



The Future of Bucks County's Fire Services

An update to the 1990 Bucks County Community Facilities: Emergency Services Report

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Prepared By:



Prepared For:

Bucks County Emergency Management/Services



The Future of Bucks County's Fire Services

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The Future of Bucks County’s Fire Service

Table of Contents

Executive Summary.....	ii
Introduction	1
County Demographic Indicators	2
Inventory of Facilities and Equipment	5
Equipment Overview	11
Structure of Fire Companies	11
Funding	12
Municipal and County Agencies and Resources	15
Future Fire Protection Needs 2020 and Beyond.....	16
Standards of Service.....	16
Future Demand for Facilities.....	18
Critical Operating Issue – Staffing.....	18
Department Demographics & Statistics.....	19
Key Findings – Select Questions.....	20
Staffing Guidelines & County Comparison.....	21
Costs of Staffing	25
Observations and Recommendations.....	29
Summary	32
Figures	
Figure One – NFPA Density Rating.....	4
Figure Two – Fires Station Locations	9
Figure Three – Fire Station Response Districts	10
Figure Four – Fire Station Protection Service Areas	17
Tables	
Table One – Municipality by NFPA Density Rating	4
Table Two – Bucks County Fire Stations	6
Table Three – Equipment/Apparatus Summary	11
Table Four – Departments with Paid Firefighters.....	12
Table Five – Tax Mills by Municipality	14
Table Six – Yearly Cost per Person	28

Executive Summary

In the 30 years since the original 1990, *Bucks County Community Facilities: Emergency Services Report* was released, the number of active firefighters in Bucks County has continued to decline and remains on a downward trajectory. The decline in volunteers can be attributed to many factors, which when aggregated together result in fewer and fewer residents opting to join the ranks of our volunteer fire departments. Most notable among the factors is the time commitment required for training and fund-raising activities associated with generating operational funds.

"BUCKS COUNTY IS FACING A SHORTAGE OF APPROXIMATELY 770 ACTIVE FIREFIGHTERS. THIS AVERAGES APPROXIMATELY 12 FIREFIGHTERS PER EACH OF THE 62 DEPARTMENTS THAT SERVE THE RESIDENTS OF THE COUNTY."

Based on the analysis of a survey issued to all 62 fire departments in the county, by the County Emergency Services Department, as well as utilizing National Fire Protection Agency recommendations, Bucks County is facing a shortage of approximately **770 active firefighters**. This averages approximately 12 firefighters per each of the 62 departments that serve the residents of the County.

Further complicating the issue are statutory limitations which limit the amount of fire tax millage that can be used for salaries and benefits to compensate the volunteers or be used for paid career firefighters. While it is possible for a municipality to implement a three-mill fire tax, only a maximum of one mill may be used for salaries and benefits. The remaining millage can be used for apparatus, training, and buildings. One unintended consequence of this limitation is an apparent surplus of apparatus in the county and only **1.12 firefighters per seat**, to fill the available apparatus. We have plenty of equipment, but not enough firefighters to go with it.

Recently introduced legislation, while intended to attract new volunteers, will likely help to retain current volunteers but do little to move the needle on attracting new recruits. Regardless these legislative measures are still needed and should be adopted.

Municipality administrators and elected officials are obligated by state law, to provide fire service for their communities. This includes financial and administrative assistance. Municipal administrators and elected officials must continue to lead the conversation and collaborate with their respective fire companies. Firefighting should not be viewed any differently than police protection. It is a necessary and vital community service. As such, the residents who benefit from the service, must also be willing to share in the costs associated with that service, this includes career firefighters. The costs to provide for paid firefighters; however, will be staggering for many municipalities. Operationally, and financially, municipal leaders should be willing to investigate regionalization and the combining of departments to ensure adequate protection. A purely parochial approach to the provision of fire protection is no longer a sustainable, viable long-term option.

The solutions to the problem will be rooted in regulatory, operational, and financial changes. While no one is advocating for the elimination of volunteer firefighters, it is time for municipalities and their fire companies to recognize that volunteers alone may not be sufficient to adequately protect a community.

Introduction

The original 1990 *Community Facilities: Emergency Services Report* was written during a unique period of land development growth and technological expansion with regards to the delivery and routing of emergency service calls through the newly instituted 911 call system. Since the original 1990 report there have been further technological, training, and equipment advances that have vastly improved the ability of individual departments to render aid and respond to fires. What has not changed in nearly 30 years is that the number of volunteer firefighters is steadily and precipitously declining, while remaining active firefighters grow older. Additionally, departments across the county are responding to significantly more non-fire calls to render aid, further stretching volunteer staffing.

With fewer people becoming firefighters and current firefighters aging, there is a crisis looming in Bucks County, and in the state. Shifting personal priorities, community expectations and a decline in the social fabric which once supported fire companies, have all combined to create the perfect storm. This phenomenon has been studied and reported on repeatedly over the past 10 years and was noted 30 years ago in the original 1990 *Community Facilities: Emergency Services Report* prepared by the Planning Commission. Unfortunately, little has changed to date.

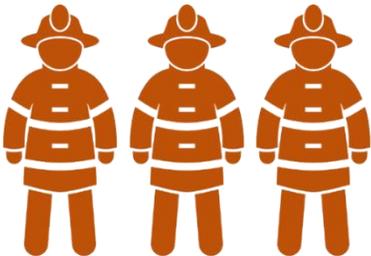
While communities have an expectation of protection and instantaneous response times, they are unaware of the lack of staffing or the true costs associated with meeting their protection expectations. Numerous prior studies were consulted in the preparation of this update, including the recent 2018, SR6 report prepared by the Commonwealth. All studies support and verify the current issues with attracting, recruiting, and maintaining volunteer firefighters.



“THIS PAST YEAR THE NUMBER OF VOLUNTEER FIREFIGHTERS DECREASED TO THE LOWEST ESTIMATE SINCE NFPA BEGAN REPORTING THIS STATISTIC IN 1986...”

NFPA U.S. FIRE DEPARTMENT PROFILE 2017

As of the writing of this report there are nine Pennsylvania House Bills that have been passed on to the State Senate for consideration and adoption. These bills are geared to incentivizing volunteers to become involved while lessening some financial burdens. Incentives such as college loan forgiveness, realty transfer tax relief, and property tax relief are being considered. Absent an organic increase in the number of volunteers electing to serve their communities, local elected officials will be faced with considering regionalization of services and/or the adoption of paid, career firefighters to protect their communities.



1970 - 300,000 Pennsylvania Volunteer Firefighters

2018 SR6 Report



2018 - 38,000 Pennsylvania Volunteer Firefighters

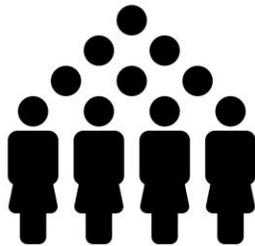
2018 SR6 Report

County Demographic Indicators

To assist in framing the situation around the volunteer firefighter crisis, we must first understand the makeup of the county from a demographic perspective. The National Fire Prevention Association (NFPA) uses certain population and geographic densities as benchmarks for promulgating the standards for fire protection and service throughout various NFPA documents. These standards are developed through a consensus methodology. For the purposes of this report, the NFPA standards serve as basis of comparison for benchmarking the county's volunteer firefighting forces.

Bucks County is geographically, topographically, and demographically diverse. This report pre-dates the upcoming 2020 decennial census and relies on American Communities Survey (ACS) data for the purposes of estimating population.

According to the 2018 ACS data, the county's population was estimated at 628,195 people living in 248,873 housing units. The Bucks County Planning Commission (BCPC) has noted a significant upward trend in the number of proposed housing units in the county since 2017. In the last three years there have been over 3,600 proposed units reviewed by planning commission staff.



628,195 People

While we cannot predict if all these units will be built, it suggests that the county's population and housing stock will continue to grow. The number of dwellings requiring fire protection will only increase. We note many of the proposed units are multifamily apartments which require significantly higher fire staffing responses than a single-family home.



3,678 Proposed Units

Exclusive of water bodies, the county contains 605.5 square miles of land area. With a population of 628,195, that equates to a population density of 1,034.66 persons per square mile. Chapter 4 of publication *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* (NFPA 1720) defines Demand Zones for firefighting jurisdictions based on certain demographic/density thresholds.

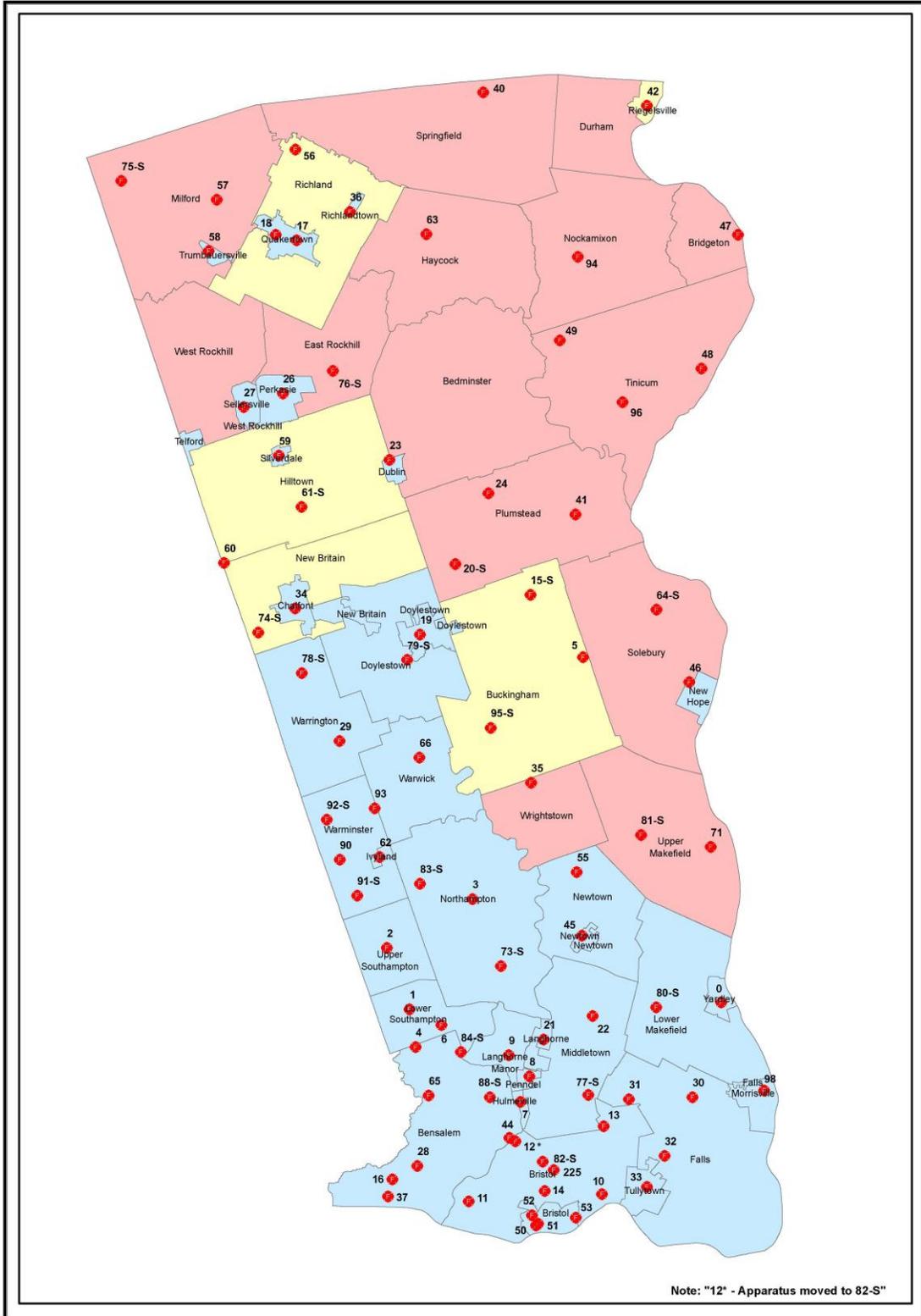
These Demand Zones are generally defined as follows:

Demand Zone	Demographics
Urban Area	>1,000 people/mi ²
Suburban Area	500-1,000 people/mi ²
Rural Area	<500 people/mi ²
Remote Area	Travel distance ≥ 8 mi

Taken as a whole, the county, with a density of 1,034.66 people/mi² classifies as an "Urban Area." We know, however, that much of the upper county is rural in nature with lower densities. Based on an analysis of each of the county's 54 municipalities, there are 35 which classify as "Urban Areas," five which are "Suburban Areas," and 14 "Rural Areas." These designations are significant in determining the "Minimum Staff to Respond," in accordance with NFPA 1720, and will be discussed later in this report. Figure One maps these Demand Zone Classifications and Table One lists the municipalities by NFPA density.

FIGURE ONE

NFPA Density Rating



BCPC
Bucks County Planning Commission

0 0.5 1 2 3 4 Miles

● Fire Stations and Sub-Stations

NFPA Rating

- Urban (>1000/SM)
- Suburban (500-1000/SM)
- Rural (<500/SM)

2020

Bucks County NFPA Rating

THE FUTURE OF BUCKS COUNTY'S FIRE SERVICE

TABLE ONE

Municipality by NFPA Density Rating

Municipality	Square Mile (Land Area Only)	Total Population (2017 ACS 5 Year Estimate)	Population Density (Per Square Mile)	NFPA Rating
Haycock Township	19.80	2,133	108	Rural: <500/SM
Durham Township	9.09	1,141	126	Rural: <500/SM
Tinicum Township	29.78	3,971	133	Rural: <500/SM
Nockamixon Township	22.17	3,414	154	Rural: <500/SM
Springfield Township	30.60	5,038	165	Rural: <500/SM
Bridgeton Township	6.44	1,145	178	Rural: <500/SM
Bedminster Township	30.45	7,034	231	Rural: <500/SM
Wrightstown Township	9.69	3,106	321	Rural: <500/SM
West Rockhill Township	16.33	5,265	322	Rural: <500/SM
Solebury Township	26.67	8,625	323	Rural: <500/SM
Milford Township	28.09	10,002	356	Rural: <500/SM
Upper Makefield Township	21.24	8,291	390	Rural: <500/SM
East Rockhill Township	12.90	5,733	444	Rural: <500/SM
Plumstead Township	27.14	13,424	495	Rural: <500/SM
Hilltown Township	27.04	15,242	564	Suburban: 500-1000/SM
Buckingham Township	32.92	20,306	617	Suburban: 500-1000/SM
Richland Township	20.47	13,221	646	Suburban: 500-1000/SM
Riegelsville Borough	0.99	758	763	Suburban: 500-1000/SM
New Britain Township	14.61	11,179	765	Suburban: 500-1000/SM
Doylestown Township	15.37	17,512	1,139	Urban: >1000/SM
Tullytown Borough	1.51	1,887	1,247	Urban: >1000/SM
Warwick Township	11.01	14,594	1,326	Urban: >1000/SM
Falls Township	22.53	33,954	1,507	Urban: >1000/SM
Northampton Township	25.69	39,411	1,534	Urban: >1000/SM
Newtown Township	11.87	19,582	1,650	Urban: >1000/SM
Warrington Township	13.72	23,920	1,744	Urban: >1000/SM
Lower Makefield Township	17.88	32,621	1,825	Urban: >1000/SM
Silverdale Borough	0.41	758	1,841	Urban: >1000/SM
New Hope Borough	1.23	2,506	2,035	Urban: >1000/SM
Trumbauersville Borough	0.44	974	2,228	Urban: >1000/SM
Upper Southampton Township	6.63	15,088	2,276	Urban: >1000/SM
Middletown Township	18.86	45,224	2,398	Urban: >1000/SM
Yardley Borough	0.94	2,289	2,437	Urban: >1000/SM
New Britain Borough	1.22	3,031	2,483	Urban: >1000/SM
Hulmeville Borough	0.38	967	2,529	Urban: >1000/SM
Chalfont Borough	1.61	4,082	2,532	Urban: >1000/SM
Langhorne Manor Borough	0.60	1,569	2,610	Urban: >1000/SM
Ivyland Borough	0.35	979	2,804	Urban: >1000/SM
Lower Southampton Township	6.66	19,081	2,866	Urban: >1000/SM
Langhorne Borough	0.51	1,536	3,017	Urban: >1000/SM
Bensalem Township	19.76	60,418	3,058	Urban: >1000/SM
Warminster Township	10.18	32,548	3,198	Urban: >1000/SM
Perkasie Borough	2.54	8,505	3,347	Urban: >1000/SM
Bristol Township	16.05	54,036	3,366	Urban: >1000/SM
Dublin Borough	0.58	2,081	3,581	Urban: >1000/SM
Sellersville Borough	1.15	4,249	3,691	Urban: >1000/SM
Newtown Borough	0.55	2,041	3,730	Urban: >1000/SM
Doylestown Borough	2.14	8,307	3,885	Urban: >1000/SM
Telford Borough	0.53	2,190	4,128	Urban: >1000/SM
Quakertown Borough	2.02	8,889	4,398	Urban: >1000/SM
Morrisville Borough	1.76	8,630	4,909	Urban: >1000/SM
Richlandtown Borough	0.26	1,325	5,132	Urban: >1000/SM
Bristol Borough	1.71	9,645	5,651	Urban: >1000/SM
Penndel Borough	0.42	3,029	7,147	Urban: >1000/SM
	605.50	626,486	1,034.66	

Inventory of Facilities and Equipment

The county's fire protection services were last inventoried and analyzed in 1990. Since that analysis, the county has implemented a 911 call system and still employs a computer aided dispatch system (CAD) to facilitate the dispatch and response to local fire service emergency calls. To supplement this most current analysis, the Bucks County Emergency Services Department (ESD) issued a survey to all 62 fire departments and received 48 responses.

As of November 2019, there are 62 fire companies operating out of 62 stations and 23 sub-stations for a total of 85 stations throughout the county. Bristol Township operates Engine 225 which is staffed by paid Township employees and is housed at the municipal building. The 23 sub-stations, operated by individual fire companies, allow a fire department to dispatch its equipment throughout its service area in a shorter period of time, presuming firefighters are available to man the apparatus. The location and proximity of the fire companies generally corresponds to the distribution of the county's population.



20,640 Incidents

In 2018, fire departments across the county were dispatched to 20,640 incident responses. Of those responses approximately 2,147 or 10 percent were actual fires. The remaining 90 percent of incident responses were non-fire-related and included EMS assistance, vehicle extractions, and alarm calls.



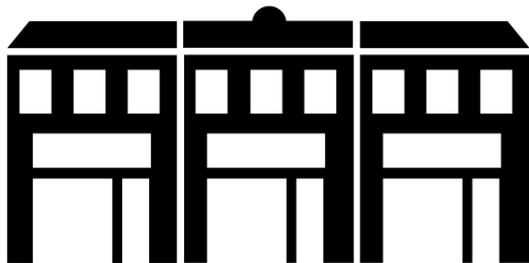
1,236 Active Firefighters

Thirty-four fire stations operate in lower Bucks County, 30 in central Bucks, and 20 in the upper Bucks region. Table Two lists the name and station number of each fire company, and Figure Two provides their locations. Bucks County also receives supplemental fire protection and support from outside the county. Mutual aid and support are provided by Montgomery, Lehigh, and Northampton counties in Pennsylvania and from Warren, Hunterdon, and Mercer counties in New Jersey. One corporate non-municipal fire company also operates in Bucks County at the Dow facility (formerly Rohm and Haas). Although they do not provide first-response service, they do respond to multiple-alarm and hazardous material calls as mutual aid. Figure Three gives the first-response areas for each of the fire companies in the county.

Based on the results of the fire company survey, there are approximately 1,236 active volunteer firefighters among the 48 responding departments as of November 2019. This equates to an average of 26 firefighters per department. If we apply this average to the remaining 14 departments which did not respond to the survey, that equates to an additional 364 potential active firefighters, bringing the county's total active firefighters to approximately 1,600. We suspect; however, the real number is much fewer.

THE FUTURE OF BUCKS COUNTY'S FIRE SERVICE

	STATION/SUB-STATION NAME	NUMBER	MUNICIPALITY
TABLE TWO	UPPER BUCKS		
	Bridgeton Township Fire Department	47	Bridgeton Township
Bucks County Fire Stations	Delaware Valley Fire Company	48	Tinicum Township
	Dublin Borough Fire Department	23	Dublin Borough
	Haycock Township Fire Department	63	Haycock Township
	Milford Township Fire Company Sub-Station	75-S	Milford Township
	Milford Township Fire Company	57	Milford Township
	Ottsville Volunteer Fire Company	49	Tinicum Township
	Delaware Valley Fire Company	96-S	Tinicum Township
	Ottsville Volunteer Fire Company	94-S	Nockamixon Township
	Perkasie Borough Fire Department	26	Perkasie Borough
	Perkasie Borough Fire Department	76-S	East Rockhill Township
	Point Pleasant Fire Company	41	Plumstead Township
	Quakertown Fire Company #1	17	Quakertown Borough
	Richland Township Fire & Rescue	56	Richland Township
	Richlandtown Borough Fire Department	36	Richlandtown Borough
	Riegelsville Borough Fire Department	42	Riegelsville Borough
	Sellersville Borough Fire Department	27	Sellersville Borough
	Silverdale Fire Company	59	Silverdale Borough
	Springtown Community Fire Company	40	Springfield Township
	Trumbauersville Borough Fire Department	58	Trumbauersville Borough
	West End Fire Station	18	Quakertown Borough



62
Stations



23
Substations

CENTRAL BUCKS	NUMBER	MUNICIPALITY
Chalfont Fire Company Sub-Station	74-S	Chalfont Borough
Chalfont Fire Company	34	Chalfont Borough
Doylestown Fire Company No. 1	19	Doylestown Borough
Doylestown Fire Company Sub-Station Co. No. 1	79-S	Doylestown Township
Hartsville Fire Company	93	Warminster Township
Ivyland Fire Department	62	Ivyland Borough
Hilltown Fire Company Sub-Station	61-S	Hilltown Township
Hilltown Volunteer Fire Company (Line Lexington)	60	Hilltown Township
Lingohocken Fire Company Sub-Station	95-S	Buckingham Township
Lingohocken Fire Department	35	Wrightstown Township
Midway Fire Department Sub-Station	15-S	Buckingham Township
Midway Volunteer Fire Department	5	Buckingham Township
New Hope Eagle Fire Department Sub-Station	64-S	Solebury Township
New Hope Eagle Fire Department	46	New Hope Borough
Newtown Fire Association	45	Newtown Borough
Newtown Fire Association	55	Newtown Township
Northampton Fire Company Sub-Station	73-S	Northampton Township
Northampton Township Fire Department Sub-Station	83-S	Northampton Township
Northampton Township Fire Department	3	Northampton Township
Plumstead Township Fire Department Sub-Station	20-S	Plumstead Township
Plumstead Township Fire Department	24	Plumstead Township
Upper Makefield Fire Department	71	Upper Makefield, Township
Upper Makefield Township Fire Company Sub-Station	81-S	Upper Makefield, Township
Upper Southampton Township Fire Department	2	Upper Southampton Township
Warminster Township Fire Station #90	90	Warminster Township
Warminster Township Fire Station #91 Sub-Station	91-S	Warminster Township
Warminster Township Fire Station #92 Sub-Station	92-S	Warminster Township
Warrington Township Fire Department	29	Warrington Township
Warrington Township Fire Company Sub-Station	78-S	Warrington Township
Warwick Township Fire Department	66	Warwick Township

**TABLE
TWO**
CONTINUED

**Bucks
County Fire
Stations**

THE FUTURE OF BUCKS COUNTY'S FIRE SERVICE

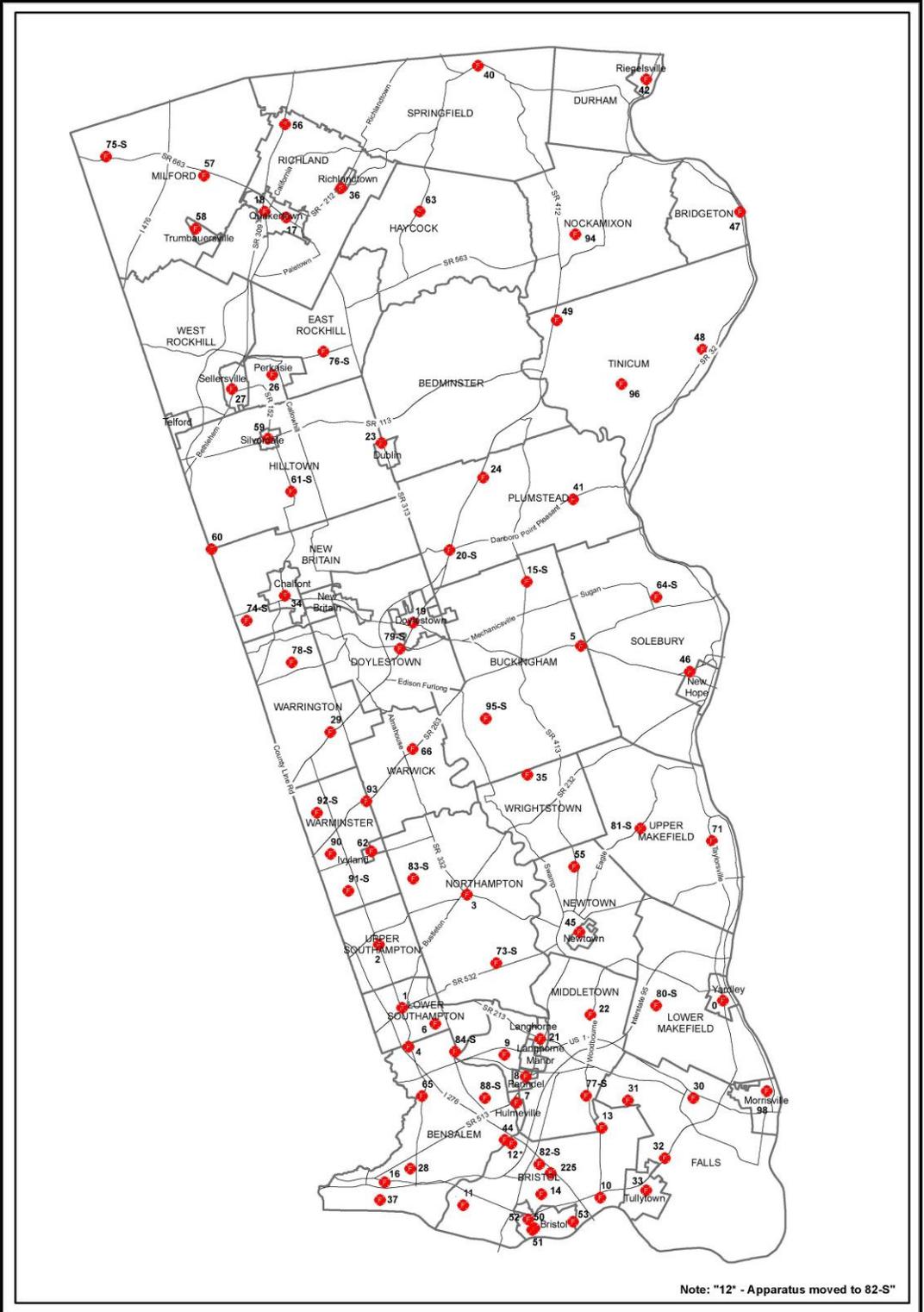
TABLE
TWO
CONTINUED

Bucks
County Fire
Stations

LOWER BUCKS	NUMBER	MUNICIPALITY
American Hose, Hook and Ladder Company #2	53	Bristol Borough
Bristol Consolidated Fire Company	50	Bristol Borough
Bristol Fire Company	51	Bristol Borough
Cornwells Fire Company #1	16	Bensalem Township
Croydon Fire Department Number 1	11	Bristol Township
Eddington Fire Company	28	Bensalem Township
Edgely Fire Company	10	Bristol Township
Fairless Hills Fire Department	31	Falls Township
Falls Township Fire Department	30	Falls Township
Feasterville Fire Company	1	Lower Southampton Township
Goodwill Hose Company Number 3	52	Bristol Borough
Langhorne-Middletown Fire Company	21	Langhorne Borough
Langhorne-Middletown Fire Company	22-S	Middletown Township
Levittown Fire Company #2	13	Bristol Township
Levittown Fire Company #1	32	Falls Township
Lower Southampton Township Fire Department	6	Lower Southampton Township
Morrisville Borough Fire Department	98	Morrisville Borough
Newport Fire Company	44	Bensalem Township
Newport Fire Company Sub-Station	88-S	Bensalem Township
Bristol Township Municipal Building	225	Bristol Township
Newportville Fire Company Sub-Station	82-S	Bristol Township
Newportville Fire Company (combined with 82-s)	12	Bristol Township
Nottingham Fire Company	65	Bensalem Township
Parkland Fire Department	9	Middletown Township
Penndel Fire Department	8	Penndel Borough
Third District Fire Company	14	Bristol Township
Trevose Fire Company Sub-Station	84-S	Bensalem Township
Trevose Fire Company	4	Bensalem Township
Tullytown Borough Fire Department	33	Tullytown Borough
Union Fire Company	37	Bensalem Township
William Penn Fire Company	7	Hulmeville Borough
William Penn Fire Company Sub-Station	77-S	Middletown Township
Yardley-Makefield Fire Company	0	Yardley Borough
Yardley-Makefield Fire Company Sub-Station	80-S	Lower Makefield Township

FIGURE TWO

Fire Station Locations

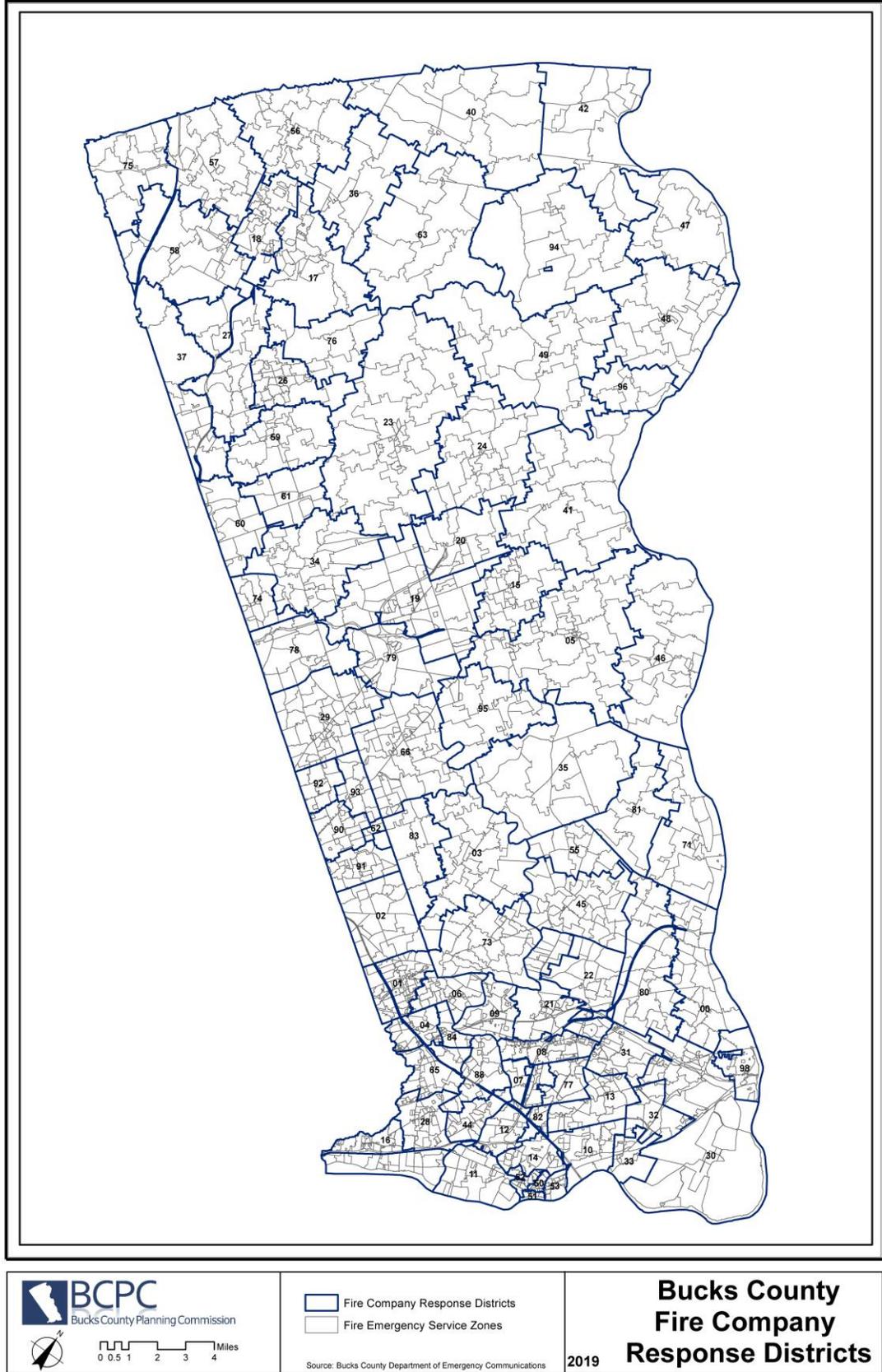


Note: *12* - Apparatus moved to 82-S

<p>BCPC Bucks County Planning Commission</p>	<ul style="list-style-type: none"> ● Fire Stations and Sub-Stations Municipal Boundary Major Roads 	<p>Location of Fire Stations and Sub-Stations</p>
2020		

FIGURE THREE

Fire Station Response Districts



Equipment Overview

While the age and condition of the fire equipment used in the county varies, the Bucks County Fire Marshal's office generally considers the equipment in the county to be in good condition and in adequate supply. Table Three provides a summary of equipment and apparatus by type. This inventory is provided as a common baseline for fire companies and municipalities to use in future planning activities. Based on the survey results there are 360 pieces of apparatus in the county. Based on a count of each station, there are over 439 pieces of equipment including engines, ladders, rescues, utility command, hazmat, and special rescue vehicles and or boats. Based on the survey responses there are 1,107 available seats on all apparatus and 1,236 active firefighters. ***This equates to having only 1.12 firefighters per available seat.***



439 Pieces of Apparatus



**1.12
Firefighters
Per Seat**

Quantity	Type
100	Engine
25	Ladder
74	Rescue
35	Marine/Amphibious
50	Utility/Personnel
22	Tanker
12	Tower (aerial)
19	Decontamination
11	Hazmat
31	Field
7	Foam
1	Chemical
3	Squirt
10	TAC
39	SS (Special Service)
439	Total

TABLE THREE
Equipment/ Apparatus Summary

Structure of Fire Companies

The structure of the 62 fire companies in Bucks County varies. Several companies have paid staff as either full time career departments or as additional staff working with existing volunteers. These paid staff provide upwards of 50 hours or more of coverage per week, generally Monday through Friday from 6:00 AM until 6:00 PM. Where paid fire fighters are supplemental staff, remaining shifts are generally covered by volunteers, as needed in the evenings or on weekends as applicable. Table Four provides an overview. The remaining companies in the county are volunteer. Of those, some are municipal, and others are independent. Municipal fire companies are those in which the fire house and equipment are owned and maintained by a municipality. Independent fire companies may reside and operate within one municipality, but they own and maintain their own equipment. Regardless of the structure of the company, the Pennsylvania Borough Code, the First-Class Township Code, and the Second-Class

“OF PENNSYLVANIA’S 2,462 FIRE COMPANIES, MORE THAN 90 PERCENT ARE VOLUNTEER COMPANIES.”

SR 6, 2018

Township Code all call for a relationship between the municipality and the fire company, which ensures adequate fire protection and financial responsibility.

	Engine	Municipality	Coverage
TABLE FOUR Departments with Paid Firefighters	Engine 222	Bensalem Township	50 Hours/week, M-F
	Engine225	Bristol Township	52.5 Hours/week, M-F
	Engine 244	Middletown Township	40 Hours/week, M-F
	Engine 55	Newtown Township	6AM – 6PM, M-F
	Engine 3	Northampton Township	6AM – 6PM, M-S
	Rescue 78	Warrington Township	40 Hours/week, M-F

Funding

The funding of fire companies comes from several sources and varies in amount. A fire tax is levied by some municipalities and used in sum or in part to support fire companies. By law, a fire tax cannot exceed three mills unless a municipal referendum is passed. Table Five lists the municipalities which charge a fire tax and at what millage rate. Of the 54 municipalities, Morrisville Borough is the only one that charges four mills for fire tax. Based on Table Five only three of the 54 municipalities charge the maximum three mills while eight municipalities (mostly Boroughs) charge no fire tax millage at all. Twelve municipalities charge millage greater than zero, but less than one mill and the remaining 26 municipalities charge somewhere between one mill and less than the full three mills. All data was compiled from the Pennsylvania Department of Community and Economic Development. It should be noted that state law currently permits only a maximum of one mill to be used for salaries and benefits. Companies also receive donations directly from municipal general funds, conduct fund-raising drives, and are eligible for low interest loans through the state volunteer loan assistance program.

“RECOGNIZING THE FUNDING GAP, SELLERSVILLE BOROUGH WILL ENACT A 3 MILL FIRE TAX EFFECTIVE JANUARY 1, 2020.”

BUCKS COUNTY HEARLD 12/12/19

Based on informal discussions with representatives from the various fire companies, the adequacy of funding and budgets varies from municipality to municipality and from company to company. Likewise, accountability varies greatly, and some departments are reluctant to divulge the state of their capital reserves. Some companies are adequately funded with significant reserves, while others are woefully underfunded.

State law requires that any entity receiving public funds disclose the amount received and the use of the funds. Any taxpayer from a municipality supporting local fire companies with tax dollars can inquire about the amount given, company budgets, and plans and justifications for such funds. This disclosure of fire company expenditures is essential for proper fire service planning. Recently introduced legislation (House Bill 1780) however, would exempt local fire companies from the right-to-know laws making it virtually impossible for the public to gain insight into the financial health of its fire department.

While it is easy to understand the context of this legislation as it relates to undue administrative burdens on already strapped staffing, nevertheless, a true and accurate financial picture is necessary to properly plan for future staffing and equipment needs. This is especially true if the introduction of paid firefighters, funded through taxpayer dollars, is to become a practical necessity.

In addition, fire companies also receive funds from revenues generated by The Volunteer Fireman’s Relief Association Act. This state law (Act 84) governs the spending of foreign fire insurance tax monies. This tax is a two percent surcharge paid by homeowners who purchase fire insurance from an out-of-state insurance company. Municipalities receive the funds from the state based on how many homes in the municipality have out-of-state insurance, then pass the receipts on to the local companies. By law, these funds are earmarked only for safety and educational equipment. Additionally, they cannot be used to fund volunteer firefighter’s pension funds. Recent changes introduced at the House of Representatives, House Bill 1673, as an example, would allow these monies to be used for retention and recruitment in addition to the current allowed uses if approved by the Pennsylvania Senate. While this may help recruitment somewhat, more importantly it would help to retain those volunteers already in service.

Within the context of the shortage of volunteer firefighters, sound financial and operational planning is essential. As many companies are independent within the same municipality, community, or region, they often plan and spend independently, unaware of the spending of other companies around them. The net effect of this is often the unneeded duplication of primary apparatus and or the acquisition of non-standard or incompatible accessory vehicles and equipment. This inefficiency depletes budgets and does not necessarily guarantee the availability of staffing to operate the apparatus. More importantly, it generates the need for additional fundraising and capital budget campaigns which further increases time commitments by current volunteers. This leads to “fundraising fatigue” and may be a deterrent to recruiting new volunteers.

Moving forward, fire companies will need to re-think the “independent” model and begin to have honest conversations about regionalization and the combining of forces to adequately protect the communities they serve, while preserving the underlying volunteerism community. This is no doubt a radical departure from the current mindset and will require a significant shift in existing paradigms about community firefighting. When this is balanced against the reality of a vanishing volunteer pool, the alternative is likely to be the eventual closure of fire companies, forced regionalization or a move to all career companies and the ultimate demise of the volunteer system.

“MOVING FORWARD, FIRE COMPANIES WILL NEED TO RE-THINK THE “INDEPENDENT” MODEL AND BEGIN TO HAVE HONEST CONVERSATIONS ABOUT REGIONALIZATION AND THE COMBINING OF FORCES TO ADEQUATELY PROTECT THE COMMUNITIES THEY SERVE, WHILE PRESERVING THE UNDERLYING VOLUNTEERISM COMMUNITY.”

THE FUTURE OF BUCKS COUNTY'S FIRE SERVICE

TABLE FIVE

Tax Mills by Municipality

Reporting Year	Municipality	County Area	Fire Tax Mills
2020	BEDMINSTER TOWNSHIP	UPPER BUCKS	1
2020	BENSALEM TOWNSHIP	LOWER BUCKS	2.75
2020	BRIDGETON TOWNSHIP	UPPER BUCKS	3
2020	BRISTOL BOROUGH	LOWER BUCKS	3
2020	BRISTOL TOWNSHIP	LOWER BUCKS	2
2020	BUCKINGHAM TOWNSHIP	CENTRAL BUCKS	0.75
2020	CHALFONT BOROUGH	CENTRAL BUCKS	1.25
2020	DOYLESTOWN BOROUGH	CENTRAL BUCKS	1.7
2020	DOYLESTOWN TOWNSHIP	CENTRAL BUCKS	1.25
2020	DUBLIN BOROUGH	CENTRAL BUCKS	0
2020	DURHAM TOWNSHIP	UPPER BUCKS	1
2020	EAST ROCKHILL TOWNSHIP	UPPER BUCKS	1
2020	FALLS TOWNSHIP	LOWER BUCKS	1.25
2020	HAYCOCK TOWNSHIP	UPPER BUCKS	0
2020	HILLTOWN TOWNSHIP	UPPER BUCKS	0.75
2020	HULMEVILLE BOROUGH	LOWER BUCKS	1.5
2020	IVYLAND BOROUGH	CENTRAL BUCKS	2.25
2020	LANGHORNE BOROUGH	LOWER BUCKS	1.65
2020	LANGHORNE MANOR BOROUGH	LOWER BUCKS	0.75
2020	LOWER MAKEFIELD TOWNSHIP	LOWER BUCKS	0.9
2020	LOWER SOUTHAMPTON TOWNSHIP	LOWER BUCKS	1.55
2020	MIDDLETOWN TOWNSHIP	LOWER BUCKS	1.545
2020	MILFORD TOWNSHIP	UPPER BUCKS	1.25
2020	MORRISVILLE BOROUGH	LOWER BUCKS	4
2020	NEW BRITAIN BOROUGH	CENTRAL BUCKS	1.25
2020	NEW BRITAIN TOWNSHIP	CENTRAL BUCKS	1.25
2020	NEW HOPE BOROUGH	CENTRAL BUCKS	1.85
2020	NEWTOWN BOROUGH	CENTRAL BUCKS	1.875
2020	NEWTOWN TOWNSHIP	CENTRAL BUCKS	0.875
2020	NOCKAMIXON TOWNSHIP	UPPER BUCKS	0
2020	NORTHAMPTON TOWNSHIP	CENTRAL BUCKS	3
2020	PENNDDEL BOROUGH	LOWER BUCKS	3
2020	PERKASIE BOROUGH	UPPER BUCKS	1.5
2020	PLUMSTEAD TOWNSHIP	CENTRAL BUCKS	1.1
2020	QUAKER TOWN BOROUGH	UPPER BUCKS	0
2020	RICHLAND TOWNSHIP	UPPER BUCKS	0.75
2020	RICHLANDTOWN BOROUGH	UPPER BUCKS	0
2020	RIEGELSVILLE BOROUGH	UPPER BUCKS	1
2020	SELLERSVILLE BOROUGH	UPPER BUCKS	3
2020	SILVERDALE BOROUGH	UPPER BUCKS	0
2020	SOLEBURY TOWNSHIP	CENTRAL BUCKS	1.75
2020	SPRINGFIELD TOWNSHIP	UPPER BUCKS	0
2020	TELFORD BOROUGH	UPPER BUCKS	0.16
2020	TINICUM TOWNSHIP	UPPER BUCKS	1.5
2020	TRUMBAUERSVILLE BOROUGH	UPPER BUCKS	0
2020	TULLYTOWN BOROUGH	LOWER BUCKS	2
2020	UPPER MAKEFIELD TOWNSHIP	CENTRAL BUCKS	0.75
2020	UPPER SOUTHAMPTON TOWNSHIP	CENTRAL BUCKS	1.45
2020	WARMINSTER TOWNSHIP	CENTRAL BUCKS	1.5
2020	WARRINGTON TOWNSHIP	CENTRAL BUCKS	1.25
2020	WARWICK TOWNSHIP	CENTRAL BUCKS	0.75
2020	WEST ROCKHILL TOWNSHIP	UPPER BUCKS	0.75
2020	WRIGHTSTOWN TOWNSHIP	CENTRAL BUCKS	0.75
2020	YARDLEY BOROUGH	LOWER BUCKS	0.85

Municipal and County Agencies and Resources

In addition to fire companies and supportive municipal governments, there are other players within the fire protection system in the county, including municipal fire marshals, the Bucks County Fire Marshal, two Bucks County Emergency Services Training Centers, and the Bucks County Emergency Management Department.

Municipal fire marshals investigate all local fires for cause and extent of damage. Some municipal fire marshals are also responsible for conducting fire code inspections. Municipal fire marshals include volunteers, as well as full and part-time paid professionals. In those municipalities with no local fire marshal, local fire company chiefs and/or the Bucks County Fire Marshal's office fulfill these duties. The Bucks County Fire Marshal's office also investigates all fires that result in injury, death, or large-scale destruction of property in the absence of a local fire marshal. The Bucks County Fire Marshal's office also assists the Bucks County District Attorney's office in investigating fires in which a crime may have been committed.

The Bucks County Community College in cooperation with the county, operates two training facilities: The Bucks County Public Safety Training Center (BCPSTC) located in Doylestown Township and the Lower Bucks Public Safety Training Center (LBPSTC) located in Croydon, Bristol Township. The addition of the second training center in Bristol Township in 2011 was a direct result of the need to reduce travel time for departments from the lower part of the county who had to travel to Doylestown for required training and continuing education. This travel time often meant that coverage, apparatus, and volunteers were not available for extended periods to respond to emergencies.

The two training centers provide introductory and ongoing instruction for the County's volunteer firefighters. Through a series of classes and training programs, volunteers are taught firefighting techniques and gain hands-on experience at the fire school training centers. Volunteers must complete course work and pass a written examination before becoming certified by the fire schools. Fire school instructors must meet county and state requirements regarding experience and training. The county's certification requirements, which exceed state standards, are set forth in the Emergency Services Training Center Procedures Manuals.

The **Bucks County Emergency Services Division (ESD)** assists local officials in preparing and coordinating response plans for large-scale fire or emergency situations. The ESD also works with local, county and state emergency personnel to develop contingency response plans for natural or chemical disasters. The ESD also coordinates closely with the **Bucks County Department of Emergency Communications** to establish a priority sequence for multiple response situations and with local hospitals to develop evacuation and large-scale emergency strategies.

The **Bucks County Department of Emergency Communications** is the sole dispatching authority for fire service in the county. The department administers the county's 911 system, as well as the Computer Aided Dispatch System including police and ambulance response coordination. The department works with all local fire companies to develop response districts and mutual aid agreements as applicable.

FUTURE FIRE PROTECTION NEEDS 2020 AND BEYOND

Standards of Service

In order to evaluate the adequacy of the county's fire protection services, appropriate standards and benchmarks are required to evaluate location of fire stations, apparatus required, as well as staffing levels. The Insurance Service Office (ISO) is a national insurance industry service group which provides advisory, actuarial, rating, and statistical services to state and regional fire rating boards and bureaus. It sets fire suppression rating schedules for municipal fire protection. In addition to the ISO this study also consulted the publications of the National Fire Protection Agency (NFPA). The NFPA uses certain population and geographic densities as benchmarks for promulgating the standards for fire protection and service throughout various NFPA documents. These standards are developed through a consensus methodology. For the purposes of this report, the NFPA standards serve as basis of comparison for benchmarking the county's volunteer firefighting forces specifically relative to staffing.

The ISO recommends suburban areas be within a 2.5-mile radius of a fire station with a first response engine and that rural areas have a first response engine within a 4-mile radius. A first response engine is



2.5 Mile Radius

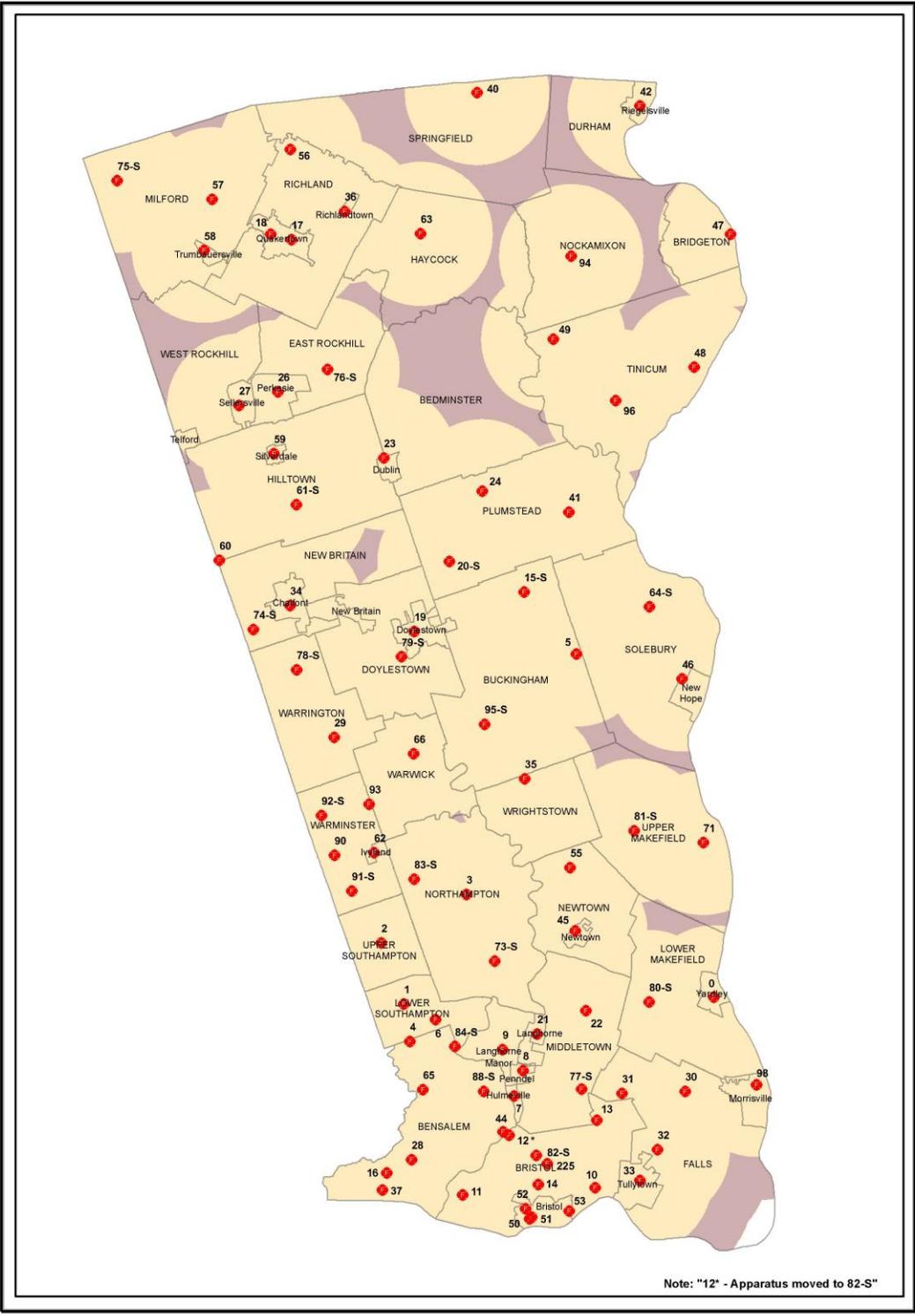
that engine which answers the first alarm and provides primary fire protection to an area. Given the ISO standards and definitions, optimally, all areas of Bucks County should be within 2.5 miles of a fire station or substation, and no area should be more than 4 miles away. By applying the ISO standards for first response engine, the county's overall fire protection can be evaluated. Figure Four shows the areas of the county that are beyond the 2.5- and 4-mile standards. It should be noted that the ISO standards represent minimal levels for service. Municipalities with more than one station in a 2.5-mile radius do not necessarily have excessive coverage as in the case of substations. More importantly, however, than the location of the fire station is whether there are enough volunteers to respond and staff the apparatus to effectively fight a fire.

To better understand the meaning of these standards, it is important to remember that mile radii are benchmarks for measuring response time. The Bucks County Fire Marshal's office estimates the average truck speed (including stops, acceleration, and deceleration) to be 30 miles per hour, or 0.5 miles per minute. Thus, areas within the 2.5-mile radius can be served within 5 minutes and those areas within the 4-mile radius can be served in at least 8 minutes. These response times, however, assume immediate dispatch of vehicles. They do not take into account the critical period of time it takes volunteer firefighters to arrive at the station.

This is a critical issue when there has been a significant trend in the workforce away from "shift work." Traditional volunteer departments relied on the availability of staffing as firefighters worked varied shifts at their primary jobs. This workforce structure typically translated into having staffing available throughout a 24-hour period. This is no longer the case in most instances. More and more volunteers hold traditional "nine-to-five" jobs and typically commute out of the municipality where they live to get to their jobs. This, coupled with familial responsibilities, has been identified as one of the leading causes in the rapid decline of volunteer firefighters.

FIGURE FOUR

Fire Station Protection Service Areas



BCPC
Bucks County Planning Commission

- Fire Stations and Sub-Stations
- Municipal Boundary
- 2.5 Miles To Nearest Fire Company
- 4 Miles To Nearest Fire Company
- Outside 4 Mile Service Area

2020

Bucks County Fire Protection Service Areas

Future Demand for Facilities

As recommended in the 1990 report, additional fire stations and substations have been constructed to further enhance coverage. As Figure Four illustrates nearly all of the county's residents are within 2.5 miles of a fire company/station. There are relatively small areas within Bedminster and Springfield Townships that fall just outside the 4-mile service area and would be classified as "Remote Demand Zones" by the NFPA.

While expanding services to meet the needs of a growing population is responsible planning, it is also prudent to examine those areas where a stable or shrinking population may make a consolidation or realignment of services practical. Some of the lower Bucks County municipalities have experienced slower growth rates in recent years and will continue to do so as they approach full development. In yet other municipalities, previously thought to be built-out, recent redevelopment proposals are responding to new market demand for multifamily housing and will see the addition of new apartment buildings. Some 1,200 units are planned for lower Bucks County. This not only increases firefighting demand, but it may also necessitate changes in apparatus, training, and staffing to adequately protect citizens. Whether stable or growing, these municipalities should evaluate their fire protection needs in light of how they have or will be developed, both residentially and otherwise, and determine the appropriate financial commitment of the municipal taxpayers.

By way of example, Bristol Borough with a land area of only 1.71 square miles, is served by five fire companies. While the Borough has seen a recent resurgence in popularity and some new infill development, substantial growth is not expected and the necessity for five departments should be reevaluated against the availability of volunteers and service areas.

Critical Operating Issue - Staffing

The most pressing operational issue for the county's 62 fire departments, remains staffing. This has not changed in nearly thirty years as noted in the original 1990 report. Over the past decade and as



9 House Bills

most recently illustrated in the 2018, SR6 report, volunteer ranks are at an all-time low. While there is recognition at the state level, the problem is pervasive and not easily remedied. New incentives to provide financial benefit and or relief from expenses, like taxes, are important and should be pursued, but these alone will not reverse the trend of declining volunteer firefighters. Many active volunteer firefighters remain skeptical that these new incentives will "move the needle" for attracting new members but acknowledge they are important incentives to *retain* existing members and will be a welcome benefit should they be passed by the state Senate. To date, nine house bills have been introduced to address various incentives for volunteer firefighters.

With the exception of those departments with paid personnel, the county is served wholly by volunteer firefighters. The service of these men and women is invaluable to the communities they serve, especially considering the cost of having career firefighters. Yet, the number of new volunteers remains low and those who are still in service are aging, with many nearing retirement age. Likewise, the obligations of extensive fundraising activity, stringent training schedules, and time away from

family discourages those otherwise willing to volunteer for firefighting service. These factors contribute significantly to the shortage of firefighters and compromise effective coverage and response times.

Bucks County has seen significant growth since the original report was drafted in 1990. Per the 1990 Census, Bucks County had 541,174 people residing in 199,934 housing units. Today, according to the 2018, ACS data, the county's population is estimated at 628,195 people residing in 248,873 housing units. This represents a 16 percent increase in population and a 24 percent increase in the number of dwellings over the past 30 years. With over 3,600 units proposed in just the past three years, the number is not only expected to continue to grow, but the composition of the housing stock, largely multifamily structures, means that the level of firefighter response needed for a fire emergency will be significantly higher.

With an increase in housing units, we see an influx of new residents. One phenomenon that has been noted with the in-migration of new residents, is that many are from other areas within the tristate area. As new residents, many are uninformed about the local fire protection system and surprised to learn that local fire service, unlike police protection, is provided by unpaid volunteers. This is especially true for those who move to the county from Philadelphia and New Jersey. There is an expectation, realistic or not, that like police protection, there will always be a firefighter on duty to respond to that emergency call.

The decline in volunteerism is a national, state, and local trend. The county's 62 fire departments, however, cannot be expected to resolve the issue on their own. Resolution of the problem and the future of firefighting services will rely on cooperation across municipal boundaries with support and

“WHILE THE RECRUITMENT OF VOLUNTEERS MUST BE CHAMPIONED BY EACH DEPARTMENT, THERE WILL NEED TO BE CANDID CONVERSATIONS ABOUT WHETHER THE ALL-VOLUNTEER MODEL OF PROVIDING FIRE SERVICE WILL BE VIABLE LONG TERM.”

direction from local, state, and federal leaders. While the recruitment of volunteers must be championed by each department, there will need to be candid conversations about whether the all-volunteer model of providing fire service will be viable long term. Furthermore, the public will need to be asked and answer the question of “how much are they willing to pay” for this protection. Going forward the conversation should address the integration of paid firefighters, combined departments, and a regionalized approach to fire protection so that the public is protected, and tragedies are avoided.

Department Demographics & Statistics

To help illustrate and understand the shortage of volunteers in Bucks County, the ESD, developed and administered a survey and issued it to all 62 departments. The survey asked specific questions as to the types of equipment and demographics of the 62 department's active firefighters. All departments were instructed to include only *active* firefighters and were to exclude Fire Police, Auxiliary, and Administrative members from the reported numbers. Departments were to list firefighters by classification: junior, interior, and exterior, as well as by age, for five specific age cohorts.

Of 62 departments, 47 responded for a 76 percent response rate. While 100 percent participation was sought, the ESD believes the results obtained provide a valid snapshot of the state of the county's volunteer fire services.

THE FUTURE OF BUCKS COUNTY'S FIRE SERVICE

The survey was composed of ten questions with Question 3 having multiple parts relative to age cohorts and firefighter classification.

Q1	How many active firefighters do you have in your department?(Please do not include; Fire Police, Auxiliary, or Administrative members)
Q2	Please fill out the number of firefighters that meet each category:
Q3	Please fill in a number for each group of Active Firefighters:
Q4	How many firefighters volunteer with another organization?
Q5	Please fill out the appropriate number for each (wheeled apparatus only)
Q6	Total number of seats provided by all apparatus:
Q7	Current ISO rating for your department
Q8	What is the square mileage of your initial response district
Q9	Are you considering regionalization, consolidation or expansion?
Q10	Please specify your department:

It is important to note that there were several discrepancies found within the reported results relative to the number of active firefighters between Questions 1, 2, and 3, as well as within Question 3 itself. Most notable was the discrepancy between the numbers reported for each classification of firefighter between Questions 2 and 3. Without independently verifying with each respondent, it was decided by the planning committee to use the totals from Question 3 as the basis for our analysis. The detailed full results chart can be found in the appendix.

Based on Question 3 the aggregate results were as follows:

Firefighter Classification	Number of Firefighters
Junior	120
Interior	776
Exterior	242

Age Cohort	Number of Firefighters	% of Total Force
<18	120	10%
18 to 30	291	24%
31 to 40	259	21%
41 to 50	240	19%
>50	326	26%
Total	1,236	100%

Key Findings – Select Questions

Q3: Please fill in a number for each group of Active Firefighters

Based on a detailed analysis of each department's response to Question 3 we can make a number of observations:

1. Only 10 percent of the active firefighters are "juniors" meaning young firefighters that will potentially serve ten years or more as a volunteer based on observed averages for length of volunteer service.
2. 55 percent of all volunteers are under the age of 40.
3. 45 percent of all volunteers are over the age of 40 and 26 percent of those are over the age of 50.

4. Of the 48 departments responding, two have active firefighters over the age of 50 that comprise more than 50 percent of their entire department.
5. Of the 48 departments responding, 13 have active firefighters over the age of 50 that comprise more than 30 percent of their entire department.
6. Of the 48 departments responding, 23 have active firefighters over the age of 40 that comprise more than 50 percent of their entire department.
7. For the 48 responding departments, there are only 776 interior firefighters or 68 percent of the total active firefighters. ***This translates roughly to an average of 16 interior firefighters per department responding to the survey.***
8. For the 48 responding departments, there are only 242 exterior firefighters or 19 percent of the total active firefighters. On an overall comparison, the ratio of interior to exterior firefighters is 3.2 to 1. While interior firefighters can perform exterior duties, exterior firefighters may not enter a structure to perform interior work. ***This translates roughly to an average of 5 exterior firefighters per department responding to the survey.***
9. With 776 interior firefighters and 248,873 housing units, that equates to each interior firefighter being responsible for 320 housing units.

What is most telling in Question 3 is that the ages of the department's volunteers are nearly evenly split between those under age 40 and those over age 40. What is concerning, however, is that only 10 percent of the volunteers are under the age of eighteen. This suggests that younger volunteers are not coming on in sufficient numbers to potentially replace the nearly 50 percent of volunteers that are over the age of 40 nor the 26 percent that are over 50. We recognize that new volunteers could be older when they join, however it is usually the younger recruits who are likely to stay with the department for longer periods versus someone who may be in their mid-30's when they join.

While there is no mandatory retirement age for a volunteer firefighter, there is the realistic presumption that as firefighters age, especially over the age of 50, that they will be more likely to serve in supporting roles versus that of active firefighter and if still active, are subject to a greater likelihood of physical injury while on duty given the demands of active fire service. With a shortage of volunteers, these department veterans are likely to feel compelled to respond to calls not only out of their sense of duty, but more importantly because no one else is available to do the job.

“WITH ONLY 1.12 FIREFIGHTERS PER SEAT, THERE IS EFFECTIVELY NO “BACKUP” CAPACITY AND DEPARTMENTS ARE TOTALLY RELIANT ON EACH FIREFIGHTER BEING AVAILABLE AS NEEDED”

Q6: Total number of seats provide by all apparatus.

Based on a detailed analysis of each department's response to Question 6 we can make a number of observations:

1. Based on the 48 responses there are 1,107 available seats on 360 reported pieces of apparatus.

2. With 1,236 active firefighters, this translates to an average of 1.12 firefighters per seat.
3. Of the 48 responses, 18 departments, or 38 percent have more seats on apparatus than firefighters to fill them.
4. With only 1.12 firefighters per seat, there is effectively no “backup” capacity and departments are totally reliant on each firefighter being available as needed.

Q9: Are you considering reorganization, consolidation, or expansion?

Based on a detailed analysis of each department’s response to Question 9 we can make a number of observations:

1. Six departments skipped the question.
2. 28 departments responded “no.” Of the 28 departments that responded “no,” 25 percent of those are departments with less than one firefighter per seat available on all apparatus noted for the department.
3. 14 departments responded “yes.” Of the 14 that responded “yes,” 50 percent of those are departments with less than one firefighter per seat available on all apparatus noted for the department.
4. 10 of the 14 that responded “yes” have departments where more than 50 percent of the active firefighters are over the age of 40.
5. 11 of the 28 that responded “no” have departments where more than 50 percent of the active firefighters are over the age of 40.

Staffing Guidelines & County Comparison

To further illustrate the shortage and the ramifications of a dwindling force, we examined a number of industry documents and guidelines to determine appropriate staffing levels for fire responses. We reviewed the publications of the National Fire Protection Agency (NFPA) specifically 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 NFPA Standard 1710, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments. We also reviewed the United States Occupational Safety and Health Administration (OSHA) policy 29 CFR 1910.134(g) (4) (i) as it relates to the “two in, two out” policy. These standards serve as basis for benchmarking the county’s volunteer firefighting forces specifically relative to staffing.

In standard NFPA1720, the recommended number of responding firefighters is determined by the level of “hazard occupancy.” The fire department, or Authority Having Jurisdiction (AHJ), uses this as the basis for dispatching first and subsequent responders to a fire call. Minimum responding staff is defined as members responding from the AHJ and automatic aid, where automatic aid is previously determined as an immediate joint first response from another department.

NFPA defines the three levels of occupancy hazard as follows:

1. High-hazard occupancies: schools, hospitals, nursing homes, explosives plants, refineries, high rise buildings, and other high life-hazard or large fire-potential occupancies.
2. Medium-hazard occupancies: apartments, offices, mercantile and industrial occupancies not normally requiring extensive rescue or firefighting forces.
3. Low-hazard occupancies: one, two or three family dwellings and scattered small businesses and industrial occupancies. For instance, a 2,000-square-foot two-story single-family home without a basement.

The recommended response staffing levels in Standard NFPA 1720 are based on the “Low-hazard occupancy” designation for the various Demand Zones as discussed earlier on Page 2. This is especially important when considering the more densely populated areas of the county with large numbers of multifamily dwellings.

NFPA 1720, Table 4.3.2, defines the minimum required staff to respond for each Demand Zone based on demographic/density thresholds as follows:

Demand Zone	Demographics	Minimum Staff to Respond (MSTR)
Urban Area	>1,000 people/mi ²	15
Suburban Area	500-1,000 people/mi ²	10
Rural Area	<500 people/mi ²	6
Remote Area	Travel distance ≥ 8 mi	4
Special Risks	Determined by AHJ	Determined by AHJ based on risk

It is important to note that the minimum staff to respond is **at any given time**, 24 hours a day, seven days per week and is for the low-hazard occupancy rating. Any response in the medium or high-hazard occupancy rating would likely require additional staffing resources through mutual aid.

As noted in Table One the county’s 54 municipalities fall into the following demand zones:

Demand Zone	Number of Municipalities
Urban Area	35
Suburban Area	5
Rural Area	14
Remote Area	0

What is important to note is that most of the county’s boroughs, calculate as urban demand zones because of small land to population ratios; however, they may actually be more suburban in character and density of land use. For the purposes of this study, the calculated demand zone is used.

Using the above data, we can assess and compare the number of recommended firefighters to those available in several ways.

Analysis Scenario One

Analysis Scenario One is a high-level calculation assuming each of the 54 municipalities would have one fire department and the minimum staffing would be based on their NFPA demand zone designation. Anecdotally, all but seven municipalities have either a main station or substation within their borders. Minimum staff is calculated by multiplying the number of municipalities by their demand zone minimum staffing requirement of 15, 10, or 6 minimum responders.

Demand Zone	Number of Municipalities	Total Minimum Staff to Respond
Urban Area	35	525
Suburban Area	5	50
Rural Area	14	84
Remote Area	0	0
Total		659

*Based on Analysis Scenario One and the above demand zones the county should have a minimum of **659 firefighters** available at all times, for any shift, as the first responders assuming each municipality had one fire department. Normal firefighting operations have the 24-hour period broken in to three eight-hour shifts to provide 24-hour coverage. **This suggests that based on the above, the actual number of firefighters needed is three times the minimum or a total of 1,977 firefighters. With at best approximately 1,600 active firefighters in the county presently, we can reasonably conclude under this scenario that the county is below the NFPA minimum required number of firefighters by approximately 377 firefighters or approximately 7 firefighters per municipality in this scenario.***

Analysis Scenario Two

Analysis Scenario Two is a more granular calculation based on the actual number of existing fire department stations and their demand zone rating based on their location within the county. For this analysis, substations were not counted as they essentially draw from the same available pool of volunteers but disperse apparatus to facilitate response times. Minimum staff is calculated by multiplying the number of primary stations by their demand zone minimum staffing requirement of 15, 10, or 6 minimum responders.

Demand Zone	Number of Primary Stations	Total Minimum Staff to respond
Urban Area	46	690
Suburban Area	4	40
Rural Area	10	60
Remote Area	0	0
Total		790

*Based on Analysis Scenario Two and the above demand zones the county should have a minimum of **790 firefighters** available at all times as the first responders, based on each station's location and NFPA Demand Zone rating. Normal firefighting operations have the 24-hour period broken in to three, eight-hour shifts to provide 24-hour coverage. **This suggests that based on the above, the actual number of firefighters needed is three times the minimum or a total of 2,370 firefighters. With at best approximately 1,600 active firefighters in the county presently, we can reasonably conclude***

that the county is below the NFPA minimum required number of firefighters by approximately 770 firefighters or approximately 12 firefighters per existing department countywide.

In either of the previous scenarios, the bottom line remains the same: there is a critical shortage of volunteer firefighters in Bucks County. With an aging force and low entry numbers, the shortage will continue to worsen.

By way of example, based on a December 15, 2019, Philadelphia Inquirer article, *“The Paoli department-which is made up of six-fulltime firefighters, about 30 part-timers and between 30-35 volunteers-covers a 14 square-mile area that includes Tredyffrin, Easttown, and Willistown Townships.”* The department located in Chester County, Pennsylvania, protects approximately 25,000, in that 14 square –miles, giving them a density ratio of 1,785 people per square mile and an NFPA “Urban Demand Zone” rating. Between paid staff and volunteers, the department hosts a staff of about **70 firefighters for the 14 square mile area.**

By comparison, the average response district in Bucks County is 13.44 square miles based on 41 responses to the survey with an average of 26 firefighters per department based on the survey results and the reported first response areas.

Costs of Staffing

Volunteer firefighters are no doubt the least expensive option for a community when it comes to providing the service. That is not to say volunteer departments come without costs. Fire stations, apparatus, training, gear, and ancillary equipment all cost money and must be funded through donations, municipal government, and state financial contributions or assistance.



\$77,875.00

While communities can invoke a fire tax up to 3 mills, the money raised varies greatly from community to community and is often just enough to keep the department operational. While some companies may have large reserves, others are essentially bankrupt. Furthermore, state law only allows up to 1 mil of a fire tax to be used for salaries and benefits for firefighters. Regardless of the present situation, what the current finances do not account for, in all but seven municipalities, is the cost of paid/career firefighters.

According to the United States Bureau of Labor Statistics (USBLS), in May of 2018, the mean hourly wage for a paid firefighter in the Philadelphia-Camden, Wilmington, PA-NJ-DE metropolitan area was \$28.80 per hour or \$59,904.00 annually based on 2,080 hours per year. This did not include any benefits. The national salary as reported by Zip Recruiter is \$45,380, as of October 2019, and in Pennsylvania they report the average as \$43,100, with a range from a low of \$23,744 to a high of \$65,534.00.

Considering a 30 percent add-on for benefits and using the mean wage as reported by the USBLS, the total hourly wage/cost equates to \$37.44 per hour for a paid firefighter. The total cost for a firefighter working an 8-hour shift, for a total of 40 hours per week, is therefore \$77,875.00 per year. This does not include individual gear or equipment to outfit the firefighter.

As noted in prior sections, there is clearly a shortage of firefighters, if we are to compare our current number of active firefighters to the NFPA 1720 standards for minimum staff to respond. Based on this we can analyze the potential costs for paid firefighters a number of ways.

Cost Scenario One: Similar to Analysis Scenario One, this analysis is a high-level calculation assuming each of the 54 municipalities would have an entirely paid department based on having round the clock coverage, three shifts per day, with the minimum staff in accordance with their NFPA demand zone rating (Table One) and staffing requirement. It also presumes the total demise of the volunteer system and no mutual aid response.

All Full Time Paid - No Mutual Aid					
Urban Demand Zone					
Time/Shift	#of FFs	Hours	Total Hours	Hourly Rate w/ Benefits	Total
7AM - 3 PM	15	8	120	\$37.44	\$4,492.80
3PM - 11PM	15	8	120	\$37.44	\$4,492.80
11PM - 7 AM	15	8	120	\$37.44	\$4,492.80
Total per Day	45	24	360		\$13,478.40
				365 Days/year	\$4,919,616.00
Surban Demand Zone					
Time/Shift	#of FFs	Hours	Total Hours	Hourly Rate w/ Benefits	Total
7AM - 3 PM	10	8	80	\$37.44	\$2,995.20
3PM - 11PM	10	8	80	\$37.44	\$2,995.20
11PM - 7 AM	10	8	80	\$37.44	\$2,995.20
Total per Day	30	24	240		\$8,985.60
				365 Days/year	\$3,279,744.00
Rural Demand Zone					
Time/Shift	#of FFs	Hours	Total Hours	Hourly Rate w/ Benefits	Total
7AM - 3 PM	6	8	48	\$37.44	\$1,797.12
3PM - 11PM	6	8	48	\$37.44	\$1,797.12
11PM - 7 AM	6	8	48	\$37.44	\$1,797.12
Total per Day	18	24	144		\$5,391.36
				365 Days/year	\$1,967,846.40

Based on Cost Scenario One, the costs are staggering to provide full paid coverage under this scenario. When annualized on a per person basis by municipality and the cost is divided per person, the average yearly cost per person is **\$1,294.16 or \$107.85 per month**. The yearly costs range from a low of \$81.43 per person, per year, to a staggering \$6,490.26 per person, as noted in Table Six.

Cost Scenario Two: Similar to **Analysis Scenario Two**, this analysis is more specific to each of the departments and assumes that existing volunteer staff is supplemented with paid staff based on having round the clock coverage, three shifts per day, with the minimum staff in accordance with their NFPA demand zone rating (Table One) and staffing requirement.

Based on **Analysis Scenario Two** the recommended number of firefighters is a total of 2,370 firefighters. Assuming there are approximately 1,600 active firefighters in the county presently, we conclude that the county is below the NFPA minimum required number of firefighters by

approximately 770 firefighters or approximately 12 firefighters per existing department/station countywide.

The cost to each department can be approximated by taking the average of 12 needed firefighters per department. This scenario also presumes there is no mutual aid.

Partial Full Time - No Mutual Aid					
Each Department					
Time/Shift	#of FFs	Hours	Total Hours	Hourly Rate w/ Benefits	Total
7AM - 3 PM	4	8	32	\$37.44	\$1,198.08
3PM - 11PM	4	8	32	\$37.44	\$1,198.08
11PM - 7 AM	4	8	32	\$37.44	\$1,198.08
Total per Day	12	24	96		\$3,594.24
				365 Days/year	\$1,311,897.60

*Based on this scenario, the estimated cost per department, regardless of demand zone is **\$1,311,897.00 per department** to supplement the existing volunteer force. As an average this cost will be higher for some departments and lower for others dependent on the actual number of active volunteers. More concerning is that it presumes the current level of volunteers remains constant and volunteers continue to participate in firefighting service.*

THE FUTURE OF BUCKS COUNTY'S FIRE SERVICE

Municipality	NFPA Rating	Total Yearly Cost**	Cost/Person	Per month
Plumstead Township	Rural: <500/SM	\$1,967,846	\$146.59	\$12.22
Milford Township	Rural: <500/SM	\$1,967,846	\$196.75	\$16.40
Solebury Township	Rural: <500/SM	\$1,967,846	\$228.16	\$19.01
Upper Makefield Township	Rural: <500/SM	\$1,967,846	\$237.35	\$19.78
Bedminster Township	Rural: <500/SM	\$1,967,846	\$279.76	\$23.31
East Rockhill Township	Rural: <500/SM	\$1,967,846	\$343.25	\$28.60
West Rockhill Township	Rural: <500/SM	\$1,967,846	\$373.76	\$31.15
Springfield Township	Rural: <500/SM	\$1,967,846	\$390.60	\$32.55
Tinicum Township	Rural: <500/SM	\$1,967,846	\$495.55	\$41.30
Nockamixon Township	Rural: <500/SM	\$1,967,846	\$576.40	\$48.03
Wrightstown Township	Rural: <500/SM	\$1,967,846	\$633.56	\$52.80
Haycock Township	Rural: <500/SM	\$1,967,846	\$922.57	\$76.88
Bridgeton Township	Rural: <500/SM	\$1,967,846	\$1,718.64	\$143.22
Durham Township	Rural: <500/SM	\$1,967,846	\$1,724.67	\$143.72
Buckingham Township	Suburban: 500-1000/SM	\$3,279,744.00	\$161.52	\$13.46
Hilltown Township	Suburban: 500-1000/SM	\$3,279,744.00	\$215.18	\$17.93
Richland Township	Suburban: 500-1000/SM	\$3,279,744.00	\$248.07	\$20.67
New Britain Township	Suburban: 500-1000/SM	\$3,279,744.00	\$293.38	\$24.45
Riegelsville Borough	Suburban: 500-1000/SM	\$3,279,744.00	\$4,326.84	\$360.57
Bensalem Township	Urban: >1000/SM	\$4,919,616.00	\$81.43	\$6.79
Bristol Township	Urban: >1000/SM	\$4,919,616.00	\$91.04	\$7.59
Middletown Township	Urban: >1000/SM	\$4,919,616.00	\$108.78	\$9.07
Northampton Township	Urban: >1000/SM	\$4,919,616.00	\$124.83	\$10.40
Falls Township	Urban: >1000/SM	\$4,919,616.00	\$144.89	\$12.07
Lower Makefield Township	Urban: >1000/SM	\$4,919,616.00	\$150.81	\$12.57
Warminster Township	Urban: >1000/SM	\$4,919,616.00	\$151.15	\$12.60
Warrington Township	Urban: >1000/SM	\$4,919,616.00	\$205.67	\$17.14
Newtown Township	Urban: >1000/SM	\$4,919,616.00	\$251.23	\$20.94
Lower Southampton Township	Urban: >1000/SM	\$4,919,616.00	\$257.83	\$21.49
Doylestown Township	Urban: >1000/SM	\$4,919,616.00	\$280.93	\$23.41
Upper Southampton Township	Urban: >1000/SM	\$4,919,616.00	\$326.06	\$27.17
Warwick Township	Urban: >1000/SM	\$4,919,616.00	\$337.10	\$28.09
Bristol Borough	Urban: >1000/SM	\$4,919,616.00	\$510.07	\$42.51
Quakertown Borough	Urban: >1000/SM	\$4,919,616.00	\$553.45	\$46.12
Morrisville Borough	Urban: >1000/SM	\$4,919,616.00	\$570.06	\$47.50
Perkasie Borough	Urban: >1000/SM	\$4,919,616.00	\$578.44	\$48.20
Doylestown Borough	Urban: >1000/SM	\$4,919,616.00	\$592.23	\$49.35
Sellersville Borough	Urban: >1000/SM	\$4,919,616.00	\$1,157.83	\$96.49
Chalfont Borough	Urban: >1000/SM	\$4,919,616.00	\$1,205.20	\$100.43
New Britain Borough	Urban: >1000/SM	\$4,919,616.00	\$1,623.10	\$135.26
Penndel Borough	Urban: >1000/SM	\$4,919,616.00	\$1,624.17	\$135.35
New Hope Borough	Urban: >1000/SM	\$4,919,616.00	\$1,963.13	\$163.59
Yardley Borough	Urban: >1000/SM	\$4,919,616.00	\$2,149.24	\$179.10
Telford Borough	Urban: >1000/SM	\$4,919,616.00	\$2,246.40	\$187.20
Dublin Borough	Urban: >1000/SM	\$4,919,616.00	\$2,364.06	\$197.01
Newtown Borough	Urban: >1000/SM	\$4,919,616.00	\$2,410.39	\$200.87
Tullytown Borough	Urban: >1000/SM	\$4,919,616.00	\$2,607.11	\$217.26
Langhorne Manor Borough	Urban: >1000/SM	\$4,919,616.00	\$3,135.51	\$261.29
Langhorne Borough	Urban: >1000/SM	\$4,919,616.00	\$3,202.88	\$266.91
Richlandtown Borough	Urban: >1000/SM	\$4,919,616.00	\$3,712.92	\$309.41
Ivyland Borough	Urban: >1000/SM	\$4,919,616.00	\$5,025.14	\$418.76
Trumbauersville Borough	Urban: >1000/SM	\$4,919,616.00	\$5,050.94	\$420.91
Hulmeville Borough	Urban: >1000/SM	\$4,919,616.00	\$5,087.50	\$423.96
Silverdale Borough	Urban: >1000/SM	\$4,919,616.00	\$6,490.26	\$540.85

TABLE SIX

Cost per person

Observations and Recommendations

Based on the survey data, research analysis and input from local fire chiefs we note the following observations and recommendations:

OBSERVATIONS

1. Whether a Township of the First Class (Bristol Township), Second Class (all others) or a Borough, the Commonwealth's enabling legislation covering the provision of emergency services for each form of municipal government essentially outlines the same responsibility: each municipality is responsible for ensuring that fire and emergency services are provided by the means and extent determined by the municipality including financial and administrative assistance.

For Townships:

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.*

For Boroughs:

Emergency services. The borough shall be responsible for ensuring that fire and emergency medical services are provided within the borough by the means and to the extent determined by the borough, including the appropriate financial and administrative assistance for these services. The borough shall consult with fire and emergency medical services providers to discuss the emergency services needs of the borough. The borough shall require any emergency services organization receiving borough funds to provide to the borough an annual itemized listing of all expenditures of these funds before the borough may consider budgeting additional funding to the organization.

There is no state or federal accountability for staffing levels, budgeting, or the purchase of apparatus. Each municipality and each fire department is free to craft their own fire service delivery including number of volunteers, quantity and type of apparatus and budgets. While this may be in accordance with the codes governing each municipal classification, it does not necessarily ensure that the proper level of planning, financial oversight, and manpower are in place. See SR6, Recommendations 3 and 16.

2. Bucks County will continue to grow. More housing units and increasing population will require increased fire protection and further stretch already limited staff resources.
3. Increasingly, land development proposals include multifamily infill development as large scale, single-family residential housing developments continue to decline in the county and the market shifts to multi-family demand. This will raise the occupancy hazard level and hence require more

personnel and different apparatus to fight fires. ***In 2019, multi-family proposals, comprised 65 percent of all proposed residential units throughout the county.***

4. The state of volunteer firefighting is in jeopardy. While volunteerism may survive, it will vary widely from municipality to municipality and from region to region. More importantly, it is likely to provide an inadequate level of protection due to the ever-dwindling number of new volunteers entering the ranks.
5. With less than 10 percent of the volunteers under the age of 18 and more than 45 percent over the age of 40, the current number of volunteers will continue to age while fewer younger volunteers join the ranks. We recognize that new volunteers could be older when they join, however it is usually the younger recruits who are likely to stay with the department for longer periods versus someone who may be in their mid-30's when they join. Anecdotally it is noted by the NFPA that 41 percent of volunteers have more than 10 years of active service (tenure period).
6. With less than two firefighters per seat on available apparatus, it further illustrates that there is no reserve capacity and that each volunteer MUST show up for a response call. Furthermore, it strongly suggests there are too many pieces of apparatus amongst all the departments.
7. While mutual aid is generally the model by which all fire companies in the county operate, at least two paid, companies, Bristol and Bensalem are restricted to their municipal boundaries for all calls.

RECOMMENDATIONS

1. The 27 recommendations as outlined in the SR6 report should be enacted and implemented to the extent feasible. Many of the recommendations underline the issues identified in this report and are reflective of the County's issues and are consistent with the views of Future of Fire Service Committee members.
2. While the county may have up to as many as 1,600 volunteers, actual department response times and number of volunteer firefighters responding, including mutual aid, should be analyzed to better quantify coverage gaps and to further understand staffing issues.
3. A more thorough analysis of fire coverage and apparatus should be conducted to analyze overlaps and identify areas where consolidation of departments may make sense. Consolidation has proven to save money in insurance premiums and ensures that apparatus is not unnecessarily duplicated. Ottsville, Riegelsville, and Bridgeton are currently entertaining the idea of regionalization.
4. The currently proposed House Bills should be passed in the senate to help maintain and retain the current volunteer ranks. While their effect on recruitment remains to be seen, local elected officials and firefighters should be soliciting their local elected officials to support passage of the legislation.
5. A more detailed analysis of the types and quantity of apparatus should be conducted to determine overlap and necessity based on response area, seat coverage and occupancy hazard

levels. Additionally, career fire companies should be permitted to respond in a mutual aid capacity beyond their municipal boundary.

6. A more detailed analysis on a department-by-department basis of volunteer availability should be conducted to understand how many volunteers are actually available during the course of a day. For example, a department may have 20 active firefighters but if they all work outside of the response area, at “nine-to-five” jobs, Monday through Friday, they are effectively unavailable.
7. A diversification of training is available and should be promoted to separate out non-firefighting skills that could be served by volunteers but not require the need for firefighter-one certification. This could potentially make volunteering more appealing to certain members of the community. Additionally, there should be standardization of training across all areas of firefighter certifications. See SR6 Recommendation 18.
8. Pennsylvania statutes limit the way in which fire tax millage can be utilized. Only up to one mill may be used for salaries and benefits for volunteer firefighters. The remaining millage, if there is any, may be used for training, apparatus, and or building projects. For those municipalities who do not charge any fire millage and those that charge less than three, may want to explore raising current millage, where applicable, to the full three mills to ensure a full one mill can be applied to paying salaries. Alternatively, this may require a change in legislation at the state level to permit more millage to be used for salaries, especially given what appears to be a surplus of apparatus and shortage of volunteers across the county. See SR6 Recommendation 16.
9. All new residential construction as well as new additions to existing dwellings should be required to have fire suppression sprinklers and interconnected smoke detectors. The nature of fires has changed with the abundance of synthetic man-made materials and “flashover” occurs much more quickly than with older construction. Policies that encourage safer structures and potentially certificate of occupancy inspections at the time of a change in ownership, would help increase occupant safety in light of dwindling manpower. See SR6 Recommendation 23.
10. The County explores the feasibility of charging a fire tax and creates a county-based firefighter department that is deployed strategically to supplement those areas and departments which are understaffed and cannot provide adequate coverage. The County could apply for a SAFER Grant to initially fund the program. A similar arrangement has been successfully implemented in Washington County, PA.

SUMMARY

While there will always be examples of successful, community-based volunteer fire departments, the unfortunate reality is that the social fabric which once bred volunteers and supported fire companies has irrevocably changed. The modern pressures of raising a family, two earner households and commuting to one's job, have all contributed to the decline in volunteers. Going forward, a major paradigm shift must occur within the fire departments themselves and the municipalities they serve.

At its core, asking an individual to potentially risk life and limb is a steep ask. Compensating someone for making that choice is more than reasonable and is becoming a necessity. Seven Bucks County municipalities have already recognized the need for paid staff especially during the normal 6 AM to 6 PM workday with volunteers to supplement as needed on nights and weekends.

In the face of well documented past and future projected staffing shortages, fire companies and municipalities must continue to plan and cooperate together. This is stipulated by Township and Borough Codes as promulgated by the Commonwealth. A parochial approach is no longer a viable long-term strategy for the survival of volunteerism and individual departments. More importantly if volunteerism is to survive, volunteers and paid career staff must learn to coexist to the benefit of all residents they protect.

While no one is advocating for the elimination of volunteer firefighters, it is time for municipalities and their fire companies to recognize that volunteers alone may not be sufficient to adequately protect a community. Municipality administrators and elected officials themselves must lead the conversation with their respective fire companies. Firefighting should not be viewed any differently than police protection. It is a necessary and vital community service. As such, the residents who benefit from the service, must also be willing to share in the costs associated with that service; this includes career firefighters.



November 3, 2018, Springfield Township



Bensalem Township

April 5, 2019, Richland Township



August 26, 2018, Croydon



June 23, 2016, Falls Township



December 20, 2016, Lahaska



April 16, 2017, Morrisville