations utilized by the two fire departments conditions varies, but overall in a good state of operation. Additionally, the general condition of the fleet maintained by the two fire departments is in excellent condition and well maintained. Collectively, the facilities and fleet utilized to serve the citizens of Warminster Township are equivalent to similar sized communities across the United States.

APPARATUS REPLACEMENT PLANNING

Long range capital replacement planning is always a challenge and one that is of particular concern to the Hartsville and the Warminster Fire Companies due to the large numbers of vehicles in operation. Fire apparatus are typically unique pieces of equipment, often very customized to operate efficiently in a narrowly defined mission. A pumper may be designed such that the compartments fit specific equipment and tools, with virtually every space on the truck designated in advance for functionality. This same vehicle, with its specialized design, cannot be expected to function in a completely different capacity, such as a hazardous materials unit or a rescue squad. For this reason, fire apparatus are very expensive and offers little flexibility in use and reassignment. As a result, communities across the country have sought to achieve the longest life span possible for these vehicles.

Unfortunately, no mechanical piece of equipment can be expected to last forever. As a vehicle ages, repairs tend to become more frequent, parts more difficult to obtain, and downtime for repair increases. Given the emergency mission that is so critical to the community, this factor of downtime is one of the most frequently identified reasons for apparatus replacement.

Because of the large expense of fire apparatus, most communities find the need to plan for the cost of replacement. To properly do so, agencies often turn to the long-accepted practice of establishing a life cycle for the apparatus that results in a replacement date anticipated well in advance. Forward-thinking organizations then set aside incremental funds during the life of the vehicle so replacement dollars are ready when needed.

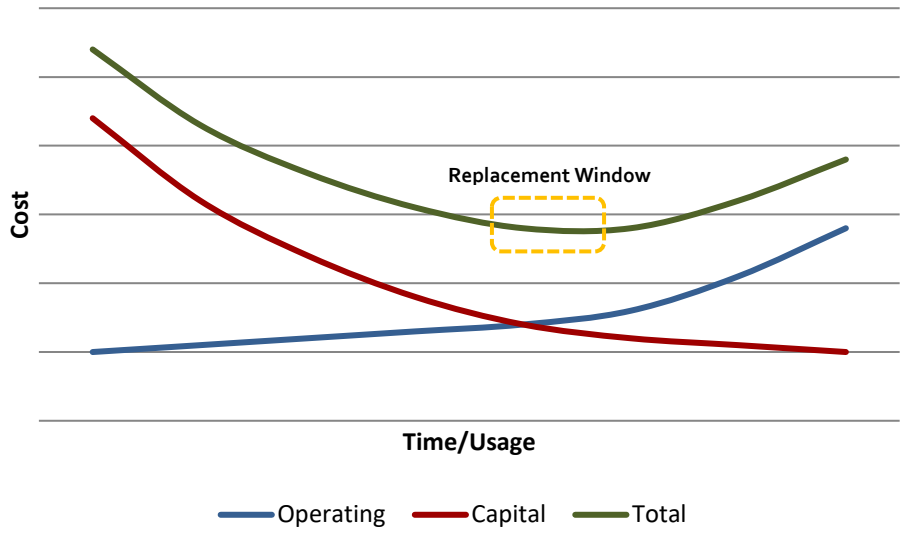
NFPA 1901: *Standard for Automotive Fire Apparatus* is a nationally recognized industry standard for the design, maintenance, and operation of fire suppression apparatus. The issue of replacement cycles for various types of apparatus has been discussed in the committee that develops the standard for many years. In developing its latest edition, the committee calls for a life cycle of 12 years in front-line service and five years in reserve status for engines, and 15 years in front-line service and five years in reserve status for ladder trucks.

Does this mean that a fire engine cannot be effective as a front-line pumper beyond 12 years? A visit to many departments in the United States might prove otherwise. Small, volunteer fire departments with only a hundred or so calls per year often get up to 25 years from a pumper, though the technology is admittedly not up-to-date. Likewise, busy downtown county fire stations in some urban communities move their engines out of front-line status in as little as eight years.

The reality is that it may be best to establish a life cycle that would be used in the development of replacement funding for various types of apparatus, while applying a different method for actually determining the replacement date in real life in an effort to achieve greater cost efficiency where possible.

A conceptual model that may be used when a replacement cycle is considered is the *Economic Theory of Vehicle Replacement*. The theory states that, *as a vehicle ages, the cost of capital diminishes and its operating cost increases*. The combination of these two costs produces a total cost curve. The model suggests the optimal time to replace any piece of apparatus is when the operating cost begins to exceed the capital costs. This optimal time may not be a fixed point but rather a range over time. The flat spot at the bottom of the total curve in the following figure represents the replacement window.

Figure 36: Economic Theory of Vehicle Replacement



Shortening the replacement cycle to this window allows for an apparatus to be replaced at optimal savings to the department. If the department does not routinely replace equipment in a timely manner, the overall reduction in replacement spending can result in a quick increase in maintenance and repair expenditures. Officials who assume that deferring replacement purchases is a good tactic for balancing the budget need to understand that two events may occur:

1. Costs are transferred from the capital budget to the operating budget.
2. Such deferral may increase overall fleet costs.

Regardless of its net effect on current apparatus costs, the deferral of replacement purchases unquestionably increases future replacement spending needs.

Collectively, the fire departments have a standard that depicts when to replace their apparatus. These decisions should be based on the service demands of their community. The current replacement costs and industry standard life expectancies of each type of unit are shown in the following figure.

Figure 37: Industry Standard Life Expectancies

Type	Vehicle	Life Expectancy (Years)	Replacement Cost
1	Squad/Utility	15	$50,000
2	Med Rescue Truck	15	$210,000
3	Heavy Rescue Truck	20	$500,000
4	Commercial Pumper	20	$350,000
5	Custom Pumper	20	$550,000
6	Tanker	20	$350,000
7	Ladder	25	$1,200,000
8	Brush	20	$140,000

Apparatus Replacement Funding

ESCI advises clients that the day that a new piece of fire apparatus is delivered the agency start to set funds aside for its replacement. Each piece of fire apparatus and the related support equipment has a predictable expected useful service life, based on a practical balance of use and maintenance cost. By analyzing age, projected service life, and replacement costs with an inflation factor, a replacement schedule can be established that looks farther into the future than simply the annual budget process, enabling agencies to more effectively forecast future financial demands and plan for them.

Generally speaking, the two fire departments operate an equal mix of older and newer apparatus. Many of the apparatus have recently been replaced. A single "Town-wide" replacement plan is important. However, fully funding a plan can be a difficult challenge. This level of financial forecasting is essential but is not in place in many fire departments. At the time of this report, both fire departments have established long-term replacement plans to address these issues with associated long-term budgeting.

Appendix H: Service Delivery

The delivery of fire suppression, rescue, and emergency medical services is no more effective than the sum of its parts. It requires efficient notification of an emergency and rapid response from well-located facilities, in appropriate apparatus, with enough well-trained personnel, following a well-practiced plan of action. This section of the report provides an analysis of the current service delivery components of the two fire departments serving Warminster Township.

Data Sources

In the following demand analysis and performance review, ESCI reviewed current and historical service demand by incident type and temporal variations for Warminster Township. GIS software was used to provide a geographic display of demand within the study area. National Fire Incident Records System (NFIRS) data and Computer Aided Dispatch (CAD) data provided by the departments was used in this section of the report. ESCI used the most appropriate source of data for the analysis being made.

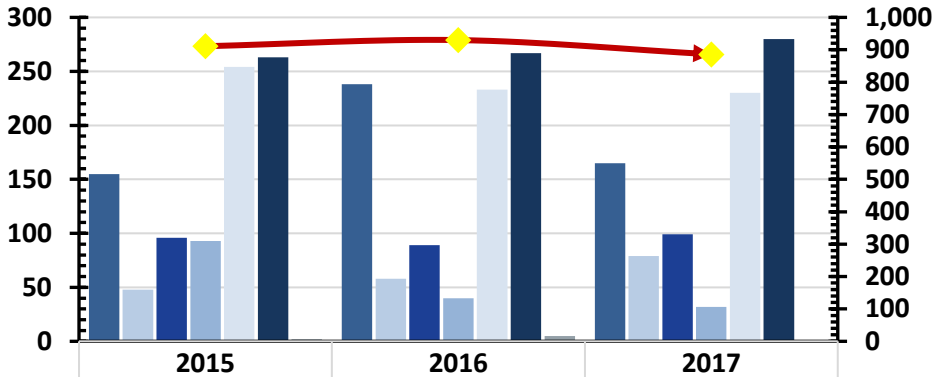
The NFIRS data provided by the two departments included years 2015 through 2017 for WFC, and 2015 through 2018 for HFC. For consistency with WFC, only the years 2015 through 2017 were used from HFC records. For the 36-month study period 2015 through 2017, a total of 2,732 records were submitted. Of these, 1,935 were from the WFC and 797 from HFC based on the FDID number. Records were further filtered for incidents that occurred within the Township of Warminster. After this adjustment, there were 2,411 total records for evaluation, 1,651 from WFC and 760 from the HFC.

Data from the Bucks County Department of Communications CAD data included 2,910 records for Warminster (municipality code 74). These records included a record for each unit that responded to an incident for the time period January 1, 2016, to September 30, 2018. As this data contained multiple records for each incident, ESCI calculated best performance time for each record and then removed duplicate records. With duplicate records removed, 1,553 records remained for the analysis that required single records.

DEMAND

The following figures demonstrate historical service demand for Warminster Township. This figure is from NFIRS data based on NFIRS codes and is the total for all incidents that were reported to NFIRS regardless of where the incident occurred.

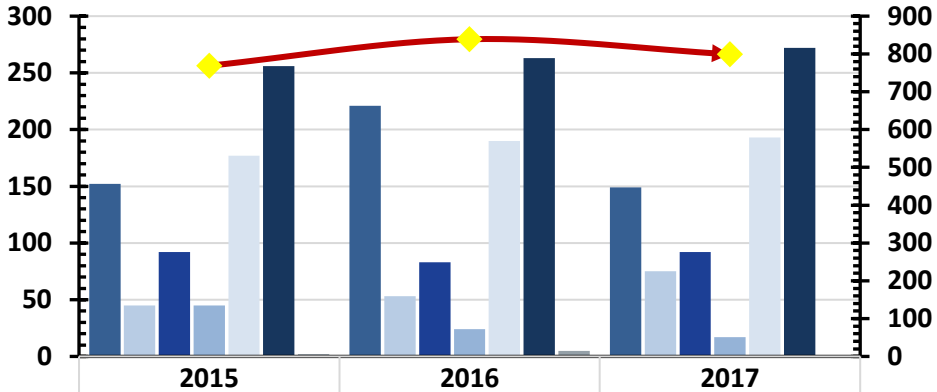
Figure 38: Historical Service Demand WFC and HFC All Areas by Incident Types (NFIRS 2015–2017)



	2015	2016	2017
Fires	155	238	165
EMS-Rescue	48	58	79
Hazard Condition	96	89	99
Service Call	93	40	32
Cancelled - Good Intent	254	233	230
False Alarms	263	267	280
Other	2	5	1
Total	911	930	886

The figure above is the historical service demand for both departments for those incidents reported to NFIRS that occurred only in Warminster Township.

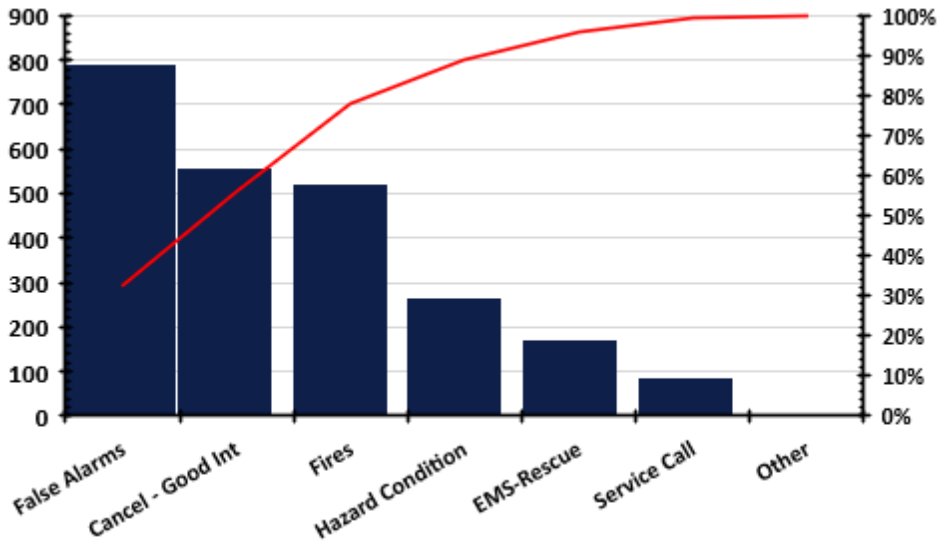
Figure 39: Historical Service Demand WFC and HFC In Warminster Only by Incident Type (NFIRS 2015–2017)



	2015	2016	2017
Fires	152	221	149
EMS-Rescue	45	53	75
Hazard Condition	92	83	92
Service Call	45	24	17
Cancelled - Good Intent	177	190	193
False Alarms	256	263	272
Other	2	5	1
Total	769	839	799

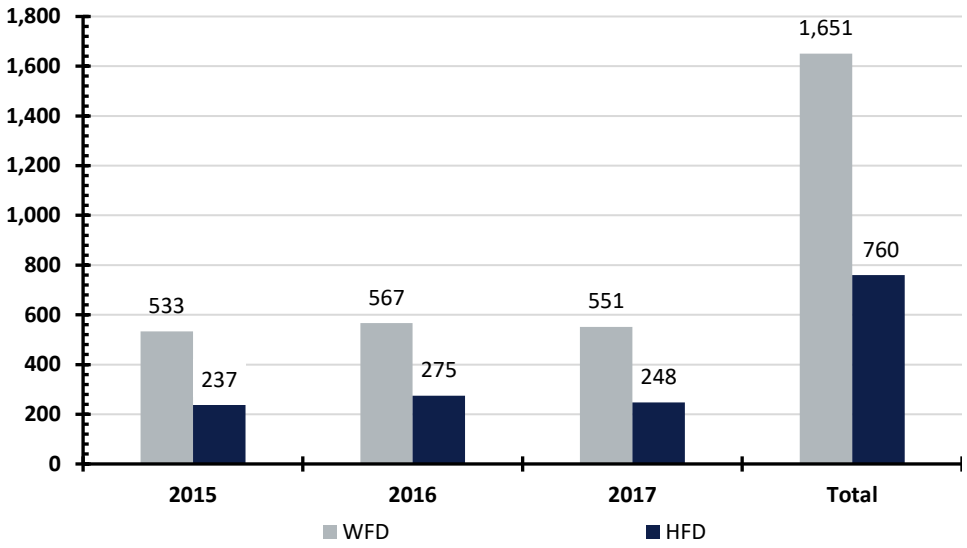
The next figure illustrates the aggregate service demand for both fire departments for incidents occurring only in Warminster. False alarms account for the highest number of incidents followed by good intent and then fires. Nearly 80 percent of the incidents fall within these three categories.

Figure 40: Historical Service Demand WFC and HFC in Warminster Only by Type of Incident (NFIRS 2015–2017)



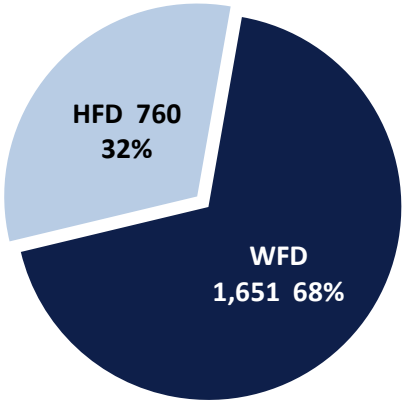
The following figure is a summary of each department's total responses in the Township for all incident types.

Figure 41: Historical Service Demand WFC and HFC In Warminster Only (NFIRS 2015–2017)



The next figure provides the percentage of incidents each department reported in the Township only.

Figure 42: Historical Service Demand WFC and HFC In Warminster Only (NFIRS 2015–2017)



TEMPORAL VARIATION

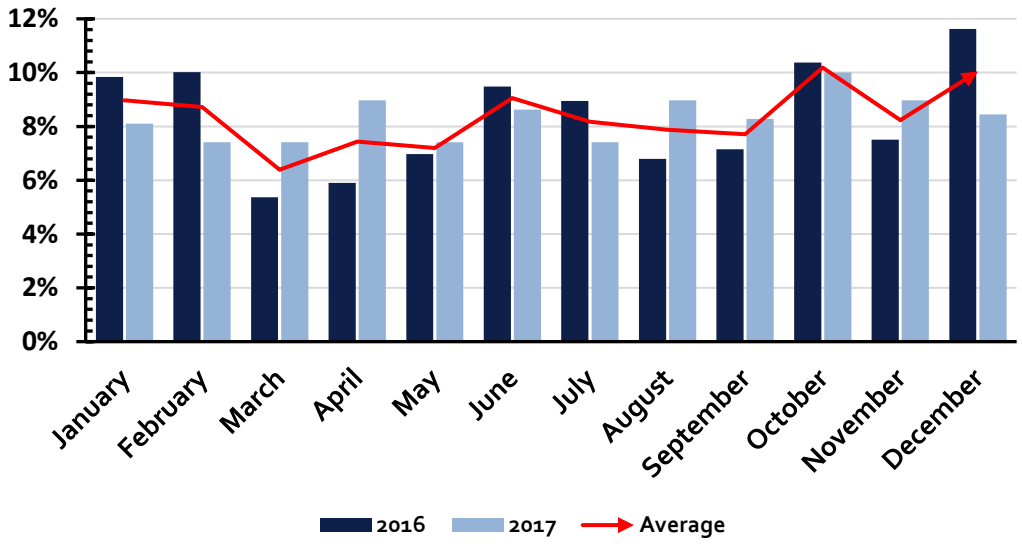
It is also useful to evaluate service demand temporally in order to understand any trending that occurs during certain periods where staffing can be modified to better fit the demand. The following figures display 2016 to 2017 service demand within the Warminster Township study area; summarized by various measures of time.

The next figure provides a graphical representation of service demand throughout the year by month. The demand varies from year to year and throughout the twelve months. The highest demand—11.6 percent—occurred in 2016 during the month of December. The lowest demand throughout the study period was March 2016 with 5.3 percent of the incidents for that year. Total incidents increased from 2016 to 2017—the percentage of incidents increased from 2016 to 2017 for the months of March, April, May, August, September, and November.

The difference between the average high percentage in October—at just over 10 percent—and the average low of 6.3 percent in March, is just under 4 percent—or in this case about 43 incidents.

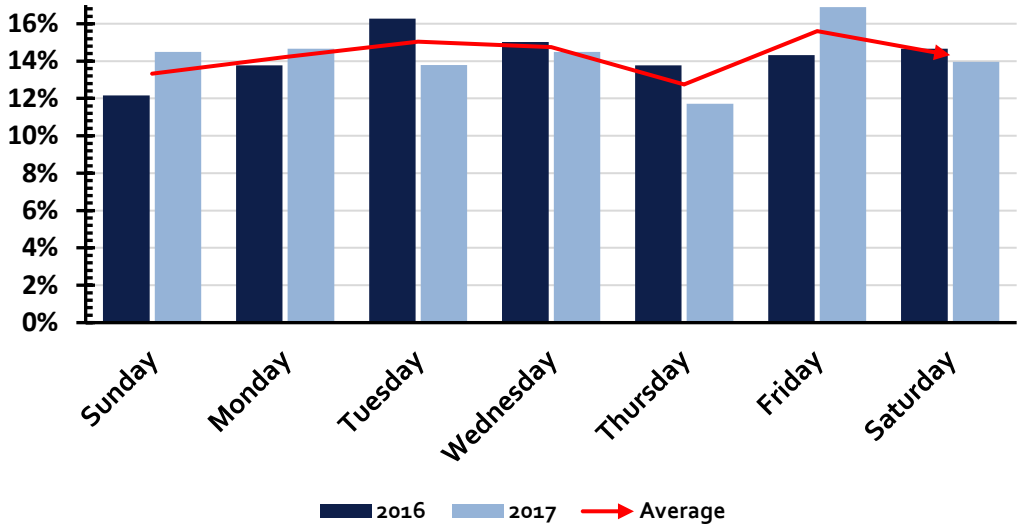
The Township should monitor these trends and changes in monthly demand while assessing any impact on deployment and performance.

Figure 43: Service Demand by Month (CAD 2016–2017)



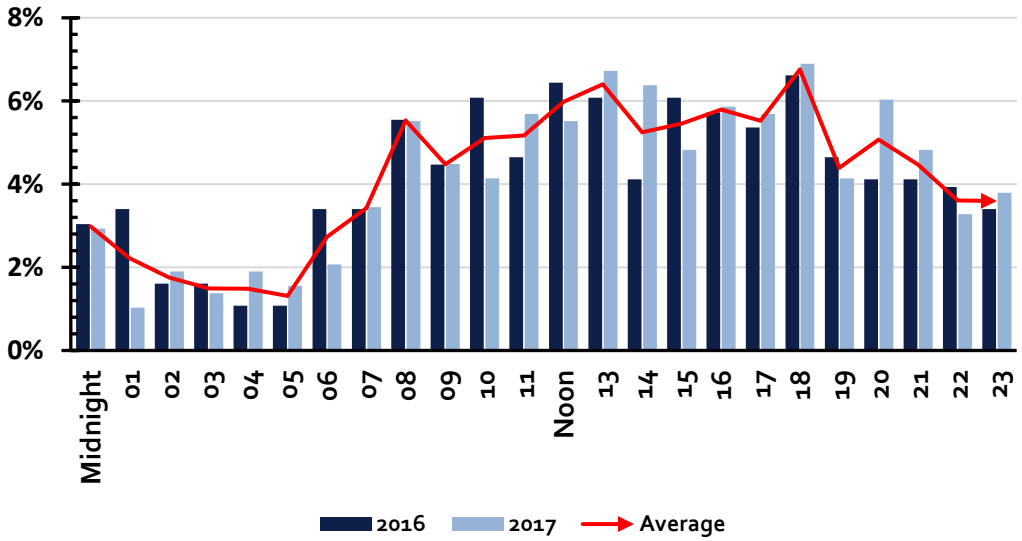
The following figure provides an understanding of daily call activity. As with monthly service demand, daily service demand varies over the 24-month study period and throughout the week. The range for average demand is relatively narrow—just under 3 percent—with a high of 15.6 percent on Fridays to a low on Thursdays of 12.8 percent. This demand pattern also should be monitored for patterns, trends, and effects on deployment.

Figure 44: Service Demand by the Day of the Week (CAD 2016–2017)



The final temporal analysis is the demand by time of day, as illustrated in the following figure. Service demand directly correlates with the activity of people, with workload increasing during daytime hours and decreasing during nighttime hours. In Warminster, there is some variation between the percentage of demand by hour in 2016 vs. 2017, but the variation is small. Average Incident activity in Warminster begins to increase at 6:00 am, continues to increase until 8:00 am, followed by slight increases and decreases until a high at 6:00 pm. Aside from a spike at 8:00 pm, there is a gradual decline through the evening and into the night reaching a low at 5:00 am. Examining the hours of 7:00 am to 5:00 pm—a common workday—this time period counts for nearly 60 percent of calls for service. This can provide a challenge for volunteer personnel who are often committed to work and other personal demands.

Figure 45: Service Demand by Time of Day (CAD 2016–2017)



Of note is that while demand is lower in the early morning hours, residential fatal fires occur most frequently late at night or in the early morning. From 2009 to 2011, residential fatal fires were highest between 1:00am to 2:00am and 4:00am to 5:00am. The 8-hour peak period (11 am to 7 am) accounted for 48 percent of residential fatal fires.[6]

The next figure provides an understanding of the volume of incidents occurring within the Township correlated to the "first due" station. Station 90 is the busiest area within the Township followed by Station 93. It is important to understand that this graphic does not specifically indicate call volume by unit, but only station service area.

Figure 46: Station Activity (NFIRS 2015–2017)

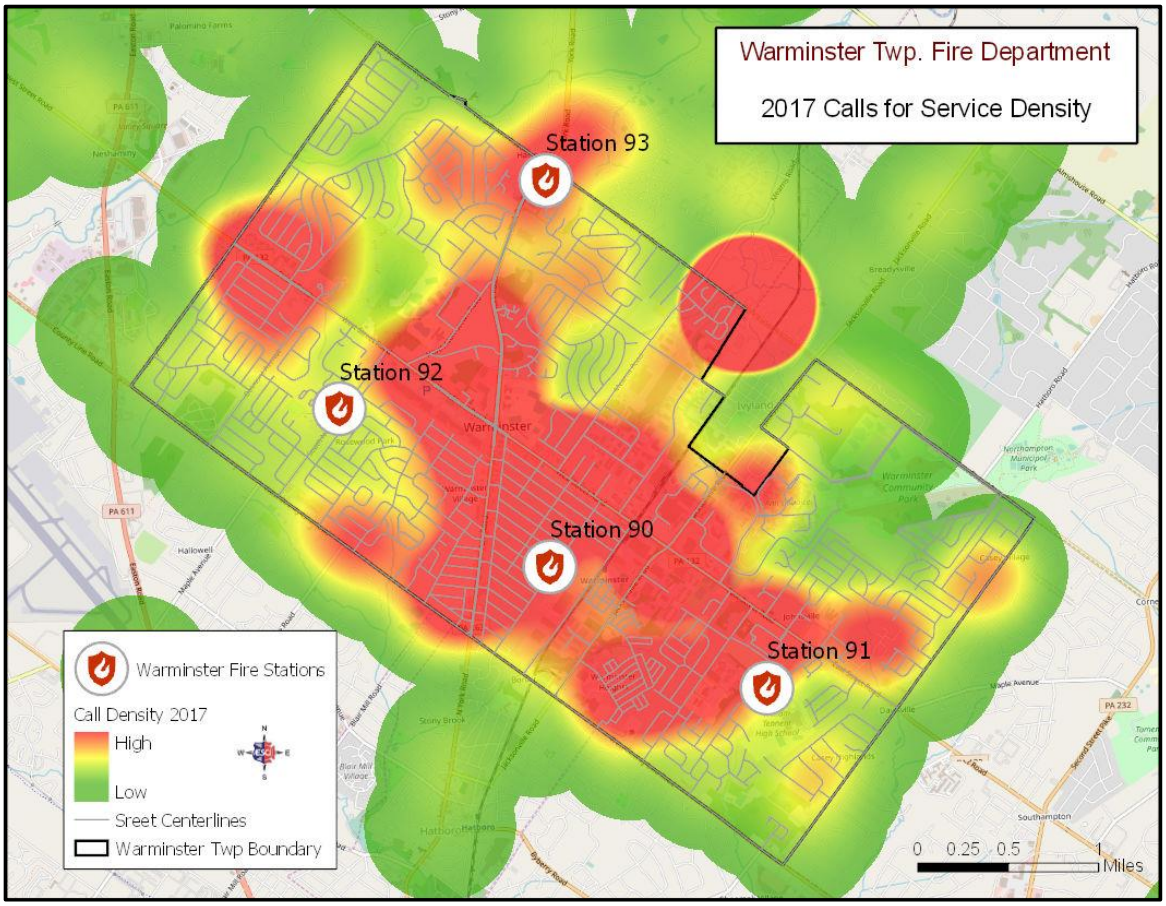
Station Number	All Incidents	Township Only
90	1,452	1,269
91	332	262
92	151	120
93	796	759

[6] *Fatal Fires in Residential Buildings (2014–2016), Topical Fire report Series Volume 19, Issue 1/June 2018, U.S. Department of Homeland Security, U.S. Fire Administration, National Fire Data Center.*

Geographic Service Demand

In addition to temporal analysis, it is useful to examine the geographic distribution of service demand. Using CAD data, ESCI plotted the incident locations and calculates the mathematical density of service demand in the Warminster Township service area during 2017.

Figure 47: Warminster Incident Density, 2017



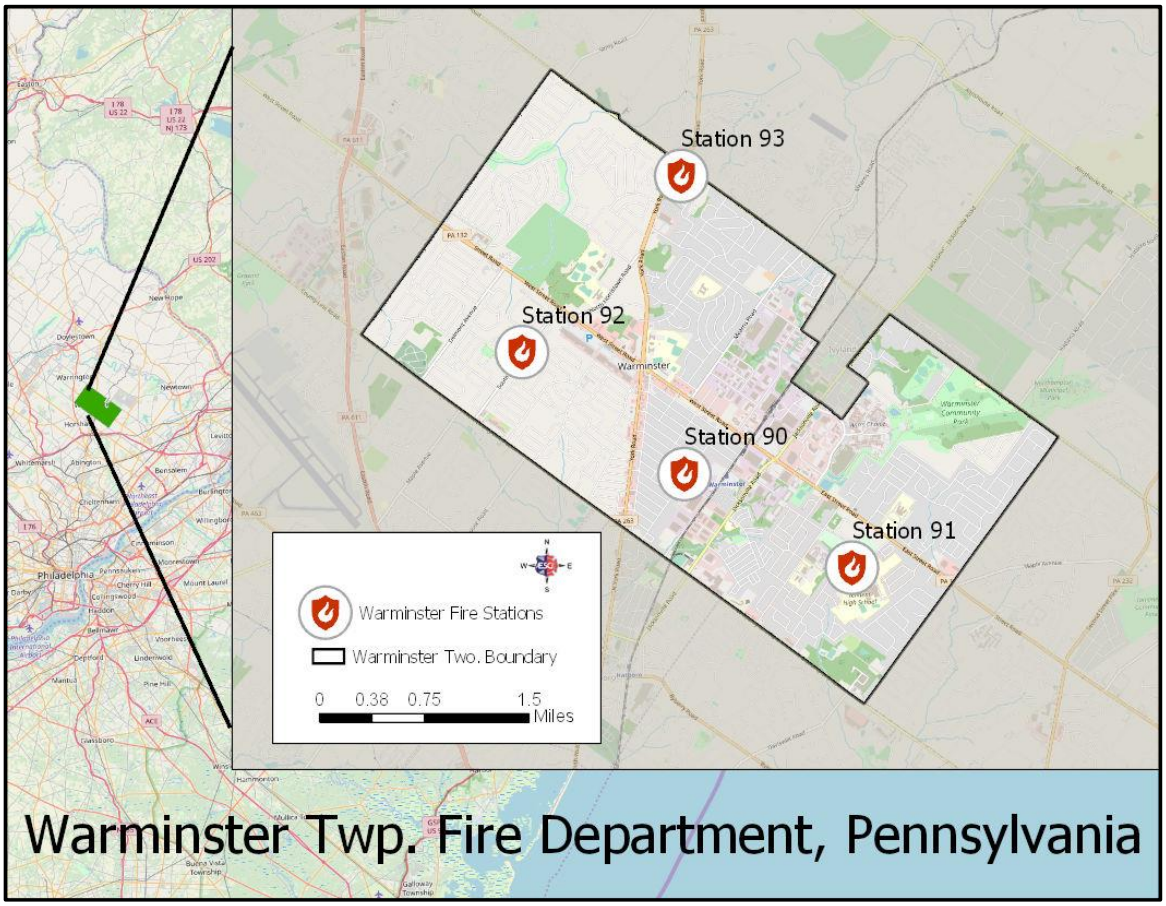
As illustrated in the figure above, the incident density varies throughout the Township. Three of the higher density areas include Stations 90, 91, and 93. This graphic generally implies that the call volume within the Township is distributed relatively evenly.

Distribution

The analysis of resource distribution presents an overview of the current deployment of fire department facilities, equipment, and personnel within the Warminster Township service area. There are two standards commonly used in the fire service to determine an agency's response distribution. The first, and most common, standard is the Insurance Services Office's (ISO) application of road miles from a fire station and water supply measurement. The second standard comes from the National Fire Protection Association (NFPA) Standard 1720: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, and utilizes a time component coupled with "fractile" reporting of response times. When used in tandem, these two standards help emergency service leaders understand current service level capabilities and plan for future impacts. Additionally, the Center for Public Safety Excellence (CPSE) provides guidance on the measurement of performance. The following section provides an analysis of both the ISO and NFPA 1720 standards.

The figure below again illustrates the station locations for the four stations that provide coverage for Warminster Township. Stations 90, 91, and 92 comprise the Warminster Fire Company No. 1; and Station 93, the Hartsville Fire Company.

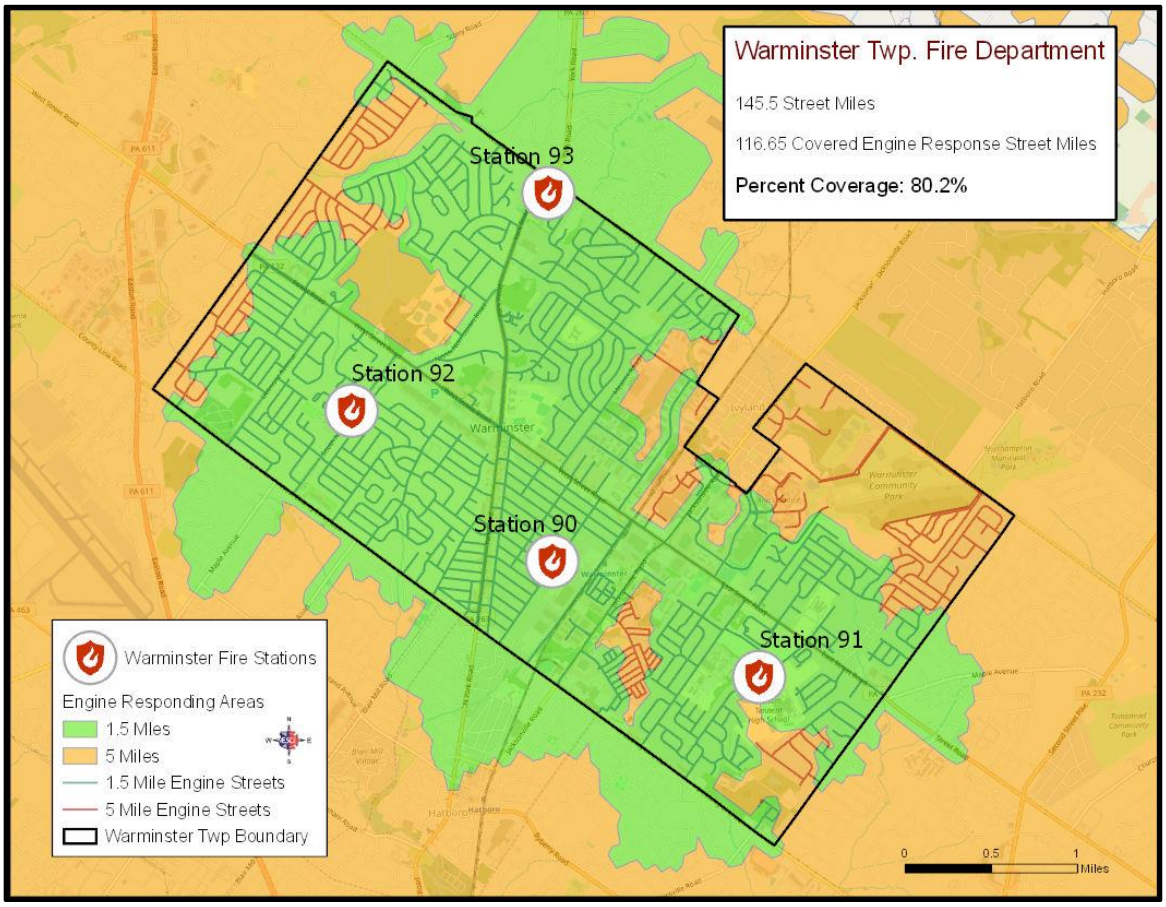
Figure 48: Warminster and Hartsville Fire Station Locations



The Insurance Services Office (ISO) is a national insurance industry organization that evaluates fire protection for communities across the country. A jurisdiction's ISO rating is an important factor when considering fire station and apparatus distribution since it can affect the cost of fire insurance for individuals and businesses. To receive maximum credit for station and apparatus distribution, ISO recommends that in urban areas, all "built upon" areas in a community be within 1.5 road miles of an engine company and 2.5 miles of a ladder company (aerial apparatus). Additionally, ISO states that a structure must be within five miles of a fire station to receive any fire protection rating for insurance purposes. The following figures examine current Warminster Township station and apparatus distribution based on credentialing criteria for the Insurance Services Office (ISO).

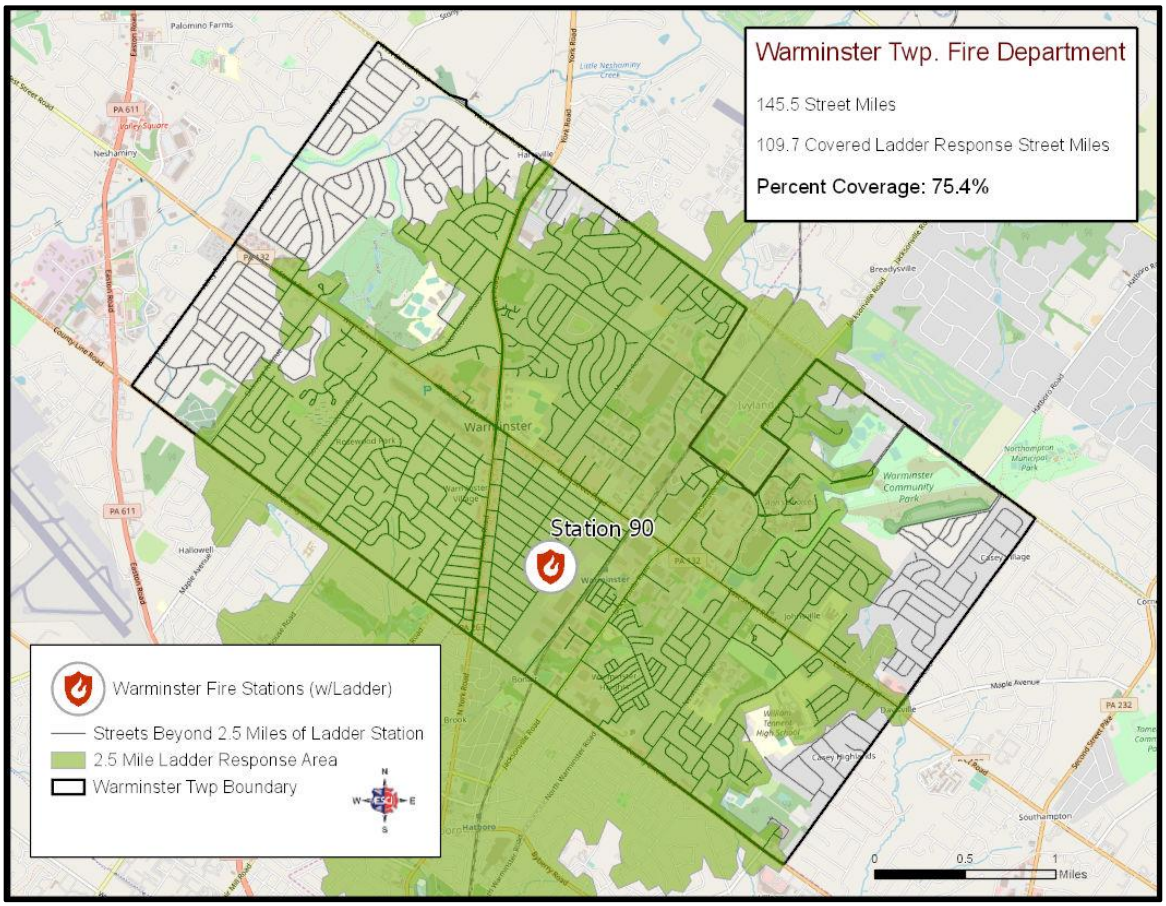
The next figure demonstrates the areas of the Township that are within 1.5 miles of an engine company as well as the five-mile criteria established by ISO. As indicated, 100 percent of the "built upon" roads within Warminster Township are within the five-mile limit and is eligible for scoring by ISO. There is 80 percent engine company coverage at 1.5 miles.

Figure 49: Warminster Township Engine Company Distribution



The ISO criteria for aerial apparatus distribution is based on the presence and number of buildings over three stories or where high fire suppression water flow is required. The figure above demonstrates the current 2.5-mile coverage area of Warminster and Hartsville Fire Company ladder companies operating from Station 90 and Station 93. Slightly more than seventy-five percent of the Township is within the 2.5 miles for ladder coverage.

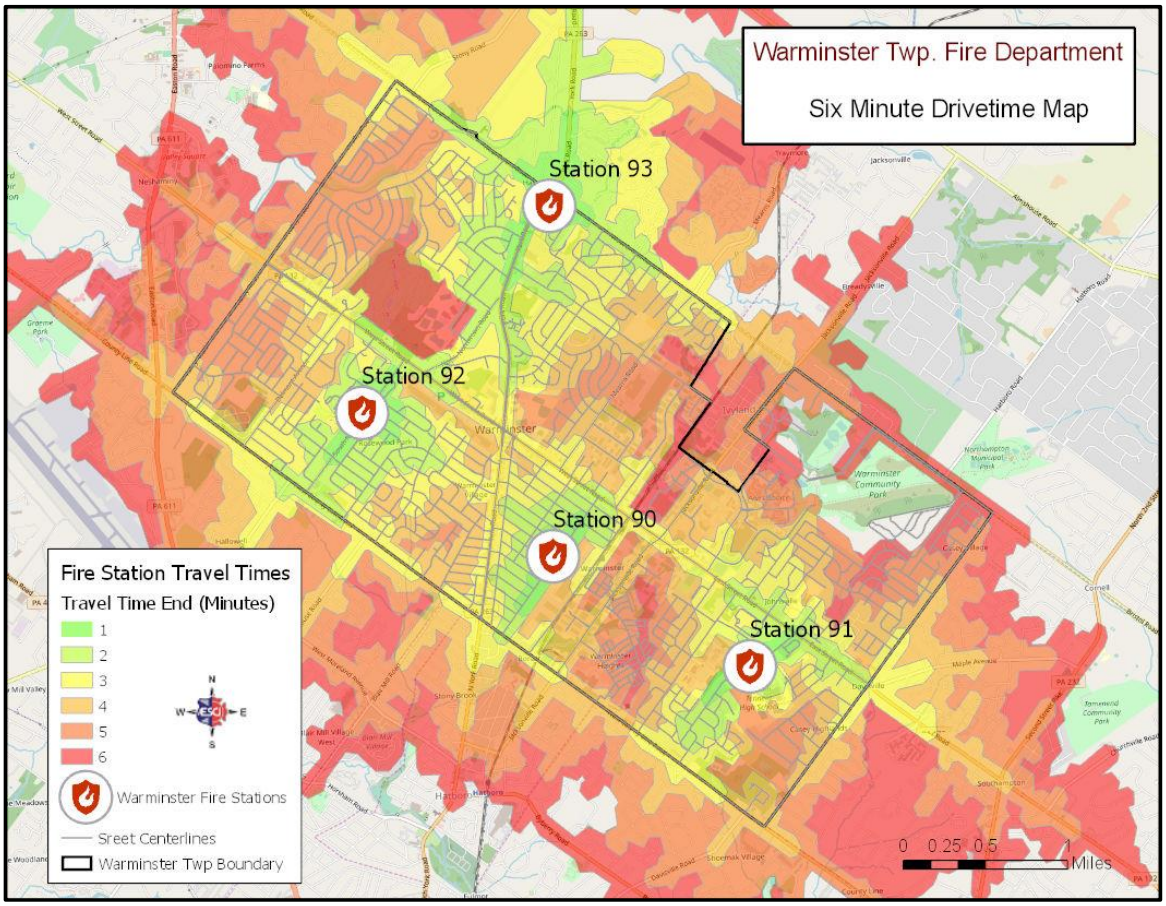
Figure 50: Warminster Township Ladder Company Distribution



Concentration

Accepted firefighting procedures call for the arrival of the entire initial assignment or effective firefighting force (sufficient apparatus and personnel to effectively deal with an emergency based on its level of risk) within a reasonable amount of time. This is to ensure that enough personnel and equipment arrive in a timely manner to safely control a fire or mitigate an emergency before there is substantial damage or injury. In this analysis, ESCI examined the ability of the departments serving Warminster Township to assemble multiple resources across the study area. It is important to note that in a volunteer system in which emergency responders must return to the station to then respond to an emergency, there are many variables to the response structures for each station and its respectively assigned staff. The next figure illustrates the predicted travel time for the WFC and HFC stations at six minutes. Aside from a small area near the community park—the entire area is covered in six minutes' travel time.

Figure 51: Predicted Six-Minute Travel Time



RELIABILITY

A review of workload by station and response unit can reveal much about response performance and a department's ability to assemble adequate resources to mitigate simultaneous incidents. Although fire stations and response units may be distributed in a manner to provide quick response, that level of performance can only be obtained when the response unit is available in its primary service area.

Concurrent Incidents

In the following figure, ESCI examined 2016 and 2017 incidents from the CAD data to find the frequency that the departments are handling multiple calls. This is important because the more calls occurring at one time; the more stretched available resources become, leading to extended response times from more distant responding available apparatus.

Figure 52: Warminster Township Concurrent Incidents (CAD 2016–2017)

No. of Incidents	Quantity	Percentage
Single Incident	1,440	98.2%
Two Incidents	26	1.8%
Three Incidents	1	< 0.1%

As illustrated—over 98 percent of the incidents occur singularly. Just under 2 percent of the incidents occur when another incident is ongoing.

Unit Hour Utilization

Unit Hour Utilization (UHU) describes the amount of time that a unit is not available for response because it is already committed to another incident. The larger the number, the greater its utilization and the less available it is for assignment to subsequent calls for service. UHU rates are expressed as a percentage of the total hours in a year. The next figure displays the amount of time response units were committed to an incident in 2016 and 2017 according to the CAD records provided.

Figure 53: Unit Utilization by Unit for All Incidents (CAD 2016–2017)

Unit	Total Incidents	Total Time	Average Time	UHU
E90	424	113:16:27	0:16:02	0.6%
R90	376	115:36:28	0:18:27	0.7%
L90	255	92:08:21	0:21:41	0.5%
E91	420	123:26:01	0:17:38	0.7%
E92	249	86:32:30	0:20:51	0.5%
E93	171	52:45:56	0:18:31	0.3%
SQ93	169	52:11:24	0:18:32	0.3%

The Unit Hour Utilization analysis for both departments in the Township indicates that all units fall well below the 10 percent threshold to meet 90th percentile performance goals. While the service demand for incidents in the Township is currently such that it falls well within acceptable parameters, this is a metric that should be monitored regularly to ensure that system performance failures are not a result of overutilization of individual units.

Response Performance

Perhaps the most publicly visible component of an emergency services delivery system is that of response performance. Most citizens and policymakers alike want to know how quickly they can expect to receive services. In the performance summary, ESCI examined emergency response performance for the Warminster Township service area using the incident data from Bucks County Communications Center. Nonemergency incidents, mutual or auto aid incidents outside the service area, data outliers, and invalid data are removed from the data set whenever possible.

The benchmark for staffing and deployment applicable to both the WFC and HFC is found in NFPA 1720 and summarized in the next figure.

Figure 54: NFPA 1720 Staffing/Deployment Matrix

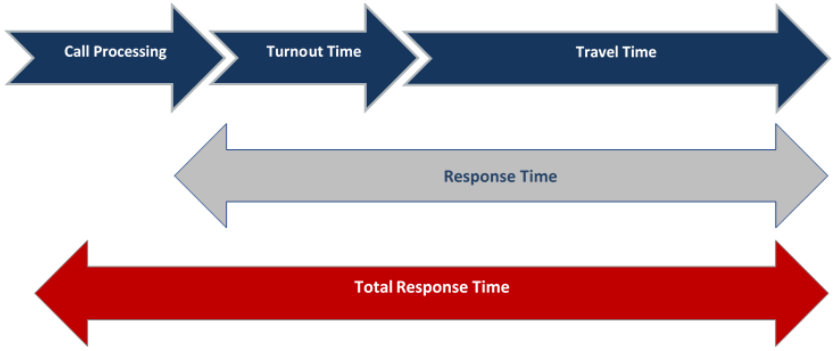
Demand Zones	Demographics	Min. Staff to Respond	Response Time (minutes)	Performance Objective
Urban	More than 1,000 people per sq. mi.	15	9	90%
Suburban	500 to 1,000 people per sq. mi.	10	10	80%
Rural	Less than 500 people per sq. mi.	6	14	80%
Remote	Travel distance 8 miles or more	4	Dependent upon travel distance	90%
Special Risk	AHJ determines	Based on risk	AHJ determined	90%

While the response time described in the figure above measures *response time* only—the components defined below include all times related to *total response time* being comprised of several different components:

- **Call Processing Time**—The amount of time between when a dispatcher answers the 911 call and when resources are dispatched.
- **Turnout Time**—The time interval between when units are notified of the incident and when the apparatus are enroute.
- **Travel Time**—The amount of time the responding unit spends traveling to the incident.
- **Response Time**—A combination of turnout time and travel time. The most commonly used measure of fire department response performance. Defined in NFPA 1720 as beginning upon completion of the dispatch notification and ends on arrival at the scene.
- **Total Response Time**—Total Response Time equals the combination of "Processing Time," "Turnout Time," and "Travel Time."

The next figure is an illustration of the total response time continuum.

Figure 55: Summary of Response Time Components



The *average* measure is a commonly used descriptive statistic also called the mean of a data set. The most important reason for not using the *average* for performance standards is that it may not accurately reflect the performance for the entire data set and may be skewed by data outliers, especially in small data sets. One extremely good or bad value can skew the *average* for the entire data set. Percentile measurements are a better measure of performance since they show that most of the data set has achieved a particular level of performance. The 90th percentile means that 10 percent of the values are greater than the value stated, and all other data is at or below this level. This can be compared to the desired performance objective to determine the degree of success in achieving the goal.

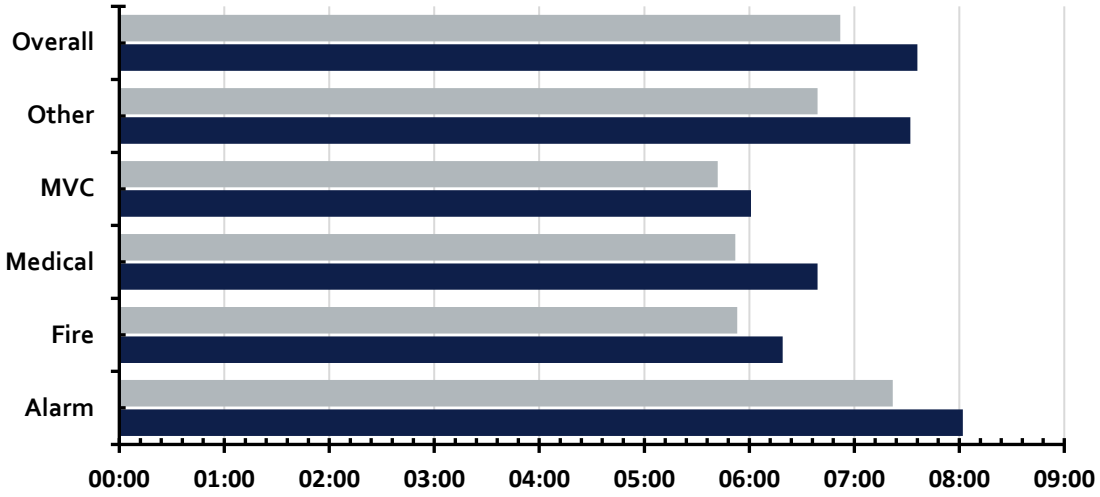
As described previously, for the measurement of performance based on NFPA 1720, the benchmark for an urban community will be used for Warminster as the population density is just over 2,100 people per square mile. Specifically, performance is based on the 90th percentile with a benchmark of nine minutes for response time and a minimum staff of 15.

Although response time is the only component WFC and HFC would measure themselves against the NFPA 1720 benchmark, ESCI included other performance—in which data was available—in this section for comparison and information for the departments.

Turnout Time

The second component of the response continuum, and one that is directly affected by response personnel, is turnout time. Turnout time is the time it takes personnel to receive the dispatch information, move to the appropriate apparatus and begin responding to the incident. Both 80th and 90th percentile performance is illustrated. Again, in a volunteer system where members must first respond to the station, there are numerous variables that can impact turnout time.

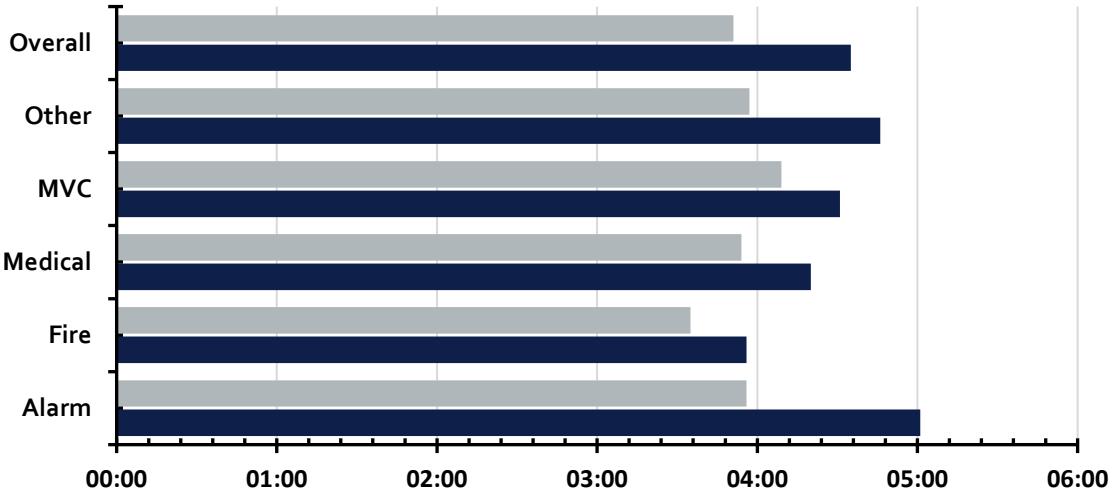
Figure 56: Summary of Turnout Time (CAD 2016–2017)



	Alarm	Fire	Medical	MVC	Other	Overall
80th Percentile	07:22	05:53	05:52	05:42	06:39	06:52
90th Percentile	08:02	06:19	06:39	06:01	07:32	07:36

The next figure illustrates travel time. Again, this is not a measurement required by NFPA 1720 but is provided here at both 80th and 90th percentiles as information.

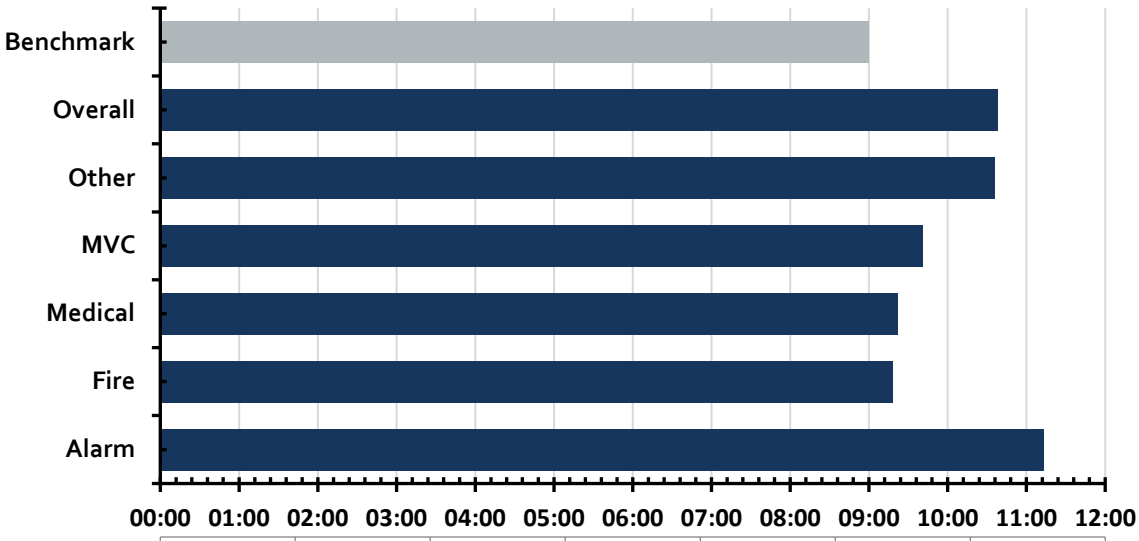
Figure 57: Summary of Travel Time (CAD 2016–2017)



	Alarm	Fire	Medical	MVC	Other	Overall
80th Percentile	03:56	03:35	03:54	04:09	03:57	03:51
90th Percentile	05:01	03:56	04:20	04:31	04:46	04:35

To measure the performance of the WFC and HFC—and to compare it to the requirements of NFPA 1720—ESCI measured response time from the time of dispatch of the alarm to when the first apparatus arrived on the scene of the emergency. ESCI calculated the 90th percentile data for these emergency incidents. The use of percentile measurement of total response time performance follows the recommendations of the NFPA standards and the Center for Public Safety Excellence (CPSE/CFAI) Standards of Cover document.

Figure 58: Summary of Response Time (CAD 2016–2017)



	Alarm	Fire	Medical	MVC	Other	Overall	Benchmark
90th Percentile	11:13	09:18	09:22	09:41	10:36	10:38	09:00

Overall performance exceeds the benchmark by 1 minute, 38 seconds. Response performance to fires comes closest to the benchmark at just 18 seconds above. Alarms have the worst individual incident type performance at 2 minutes, 13 seconds above the nine-minute target. It should be noted that for some incidents, units may have responded in a non-emergency mode are also included here as the CAD data allows for the removal of them.

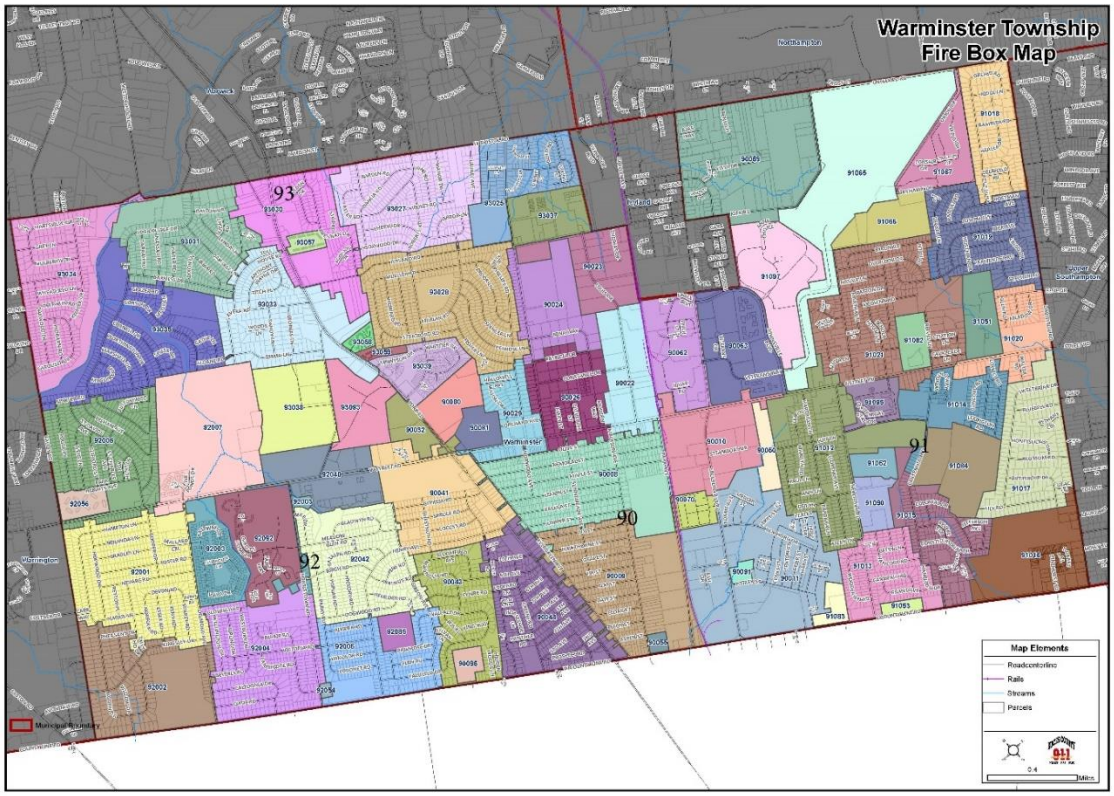
Mutual and Automatic Aid Systems

There are existing mutual aid/automatic aid agreements in place between fire agencies within the Bucks County area. Mutual aid is employed using predetermined box cards. This allows for—depending on the location and type of incident—the appropriate apparatus to be dispatched by the 911 center.

Automatic aid agreements differ from mutual aid agreements in that under certain mutually agreed upon criteria, resources from the assisting agency are automatically dispatched as part of the initial response. These agreements facilitate closest unit dispatch to emergencies in boundary areas and allow for the dispatch of additional apparatus and personnel to specific predefined emergencies.

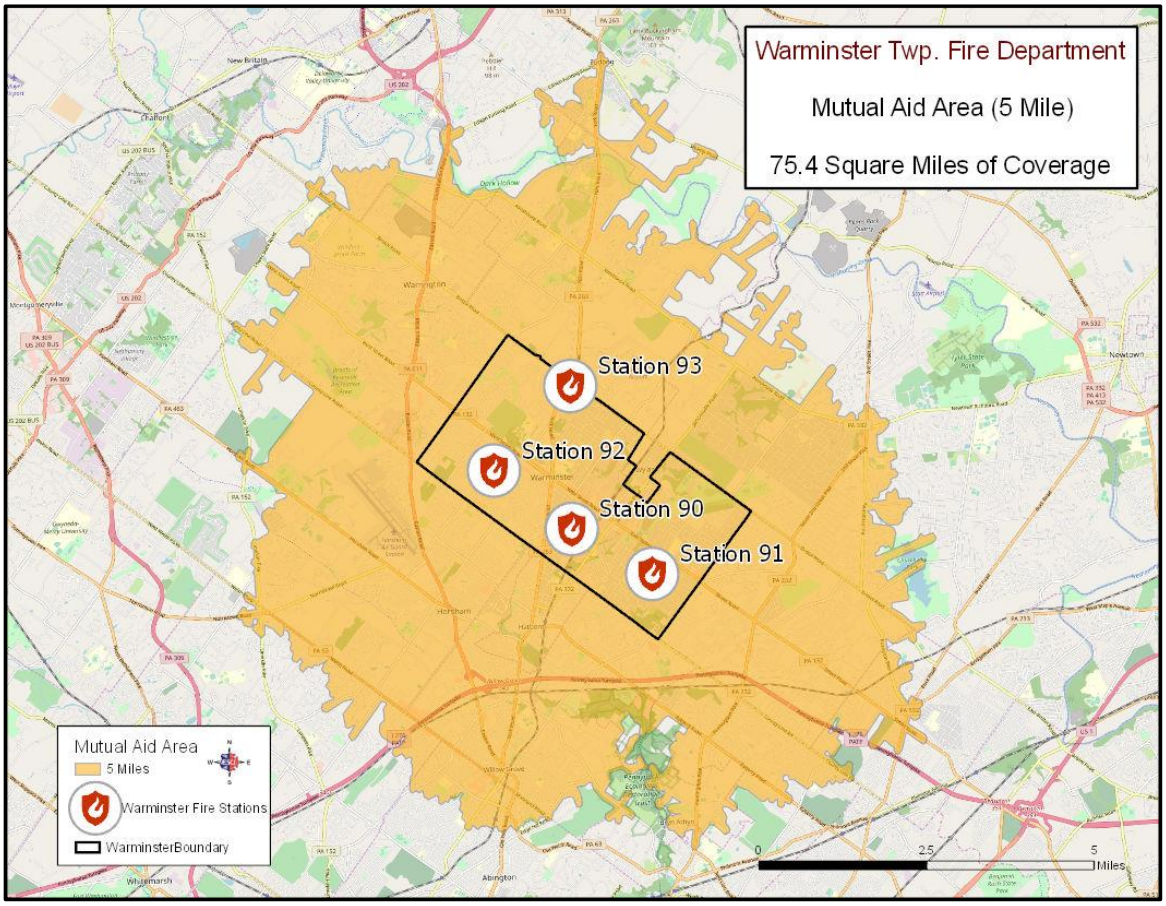
The following figure illustrates the box cards for the areas in Warminster Township.

Figure 59: Mutual Aid Box Cards



As both the WFC and HFC participate in the box card response program, the figure above displays the portions of the surrounding jurisdictions—for example—that are within a five-mile travel distance from WFC or HFC stations. ESCI utilized GIS software to project the travel time from the four stations within the Township. This analysis is accomplished using the posted speed limits provided by ESRI. This is intended to show relative distances that are within five miles—not to indicate the only area were responses occur.

Figure 60: Five-Mile Coverage Area Outside Warminster



The next figure is based on NFIRS data from 2015 through 2017 as it related to mutual aid and automatic aid given and received.

Figure 61: Mutual and Automatic Aid Summary (2015–2017)

Type	Station 90	Station 91	Station 92	Station 93
Mutual Aid Received	10	5	4	46
Automatic Aid Received	38	21	9	–
Mutual Aid Given	17	1	22	524
Automatic Aid Given	153	2	26	–
Other Aid Given	2	–	–	–
Net (Given - Received)	**124**	**- 23**	**35**	**478**

As illustrated, Stations 90, 92, and 93 give more aid than they receive while station 91 receives more than it gives. Station 93 has the highest spread between given and received.

It is recommended that both the WFC and HFC work with all mutual aid/automatic aid partners to ensure agreements are and remain current and properly executed.

Appendix I: Training Programs

The provision of safe and effective fire and emergency services requires a well-trained response force. The training and education of personnel are critical functions for any emergency services provider. Without quality, comprehensive training programs, emergency outcomes are compromised and emergency personnel are at risk.

> *"One of the most important jobs in any department is the thorough training of personnel. The personnel have the right to demand good training and the department has the obligation to provide it."*[7]

Initial training of newly hired firefighters is essential, requiring a structured recruit training and testing process. Beyond introductory training, personnel need to be actively engaged on a regular basis and tested regularly to ensure skills and knowledge are maintained. To accomplish this task, agencies must either have a sufficient number of instructors within their own organization or be able to obtain those resources elsewhere. Training sessions should be formal and follow a prescribed lesson plan that meets specific objectives. In addition, a Safety Officer should be dedicated to all training sessions that involve manipulative exercises.

In the following pages, ESCI reviews training practices of the two fire departments serving Warminster Township, compares them to national standards and best practices, and recommends modifications, where appropriate.

General Training Competencies

For training to be fully effective, it should be based on established standards. There are a variety of sources for training standards. Both departments utilize the National Fire Protection Association (NFPA) job performance requirements, International Fire Service Training Association (IFSTA) training materials, and Pennsylvania firefighter training standards as the basis for its fire suppression training practices, and national emergency medical services standards are used as the baseline for medical training coursework.

Both Hartsville and Warminster Fire Company No. 1s utilize the National Incident Management System (NIMS) compliant ICS system and a compatible accountability system. All individuals are required to be certified at the Firefighter I level prior to making entry into the "immediately dangerous to life and health" (IDLH) environment and the training is consistent with NFPA 1001 with interior firefighter trained to a minimum Firefighter I level. Individuals not trained to the Firefighter I level may be assigned exterior operational duties based upon their individual training levels. Both agencies are also equally trained relative to specialty rescue (i.e., high angle, technical rescue, etc.). Both agencies have trained response personnel to the "operational" level for hazardous materials incidents.

[7] *Robert Klinoff, Introduction to Fire Protection, Delmar Publishers, 1997. New York, NY.*

Training Administration

To function effectively, a training program needs to be intentionally managed. Administrative program support is important, though often minimally provided. An additional element of effective administration is the development of program guidance in the form of training planning, goals, and defined objectives.

Both agencies conduct regular training and are generally considered to be consistent with accepted standards. Additionally, each of the agencies has assigned the training program management responsibilities to individual serving at either the Battalion Chief or Deputy Chief levels. The departments utilize certified instructors and formal lesson plans as part of their training activities. The departments also use written goals and objectives are part of their respective training programs to ensure effectiveness in the delivery and evaluation of training.

Training Facilities

Neither of the fire departments has an established training facility within their respective response areas but rely upon Bucks County facilities to conduct live fire and advanced fire suppression training activities. Within the most recent Insurance Services Office (ISO) grading, the Township did not receive a maximum possible score for training. Specifically, a significant amount of points remain available in the "facilities and use" category. It is recommended that both fire departments establish a common plan to maximize the usage of Bucks County's fire training facilities.

Discussion

Overall, the two fire departments operate robust training programs for their respective staff members. As with any organization, there are opportunities for improvement and the two fire departments, along with the Township, should look to its most recent ISO grading report to identify specific areas of opportunity. Specific to the 2016 ISO grading, the Township received 3.74 points of a possible 9. Specific areas of focus should be to ensure the delivery of at least 18 hours of training per year to each firefighter at a dedicated training facility, at least 16 hours per year in company level training, classes for officers, and include pre-fire planning in their training programs.

Appendix J: Fire Prevention and Public Education Programs

Life Safety Services (Fire Prevention)

It is far more effective to prevent fires and other emergencies than it is to respond to them. The financial impact of a fire or injury goes far beyond the cost of extinguishment or treatment. According to the Federal Emergency Management Agency, 40 percent of businesses do not reopen following a disaster. Additionally, another 25 percent fail within one year. The United States Small Business Administration found that more than 90 percent of companies fail within two years of being struck by a disaster.

The fiscal impacts of injuries, while not as immediately observable, can be equally devastating. Individuals experiencing an injury lose the ability to earn an income during the recovery time and businesses lose the productivity of that individual until they return to work. Beyond the fiscal impacts associated with lost work time, injured persons and families often experience significant emotional trauma.

A strong fire prevention and life safety program, based on effective application of relevant codes and ordinances, reduce the loss of property, life, and the personal disruption that accompanies a catastrophic fire and accidents.

The fundamental components of an effective fire prevention program are listed in the following figure, accompanied by the elements needed to address each component:

Figure 62: Fire Prevention Program Components

Fire Prevention Program Components	Elements Needed to Address Program Components
Fire Code Enforcement	Proposed construction and plans review New construction inspections Existing structure/occupancy inspections Internal protection systems design review Storage and handling of hazardous materials
Public Fire and Life Safety Education	Public education Specialized education Juvenile fire setter intervention Prevention information dissemination
Fire Cause Investigation	Fire cause and origin determination Fire death investigation Arson investigation and prosecution

Code Enforcement Activities

The Warminster Township Director of Emergency Management/Services also serves as the Township Fire Marshal. His responsibilities include responding to buildings where structural stability is in question following vehicle strikes or other natural disasters. He also handles complaints regarding questionably inhabited dwellings including but not limited to hoarding.

New Construction Inspection and Involvement

New construction inspections in Warminster Township are contracted to a third-party vendor that is managed by the Warminster Township Department of Licenses and Inspections. The Director of Emergency Services provides land development review and follows those projects until sign off.

Existing Occupancy Inspection

The Warminster Township fire inspection program is developed and managed by the Emergency Management/Services Department. As part of this program, the Director issues tablets to staff provided by a third-party vendor, Keystone Municipal Services (KMS), whose employees then conduct the inspections based on a schedule issued by the Director. The Township handles the associated billing and tracking for these inspections.

The Director of the Emergency Management/Services reported that Warminster Township has a 100 percent annual inspection rate for the 900 plus businesses within the Township. This equates to 1,100 unique fire inspections with a total of 2,500 completed annual inspections and re-inspections. KMS charges the Warminster Township 60 percent of the cost of each inspection. During the most recent fiscal year, Warminster Township paid KMS $90,000 of the $150,000 that was collected by the Township for inspections.

The current inspection program in Warminster Township is efficient and effective in that 100 percent of the businesses in the Township are being inspected annually under the supervision of Township staff. While this arrangement has served the Warminster Township well to date, ESCI recommends that the inspection program be revisited when the Township makes the decision to hire daytime firefighters. The current Warminster call volume leaves adequate time during the day for paid firefighters to complete inspections, and the $90,000 paid last year to KMS can be used by Warminster Township to offset the cost of hiring firefighters. Individuals hired by the Warminster Township to perform the functions of Fire & Life Safety Inspectors should be trained to NFPA 1031 standards. Such personnel should be cross-trained to perform firefighter and/or EMS functions as part of their assigned duties and when the Township chooses to hire firefighters.

Fire and Life Safety Public Education Program

Providing fire and life safety education to the public to minimize the number of emergencies while training the community to take appropriate actions when an emergency occurs is essential. Life and fire safety education provides the best chance for minimizing the effects of fire, injury, and illness to the community. Warminster Township's public education program is managed by the Director of Emergency Management/Services. Fire and Life Safety Education Programs offered within the Warminster Township include Exit Drills in the Home (EDITH), Smoke Alarms, and Fire Extinguishers.

ESCI recommends that Warminster Township develop and implement a formal Community Risk Reduction (CRR) plan that is updated annually. The plan should evaluate the risks that are most commonly faced by the residents of the Warminster Township and establish strategies for reducing those risks. A formal risk evaluation will evaluate the need for additional programming which could include calling 911, carbon monoxide emergencies, cooking safety, and injury prevention. ESCI further recommends that the Warminster Township consider the long-term establishment of the position of Community Outreach Coordinator. This position may be volunteer or paid and assigned to the Fire Marshal's Office. The role of the Community Outreach Coordinator would be to ensure that development, delivery, and enhancement of Warminster's Community Risk Reduction Program.

Fire Origin and Cause Determination

Accurately determining the cause of a fire is an essential element of a fire prevention program. When fires are set intentionally, identification and/or prosecution of the responsible offender is critical in preventing additional fires and potential loss of life. Further, if the cause of fires is accidental, it is also of great importance because knowing and understanding how accidental fires start is the most effective way to identify appropriate fire prevention and public education measures to prevent a reoccurrence.

Warminster Township's Fire Marshal provides fire origin and cause determination and works in partnership with the Warminster Police Department as necessary for arson investigations and prosecution.

Data Collection and Analysis

Both Warminster and Hartsville utilize Firehouse Software as their fire records management system (RMS) to record incident data and produce reports, however, Warminster switched to Emergency Reporting as of January 2018. The data collection and analysis processes currently utilized between the two fire departments and the Fire Marshal's office can cause inconsistencies in the collection and analysis of data. It is recommended the fire departments and Fire Marshal's Office transition to a streamlined system of data entry using a single records management system to allow for more effective data collection and regular analysis. Without an effective process in place, the departments and Township cannot plan and establish departmental operations and adjust procedures. Additionally, it is recommended the Fire Marshal's office and fire departments' leadership utilize this data to develop a monthly report to allow for the regular review of incident data and the response performance of each department. The information contained within a common records management system provides valuable information that can assist the departments and Township in identifying areas of concern needing to be addressed through its fire prevention programs. It is ESCI's position that improved data collection methods, consistent reporting methods and procedures, and developing a specific set of evaluative tools are one of the most important and beneficial steps that should be taken to improve the overall level of service provided throughout the Township. These tools will allow the fire departments to benchmark their respective performance and the level of service provided to the residents of Warminster Township.

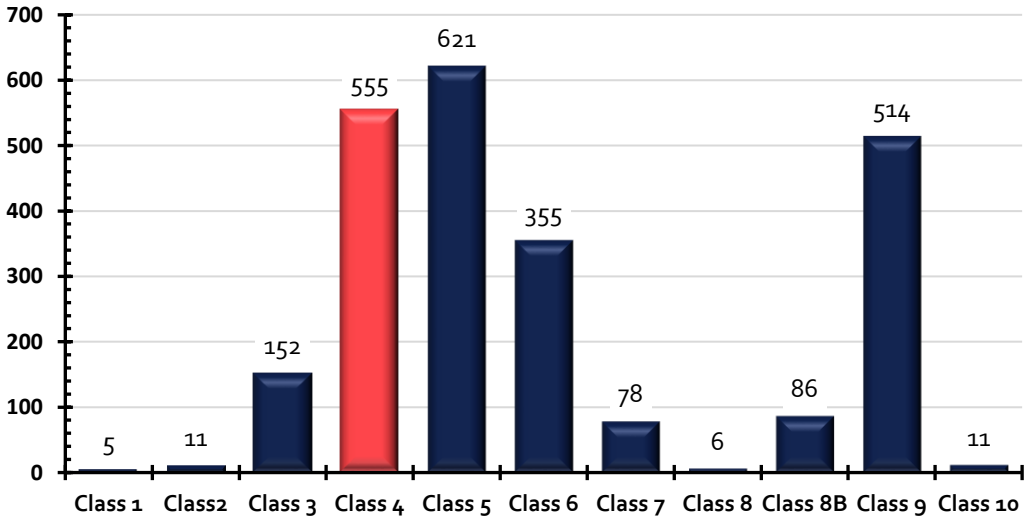
Appendix K: Effect of Enhanced Prevention Activities on ISO PPC Classification

The Insurance Services Office, Inc. (ISO©) is an independent company that collects and analyzes data about municipal fire suppression efforts in communities throughout the United States. According to a recent report, the ISO's Public Protection Classification program, or PPC, "is a proven and reliable predictor of future fire losses."[8] The ISO uses the PPC program to evaluate fire protection according to a uniform set of criteria based on nationally recognized standards developed by the National Fire Protection Association and the American Water Works Association. The ISO then assigns a grade using a scale of 1 to 10, with Class 1 representing the highest degree of fire protection, and Class 10 designating a fire suppression program that does not meet ISO's minimum criteria.

Current ISO Classification

In July 2016, Warminster Township was assigned an ISO classification of **Class 4**. As a result of the latest reclassification, The Township's PPC of 4 is one of 555 communities out of 2,394 communities surveyed across the State of Pennsylvania to achieve a Class 4 rating. As such, Warminster Township ranks in the top 30 percent of all communities surveyed, as shown in the following figure.[9]

Figure 63: Comparison of ISO Class Ratings, Pennsylvania



Source: isomitigation.com

[8] *Public Protection Classification, (PPC™) Summary Report, Sioux Falls and Wayne TS, South Dakota, Prepared by Insurance Services Office, Inc., Mt. Laurel, New Jersey; July 2011.*

[9] *Source: Distribution of Communities by PPC Class Number within Classification: Facts and Figures about PPC™ Codes around the Country; Insurance Services Office, Inc., Mt. Laurel, New Jersey; © 1996, 2017; retrieved from https://www.isomitigation.com/program-works/facts-and-figures-about-ppc-codes-around-the-country.html*

Discussion About Warminster Township's ISO Score

The ISO Fire Suppression Rating Schedule (FSRS) measures four primary elements of a community's fire protection system. The numerical score, or Public Protection Classification (PPC™), is the product of that measurement, and is weighted as follows, with a maximum possible score of 105.5:

- **Emergency Communications** (max 10 points). ISO provides credit for emergency reporting (911 system), telecommunicators (NFPA 1221 and other protocols, training, and certification), and dispatch circuits (NFPA 1221);
- **Fire Department** (max 50 points). ISO provides credit for engine companies, reserve engine companies, pump capacity, ladder/service companies, and reserves, deployment, personnel, and training, based on the needs and size of the community, equipment carried, and the department's operational methods;
- **Water Supply** (max 40 points). ISO provides credit for water flow provided compared to the needed fire flows at various locations throughout the community, fire hydrant distribution and installation, and Inspection and fire flow testing of hydrants; and
- **Community Risk Reduction** (max 5.5 points). ISO provides credit for fire code adoption and enforcement, public fire safety education, and fire investigation.

Figure 64 summarizes the grading for each of the four categories, plus divergence, from the most recent ISO audit. As shown, the highest scores for the Warminster Township were for Fire Investigation Programs (18.8 out of a possible 20 points), Emergency Communications (8.5 out of a possible 10 points), and Water Supply (30.81 out of a possible 40 points).

Figure 64: ISO Classification

Category	Score
Communications (Max Score = 10.00)	**8.50**
Percent Max Score	85%
Fire Department (Max Score = 50.00)	**29.13**
Percent Max Score	58.26%
Water Supply (Max Score = 40.00)	**30.81**
Percent Max Score	77.03%
Risk Reduction (Max Score = 5.50)	**3.77**
Percent Max Score	75.4%
Divergence Factor	**- 3.75**
Total Score	**68.46**
ISO Classification	**4**

DIVERGENCE

According to ISO, divergence "recognizes any disparity in the relative level of effectiveness of your fire department and water supply."[10] A divergence score is always negative, and ISO will reduce the overall PPC score if the relative scores for the fire department and water supply are different. In fact, the divergence factor may be high enough to result in a poorer ISO PPC classification. Thus, it is important to consider both the water supply and fire department when seeking to improve a PPC classification; investing in one without the other will be less effective over time. Areas of divergence to be considered by the Township, along with the resultant impact, are shown elsewhere in this report.

Areas of deficiencies within the Community Risk Reduction area that would have the greatest impact are shown below. ESCI recommends that Warminster Township's Fire Marshal contact their ISO representative to confirm the overall potential impact, both financially and on their ISO rating, before investing in any improvements.

[10] *Source: Divergence factor, Insurance Services Office, Inc., Mt. Laurel, New Jersey; © 1996, 2017; retrieved from https://www.isomitigation.com/technical/divergence-factor.html*

Appendix L: Community Risk Reduction

Areas of deficiencies within the Community Risk Reduction category that would have the greatest impact are shown in the next figure. ESCI recommends that Warminster Township contact their ISO representative to confirm the overall potential impact, both financially and on their ISO rating, before investing in any improvements.

Figure 65: Community Risk Reduction Areas of Potential Improvement

Factor	Score	Max Score	% Max Score	Impact
1025. Fire Prevention Code Regulation	2.76	10	27.6%	HIGH
1025. Fire Prevention Certification and Training	3.63	6	60.5%	MODERATE
1025. Fire Prevention Programs	14	16	87.5%	MODERATE
1033. Public Fire Safety Educators Qualifications	5	10	50%	HIGH
1033. Public Fire Safety Education Programs	16.45	30	54.8%	HIGH
1044. Fire Investigator Certification/Training	4.8	6	80%	MODERATE

KEY RECOMMENDATIONS:

- Transition to a single records management to improve data collection and analysis.
- Utilize data to develop a monthly report allowing for regular review of incident data and improve fire prevention initiatives.
- Develop and implement a formal risk reduction plan that is updated annually.
- Add one or more full-time Fire & Life Safety Inspectors, trained to NFPA 1031 standards. Such personnel could be cross-trained to perform firefighter and/or EMS functions as part of their assigned duties.
- Consider the long-term establishment of the position, paid or volunteer, Community Outreach Coordinator, assigned to the Fire Marshal, to ensure the development, delivery, and enhancement of necessary community outreach and risk reduction program elements.

Appendix M: Future System Demand Projections

In preparing for the development of future service delivery options, it is first necessary to evaluate the population history of the response area and to attempt to predict how populations will change over time. These changes in populations will directly impact the service demand of the organizations and could stress resources if not properly deployed.

Population History and Growth Projections

According to the census, the population of Warminster was 34,900 in 1970.[11] Between 1970 and 2010, the Township experienced both increases and decreases in population. In 2010, the population was 32,578, a decrease of seven percent from 1970. This is a compounded annual change of -2 percent. The percentage of growth ranged from a high of four percent in the decade from 2000 to 2010, but before that increase, there was a seven percent loss between 1980 and 1990.

Examining U.S. Census information allows for an analysis of the Town's estimated growth from 2010 to 2017. During the time period from 2000 to 2017, the population increased and decreased. The population increased to 32,727 in 2013, followed by decreases through 2017. The U.S. Census estimated 32,548 as the Township's population in 2017.[12] This is a -0.09 percent over seven years—the average was -0.013 percent per year.

These results using the linear projection formula—a population of 32,596 is forecasted. Using the average growth formula—a population of 32,518 is predicted.

In addition to the census-based projections described above—ESCI also reviewed the population projections found in the County and Municipal-Level Population Forecasts, 2015–2045 from the Delaware Valley Regional Planning Commission.[13] Projected in this report was an estimated population in 2020 of 33,035, and in 2025 of 33,473. While this forecast is slightly higher than that described from census data above, both prediction methodologies produce a relatively flat forecast change population.

Understanding the population changes within the community is significant relative to understanding future service demands. One of the most common factors influencing service demand is the population of a community. As a result of this relatively flat population change—it is reasonable to expect the demand for service to remain relatively flat.

Service Demand Projections

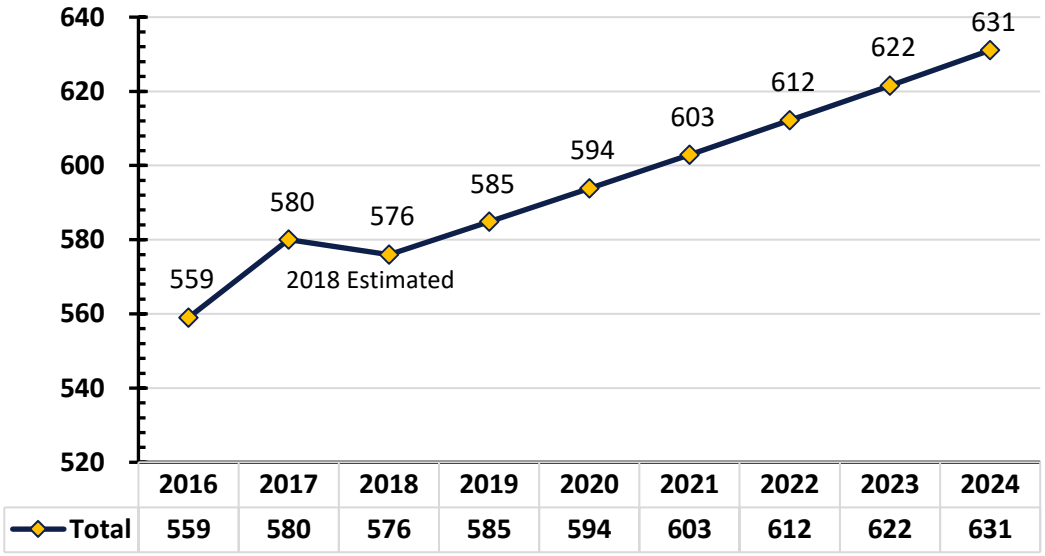
In evaluating the deployment of facilities, resources, and staffing, it is imperative consideration be given to potential changes, such as population growth, that can directly affect emergency workload. Changes in service demand may require changes and adjustments in the deployment of staffing and capital assets in order to maintain acceptable levels of performance.

[11] Retrieved from: https://en.wikipedia.org/wiki/Warminster_Township,_Bucks_County,_Pennsylvania
[12] U.S. Census, 2013–2017 American Community Survey 5-Year Estimates.
[13] Retrieved From: https://www.dvrpc.org/Reports/ADR022.pdf

Population projections, along with historical and forecast incident rates, were utilized to develop projections for future service demand. As population and demographic changes so will the service demand. To determine a historical demand, ESCI considered the last three years (October, November, and December of 2018 were estimated) of service demand from the Bucks County CAD data presented previously. There was a three percent growth in incident demand from 2016 through 2018; this represents an average increase of 1.5 percent. During this same time period, the population decreased just under one percent.

Based on the projected population growth and forecast demographic changes, service demand within the Township will likely increase over the study forecast period but by a small percentage. Using the average annual growth from 2016 through 2018 of 1.5 percent, Figure 66 was created.

Figure 66: Service Delivery Forecast, 2019–2024



	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total	559	580	576	585	594	603	612	622	631

The Township should track annual call volume to determine whether changes in population and demographics over time have a positive or negative effect on service demand forecast.

Also, as part of the hazard mitigation plan—critical facilities within the Township have been identified. Some of these occupancies can create risks and incidents that are larger in size and complexity than everyday emergencies that the fire department responds to and mitigates. These high or target hazard occupancies have the potential of exceeding the capabilities of a fire department in the event of a fire or other emergency.

Demographics

Age and sex demographics are provided in the next figure. The figure provides a percentage comparison between the Town of Warminster, Bucks County, and the State of Pennsylvania.

Figure 67: Age and Sex Percentage Comparisons[14]

Age/Sex	Warminster	Bucks County	Pennsylvania
Persons under 5 years	5.0%	4.9%	5.6%
Persons under 18 years	18.8%	21.1%	21.0%
Persons 65 years and over	25.9%	17.1%	17.1%
Female persons	52.8%	50.9%	51.1%

[1] U.S. Census Bureau

Nearly 26 percent of the population in Warminster is 65 years of age or older as illustrated in the above figure—this is above the percentage in this category in Bucks County and in the State. Five percent of the population is under five years of age. This places just over 30 percent of the Town's population within the age groups that are at highest risk in residential fire incidents and account for some of the highest use of emergency medical services. Senior citizens can have difficulty escaping from fire due to physical limitations. Seniors also tend to use emergency medical services more frequently than younger persons. As the population ages, this will create an increase in service demand for emergency medical services.

The very young also represent a vulnerable population, regarding both their ability to escape a structure fire as well as their susceptibility to serious medical ailments such as asthma, traumatic events, choking, or injury from vehicular accidents.

Future Delivery System Models

The following figure provides a chart of NFPA 1720 standards based on population density.

Figure 68: NFPA 1720 Staffing/Deployment Matrix

Demand Zones	Demographics	Min. Staff to Respond	Response Time (minutes)	Performance Objective
Urban	More than 1,000 people per sq. mi.	15	9	90%
Suburban	500 to 1,000 people per sq. mi.	10	10	80%
Rural	Less than 500 people per sq. mi.	6	14	80%
Remote	Travel Distance 8 miles or more	4	Dependent upon travel distance	90%
Special Risk	AHJ determines	Based on risk	AHJ determined	90%

[14] *U.S. Census Bureau*

The Township and fire departments should consider the establishment of service demand zones within the jurisdiction. The use of service demand zones allows for the establishment of realistic benchmarks for performance based upon the demonstrated capabilities of the department. For example, based on NFPA 1720 definitions, the Township has an urban population density.

Development of Response Standards and Targets

ESCI emphasizes the importance of each fire department serving the Township establishing response performance metrics. Once established, these standards become measurable goals for service delivery, which then form the foundation upon which planning for deployment of resources is based. Absent these processes, the organization is not able to determine where it needs to go, nor is it able to evaluate when it is achieving its goals or meeting the community's expectations. Currently, each department follows the requirements of ISO, which have been static requirements. Future ISO evaluations will analyze the data for turnout and travel times compared to NFPA 1720 response time objectives. If maintaining a quality ISO Class 4 rating is important to the Township and fire departments, then adopting and monitoring these objectives should be a priority.

Response standards must be developed by each community, based on the expectations of elected officials and citizens and balanced against the financial aspect of what a community is able and willing to afford. For this reason, ESCI cannot establish these standards for each of the departments but rather will provide guidance in this process.

Response performance metrics revolve around two key factors: staffing and speed of rendering aid. This is part of what is called standards of cover. Not only response time and its components are part of NFPA 1720, but so are necessary effective response force levels discussed elsewhere in this report. All fire departments undergoing the accreditation process are required to do a performance-based analysis on required staffing for all types of service requests likely to occur in their jurisdiction. Even for departments not attempting to achieve accreditation it is considered to be an industry best practice to conduct a staffing analysis based upon specific risks facing the community served.

The next sections address the suggested process for a department to determine critical tasks, based on local risk and setting response time standards.

Figure 69: Sample of Critical Task Staffing by Risk[15]

Firefighter Personnel Needed Based on Level of Risk				
	Structure Maximum Risk	Structure High Risk	Structure Moderate Risk	Non-Structure Low Risk
Attack line	4	4	2	2
Back-up line		2	2	(2)
Support for hose lines/Water Supply		3	2#	
Ventilation	4	2	2	
Search and rescue	4	2	2	
Forcible Entry/Support		2	2	
Standby/Rapid intervention team	4	2	2	
Driver/Pump Operator	1	1	1	1
2nd apparatus/ladder operator		1		
Command	2	1	1	1#
Communications/Safety	1	1	1	
Accountability		1		
Salvage				
Rehabilitation	2			
Building Fire Pump Monitor	(1)			
Attack line—Floor Above the Fire	2			
Evacuation Management Teams	4			
Elevator Operations Manager	1			
Lobby Operations	1			
Transport Equipment to Staging	2			
EMS Crews	4			
Division/group supervisors	4			
Total	**40–41**	**28**	**16–17**	**3–6**

() indicates tasks may not be required at all such incidents
 # indicates task may, at times, be completed concurrently with other position

The first 15 minutes is the most crucial period in the suppression of a fire. How effectively and efficiently firefighters perform during this period has a significant impact on the overall outcome of the event. This general concept is applicable to fire, rescue, and medical situations.

[15] *Adapted based on examples provided in the publication "Community Risk Assessment: Standards of Cover" 6th edition; Center for Public Safety Excellence.*

Critical tasks must be conducted in a timely manner to control a fire or to treat a patient. Three scenarios of commonly encountered emergencies are routinely utilized by fire departments when conducting field validation and critical tasking: a moderate risk structure fire, a traffic collision with a trapped victim, and a cardiac arrest. Each scenario is conducted using standard operating procedures and realistic response times, based on actual system performance. Each scenario is normally run multiple times with a variety of fire companies to validate and verify observations and times.

To further validate the analysis process, results are compared with records from actual working fires and similar incidents from previous years. Overall results are reviewed to determine if the actions taken within the early minutes of an incident resulted in a stop-loss or not and if additional resources were required. The critical task analysis process demonstrates the rate in which the current deployment plan results in stopping loss a high percentage of time within initial critical time goals.

Again, critical tasks are those activities that must be conducted in a timely manner by firefighters at emergency incidents to control the situation, stop loss, and to perform necessary tasks required for a medical emergency. Each of the fire departments serving the Township is responsible for assuring that responding companies can perform all the described tasks in a prompt, efficient, and safe manner.

All Risk Critical Resource Tasking

Fire departments respond to many incidents other than structure fires, including hazardous materials (dangerous goods) releases, motor vehicle collisions, basic and advanced life support medical emergencies, and non-structural fires. Personnel responding to these types of incidents should be assigned tasks similar to structure fires.

The following figures are provided as an example for these types of incidents, although ESCI recommends that each of the fire departments conduct its own field validation exercises with its crews, including mutual aid resources, to verify the critical tasking analysis provided. After field validation is complete, the departments may find that the critical tasking can be adjusted appropriately upward or downward for each incident type.

Figure 70: Sample Non-Structure Fire Critical Tasking

Task	Personnel
Command	1
Pump Operator	1
Primary Attack Line	2
Total	**4**

Figure 71: Sample Hazardous Materials Incident Critical Tasking

Task	Personnel
Command	1
Pump Operator	1
Primary Attack Line	2
Back-Up Line	2
Support Personnel	7
Total	**13**

Figure 72: Sample Motor Vehicle Collision with Entrapment Critical Tasking

Task	Personnel
Command	1
Pump Operator	1
Primary Attack Line	2
Extrication	3
Patient Care	2
Total	**9**

Appendix N: Table of Figures