INDIANA UNIVERSITY BLOOMINGTON

Monroe County Public Safety Local Income Tax Allocation Analysis

O'Neill School of Public and Environmental Affairs Capstone

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Acknowledgments

We would like to thank all those who participated in our research efforts. The knowledge gained from hours of interviews and the questionnaires is indispensable and greatly appreciated. Furthermore, we thank the Monroe County Public Safety Local Income Tax Committee for giving us the opportunity to be a part of improving the communities' fire service.

Township Trustees	Fire Chiefs
Christopher Reynolds, Indian Creek	Dustin Dillard, Monroe Fire Protection District
Thelma Kelley Jeffries, Clear Creek	Joel Bomgardner, Northern Monroe Fire Territory
Donn Hall, Salt Creek	Zachary Shaw, Bean Blossom/Steinville Volunteer Fire Service
Chris Spiek, Polk	Mike Cornman, Ellettsville Fire Department
Dan Combs, Perry	Bill Tusing, Van Buren Township Fire Department
Kim Alexander, Bloomington	Raymond Warthan, Benton Township Fire Department
Barbara Ooley, Washington	Jason Moore, City of Bloomington Fire Department
Ronald Hutson, Bean Blossom	
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TABLE OF CONTENTS

Executive Summary

Purpose

The purpose of this capstone project is to analyze program challenges faced by Qualifying Service Providers (QSP) in the Public Safety Local Income Tax (PS LIT) application process, determine the needs and priorities of the QSPs and offer improvements to the application process. The PS LIT Committee (Committee) has specific criteria used to evaluate the applications to determine the amount of the PS LIT funds awarded to each applicant.

Procedures

To accomplish the purpose, the capstone team studied the PS LIT tax law and legislation, reviewed available financial and operational data of service providers, interviewed stakeholders consisting of QSP Fire Chiefs, PSL LIT Committee members, Township Trustees, and Central Dispatch. The results of this research were used to pinpoint the key areas of the application process that need modification and identify criteria that are important to the QSPs but may not be recognized by the PS LIT Committee.

Results

Results of the research indicate that the majority of the fire service providers believe the application process starts too late in the calendar year and not enough time is allowed to complete the application. The Capstone team also determined that the application changes too much year-over-year and there is uncertainty regarding the decision-criteria. Other results indicated that the QSPs do not feel that the PS LIT Committee understands their needs and some QSPs are better at presenting their needs than others. Finally, the interviewees believe that there are not any established factors for determining priority allocation of resources.

Recommendations

The first recommendation is to simplify the application process which would reduce workload and decrease uncertainty without compromising the decision quality. Two specific changes to the application process proposed by the capstone team are modifying the application time frame and providing additional guidelines for applicants. There is a majority consensus amongst interviewees that starting the application earlier would improve the process. The auxiliary guideline would be that the Fire Departments rely on PS LIT funding for common expenditures and free up their own resources for their specialized needs. Another area that would reduce workload would be to consider allowing QSPs to propose a joint multi-year plan for PS LIT funds.

The next recommendation is to bridge the distance between stakeholders by having the committee ride along with QSPs or conduct on-site meetings to better understand the specific needs of the QSPs. Establishing a unified budget reporting format would benefit the Committee in decision making and fund allocation as well. Having a higher reliance on Fire/Emergency Service data would also improve decision-making.

The final recommendation is to establish factors for determining priority allocation of resources during the decision-making process in cases where there is no clear consensus. Prioritizing understaffed departments could positively impact service provision in those areas and free-up service for additional staff. Funding department's efforts to comply with NFPA standards would lead to a stronger reliance on data-driven decision-making. Prioritizing applications for cost-saving initiatives can help maximize the positive impact of PS LIT on fire and emergency service provisions.

Introduction

1. Introduction

In 2015, the Indiana Legislature passed IC 6-3.6-6-8 which allowed for counties to adopt an additional income tax for the sole purpose of funding public safety needs[1]. In 2016, the Monroe County LIT Council (Council) authorized a Public Safety Local Income Tax (PS LIT) as part of the Monroe County Local Income (MC LIT) Tax to be allocated for improvements to Public Safety Providers. There are three types of Public Safety Providers, the Public Safety Answering Point (PSAP), which is a 24-hour emergency assistance central dispatch, Qualifying Service Providers (QSP), which are the Township Fire Departments, and the Member-Jurisdictions for Public Safety. A PS LIT Committee (Committee) was also created, and the Committee consists of Council members from, the City of Bloomington, the Town of Ellettsville and the Town of Stinesville. The Committee's purpose is to consider the needs of Public Safety Providers and make decisions on the tax rate and allocation of funds[2,3]. The Committee has experienced difficulty serving its purpose since its inception. Currently, the Committee's primary concern is balancing and understanding the needs of QSPs and Member-Jurisdictions. The purpose of this report is to identify the cause of this difficulty as well as to provide recommendations which will improve the Committee's ability to meet its purpose.

Legal Background

2. Legal Background

Developing a clear understanding of IC 6-3.6-6-8 is the first step in establishing a common ground for the Committee and the other stakeholders in the process. Below is a summary of IC 6-3.6-6-8, followed by a detailed legal description, analysis, and visualization of the process.

2.1. Summary

The process under the law proceeds as follows: PS LIT funds are first allocated to the PSAP. QSPs can then apply for funding, and the committee must review their applications, but don't have to fund them. Whatever funds are left are then dispersed to the county, city, and towns.

2.2. Legal Description

Legal definitions give context to the PS LIT process. The lists in the laws provide an understanding of what is included, and what isn't covered is understood to be excluded.

Public safety is defined as[4]:

(1) A police and law enforcement system to preserve public peace and order.

(2) A firefighting and fire prevention system.

(3) Emergency ambulance services (as defined in IC 16-18-2-107).

(4) Emergency medical services (as defined in IC 16-18-2-110).

(5) Emergency action (as defined in IC 13-11-2-65).

(6) A probation department of a court.

(7) Confinement, supervision, services under a community corrections program (as defined in IC 35-38-2.6-2), or other correctional services for a person who has been: (A) diverted before a final hearing or trial under an agreement that is between the county prosecuting attorney and the person or the person's custodian, guardian, or parent and that provides for confinement, supervision, community corrections services, or other correctional services instead of a final action described in clause (B) or (C); (B) convicted of a crime; or (C) adjudicated as a delinquent child or a child in need of services.

(8) A juvenile detention facility under IC 31-31-8.

(9) A juvenile detention center under IC 31-31-9.

(10) A county jail.

(11) A communications system (as defined in IC 36-8-15-3), an enhanced emergency telephone system (as defined in IC 36-8-16-2, before its repeal on July 1, 2012), a PSAP (as defined in IC 36-8-16.7-20) that is part of the statewide 911 system (as defined in IC 36-8-16.7-22) and located within the county, or the statewide 911 system (as defined in IC 36-8-16.7-22).

(12) Medical and health expenses for jailed inmates and other confined persons.

(13) Pension payments for any of the following: (A) A member of a fire department (as defined in IC 36-8-1-8) or any other employee of the fire department. (B) A member of a police department (as defined in IC 36-8-1-9), a police chief hired under a waiver under IC 36-8-4-6.5, or any other employee hired by the police department. (C) A county sheriff or any other member of the office of the county sheriff. (D) Other personnel employed to provide a service described in this section.

(14) Law enforcement training."

PSAP is defined as a "public safety answering point[4]:

(1) that operates on a twenty-four (24) hour basis; and

(2) whose primary function is to receive incoming requests for emergency assistance and relay those requests to an appropriate responding public safety agency." IC 6-3.6-2-13.5; IC 36-8-16.7-20. In Monroe County, it is also known as Unified Central Dispatch (Central Dispatch) and operates in conformance with an Interlocal Agreement between the City and County which, in part, requires its Policy Board to propose a Budget by the end of June each year[5].

A Qualifying Service Provider (QSP) is defined as a fire department, volunteer fire department, or emergency medical services provider that: provides fire protection or emergency medical services within the county; and is operated by or serves a political subdivision that is not otherwise entitled to receive a distribution of tax revenue under this section[4].

2.3. Legal Analysis

The law lays out the process which states that PS LIT funding first goes to fund PSAP, then to the QSP proposals, then the remaining money is dispersed to the city, county, and towns. The QSPs must apply before July 1st to be considered, and the PS LIT committee must review all applications submitted by that time. The PS LIT committee must make their funding decisions by September 1st. The law does not stipulate any start dates or limitations on how early the application process can begin, but it does lay out those due dates and order of funding. By law, there is no memorandum of understanding to enforce the purposes of the grant funding, but the committee is permitted to use this as criteria for future funding decisions[4].

Senate Bill No. 248 would include the QSPs in the final distribution process. This law would require the county to give part of their portion of the final distribution to the QSPs. Should this bill pass, this would go into effect for the year 2020. This law would not eliminate the application for special funding for the QSPs (See Figure I). Depending on how large the fraction

of the distribution is for the QSPs, the committee may want to still fund applications from the QSPs. For example, the committee has been providing the QSPs with around $300,000 in funding collectively. If the distributions to the QSPs would be approximately $100,000 total, the committee might want to continue to provide some funding to the QSPs.

If this law passed, the QSPs would have a guaranteed source of funding. The funds could be used for recurring annual expenses, such as personnel. The allocation process might be an excellent way to continue to fund special capital expenses, such as the SCBA units that have received funding in the past.

Some Fire Chiefs have spoken to a few individuals at the statehouse and believes this bill is unlikely to pass. There is no formula for distribution to the Townships or District regarding PS LIT. The above-mentioned bill would undoubtedly have provided a formula to do so, but only from the county portion. They oppose the formula due to the negative impact on the Sheriff, Justice Department and Juvenile Courts at the county level. The above-listed definition of Public Safety includes many services that are only handled at the county level, and the PS LIT funds support those services, as permitted by the above definition of Public Safety.

2.4. Visualization of IC 6-3.6-6-8

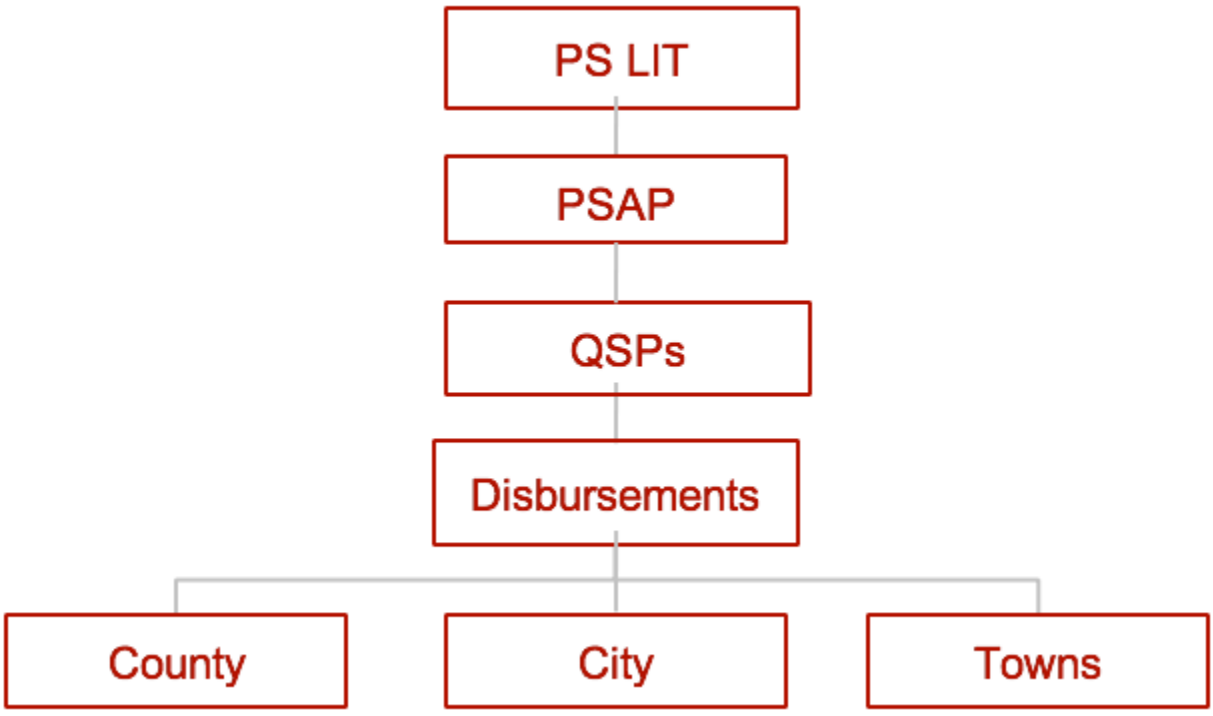


Figure I: Visualization of the PS LIT funding process

Monroe County PS LIT Process

3. Monroe County PS LIT Process

The Committee is composed of four City of Bloomington voting members, two County voting members, one Town of Ellettsville voting member and one non-voting member for the Town of Stinesville. The Committee's annual session consists of a mid-June meeting to elect a chair, approve the application form, set allocation guidelines and the schedule, as well as reviewing revenue and needs. In July, one or two meetings are held to review PSAP Budget, QSP applications, and the needs of the Member Jurisdictions. In early August, one or two meetings are held to continue to review and discuss needs and requests and make recommendations to the MC LIT Council Fiscal Bodies. Committee meetings are open door for the public to attend, observe and record the occurrences. The Committee allows those applying for funds to make presentations, and answer questions from the Committee and the public. All applications are then reviewed by the Tax Council; approvals must be adopted by September 1st of each year.

This evaluation process is the determining factor in deciding the amount of the PS LIT funds are given to each applicant. The aforementioned allocation rules make this determination critical to the Committee's ability to meet its purpose. This is because the amount allocated to QSPs must be determined before any funds are allocated to Member-Jurisdictions. Therefore, to provide adequate public safety service across the entire County, the Committee must use these principles to balance the needs of QSPs and Member Jurisdictions as well as QSPs against each other.

Monroe County Fire Service Providers

4. Monroe County Fire Service Providers

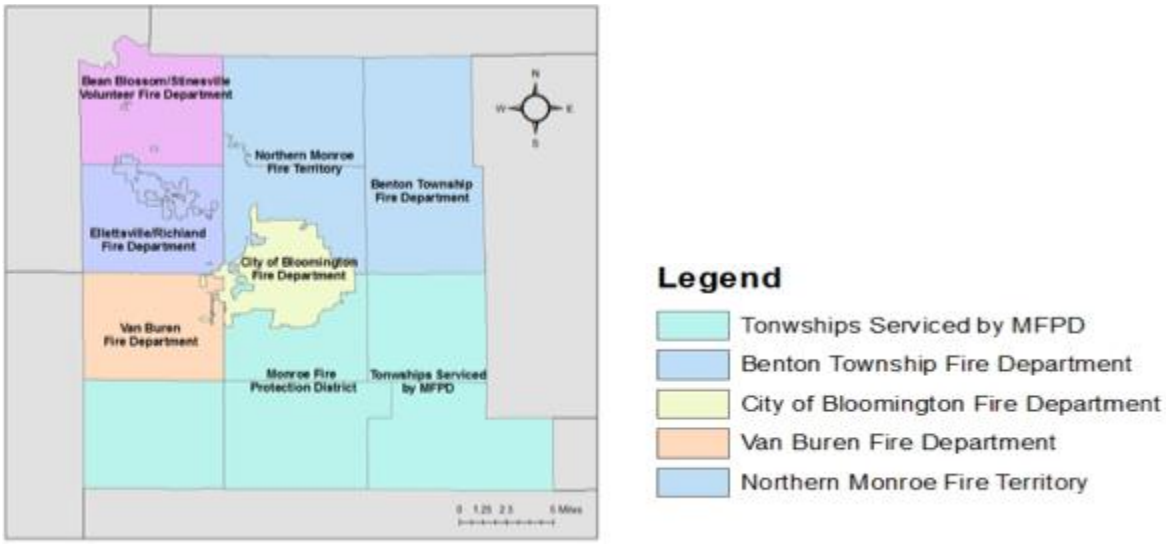


Figure II: Map of Monroe County fire service providers

4.1. Overview

Monroe County, Indiana is made up of 11 Townships consisting of Bean Blossom, Benton, Bloomington, Clear Creek, Indian Creek, Perry, Polk, Richland, Salt Creek, Van Buren, and Washington. Fire Service in Monroe County is provided by fire departments in the City of Bloomington and the Town of Ellettsville, the Northern Monroe Fire Protection Territory, the Monroe Fire Protection District, and Township fire departments.

The City of Bloomington Fire Department is staffed by career firefighters and serves the City of Bloomington and Indiana University, with five stations and serves approximately 85,071 residents[6].

The Town of Ellettsville's Fire Department is staffed by career firefighters and provides fire, rescue, and basic life support protection via two stations to 5,100 residents[6], including Richland residents, with a mix of rural, residential and heavy industry.

The Northern Monroe Fire Territory is staffed by a mixture of volunteer and career firefighters. The Territory provides coverage to the areas of Bloomington Township that are not annexed to the City of Bloomington. By contract, the department also provides coverage, as the first response agency for Washington Township and Benton Township. The coverage area is approximately 140 square miles and has a population of roughly 12,000 people[6]. The region

varies from industrial and suburban to rural and forested areas. The area includes several lakes and ponds, as well as several active quarry sites.

The Monroe Fire Protection District is staffed by a mixture of volunteer and career firefighters. The District is the primary provider of fire and emergency medical service for five townships. This includes Perry, Clear Creek, and Indian Creek townships, which are formally a part of the district, plus Salt Creek and Polk townships, which are contracting annually with the fire district for service. Currently, the District serves approximately 20,600[6] residents in a 166-square-mile area.

The Bean Blossom Fire Department is staffed mostly by volunteer firefighters. The Department has one station and provides fire and EMT service to the Townships Bean Blossom and Stinesville, serving a population of 2,848[6].

The Van Buren Fire Department provides service to Van Buren Township. The department's two stations protect a largely rural district including the Monroe County Airport.

4.2. Township Fire Service Consolidation Projections

Many county officials believe that a Monroe County Wide fire department would benefit the County and its fire service production. As aforementioned, consolidation within the county has already begun. Of those who have not consolidated into either the Northern Monroe Fire Territory or the Monroe Fire Protection District, Richland, Van Buren, and Benton Townships have shown interest in consolidation. Our research has shown that Richland is interested in joining the Monroe Fire Protection District. To do so, Richland would need Van Buren Township to join the Monroe Fire Protection District for logistical purposes. Whether Van Buren will join the District is yet to be seen as the county fears it will be annexed into the City of Bloomington if they join the district. Similarly, the Benton Township Volunteer Fire Department, who has an automatic aid contract with the Northern Monroe Fire Territory, planned to join the Northern Monroe Fire Territory. However, the deal fell through and currently; there are no plans to join officially.

In conclusion, townships typically have limited funding to invest in fire services due to their small populations and the fact that they cannot increase their taxes regularly even though the cost of fire services continues to escalate. Therefore, the need to merge townships to support each other in fire service is indispensable.

Monroe County fire service could benefit by merging townships into the existing Monroe Fire Protection District and the Northern Monroe Fire Territory. A major concern with merging

fire service personnel is identifying which fire chiefs would be kept and which would be demoted.

Township fire departments are cautious about merging with other township fire departments in fear of losing their autonomy and the ability to voice their needs when they join a district or territory. Currently, the townships' fire chiefs and elected supervisors think that the PS LIT committee does not understand their funding needs.

Service Provider Performance

5. Service Provider Performance

There are a total of seven fire departments in Monroe County: Bean Blossom Township Stinesville Volunteer Fire Department, Benton Township of Monroe County Volunteer Fire Department, Indian Creek Firefighters, Northern Monroe County Fire Protection Territory, Monroe Fire Protection District, Van Buren Volunteer Fire Department, Washington Township of Monroe County. These fire departments are a mix of volunteer and professional staff and provide fire service in addition to an array of other services to the citizens of Monroe County. Included is an overview of fire service in Monroe County through the lens of key performance measures.

7
Total Fire Departments

146,000
Estimated Service Population

County Wide Performance

Figure 1

Aggregate Report 2015-2018

Datafield	Additional Description	Count of Event 2018	Count of Event 2017	Count of Event 2016	Count of Event 2015
AMBULANCE	AMBULANCE	2,331	2,902	2,971	2,785
AMBULANCE DUAL	AMBULANCE DUAL	2,258	2,105	2,134	2,045
FALA	FIRE ALARM	1,756	1,536	1,610	1,656
ACCIDENT PI	ACCIDENT WITH INJURY	761	850	867	780
FSTRUCTURE FIRE	STRUCTURE FIRE	474	431	428	516
FODOR	ODOR INVESTIGATION	252	260	220	234
ACCIDENT UNK	ACCIDENT INJURIES UNKNOWN	217	217	255	314
FLINES	POWER LINE DOWN/TREE DOWN	148	171	137	128
FBRUSH FIRE	BRUSH FIRE	139	175	163	163
FOPEN BURNING	OPEN BURNING	117	149	148	168
CO	CARBON MONOXIDE	91	81	80	77
FVEHICLE FIRE	VEHICLE FIRE	75	81	109	106
FSERVICE	FIRE SERVICE/ASSISTANCE	58	88	68	15
FRESCUE	FIRE RESCUE	57	74	41	42
FTRASH FIRE	TRASH/DUMPSTER FIRE	37	40	52	56
FHAZMAT	HAZARDOUS MATERIAL	36	35	41	33
SERVICE IP	SERVICE/ASSISTANCE IN PROGRESS	3	10	14	48
ACCIDENT HAZ	ACCIDENT HAZMAT CLEAN UP	3	10	3	1
MOTORIST ASSIST	MOTORIST ASSISTANCE	2	2	1	2
DEATH	DEATH INVESTIGATION	2	3	1	8
TRAFFIC HAZARD	TRAFFIC HAZARD	1	4	5	2

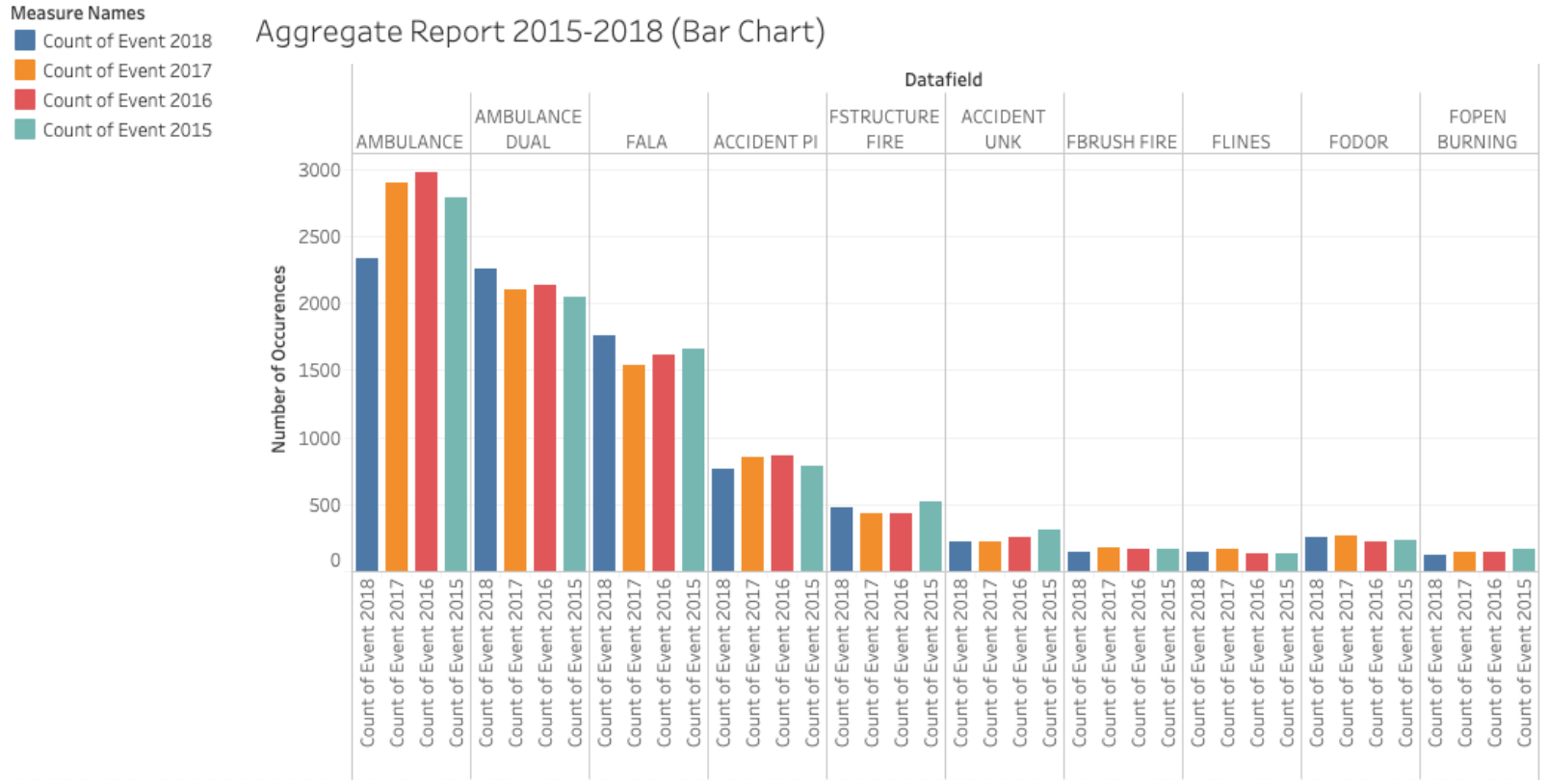
Figure 2

Aggregate Report 2015-2018 Ratios

Datafield	Additional Description	Ratio of Event 2018	Ratio of Event 2017	Ratio of Event 2016	Ratio of Event 2015
AMBULANCE	AMBULANCE	26.43%	31.46%	31.78%	30.34%
AMBULANCE DUAL	AMBULANCE DUAL	25.61%	22.82%	22.83%	22.28%
FALA	FIRE ALARM	19.91%	16.65%	17.22%	18.04%
ACCIDENT PI	ACCIDENT WITH INJURY	8.63%	9.22%	9.27%	8.50%
FSTRUCTURE FIRE	STRUCTURE FIRE	5.38%	4.67%	4.58%	5.62%
FODOR	ODOR INVESTIGATION	2.86%	2.82%	2.35%	2.55%
ACCIDENT UNK	ACCIDENT INJURIES UNKNOWN	2.46%	2.35%	2.73%	3.42%
FLINES	POWER LINE DOWN/TREE DOWN	1.68%	1.85%	1.47%	1.39%
FBRUSH FIRE	BRUSH FIRE	1.58%	1.90%	1.74%	1.78%
FOPEN BURNING	OPEN BURNING	1.33%	1.62%	1.58%	1.83%
CO	CARBON MONOXIDE	1.03%	0.88%	0.86%	0.84%
FVEHICLE FIRE	VEHICLE FIRE	0.85%	0.88%	1.17%	1.15%
FSERVICE	FIRE SERVICE/ASSISTANCE	0.66%	0.95%	0.73%	0.16%
FRESCUE	FIRE RESCUE	0.65%	0.80%	0.44%	0.46%
FTRASH FIRE	TRASH/DUMPSTER FIRE	0.42%	0.43%	0.56%	0.61%
FHAZMAT	HAZARDOUS MATERIAL	0.41%	0.38%	0.44%	0.36%
SERVICE IP	SERVICE/ASSISTANCE IN PROGRESS	0.03%	0.11%	0.15%	0.52%
ACCIDENT HAZ	ACCIDENT HAZMAT CLEAN UP	0.03%	0.11%	0.03%	0.01%
MOTORIST ASSIST	MOTORIST ASSISTANCE	0.02%	0.02%	0.01%	0.02%
DEATH	DEATH INVESTIGATION	0.02%	0.03%	0.01%	0.09%
TRAFFIC HAZARD	TRAFFIC HAZARD	0.01%	0.04%	0.05%	0.02%

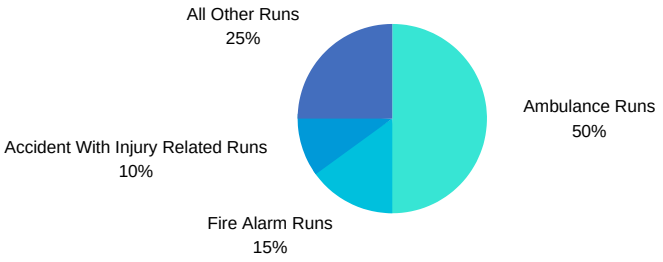
County Wide Performance

Figure 3



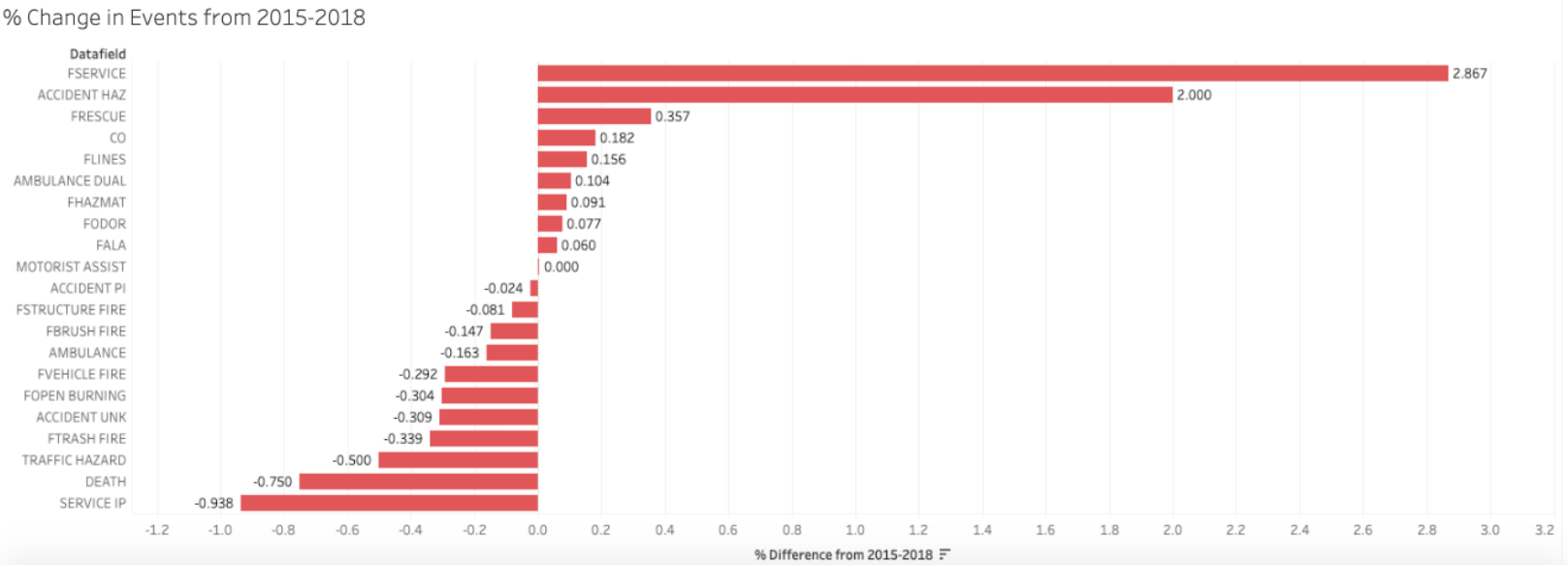
The above data was collected by Monroe County's Central Dispatch. From Figures 1 and 2, it is clear that ambulance or EMS related runs have typically accounted for a substantial proportion of the total runs that are conducted in Monroe County on an annual basis. Behind ambulance related runs, Fire Alarm related runs and Accidents with Injury related runs have together typically accounted for a quarter of runs on an annual basis. This indicates remaining runs such as Open Burning related runs, Fire Rescue related runs, Brush Fire related runs, Vehicle Fire related runs, and Fire Service/Assistance related runs have typically accounted for the remaining quarter of runs on an annual basis.

Typical Annual Breakdown of Runs



County Wide Performance

Figure 4



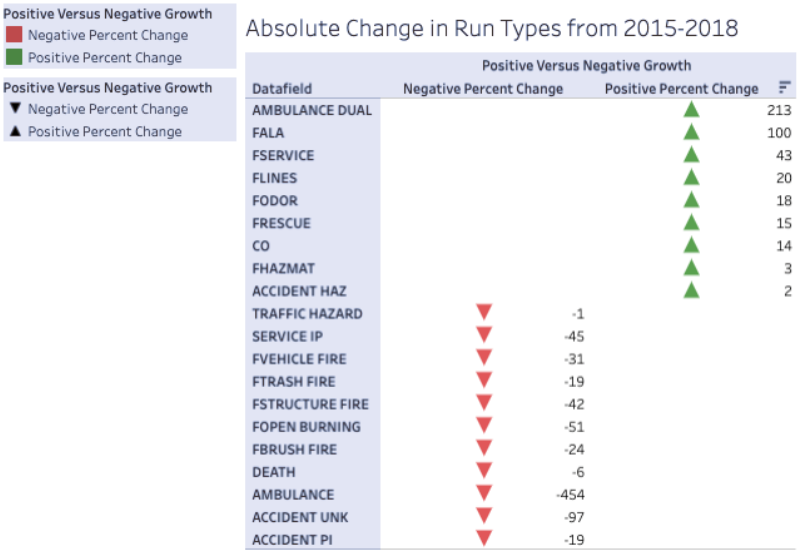
As presented in Figure 4, Fire Service Runs have increased the most relative to all other runs increasing by **287%** from 2015-2018. Within the same period of time Accident Hazard Clean Up Runs also increased substantially by **200%**.

County Wide Performance

Figure 4

Datafield	Positive Versus Negative Growth: Negative Percent Change	Positive Versus Negative Growth: Positive Percent Change
FSERVICE		2.867
ACCIDENT HAZ		2.000
FRESCUE		0.357
CO		0.182
FLINES		0.156
AMBULANCE DUAL		0.104
FHAZMAT		0.091
FODOR		0.077
FALA		0.060
TRAFFIC HAZARD	-0.500	
SERVICE IP	-0.938	
FVEHICLE FIRE	-0.292	
FTRASH FIRE	-0.339	
FSTRUCTURE FIRE	-0.081	
FOPEN BURNING	-0.304	
FBRUSH FIRE	-0.147	
DEATH	-0.750	
AMBULANCE	-0.163	
ACCIDENT UNK	-0.309	
ACCIDENT PI	-0.024	

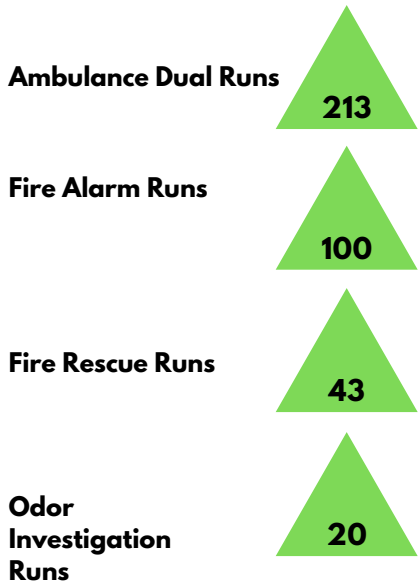
Figure 5



Datafield	Positive Versus Negative Growth: Negative Percent Change	Positive Versus Negative Growth: Positive Percent Change
AMBULANCE DUAL		213
FALA		100
FSERVICE		43
FLINES		20
FODOR		18
FRESCUE		15
CO		14
FHAZMAT		3
ACCIDENT HAZ		2
TRAFFIC HAZARD	-1	
SERVICE IP	-45	
FVEHICLE FIRE	-31	
FTRASH FIRE	-19	
FSTRUCTURE FIRE	-42	
FOPEN BURNING	-51	
FBRUSH FIRE	-24	
DEATH	-6	
AMBULANCE	-454	
ACCIDENT UNK	-97	
ACCIDENT PI	-19	

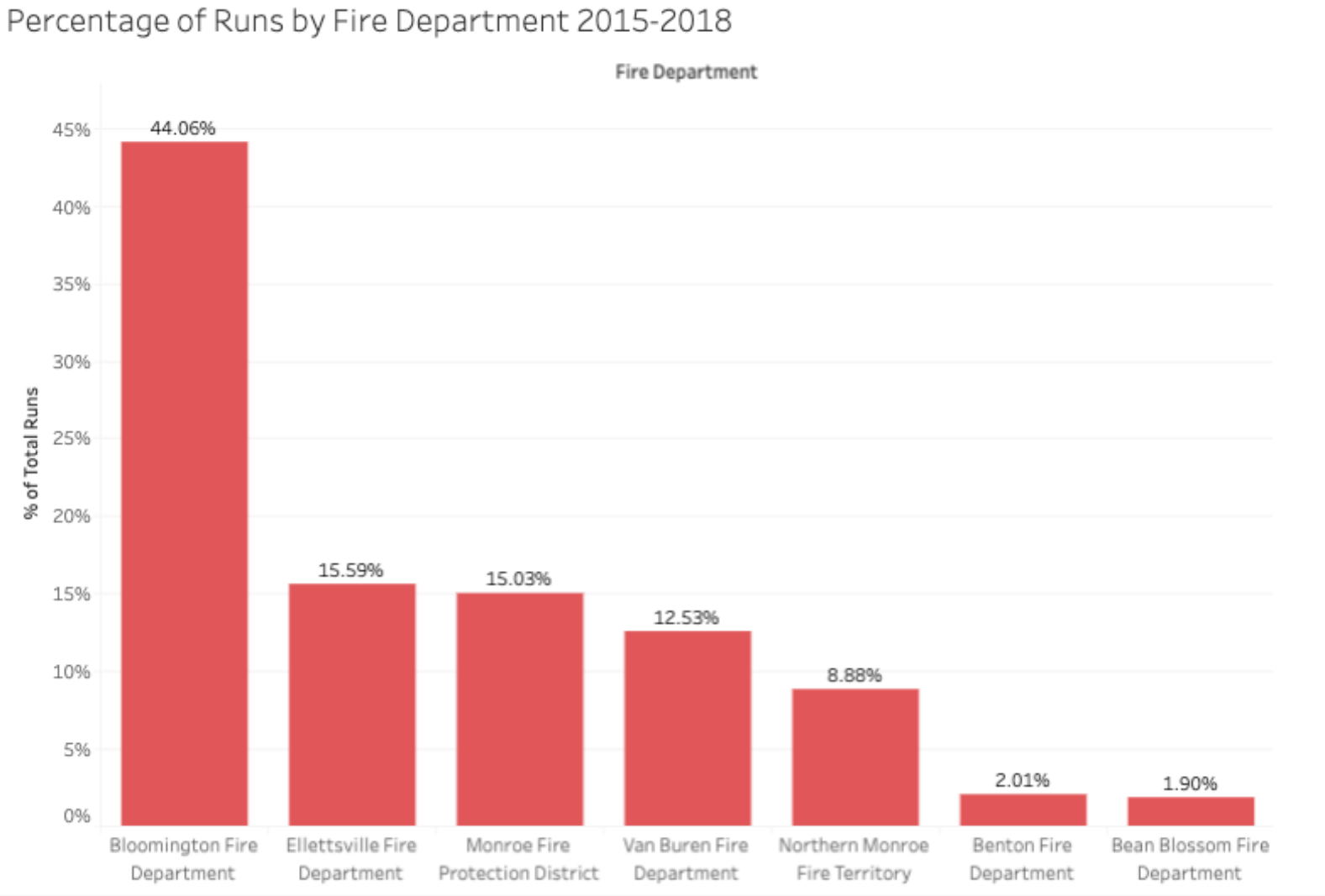
While Figure 4 displays the types of runs that have increased the most in percentage terms from 2015-2018, it communicates very little about the degree of change in absolute terms across different run types. Figure 5 displays the types of runs that have increased the most in absolute terms within the same window of time.

2015-2018 Comparisons



County Wide Performance

Figure 6



As presented in Figure 6, it is clear that the Bloomington Fire Department is responsible for conducting a substantial proportion of the runs conducted in Monroe County, which is expected since it services the most densely populated portion of Monroe County. While Figure 6, shows how runs are distributed across Monroe County's QSPs, it does not communicate the types of runs each individual department tends to respond to on an annual basis.

In an effort to better evaluate the fire service needs of Monroe County's QSPs, we believe that it is helpful to the use the proportion of the types of runs conducted on an annual basis for each department as a proxy for understanding the types of resources that each qualified service provider may need the most. In an effort to help the PS LIT Committee better understand the needs of its qualified service providers we have constructed individual department profiles that display and summarize the runs types conducted by each service provider and summarize how the needs of each provider, on the basis of run types conducted, rank against one another.

Ellettsville Run Type Analysis

Figure 7

Figure 8

Ellettsville Run Type Annual Breakdown

The graph below shows the annual proportion of each run type on an annual basis

Fire Department	Datafield	Datafield Name	2015	2016	2017	2018
Ellettsville Fire Department	AMBULANCE	AMBULANCE	55.74%	58.16%	55.61%	12.85%
	AMBULANCE DUAL	AMBULANCE DUAL	14.99%	14.75%	14.82%	36.20%
	FALA	FIRE ALARM	10.51%	9.09%	8.61%	15.57%
	ACCIDENT PI	ACCIDENT WITH INJURY	4.74%	5.96%	6.74%	12.85%
	FSTRUCTURE FIRE	STRUCTURE FIRE	3.57%	3.19%	3.67%	8.37%
	ACCIDENT UNK	ACCIDENT INJURIES UNK..	1.69%	1.93%	2.00%	2.48%
	FODOR	ODOR INVESTIGATION	1.69%	1.57%	1.87%	3.18%
	FOPEN BURNING	OPEN BURNING	1.95%	1.20%	1.20%	1.65%
	FLINES	POWER LINE DOWN/TREE..	1.04%	0.90%	1.40%	2.12%
	FBRUSH FIRE	BRUSH FIRE	1.04%	0.96%	1.47%	1.42%
	FVEHICLE FIRE	VEHICLE FIRE	0.84%	0.78%	0.60%	0.71%
	CO	CARBON MONOXIDE	0.58%	0.42%	0.60%	1.65%
	FSERVICE	FIRE SERVICE/ASSISTANCE	0.13%	0.30%	0.40%	0.24%
	FTRASH FIRE	TRASH/DUMPSTER FIRE	0.32%	0.24%	0.13%	0.12%
	FHAZMAT	HAZARDOUS MATERIAL	0.13%	0.12%	0.33%	0.35%
	FRESCUE	FIRE RESCUE	0.19%		0.40%	0.12%
	SERVICE IP	SERVICE/ASSISTANCE IN ..	0.26%	0.12%		0.12%
	TRAFFIC HAZARD	TRAFFIC HAZARD	0.06%	0.12%		
	MOTORIST ASSIST	MOTORIST ASSISTANCE	0.13%		0.07%	
	TRAFFIC STOP	TRAFFIC STOP	0.06%	0.06%		
	RUNAWAY	RUNAWAY	0.13%			
	WELFARE CHK IP	WELFARE CHECK IN PROG..			0.07%	
	WEAPONS NP	WEAPONS CALL NOT IN P..		0.06%		
	FIGHT NP	FIGHT NOT IN PROGRESS		0.06%		

Ellettsville Run Type Analysis

Figure 9

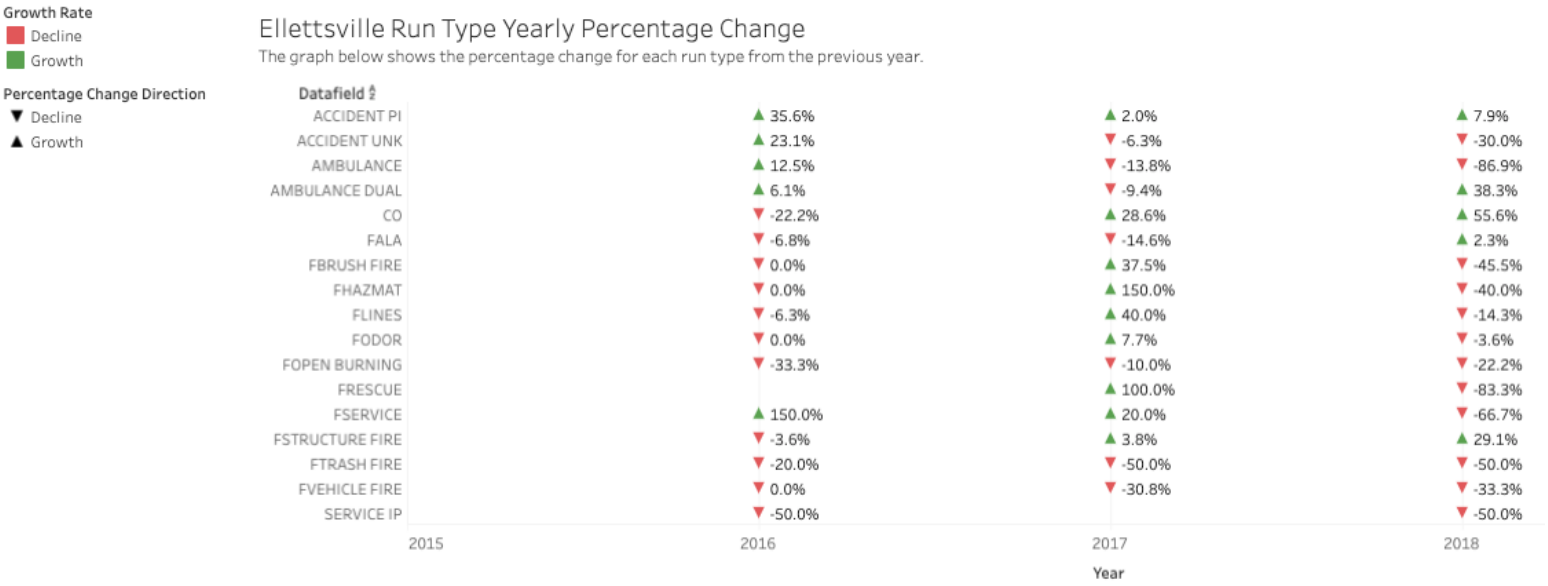
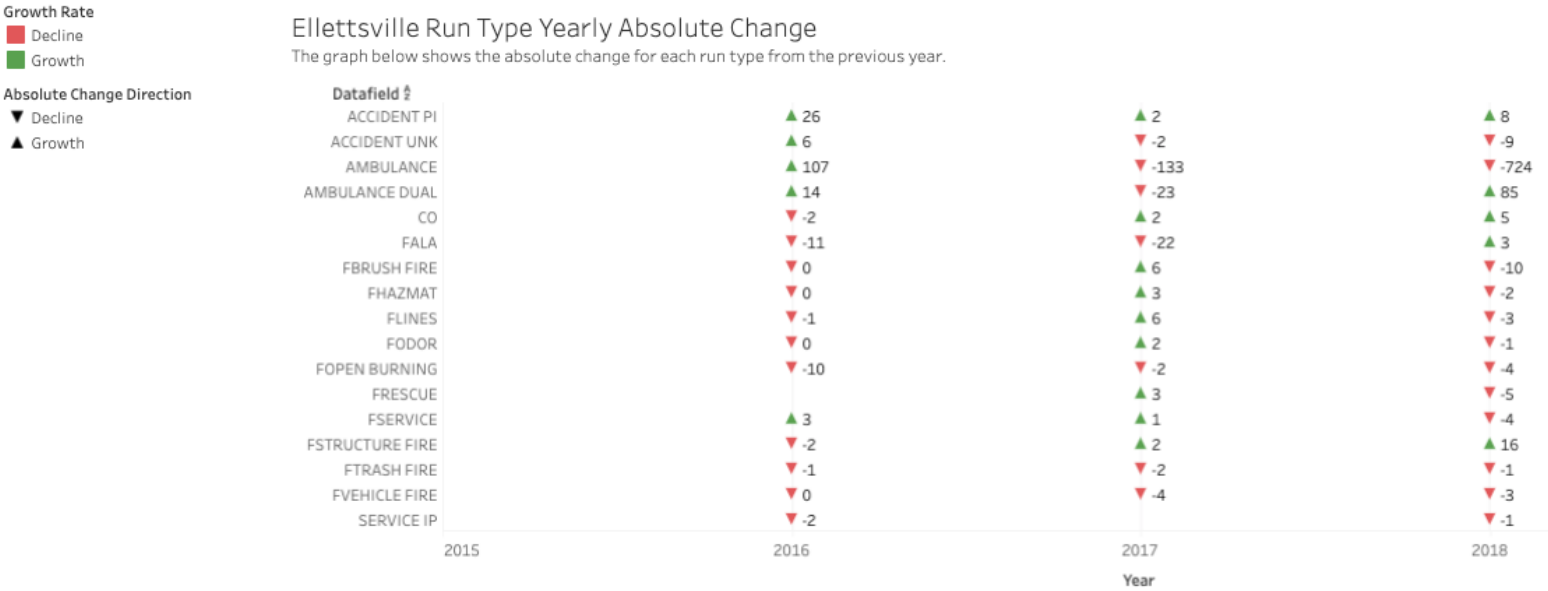


Figure 10



Ellettsville Run Type Analysis

Ellettsville Fire Department Profile Overview

Percent Change From 2017-2018		Absolute Change From 2017-2018		Percent Growth Rank From 2017-2018
Ambulance Runs	-86.9%	Ambulance Runs	-724	Ambulance Runs 6th
Ambulance Dual Runs	38.3%	Ambulance Dual Runs	85	Ambulance Dual Runs 1st
Fire Alarm Runs	2.3%	Fire Alarm Runs	3	Fire Alarm Runs 6th
Structure Fire Runs	29.1%	Structure Fire Runs	16	Structure Fire Runs 3rd
Open Burning Fire Runs	-22.2%	Open Burning Fire Runs	-4	Open Burning Fire Runs 5th
Brush Fire Runs	-45.5%	Brush Fire Runs	-10	Brush Fire Runs 5th
Vehicle Fire Runs	-33.3%	Vehicle Fire Runs	-3	Vehicle Fire Runs 6th
Accident With Injury Runs	7.9%	Accident With Injury Runs	8	Accident With Injury Runs 2nd

Percent of Total Runs 2018		Total Number of Runs 2018		Percent of Total Runs Rank From 2017-2018	
Ambulance Runs	12.91%	Ambulance Runs	109	Ambulance Runs	6th
Ambulance Dual Runs	36.37%	Ambulance Dual Runs	307	Ambulance Dual Runs	1st
Fire Alarm Runs	15.64%	Fire Alarm Runs	132	Fire Alarm Runs	1st
Structure Fire Runs	8.41%	Structure Fire Runs	71	Structure Fire Runs	1st
Open Burning Fire Runs	1.66%	Open Burning Fire Runs	14	Open Burning Fire Runs	1st
Brush Fire Runs	1.42%	Brush Fire Runs	12	Brush Fire Runs	6th
Vehicle Fire Runs	0.71%	Vehicle Fire Runs	6	Vehicle Fire Runs	4th
Accident With Injury Runs	12.85%	Accident With Injury Runs	8	Accident With Injury Runs	1st

Monroe Fire Protection District Run Type Analysis

Figure 11

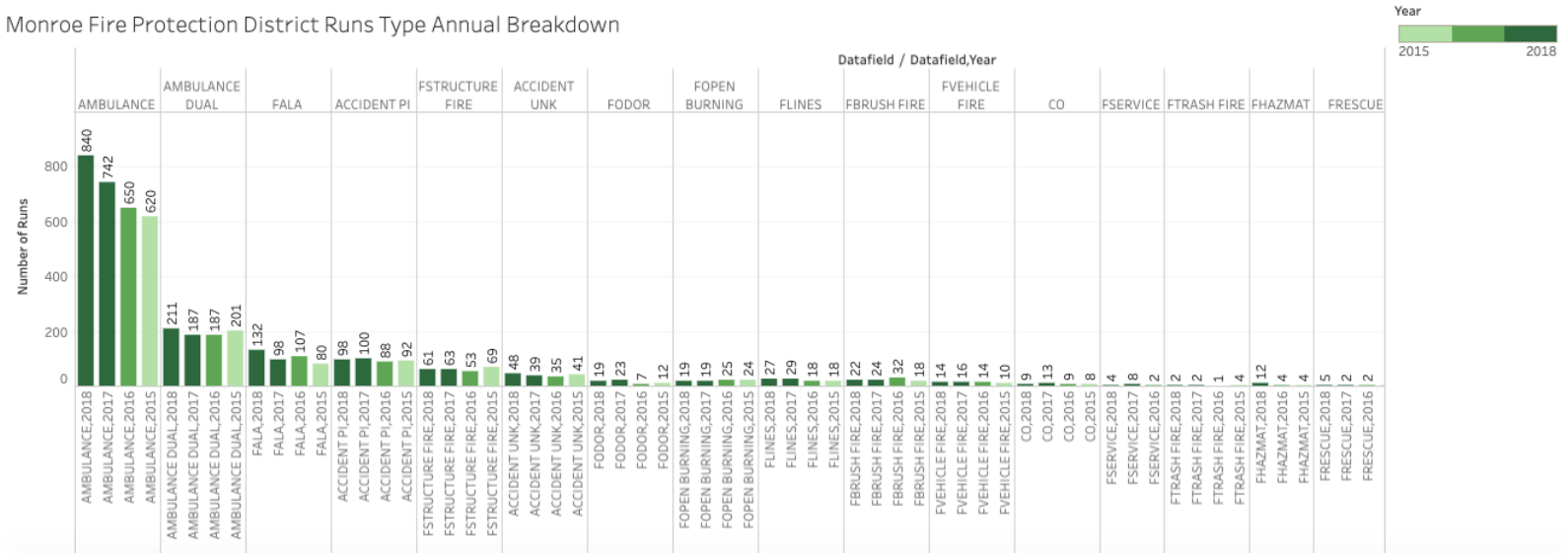


Figure 12

Monroe Fire Protection District Run Type Annual Breakdown

The graph below shows the annual proportion of each run type on an annual basis

Fire Department	Datafield	Datafield Name				
Monroe Fire Protection District	AMBULANCE	AMBULANCE	51.03%	52.55%	54.04%	55.08%
	AMBULANCE DUAL	AMBULANCE DUAL	16.54%	15.12%	13.62%	13.84%
	FALA	FIRE ALARM	6.58%	8.65%	7.14%	8.66%
	ACCIDENT PI	ACCIDENT WITH INJURY	7.57%	7.11%	7.28%	6.43%
	FSTRUCTURE FIRE	STRUCTURE FIRE	5.68%	4.28%	4.59%	4.00%
	ACCIDENT UNK	ACCIDENT INJURIES UNK..	3.37%	2.83%	2.84%	3.15%
	FBRUSH FIRE	BRUSH FIRE	1.48%	2.59%	1.75%	1.44%
	FLINES	POWER LINE DOWN/TREE..	1.48%	1.46%	2.11%	1.77%
	FOPEN BURNING	OPEN BURNING	1.98%	2.02%	1.38%	1.25%
	FODOR	ODOR INVESTIGATION	0.99%	0.57%	1.68%	1.25%
	FVEHICLE FIRE	VEHICLE FIRE	0.82%	1.13%	1.17%	0.92%
	CO	CARBON MONOXIDE	0.66%	0.73%	0.95%	0.59%
	FHAZMAT	HAZARDOUS MATERIAL	0.33%	0.32%		0.79%
	FSERVICE	FIRE SERVICE/ASSISTANCE		0.16%	0.58%	0.26%
	FRESCUE	FIRE RESCUE	0.25%	0.16%	0.15%	0.33%
	FTRASH FIRE	TRASH/DUMPSTER FIRE	0.33%	0.08%	0.15%	0.13%
	SERVICE IP	SERVICE/ASSISTANCE IN ..	0.25%		0.22%	
	ATL	ATTEMPT TO LOCATE	0.16%			
	ASSAULT NP	ASSAULT/BATTERY NOT I..	0.16%			
	TRAFFIC HAZARD	TRAFFIC HAZARD	0.08%	0.08%		
	MOTORIST ASSIST	MOTORIST ASSISTANCE		0.08%	0.07%	
	JUVENILE	JUVENILE		0.08%		0.07%
	ACCIDENT PD NP	ACCIDENT PROP DAM NO..			0.15%	
	WELFARE CHK NP	WELFARE CHECK NOT IN P..	0.08%			
	FOLLOW UP	FOLLOWUP	0.08%			
	DEATH	DEATH INVESTIGATION	0.08%			
	ACCIDENT PD IP	ACCIDENT PROP DAMAGE ..			0.07%	
	ACCIDENT HAZ	ACCIDENT HAZMAT CLEA..			0.07%	
	ROBBERY NP	ROBBERY NOT IN PROGR..				0.07%

2015 2016 2017 2018 2019

Monroe Fire Protection District Run Type Analysis

Figure 13

Growth Rate
Decline
Growth

Percentage Change Direction
▼ Decline
▲ Growth

Monroe Fire Protection District Run Type Yearly Percentage Change

The graph below shows the percentage change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT PI	ACCIDENT WITH INJURY		▼ -4.3%	▲ 13.6%	▼ -2.0%	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▼ -14.6%	▲ 11.4%	▲ 23.1%	
AMBULANCE	AMBULANCE		▲ 4.8%	▲ 14.2%	▲ 13.2%	
AMBULANCE DUAL	AMBULANCE DUAL		▼ -7.0%	▼ 0.0%	▲ 12.8%	
CO	CARBON MONOXIDE		▲ 12.5%	▲ 44.4%	▼ -30.8%	
FALA	FIRE ALARM		▲ 33.8%	▼ -8.4%	▲ 34.7%	
FBRUSH FIRE	BRUSH FIRE		▲ 77.8%	▼ -25.0%	▼ -8.3%	
FHAZMAT	HAZARDOUS MATERIAL		▼ 0.0%			
FLINES	POWER LINE DOWN/TREE..		▼ 0.0%	▲ 61.1%	▼ -6.9%	
FODOR	ODOR INVESTIGATION		▼ -41.7%		▼ -17.4%	
FOPEN BURNING	OPEN BURNING		▲ 4.2%	▼ -24.0%	▼ 0.0%	
FRESCUE	FIRE RESCUE		▼ -33.3%	▼ 0.0%	▲ 150.0%	
FSERVICE	FIRE SERVICE/ASSISTANCE				▼ -50.0%	
FSTRUCTURE FIRE	STRUCTURE FIRE		▼ -23.2%	▲ 18.9%	▼ -3.2%	
FTRASH FIRE	TRASH/DUMPSTER FIRE		▼ -75.0%	▲ 100.0%	▼ 0.0%	
FVEHICLE FIRE	VEHICLE FIRE		▲ 40.0%	▲ 14.3%	▼ -12.5%	
JUVENILE	JUVENILE				▼ 0.0%	
SERVICE IP	SERVICE/ASSISTANCE IN ..			▼ 0.0%		

Year

Figure 14

Growth Rate
Decline
Growth

Absolute Change Direction
▼ Decline
▲ Growth

Monroe Fire Protection District Run Type Yearly Absolute Change

The graph below shows the absolute change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT PI	ACCIDENT WITH INJURY		▼ -4	▲ 12	▼ -2	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▼ -6	▲ 4	▲ 9	
AMBULANCE	AMBULANCE		▲ 30	▲ 92	▲ 98	
AMBULANCE DUAL	AMBULANCE DUAL		▼ -14	▼ 0	▲ 24	
CO	CARBON MONOXIDE		▲ 1	▲ 4	▼ -4	
FALA	FIRE ALARM		▲ 27	▼ -9	▲ 34	
FBRUSH FIRE	BRUSH FIRE		▲ 14	▼ -8	▼ -2	
FHAZMAT	HAZARDOUS MATERIAL		▼ 0			
FLINES	POWER LINE DOWN/TREE..		▼ 0	▲ 11	▼ -2	
FODOR	ODOR INVESTIGATION		▼ -5		▼ -4	
FOPEN BURNING	OPEN BURNING		▲ 1	▼ -6	▼ 0	
FRESCUE	FIRE RESCUE		▼ -1	▼ 0	▲ 3	
FSERVICE	FIRE SERVICE/ASSISTANCE				▼ -4	
FSTRUCTURE FIRE	STRUCTURE FIRE		▼ -16	▲ 10	▼ -2	
FTRASH FIRE	TRASH/DUMPSTER FIRE		▼ -3	▲ 1	▼ 0	
FVEHICLE FIRE	VEHICLE FIRE		▲ 4	▲ 2	▼ -2	
JUVENILE	JUVENILE				▼ 0	
SERVICE IP	SERVICE/ASSISTANCE IN ..			▼ 0		

Year

Monroe Fire Protection District Run Type Analysis

Monroe Fire Protection District Profile Overview

Percent Change From 2017-2018		Absolute Change From 2017-2018		Percent Growth Rank From 2017-2018	
Ambulance Runs	13.2%	Ambulance Runs	98	Ambulance Runs	4th
Ambulance Dual Runs	12.8%	Ambulance Dual Runs	24	Ambulance Dual Runs	5th
Fire Alarm Runs	34.7%	Fire Alarm Runs	34	Fire Alarm Runs	3rd
Structure Fire Runs	-3.2%	Structure Fire Runs	-2	Structure Fire Runs	6th
Open Burning Fire Runs	0%	Open Burning Fire Runs	0	Open Burning Fire Runs	3rd
Brush Fire Runs	-45.5%	Brush Fire Runs	-2	Brush Fire Runs	3rd
Vehicle Fire Runs	-8.3%	Vehicle Fire Runs	-2	Vehicle Fire Runs	1st
Accident With Injury Runs	-2.0%	Accident With Injury Runs	-2	Accident With Injury Runs	4th

Percent of Total Runs 2018		Total Number of Runs 2018		Percent of Total Runs Rank From 2017-2018	
Ambulance Runs	55.09%	Ambulance Runs	840	Ambulance Runs	2nd
Ambulance Dual Runs	13.96%	Ambulance Dual Runs	211	Ambulance Dual Runs	3rd
Fire Alarm Runs	8.74%	Fire Alarm Runs	132	Fire Alarm Runs	3rd
Structure Fire Runs	4.04%	Structure Fire Runs	61	Structure Fire Runs	4th
Open Burning Fire Runs	1.26%	Open Burning Fire Runs	19	Open Burning Fire Runs	3rd
Brush Fire Runs	1.46%	Brush Fire Runs	22	Brush Fire Runs	5th
Vehicle Fire Runs	0.93%	Vehicle Fire Runs	14	Vehicle Fire Runs	1st
Accident With Injury Runs	6.49%	Accident With Injury Runs	98	Accident With Injury Runs	4th

Van Buren Fire Department Run Type Analysis

Figure 15

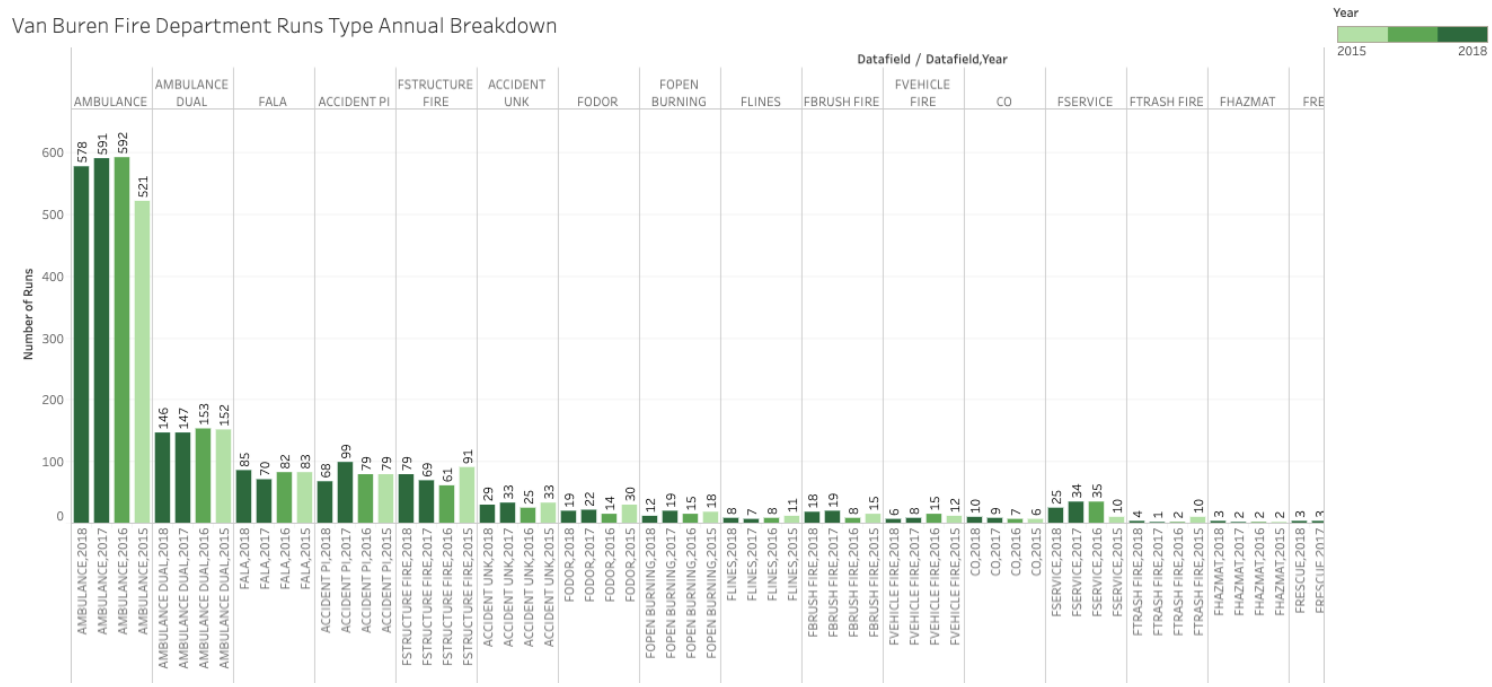


Figure 16

Van Buren Fire Department Run Type Annual Breakdown

The graph below shows the annual proportion of each run type on an annual basis

Fire Department	Datafield	Datafield Name	2015	2016	2017	2018
Van Buren Fire Department	AMBULANCE	AMBULANCE	46.68%	53.29%	51.98%	52.69%
	AMBULANCE DUAL	AMBULANCE DUAL	13.62%	13.77%	12.93%	13.31%
	FALA	FIRE ALARM	7.44%	7.38%	6.16%	7.75%
	ACCIDENT PI	ACCIDENT WITH INJURY	7.08%	7.11%	8.71%	6.20%
	FSTRUCTURE FIRE	STRUCTURE FIRE	8.15%	5.49%	6.07%	7.20%
	ACCIDENT UNK	ACCIDENT INJURIES UNK..	2.96%	2.25%	2.90%	2.64%
	FBRUSH FIRE	BRUSH FIRE	1.34%	0.72%	1.67%	1.64%
	FLINES	POWER LINE DOWN/TREE..	0.99%	0.72%	0.62%	0.73%
	FOPEN BURNING	OPEN BURNING	1.61%	1.35%	1.67%	1.09%
	FODOR	ODOR INVESTIGATION	2.69%	1.26%	1.93%	1.73%
	FVEHICLE FIRE	VEHICLE FIRE	1.08%	1.35%	0.70%	0.55%
	CO	CARBON MONOXIDE	0.54%	0.63%	0.79%	0.91%
	FHAZMAT	HAZARDOUS MATERIAL	0.18%	0.18%	0.18%	0.27%
	FSERVICE	FIRE SERVICE/ASSISTANCE	0.90%	3.15%	2.99%	2.28%
	FRESCUE	FIRE RESCUE	0.18%	0.18%	0.26%	0.27%
	FTRASH FIRE	TRASH/DUMPSTER FIRE	0.90%	0.18%	0.09%	0.36%
	SERVICE IP	SERVICE/ASSISTANCE IN ..	2.78%	0.36%	0.18%	
	ATL	ATTEMPT TO LOCATE	0.09%	0.09%		
	ASSAULT NP	ASSAULT/BATTERY NOT I..	0.09%			0.09%
	MOTORIST ASSIST	MOTORIST ASSISTANCE				0.09%
	JUVENILE	JUVENILE	0.09%			
	DEATH	DEATH INVESTIGATION	0.09%			0.09%
	ACCIDENT PD IP	ACCIDENT PROP DAMAGE ..		0.09%		
	ACCIDENT HAZ	ACCIDENT HAZMAT CLEA..		0.09%		
	AIR ALERT 2	AIRCRAFT EMERGENCY A..		0.27%	0.18%	
	AIR ALERT 3	AIR EMERGENCY ALERT 3	0.18%			
	CIRT	CRITICAL INCIDENT RESP ..				0.09%
	DRUGS IP	DRUGS IN PROGRESS		0.09%		
	OTHER	OTHER DOES NOT APPLY	0.09%			

Van Buren Fire Department Run Type Analysis

Figure 17

Growth Rate
Decline
Growth

Percentage Change Direction
▼ Decline
▲ Growth

Van Buren Fire Department Run Type Yearly Percentage Change

The graph below shows the percentage change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT PI	ACCIDENT WITH INJURY		▼ 0.0%	▲ 25.3%	▼ -31.3%	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▼ -24.2%	▲ 32.0%	▼ -12.1%	
AIR ALERT 2	AIRCRAFT EMERGENCY A..			▼ -33.3%		
AMBULANCE	AMBULANCE		▲ 13.6%	▼ -0.2%	▼ -2.2%	
AMBULANCE DUAL	AMBULANCE DUAL		▲ 0.7%	▼ -3.9%	▼ -0.7%	
CO	CARBON MONOXIDE		▲ 16.7%	▲ 28.6%	▲ 11.1%	
DEATH	DEATH INVESTIGATION				▼ 0.0%	
FALA	FIRE ALARM		▼ -1.2%	▼ -14.6%	▲ 21.4%	
FBRUSH FIRE	BRUSH FIRE		▼ -46.7%	▲ 137.5%	▼ -5.3%	
FHAZMAT	HAZARDOUS MATERIAL		▼ 0.0%	▼ 0.0%	▲ 50.0%	
FLINES	POWER LINE DOWN/TREE..		▼ -27.3%	▼ -12.5%	▲ 14.3%	
FODOR	ODOR INVESTIGATION		▼ -53.3%	▲ 57.1%	▼ -13.6%	
FOPEN BURNING	OPEN BURNING		▼ -16.7%	▲ 26.7%	▼ -36.8%	
FRESCUE	FIRE RESCUE		▼ 0.0%	▲ 50.0%	▼ 0.0%	
FSERVICE	FIRE SERVICE/ASSISTANCE			▼ -2.9%	▼ -26.5%	
FSTRUCTURE FIRE	STRUCTURE FIRE		▼ -33.0%	▲ 13.1%	▲ 14.5%	
FTRASH FIRE	TRASH/DUMPSTER FIRE		▼ -80.0%	▼ -50.0%		
FVEHICLE FIRE	VEHICLE FIRE		▲ 25.0%	▼ -46.7%	▼ -25.0%	
SERVICE IP	SERVICE/ASSISTANCE IN ..			▼ -50.0%		

Year

Figure 18

Growth Rate
Decline
Growth

Absolute Change Direction
▼ Decline
▲ Growth

Van Buren Fire Department Run Type Yearly Absolute Change

The graph below shows the absolute change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT PI	ACCIDENT WITH INJURY		▼ 0	▲ 20	▼ -31	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▼ -8	▲ 8	▼ -4	
AIR ALERT 2	AIRCRAFT EMERGENCY A..			▼ -1		
AMBULANCE	AMBULANCE		▲ 71	▼ -1	▼ -13	
AMBULANCE DUAL	AMBULANCE DUAL		▲ 1	▼ -6	▼ -1	
CO	CARBON MONOXIDE		▲ 1	▲ 2	▲ 1	
DEATH	DEATH INVESTIGATION				▼ 0	
FALA	FIRE ALARM		▼ -1	▼ -12	▲ 15	
FBRUSH FIRE	BRUSH FIRE		▼ -7	▲ 11	▼ -1	
FHAZMAT	HAZARDOUS MATERIAL		▼ 0	▼ 0	▲ 1	
FLINES	POWER LINE DOWN/TREE..		▼ -3	▼ -1	▲ 1	
FODOR	ODOR INVESTIGATION		▼ -16	▲ 8	▼ -3	
FOPEN BURNING	OPEN BURNING		▼ -3	▲ 4	▼ -7	
FRESCUE	FIRE RESCUE		▼ 0	▲ 1	▼ 0	
FSERVICE	FIRE SERVICE/ASSISTANCE			▼ -1	▼ -9	
FSTRUCTURE FIRE	STRUCTURE FIRE		▼ -30	▲ 8	▲ 10	
FTRASH FIRE	TRASH/DUMPSTER FIRE		▼ -8	▼ -1		
FVEHICLE FIRE	VEHICLE FIRE		▲ 3	▼ -7	▼ -2	
SERVICE IP	SERVICE/ASSISTANCE IN ..			▼ -2		

Year

Van Buren Fire Department Run Type Analysis

Van Buren Fire Department Profile Overview

	Percent Change From 2017-2018	Absolute Change From 2017-2018	Percent Growth Rank From 2017-2018
Ambulance Runs	-2.2%	-31	5th
Ambulance Dual Runs	-0.7%	-1	6th
Fire Alarm Runs	21.4%	15	4th
Structure Fire Runs	14.5%	10	4th
Open Burning Fire Runs	-36.8%	-7	6th
Brush Fire Runs	-5.3%	-1	2nd
Vehicle Fire Runs	-25.0%	-2	3rd
Accident With Injury Runs	-31.3%	-31	6th

	Percent of Total Runs 2018	Total Number of Runs 2018	Percent of Total Runs Rank From 2017-2018
Ambulance Runs	53.03%	578	4th
Ambulance Dual Runs	13.39%	146	4th
Fire Alarm Runs	7.80%	85	4th
Structure Fire Runs	7.25%	79	2nd
Open Burning Fire Runs	1.10%	12	5th
Brush Fire Runs	1.65%	18	4th
Vehicle Fire Runs	0.55%	6	5th
Accident With Injury Runs	6.25%	68	5th

Northern Monroe Fire Territory Run Type Analysis

Figure 21

Growth Rate
Decline
Growth

Percentage Change Direction
▼ Decline
▲ Growth

Northern Monroe Fire Territory Run Type Yearly Percentage Change

The graph below shows the percentage change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT HAZ	ACCIDENT HAZMAT CLEA..			▼ 0.0%		
ACCIDENT PI	ACCIDENT WITH INJURY		▲ 7.1%	▼ -16.0%	▼ -11.1%	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▼ -2.6%	▼ -35.1%	▼ -12.5%	
AMBULANCE	AMBULANCE		▼ 0.0%	▼ -14.7%	▲ 19.3%	
AMBULANCE DUAL	AMBULANCE DUAL		▲ 6.0%	▼ -32.5%	▲ 25.3%	
CO	CARBON MONOXIDE		▼ -66.7%	▼ 0.0%		
DEATH	DEATH INVESTIGATION			▼ 0.0%	▼ 0.0%	
FALA	FIRE ALARM		▼ -35.2%	▼ -4.3%	▲ 6.8%	
FBRUSH FIRE	BRUSH FIRE		▼ 0.0%	▲ 41.2%	▼ -16.7%	
FHAZMAT	HAZARDOUS MATERIAL		▼ -40.0%	▼ -33.3%	▲ 50.0%	
FLINES	POWER LINE DOWN/TREE..		▲ 33.3%	▲ 18.8%	▲ 5.3%	
FODOR	ODOR INVESTIGATION		▼ -45.5%	▲ 58.3%	▲ 26.3%	
FOPEN BURNING	OPEN BURNING		▼ -50.0%	▲ 83.3%	▼ -9.1%	
FRESCUE	FIRE RESCUE		▲ 100.0%		▼ -63.6%	
FSERVICE	FIRE SERVICE/ASSISTANCE			▲ 66.7%	▼ -60.0%	
FSTRUCTURE FIRE	STRUCTURE FIRE		▼ -39.4%	▼ -5.0%	▲ 68.4%	
FTRASH FIRE	TRASH/DUMPSTER FIRE				▼ 0.0%	
FVEHICLE FIRE	VEHICLE FIRE		▲ 44.4%	▼ -53.8%	▼ 0.0%	
SERVICE IP	SERVICE/ASSISTANCE IN ..			▼ -50.0%		

Year

Figure 22

Growth Rate
Decline
Growth

Absolute Change Direction
▼ Decline
▲ Growth

Northern Monroe Fire Territory Run Type Yearly Absolute Change

The graph below shows the absolute change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT HAZ	ACCIDENT HAZMAT CLEA..			▼ 0		
ACCIDENT PI	ACCIDENT WITH INJURY		▲ 5	▼ -12	▼ -7	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▼ -1	▼ -13	▼ -3	
AMBULANCE	AMBULANCE		▼ 0	▼ -63	▲ 71	
AMBULANCE DUAL	AMBULANCE DUAL		▲ 7	▼ -40	▲ 21	
CO	CARBON MONOXIDE		▼ -4	▼ 0		
DEATH	DEATH INVESTIGATION			▼ 0	▼ 0	
FALA	FIRE ALARM		▼ -25	▼ -2	▲ 3	
FBRUSH FIRE	BRUSH FIRE		▼ 0	▲ 7	▼ -4	
FHAZMAT	HAZARDOUS MATERIAL		▼ -2	▼ -1	▲ 1	
FLINES	POWER LINE DOWN/TREE..		▲ 4	▲ 3	▲ 1	
FODOR	ODOR INVESTIGATION		▼ -10	▲ 7	▲ 5	
FOPEN BURNING	OPEN BURNING		▼ -6	▲ 5	▼ -1	
FRESCUE	FIRE RESCUE		▲ 1		▼ -7	
FSERVICE	FIRE SERVICE/ASSISTANCE			▲ 2	▼ -3	
FSTRUCTURE FIRE	STRUCTURE FIRE		▼ -13	▼ -1	▲ 13	
FTRASH FIRE	TRASH/DUMPSTER FIRE				▼ 0	
FVEHICLE FIRE	VEHICLE FIRE		▲ 4	▼ -7	▼ 0	
SERVICE IP	SERVICE/ASSISTANCE IN ..			▼ -1		

Year

Northern Monroe Fire Territory Run Type Analysis

Figure 19

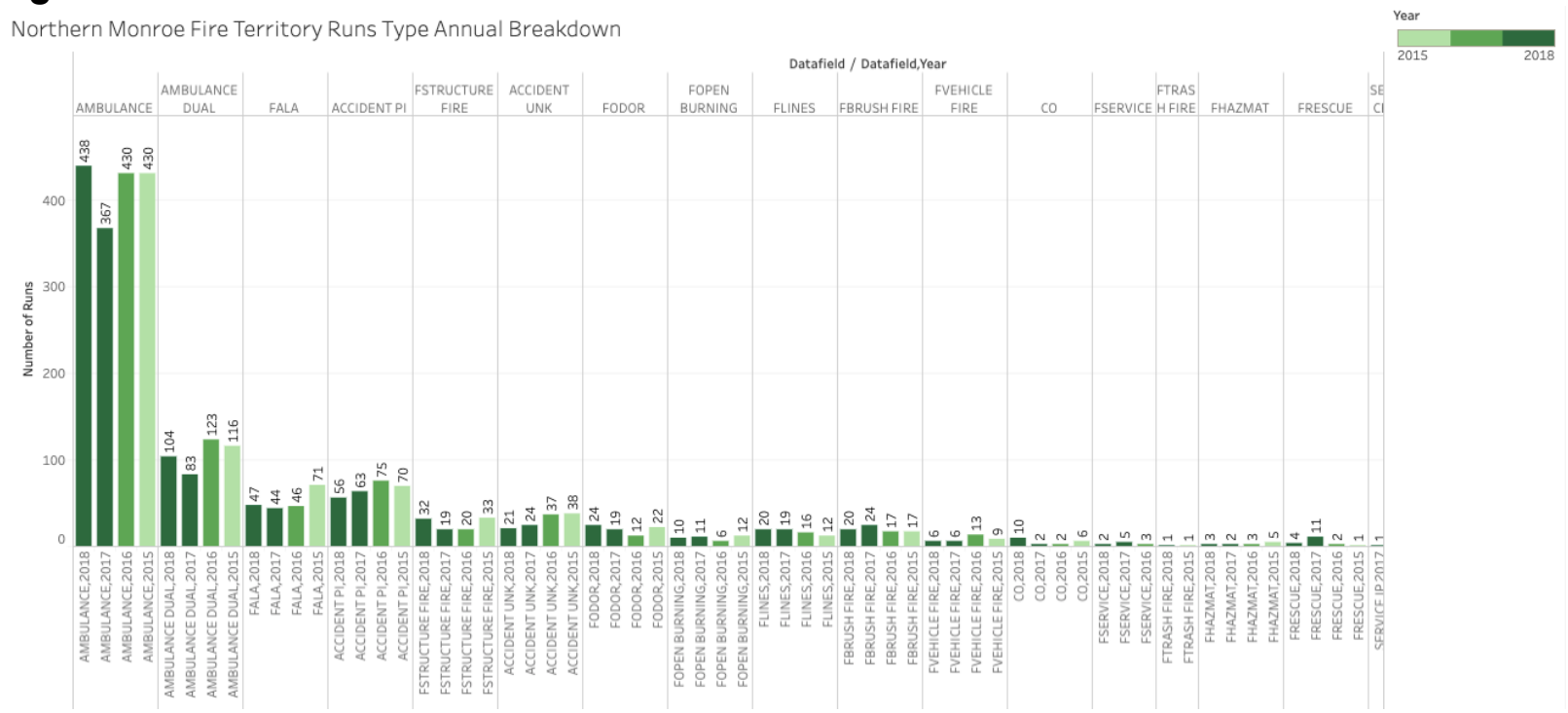


Figure 20

Northern Monroe Fire Territory Run Type Annual Breakdown

The graph below shows the annual proportion of each run type on an annual basis

Fire Department	Datafield	Datafield Name	2015	2016	2017	2018
Northern Monroe Fire Territory	AMBULANCE	AMBULANCE	50.65%	53.22%	52.06%	54.82%
	AMBULANCE DUAL	AMBULANCE DUAL	13.66%	15.22%	11.77%	13.02%
	FALA	FIRE ALARM	8.36%	5.69%	6.24%	5.88%
	ACCIDENT PI	ACCIDENT WITH INJURY	8.24%	9.28%	8.94%	7.01%
	FSTRUCTURE FIRE	STRUCTURE FIRE	3.89%	2.48%	2.70%	4.01%
	ACCIDENT UNK	ACCIDENT INJURIES UNK..	4.48%	4.58%	3.40%	2.63%
	FBRUSH FIRE	BRUSH FIRE	2.00%	2.10%	3.40%	2.50%
	FLINES	POWER LINE DOWN/TREE..	1.41%	1.98%	2.70%	2.50%
	FOPEN BURNING	OPEN BURNING	1.41%	0.74%	1.56%	1.25%
	FODOR	ODOR INVESTIGATION	2.59%	1.49%	2.70%	3.00%
	FVEHICLE FIRE	VEHICLE FIRE	1.06%	1.61%	0.85%	0.75%
	CO	CARBON MONOXIDE	0.71%	0.25%	0.28%	1.25%
	FHAZMAT	HAZARDOUS MATERIAL	0.59%	0.37%	0.28%	0.38%
	FSERVICE	FIRE SERVICE/ASSISTANCE		0.37%	0.71%	0.25%
	FRESCUE	FIRE RESCUE	0.12%	0.25%	1.56%	0.50%
	FTRASH FIRE	TRASH/DUMPSTER FIRE	0.12%			0.13%
	SERVICE IP	SERVICE/ASSISTANCE IN ..		0.25%	0.14%	
	ATL	ATTEMPT TO LOCATE			0.14%	
	TRAFFIC HAZARD	TRAFFIC HAZARD			0.28%	
	DEATH	DEATH INVESTIGATION	0.12%		0.14%	0.13%
	ACCIDENT HAZ	ACCIDENT HAZMAT CLEA..		0.12%	0.14%	
	ACCIDENT LSA NP	ACCIDENT LSA NOT IN PR..	0.12%			
	AIR ALERT 4	AIR EMERGENCY ALERT 3	0.12%			
	CIVIL IP	CIVIL IN PROGRESS	0.12%			
	COURT	COURT SERVICES	0.12%			
	DOMESTIC NP	DOMESTIC NOT IN PROGR..	0.12%			

Northern Monroe Fire Territory Run Type Analysis

Northern Monroe Fire Territory Profile Overview

Percent Change From 2017-2018		Absolute Change From 2017-2018		Percent Change Relative to Other QSPs 2017-2018	
Ambulance Runs	19.3%	Ambulance Runs	71	Ambulance Runs	3rd
Ambulance Dual Runs	25.3%	Ambulance Dual Runs	21	Ambulance Dual Runs	3rd
Fire Alarm Runs	6.8%	Fire Alarm Runs	3	Fire Alarm Runs	5th
Structure Fire Runs	68.4%	Structure Fire Runs	13	Structure Fire Runs	1st
Open Burning Fire Runs	-9.1%	Open Burning Fire Runs	-1	Open Burning Fire Runs	4th
Brush Fire Runs	-16.7%	Brush Fire Runs	-4	Brush Fire Runs	4th
Vehicle Fire Runs	0.0%	Vehicle Fire Runs	0	Vehicle Fire Runs	1st
Accident With Injury Runs	-11.1%	Accident With Injury Runs	-7	Accident With Injury Runs	5th

Percent of Total Runs 2018		Total Number of Runs 2018		Percent of Run Types Relative to Other QSPs 2017-2018	
Ambulance Runs	55.09%	Ambulance Runs	438	Ambulance Runs	3rd
Ambulance Dual Runs	13.08%	Ambulance Dual Runs	104	Ambulance Dual Runs	6th
Fire Alarm Runs	5.91%	Fire Alarm Runs	47	Fire Alarm Runs	5th
Structure Fire Runs	4.03%	Structure Fire Runs	32	Structure Fire Runs	5th
Open Burning Fire Runs	1.26%	Open Burning Fire Runs	10	Open Burning Fire Runs	3rd
Brush Fire Runs	2.52%	Brush Fire Runs	20	Brush Fire Runs	2nd
Vehicle Fire Runs	0.75%	Vehicle Fire Runs	6	Vehicle Fire Runs	2nd
Accident With Injury Runs	7.04%	Accident With Injury Runs	56	Accident With Injury Runs	3rd

Benton Fire Department Run Type Analysis

Figure 23

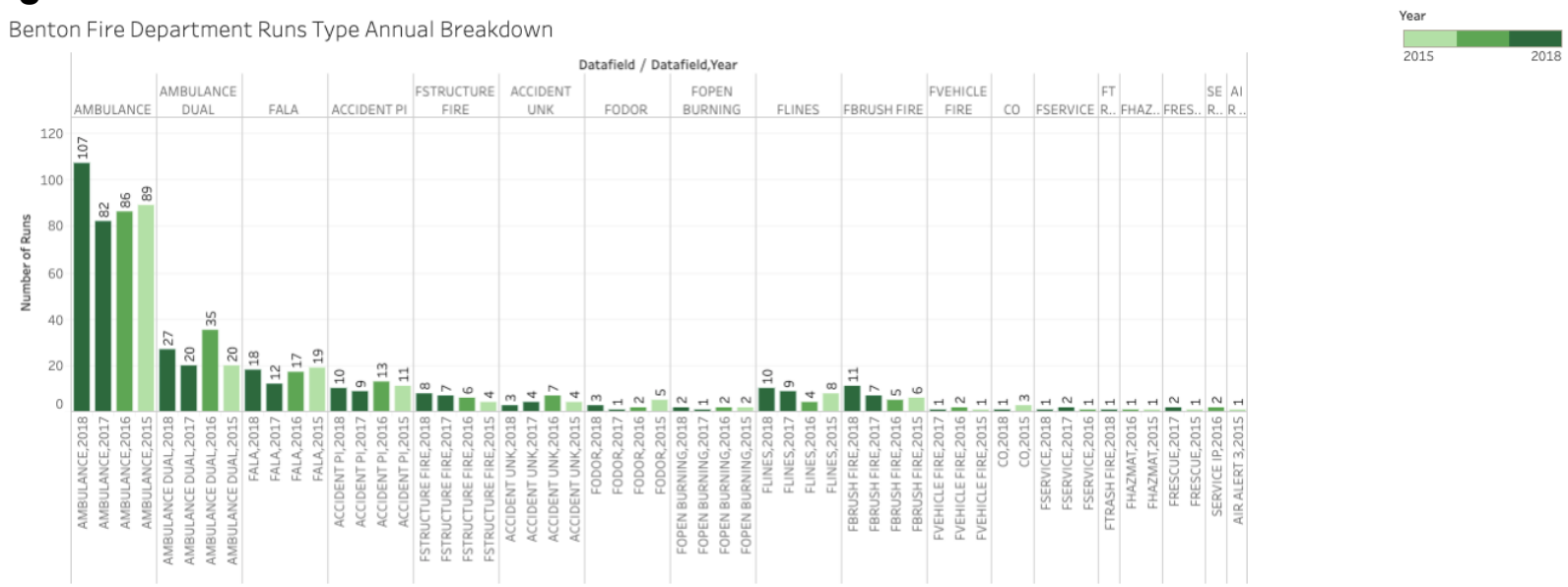


Figure 24

Benton Fire Department Run Type Annual Breakdown

The graph below shows the annual proportion of each run type on an annual basis

Fire Department	Datafield	Datafield Name				
Benton Fire Department	AMBULANCE	AMBULANCE	50.86%	46.99%	52.23%	52.97%
	AMBULANCE DUAL	AMBULANCE DUAL	11.43%	19.13%	12.74%	13.37%
	FALA	FIRE ALARM	10.86%	9.29%	7.64%	8.91%
	ACCIDENT PI	ACCIDENT WITH INJURY	6.29%	7.10%	5.73%	4.95%
	FSTRUCTURE FIRE	STRUCTURE FIRE	2.29%	3.28%	4.46%	3.96%
	ACCIDENT UNK	ACCIDENT INJURIES UNK..	2.29%	3.83%	2.55%	1.49%
	FBRUSH FIRE	BRUSH FIRE	3.43%	2.73%	4.46%	5.45%
	FLINES	POWER LINE DOWN/TREE..	4.57%	2.19%	5.73%	4.95%
	FOPEN BURNING	OPEN BURNING	1.14%	1.09%	0.64%	0.99%
	FODOR	ODOR INVESTIGATION	2.86%	1.09%	0.64%	1.49%
	FVEHICLE FIRE	VEHICLE FIRE	0.57%	1.09%	0.64%	
	CO	CARBON MONOXIDE	1.71%			0.50%
	FHAZMAT	HAZARDOUS MATERIAL	0.57%	0.55%		
	FSERVICE	FIRE SERVICE/ASSISTANCE		0.55%	1.27%	0.50%
	FRESCUE	FIRE RESCUE	0.57%		1.27%	
	FTRASH FIRE	TRASH/DUMPSTER FIRE				0.50%
	SERVICE IP	SERVICE/ASSISTANCE IN ..		1.09%		
	AIR ALERT 3	AIR EMERGENCY ALERT 3	0.57%			

2015 2016 2017 2018 2019

Benton Fire Department Run Type Analysis

Figure 25

Growth Rate
- Decline
- Growth

Percentage Change Direction
- ▼ Decline
- ▲ Growth

Benton Fire Department Run Type Yearly Percentage Change

The graph below shows the percentage change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT PI	ACCIDENT WITH INJURY		▲ 18.2%	▼ -30.8%	▲ 11.1%	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▲ 75.0%	▼ -42.9%	▼ -25.0%	
AMBULANCE	AMBULANCE		▼ -3.4%	▼ -4.7%	▲ 30.5%	
AMBULANCE DUAL	AMBULANCE DUAL		▲ 75.0%	▼ -42.9%	▲ 35.0%	
CO	CARBON MONOXIDE				▼ -66.7%	
FALA	FIRE ALARM		▼ -10.5%	▼ -29.4%	▲ 50.0%	
FBRUSH FIRE	BRUSH FIRE		▼ -16.7%	▲ 40.0%	▲ 57.1%	
FHAZMAT	HAZARDOUS MATERIAL		▼ 0.0%			
FLINES	POWER LINE DOWN/TREE..		▼ -50.0%	▲ 125.0%	▲ 11.1%	
FODOR	ODOR INVESTIGATION		▼ -60.0%	▼ -50.0%		
FOPEN BURNING	OPEN BURNING		▼ 0.0%	▼ -50.0%	▲ 100.0%	
FRESCUE	FIRE RESCUE			▲ 100.0%		
FSERVICE	FIRE SERVICE/ASSISTANCE			▲ 100.0%	▼ -50.0%	
FSTRUCTURE FIRE	STRUCTURE FIRE		▲ 50.0%	▲ 16.7%	▲ 14.3%	
FVEHICLE FIRE	VEHICLE FIRE		▲ 100.0%	▼ -50.0%		

Year

Figure 26

Growth Rate
- Decline
- Growth

Absolute Change Direction
- ▼ Decline
- ▲ Growth

Benton Fire Department Run Type Yearly Absolute Change

The graph below shows the absolute change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT PI	ACCIDENT WITH INJURY		▲ 2	▼ -4	▲ 1	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▲ 3	▼ -3	▼ -1	
AMBULANCE	AMBULANCE		▼ -3	▼ -4	▲ 25	
AMBULANCE DUAL	AMBULANCE DUAL		▲ 15	▼ -15	▲ 7	
CO	CARBON MONOXIDE				▼ -2	
FALA	FIRE ALARM		▼ -2	▼ -5	▲ 6	
FBRUSH FIRE	BRUSH FIRE		▼ -1	▲ 2	▲ 4	
FHAZMAT	HAZARDOUS MATERIAL		▼ 0			
FLINES	POWER LINE DOWN/TREE..		▼ -4	▲ 5	▲ 1	
FODOR	ODOR INVESTIGATION		▼ -3	▼ -1		
FOPEN BURNING	OPEN BURNING		▼ 0	▼ -1	▲ 1	
FRESCUE	FIRE RESCUE			▲ 1		
FSERVICE	FIRE SERVICE/ASSISTANCE			▲ 1	▼ -1	
FSTRUCTURE FIRE	STRUCTURE FIRE		▲ 2	▲ 1	▲ 1	
FVEHICLE FIRE	VEHICLE FIRE		▲ 1	▼ -1		

Year

Benton Fire Department Run Type Analysis

Benton Fire Department Profile Overview

Percent Change From 2017-2018		Absolute Change From 2017-2018		Percent Growth Rank From 2017-2018	
Ambulance Runs	30.5%	Ambulance Runs	25	Ambulance Runs	2nd
Ambulance Dual Runs	35.0%	Ambulance Dual Runs	7	Ambulance Dual Runs	2nd
Fire Alarm Runs	50.0%	Fire Alarm Runs	6	Fire Alarm Runs	2nd
Structure Fire Runs	14.3%	Structure Fire Runs	1	Structure Fire Runs	5th
Open Burning Fire Runs	100%	Open Burning Fire Runs	1	Open Burning Fire Runs	2nd
Brush Fire Runs	57.1%	Brush Fire Runs	4	Brush Fire Runs	1st
Vehicle Fire Runs	NULL	Vehicle Fire Runs	NULL	Vehicle Fire Runs	NULL
Accident With Injury Runs	11.1%	Accident With Injury Runs	1	Accident With Injury Runs	1st

Percent of Total Runs 2018		Total Number of Runs 2018		Percent of Total Runs Rank From 2017-2018	
Ambulance Runs	52.97%	Ambulance Runs	107	Ambulance Runs	5th
Ambulance Dual Runs	13.37%	Ambulance Dual Runs	27	Ambulance Dual Runs	5th
Fire Alarm Runs	8.91%	Fire Alarm Runs	18	Fire Alarm Runs	2nd
Structure Fire Runs	3.96%	Structure Fire Runs	8	Structure Fire Runs	6th
Open Burning Fire Runs	0.99%	Open Burning Fire Runs	2	Open Burning Fire Runs	6th
Brush Fire Runs	5.45%	Brush Fire Runs	11	Brush Fire Runs	1st
Vehicle Fire Runs	NULL	Vehicle Fire Runs	NULL	Vehicle Fire Runs	NULL
Accident With Injury Runs	4.95%	Accident With Injury Runs	10	Accident With Injury Runs	6th

Bean Blossom Fire Department Run Type Analysis

Figure 27

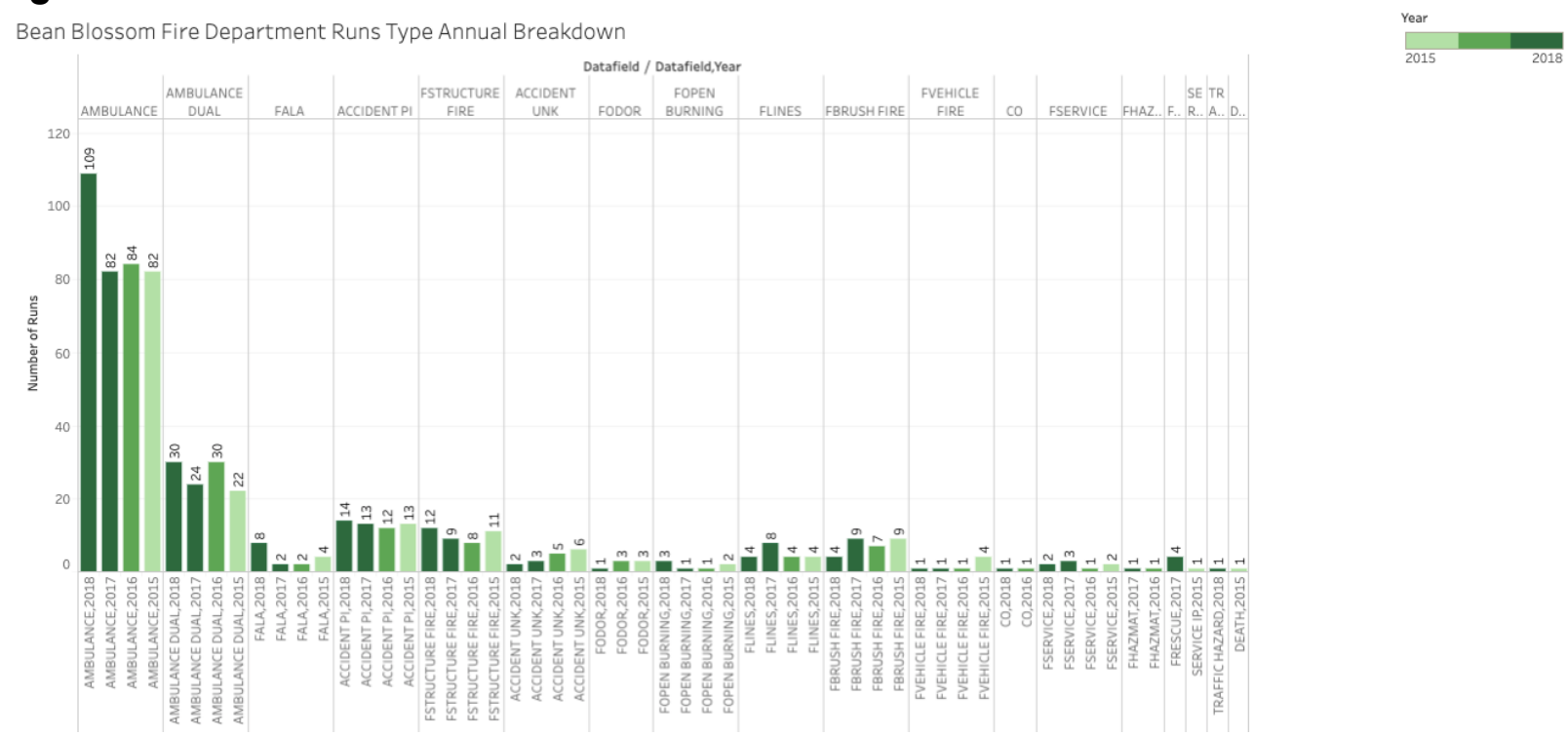


Figure 28

Bean Blossom Fire Department Run Type Annual Breakdown

The graph below shows the annual proportion of each run type on an annual basis

Fire Department	Datafield	Datafield Name				
Bean Blossom Fire Department	AMBULANCE	AMBULANCE	50.00%	52.50%	51.25%	56.77%
	AMBULANCE DUAL	AMBULANCE DUAL	13.41%	18.75%	15.00%	15.63%
	FALA	FIRE ALARM	2.44%	1.25%	1.25%	4.17%
	ACCIDENT PI	ACCIDENT WITH INJURY	7.93%	7.50%	8.13%	7.29%
	FSTRUCTURE FIRE	STRUCTURE FIRE	6.71%	5.00%	5.63%	6.25%
	ACCIDENT UNK	ACCIDENT INJURIES UNK..	3.66%	3.13%	1.88%	1.04%
	FBRUSH FIRE	BRUSH FIRE	5.49%	4.38%	5.63%	2.08%
	FLINES	POWER LINE DOWN/TREE..	2.44%	2.50%	5.00%	2.08%
	FOPEN BURNING	OPEN BURNING	1.22%	0.63%	0.63%	1.56%
	FODOR	ODOR INVESTIGATION	1.83%	1.88%		0.52%
	FVEHICLE FIRE	VEHICLE FIRE	2.44%	0.63%	0.63%	0.52%
	CO	CARBON MONOXIDE		0.63%		0.52%
	FHAZMAT	HAZARDOUS MATERIAL		0.63%	0.63%	
	FSERVICE	FIRE SERVICE/ASSISTANCE	1.22%	0.63%	1.88%	1.04%
	FRESCUE	FIRE RESCUE			2.50%	
	SERVICE IP	SERVICE/ASSISTANCE IN ..	0.61%			
	TRAFFIC HAZARD	TRAFFIC HAZARD				0.52%
	DEATH	DEATH INVESTIGATION	0.61%			

2015 2016 2017 2018 2019

Bean Blossom Fire Department Run Type Analysis

Figure 29

Growth Rate
- Decline
- Growth

Percentage Change Direction
- ▼ Decline
- ▲ Growth

Bean Blossom Fire Department Run Type Yearly Percentage Change

The graph below shows the percentage change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT PI	ACCIDENT WITH INJURY		▼ -7.7%	▲ 8.3%	▲ 7.7%	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▼ -16.7%	▼ -40.0%	▼ -33.3%	
AMBULANCE	AMBULANCE		▲ 2.4%	▼ -2.4%	▲ 32.9%	
AMBULANCE DUAL	AMBULANCE DUAL		▲ 36.4%	▼ -20.0%	▲ 25.0%	
CO	CARBON MONOXIDE				▼ 0.0%	
FALA	FIRE ALARM		▼ -50.0%	▼ 0.0%		
FBRUSH FIRE	BRUSH FIRE		▼ -22.2%	▲ 28.6%	▼ -55.6%	
FHAZMAT	HAZARDOUS MATERIAL			▼ 0.0%		
FLINES	POWER LINE DOWN/TREE..		▼ 0.0%	▲ 100.0%	▼ -50.0%	
FODOR	ODOR INVESTIGATION		▼ 0.0%		▼ -66.7%	
FOPEN BURNING	OPEN BURNING		▼ -50.0%	▼ 0.0%		
FSERVICE	FIRE SERVICE/ASSISTANCE		▼ -50.0%		▼ -33.3%	
FSTRUCTURE FIRE	STRUCTURE FIRE		▼ -27.3%	▲ 12.5%	▲ 33.3%	
FVEHICLE FIRE	VEHICLE FIRE		▼ -75.0%	▼ 0.0%	▼ 0.0%	

Year

Figure 30

Growth Rate
- Decline
- Growth

Absolute Change Direction
- ▼ Decline
- ▲ Growth

Bean Blossom Fire Department Run Type Yearly Absolute Change

The graph below shows the absolute change for each run type from the previous year.

Datafield	Datafield Name	2015	2016	2017	2018	2019
ACCIDENT PI	ACCIDENT WITH INJURY		▼ -1	▲ 1	▲ 1	
ACCIDENT UNK	ACCIDENT INJURIES UNK..		▼ -1	▼ -2	▼ -1	
AMBULANCE	AMBULANCE		▲ 2	▼ -2	▲ 27	
AMBULANCE DUAL	AMBULANCE DUAL		▲ 8	▼ -6	▲ 6	
CO	CARBON MONOXIDE				▼ 0	
FALA	FIRE ALARM		▼ -2	▼ 0		
FBRUSH FIRE	BRUSH FIRE		▼ -2	▲ 2	▼ -5	
FHAZMAT	HAZARDOUS MATERIAL			▼ 0		
FLINES	POWER LINE DOWN/TREE..		▼ 0	▲ 4	▼ -4	
FODOR	ODOR INVESTIGATION		▼ 0		▼ -2	
FOPEN BURNING	OPEN BURNING		▼ -1	▼ 0		
FSERVICE	FIRE SERVICE/ASSISTANCE		▼ -1		▼ -1	
FSTRUCTURE FIRE	STRUCTURE FIRE		▼ -3	▲ 1	▲ 3	
FVEHICLE FIRE	VEHICLE FIRE		▼ -3	▼ 0	▼ 0	

Year

Bean Blossom Fire Department Run Type Analysis

Bean Blossom Fire Department Profile Overview

Percent Change From 2017-2018		Absolute Change From 2017-2018		Percent Growth Rank From 2017-2018	
Ambulance Runs	32.9%	Ambulance Runs	1	Ambulance Runs	1st
Ambulance Dual Runs	25%	Ambulance Dual Runs	6	Ambulance Dual Runs	4th
Fire Alarm Runs	NULL	Fire Alarm Runs	NULL	Fire Alarm Runs	1st
Structure Fire Runs	33.3%	Structure Fire Runs	3	Structure Fire Runs	2nd
Open Burning Fire Runs	NULL	Open Burning Fire Runs	NULL	Open Burning Fire Runs	1st
Brush Fire Runs	-55.6%	Brush Fire Runs	-5	Brush Fire Runs	6th
Vehicle Fire Runs	0.0%	Vehicle Fire Runs	0	Vehicle Fire Runs	NULL
Accident With Injury Runs	7.7%	Accident With Injury Runs	1	Accident With Injury Runs	3rd

Percent of Total Runs 2018		Total Number of Runs 2018		Percent of Total Runs Rank From 2017-2018	
Ambulance Runs	57.07%	Ambulance Runs	109	Ambulance Runs	1st
Ambulance Dual Runs	15.71%	Ambulance Dual Runs	30	Ambulance Dual Runs	2nd
Fire Alarm Runs	4.19%	Fire Alarm Runs	8	Fire Alarm Runs	6th
Structure Fire Runs	6.28%	Structure Fire Runs	12	Structure Fire Runs	3rd
Open Burning Fire Runs	1.57%	Open Burning Fire Runs	3	Open Burning Fire Runs	2nd
Brush Fire Runs	2.09%	Brush Fire Runs	4	Brush Fire Runs	3rd
Vehicle Fire Runs	0.52%	Vehicle Fire Runs	1	Vehicle Fire Runs	5th
Accident With Injury Runs	7.33%	Accident With Injury Runs	14	Accident With Injury Runs	2nd

County-Wide Ranking Overview

EVFD Percent Growth Rank From 2017-2018	
Ambulance Runs	6th
Ambulance Dual Runs	1st
Fire Alarm Runs	6th
Structure Fire Runs	3rd
Open Burning Fire Runs	5th
Brush Fire Runs	5th
Vehicle Fire Runs	6th
Accident With Injury Runs	2nd

MFPD Percent Growth Rank From 2017-2018	
Ambulance Runs	4th
Ambulance Dual Runs	5th
Fire Alarm Runs	3rd
Structure Fire Runs	6th
Open Burning Fire Runs	3rd
Brush Fire Runs	3rd
Vehicle Fire Runs	1st
Accident With Injury Runs	4th

VBFD Percent Growth Rank From 2017-2018	
Ambulance Runs	5th
Ambulance Dual Runs	6th
Fire Alarm Runs	4th
Structure Fire Runs	4th
Open Burning Fire Runs	6th
Brush Fire Runs	2nd
Vehicle Fire Runs	3rd
Accident With Injury Runs	6th

NMFT Percent Growth Rank From 2017-2018	
Ambulance Runs	3rd
Ambulance Dual Runs	3rd
Fire Alarm Runs	5th
Structure Fire Runs	1st
Open Burning Fire Runs	4th
Brush Fire Runs	4th
Vehicle Fire Runs	1st
Accident With Injury Runs	5th

BNFD Percent Growth Rank From 2017-2018	
Ambulance Runs	2nd
Ambulance Dual Runs	2nd
Fire Alarm Runs	2nd
Structure Fire Runs	5th
Open Burning Fire Runs	2nd
Brush Fire Runs	1st
Vehicle Fire Runs	NULL
Accident With Injury Runs	1st

BBFD Percent Growth Rank From 2017-2018	
Ambulance Runs	1st
Ambulance Dual Runs	4th
Fire Alarm Runs	1st
Structure Fire Runs	2nd
Open Burning Fire Runs	1st
Brush Fire Runs	6th
Vehicle Fire Runs	NULL
Accident With Injury Runs	3rd

County-Wide Ranking Overview

EVFD Percent of Total Runs Rank From 2017-2018	
Ambulance Runs	6th
Ambulance Dual Runs	1st
Fire Alarm Runs	1st
Structure Fire Runs	1st
Open Burning Fire Runs	1st
Brush Fire Runs	6th
Vehicle Fire Runs	4th
Accident With Injury Runs	1st

MFPD Percent of Total Runs Rank From 2017-2018	
Ambulance Runs	2nd
Ambulance Dual Runs	3rd
Fire Alarm Runs	3rd
Structure Fire Runs	4th
Open Burning Fire Runs	3rd
Brush Fire Runs	5th
Vehicle Fire Runs	1st
Accident With Injury Runs	4th

VBFD Percent Growth Relative Rank 2017-2018	
Ambulance Runs	5th
Ambulance Dual Runs	6th
Fire Alarm Runs	4th
Structure Fire Runs	4th
Open Burning Fire Runs	6th
Brush Fire Runs	2nd
Vehicle Fire Runs	3rd
Accident With Injury Runs	6th

NMFT Percent Growth Rank From 2017-2018	
Ambulance Runs	3rd
Ambulance Dual Runs	3rd
Fire Alarm Runs	5th
Structure Fire Runs	1st
Open Burning Fire Runs	4th
Brush Fire Runs	4th
Vehicle Fire Runs	1st
Accident With Injury Runs	5th

BNFD Percent Growth Rank From 2017-2018	
Ambulance Runs	2nd
Ambulance Dual Runs	2nd
Fire Alarm Runs	2nd
Structure Fire Runs	5th
Open Burning Fire Runs	2nd
Brush Fire Runs	1st
Vehicle Fire Runs	NULL
Accident With Injury Runs	1st

BBFD Percent Growth Rank From 2017-2018	
Ambulance Runs	1st
Ambulance Dual Runs	4th
Fire Alarm Runs	1st
Structure Fire Runs	2nd
Open Burning Fire Runs	1st
Brush Fire Runs	6th
Vehicle Fire Runs	NULL
Accident With Injury Runs	3rd

Characteristics of Fire Service in the United States

6. Characteristics of Fire Service in the United States

Monroe County is composed of communities which vary in size; 45.5 percent of the County is rural, population of 2,500 or less, 27.3 percent is suburban-rural, population of 2,5000-5,000, 18.2 percent is suburban, 10,000 to 25,000, and 9 percent is metropolitan, 50,000-100,000[7]. The biggest challenge the variance in community size causes is balancing the needs of rural and metropolitan communities. Therefore the discussion of fire service challenges related to community size will focus on these two groups.

6.1. Community Characteristics

The main characteristics of rural communities are the separation of communities to each other as well as residents within a community. This low population density results in a lower economy of scale and concentration compared to higher population density areas. Population density is important to public safety services as the required travel takes longer and cost more. The increase in service cost is critical as a correlated characteristic of rural communities is lower average income. The percent of the population living below the poverty line is 2 percent higher in rural areas than in metropolitan areas. The drop in income provides fewer resources and creates a greater need for services as well as the need for third-party help to fill said need. Poverty is the most important characteristic as it is a more influential factor contributing to the higher fire risk in rural communities[8].

6.2. Fire Characteristics

Data comparing fire incident and death rates of different community sizes shows that rural communities have the highest rates. The trend of the incident/death rates relative to population, also indicates that these rates are lowest in the middle, suburban-rural and suburban communities, and highest at the extremes, rural and metropolitan communities. Along with differences in the magnitude of incidents/deaths, the degree of damage varies with community size. In rural areas, 29 percent of residential fires destroy the entire structure. In contrast, only 17 percent are destroyed in urban areas[8].

6.3. Fire Service Challenges

There are several key differences between rural and metropolitan fire service they are:

- Staff Classification

  Rural fire departments are nearly all volunteer, while metropolitan departments are often substantially career[8]. This difference in classification is essential as it determines the National Fire Protection Association (NFPA) standard departments must follow. This

standard, which can be found in the appendix, sets minimum criteria to ensure communities have adequate fire service[9].

- Number of Fire Stations

  The previously mentioned NFPA standards set goals for response time. While rural areas are held to a lower standard, according to distance guidelines from the Insurance Service Office (ISO), as well as the Rand Corporation's models for response distance as a function of the community area and the number of fire stations, the majority of the rural regions have too few fire stations. Rural departments are also short staffed. 21 percent of rural departments are unable to deliver the minimum of four firefighters needed to initiate an interior attack. This is most likely due to fiscal constraints as well as societal norms. In contrast, the higher standard of NFPA and the access to resources allows for metropolitan areas to have more fire stations to achieve shorter response times[8].

- Access to Resources

  As aforementioned, rural communities often have smaller income streams compared to metropolitan communities. This results in variance in the access to resources such as equipment, and training[8].

- Fire Prevention Programs

  Compared to larger communities rural areas are more likely to have gaps in code enforcement, permit approval and other fire prevention programs. Similar to other parameters, this is likely due to fiscal constraints as well as societal norms[8].

The differences between rural and metropolitan fire service make it difficult to compare departments needs and performance. This hinders the Committee's ability to evaluate departments correctly and distribute funds effectively.

Challenges of Fire Service in Monroe County

7. Challenges of Fire Service in Monroe County

The committee's charge to consider the needs of public safety providers and decide on the tax rate and fund allocation is hindered by the non-homogeneity in community size and department type in Monroe. This non-homogeneity has manifested in the rural areas relying heavily on mutual aid, draining the resources of neighboring departments. Which is exacerbated by the growth of the City of Bloomington. The growth of the City not only increases the strain on their resources but makes meeting the NFPA standards more difficult. Lastly, the non-homogeneity in Monroe also extends to position on fire service and the trust level with neighboring communities. This has made consolidation within the County difficult.

Widespread throughout Monroe County, and the Country at large, is the presence of personnel challenges. Our research revealed a common opinion that the biggest challenge fire departments are facing is a shortage of personnel. Particularly, service providers that rely heavily on volunteers are facing hardships in finding and recruiting new volunteers. For example, it has been over six years since the Bean Blossom Fire Department has had a new volunteer. Current volunteer members have served their communities for many years with pride and commitment, but they are now reaching retirement age. In addition, the service providers whose staff is mainly volunteer, have difficulty providing the optimal level of service because volunteers cannot always prioritize calls for service over their work or business. Employers have gradually deemed such commitment as a conflict of interests, and as a result, more and more volunteers, albeit their strong will to respond to the calls, cannot leave their work. Moreover, younger generations are not as attracted to serve their community as previous generations. Therefore, even with enough equipment, the optimal level of fire service is hard to be expected from those fire departments.

Volunteer and career staffed departments alike face hardships when responding to consecutive calls within a narrow timeframe. For example, assuming that it takes forty minutes on average to respond a call and come back to the station to be ready for the next call; if another call comes in while dealing with the first call, a station further away than the designated station should respond the call. In that case, the increase in the expected response time is unavoidable, and the magnitude of life and property loss may increase.

Data Analysis

8. Data Analysis

8.1. Qualitative

Through the course of our outreach efforts, we interviewed a total of 16 different stakeholders related to the current PS LIT Committee process. These 16 different stakeholders include interviews with all QSP Fire Chiefs, members from the Committee, Township Trustees, and a representative from PSAP. Through our conducted interviews, we asked all stakeholders to rank various recommendation for the current process ranked from 1 to 5, with 1 being the weakest support and 5 being the strongest support. We also asked stakeholders to rank characteristics that they want out of the current process ranked from 1 to 5, with 1 being the weakest support and 5 being the strongest support. The results presented below specifically summarize the responses that we collected from QSP Fire Chiefs.

As shown in figure 31, when QSPss were asked whether the PS LIT Committee should provide a menu of options that qualified service providers can apply for, 50.0% of QSPs providers showed strong support for this recommendation. While 50.0% of QSPs strongly supported this recommendation, the remaining 50% of QSPs were widely distributed across rankings, which indicates that amongst qualified service providers there is not overwhelming support for this recommendation.

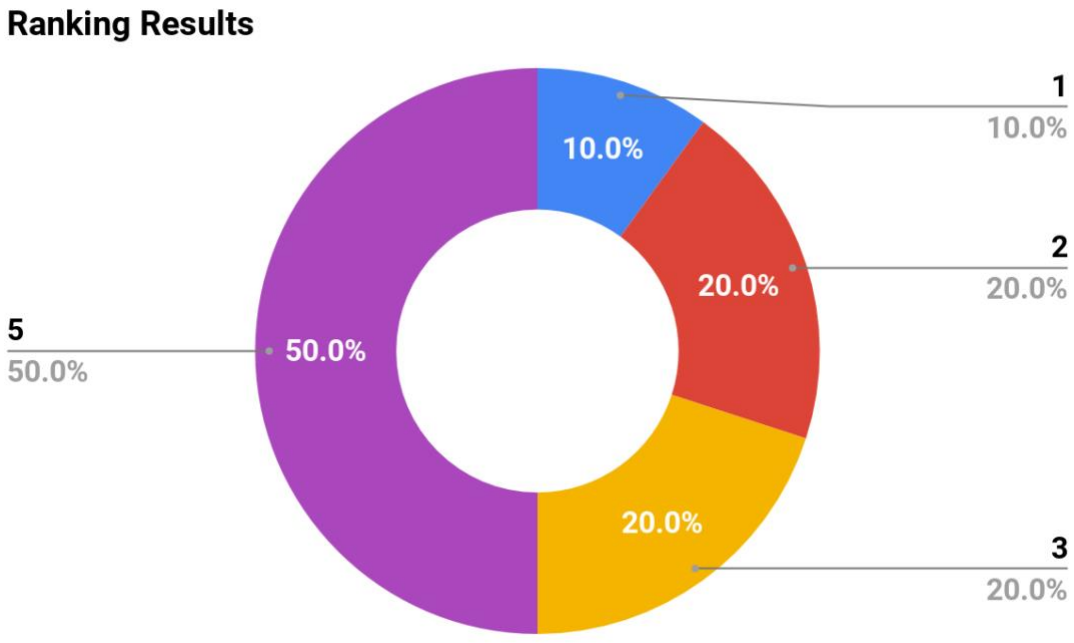


Figure 31: Interview response to “should the Committee provide a menu of options?”

Figure 32 shows that when QSPs were asked whether the Committee should provide a longer period for QSPs to submit their applications, 28.6% of QSPs showed strong support for this recommendation. Given that only 28.6% of QSPs strongly supported this recommendation and given that the remaining QSPs were widely distributed across rankings, it is clear that there is not overwhelming support for this recommendation.

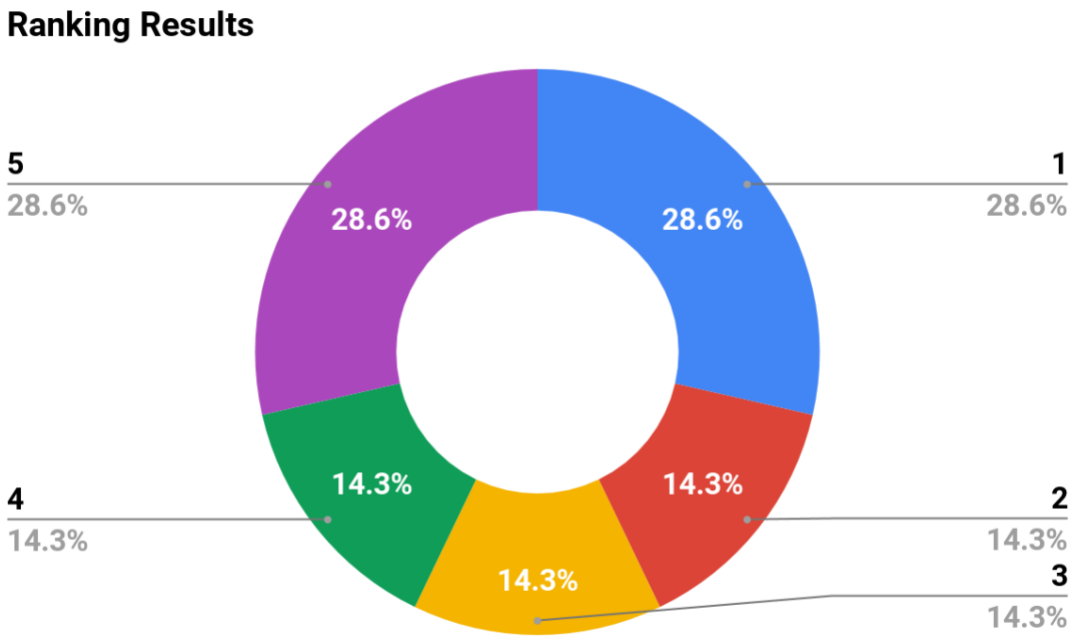


Figure 32: Interview response to "Should the Committee increase the application period for QSPs?"

Figure 33 depicts the responses we received when QSPs were asked whether the Committee should start the PS LIT application process earlier in the year. 71.4% of QSPs showed strong support for this recommendation. Given that 71.4% of QSPs showed strong support for this recommendation it is clear that QSPs overwhelmingly strongly support this recommendation. While there was no clearly defined earlier date for the application process, it is still clear that there is a strong consensus amongst QSPs for the current process to start earlier in the year.

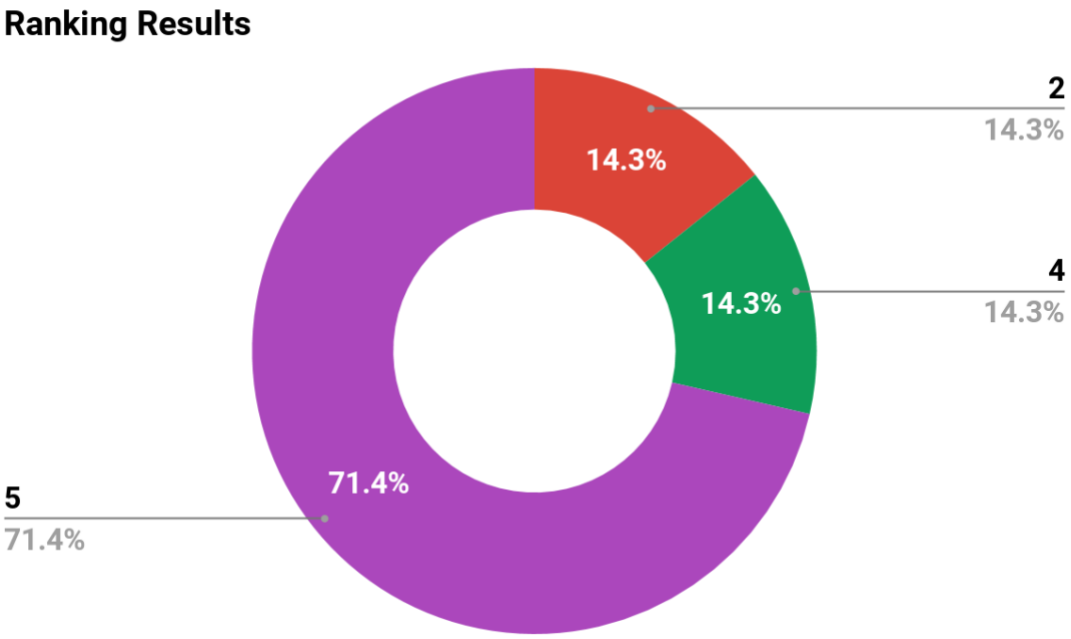


Figure 33: Interview response to "Should the Committee start the application process earlier?"

As depicted in figure 6, when QSPs were asked whether the Committee should provide QSPs with a detailed instruction packet of how to apply for PS LIT funding, 42.9% of QSPs showed strong support for this recommendation. While 42.9% of QSPs strongly supported this recommendation, given the wide distribution of QSPs across the remaining rankings, it is clear that there is not overwhelming support for this recommendation.

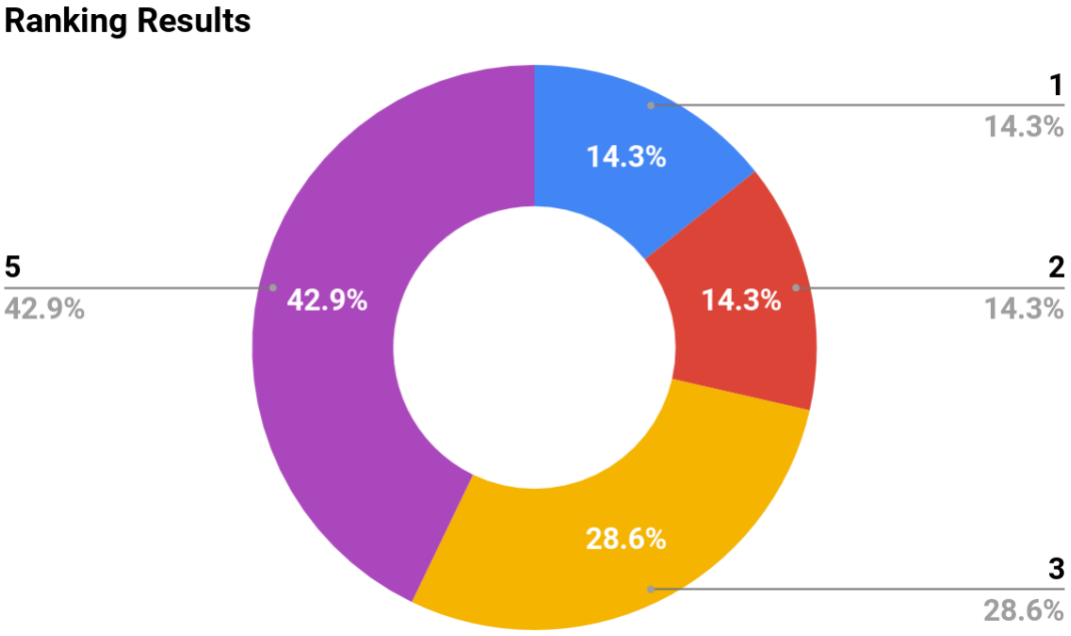


Figure 34: Interview response to "Should the Committee provide QSPs an instruction packet?"

When QSPs were asked whether QSPs should agree to and submit one unified 5-year funding request to the PS LIT committee, 71.4% of QSPs showed strong support for this recommendation. Given that 71.4% of QSPs showed strong support for this recommendation it is clear that QSPs overwhelmingly strongly support this recommendation.

As shown in figure 35, when QSPs were asked whether the PS LIT Committee should clearly define a set amount of funds that QSPs could apply for, 57.1% of QSPs showed strong support for this recommendation. Given that 57.1% of QSPs strongly supported this recommendation, while there is not overwhelming support of this recommendation, there is strong support for this recommendation.

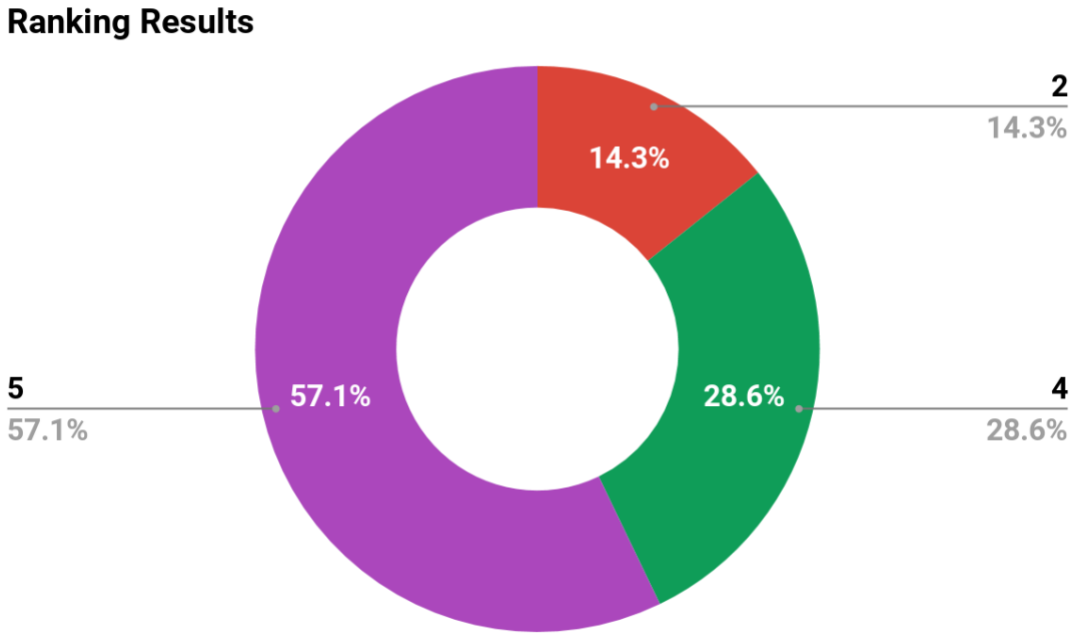


Figure 35: Interview response to "Should the Committee set an amount for QSPs?"

Through our conducted interviews, we found that an overwhelming majority of QSPs, 71.4%, strongly support starting the PS LIT application process earlier in the year and strongly support agreeing to submit one unified 5-year funding request to the PS LIT committee. The results from this question set are summarized below in figure 8:

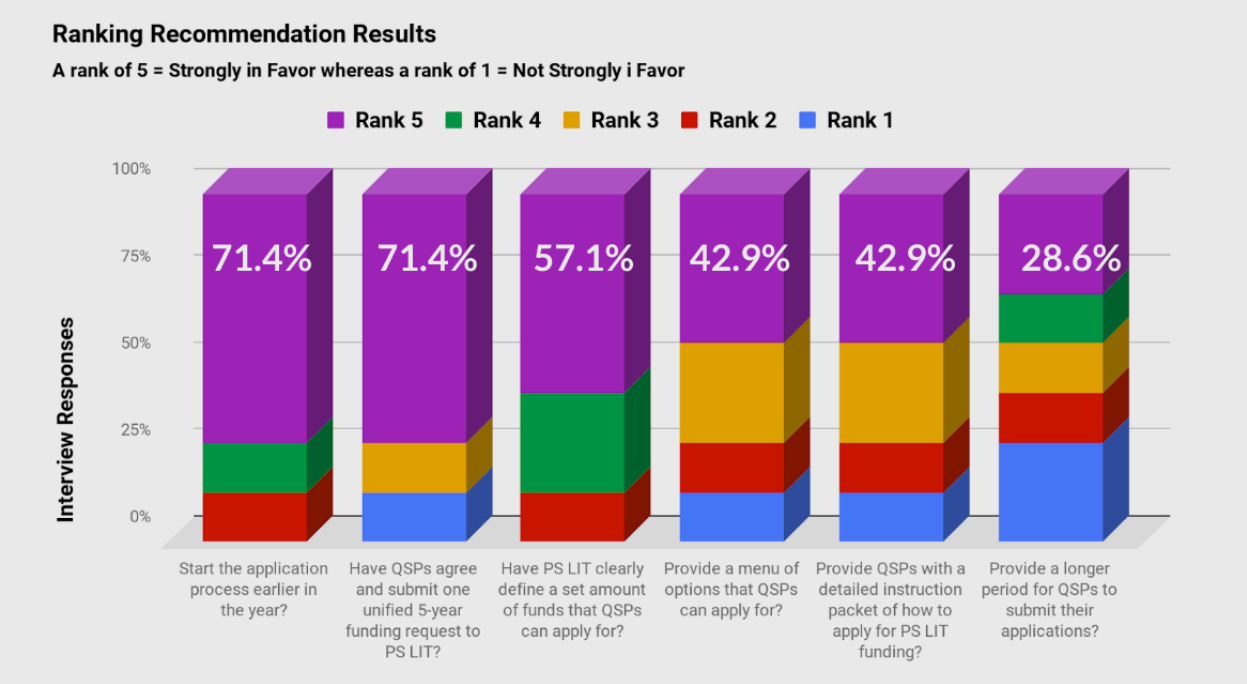


Figure 36: Summarization of ranking of recommendations

While the above results are informative, they do place a disproportionate degree of weight on recommendations that received the most 5 rankings. In an effort to decrease the weight of the 5th ranking on the results, we decided to interpret rankings 4-5 as rankings that indicate clear support, and we also chose to interpret rankings 1-2 as rankings that indicate slight or clear opposition. When reorganizing the response data through this different lens, we found 86% of QSPs support starting the application process earlier and that they favor the committee clearly defining a clear amount of funds for whichQSPs can apply. We also found that support for a unified 5-year funding plan from QSPs to the PS LIT committee still had significant support at 63%.

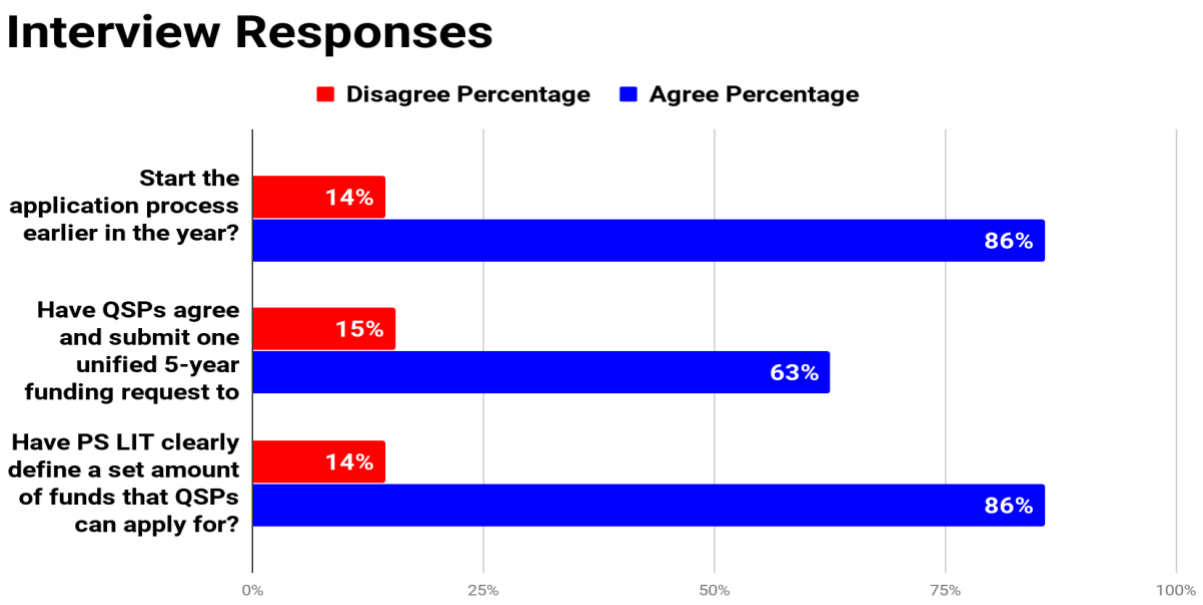


Figure 37: Summarization of support for recommendations

For our second set of interview questions, we asked QSPs to rank what they wanted most out of the current PS LIT application process on a scale from 1 to 4, 1 being the weakest support and 5 being the strongest support. From our interviews, we found that 60% of QSPs thought that greater simplicity and greater certainty and predictability should be a high priority for the PS LIT Committee. When comparing the interview responses from the first set of questions to the second set of questions, it appears that the recommendations that QSPs overwhelmingly support also compliment what they strongly believe should be high priorities for the PS LIT Committee.

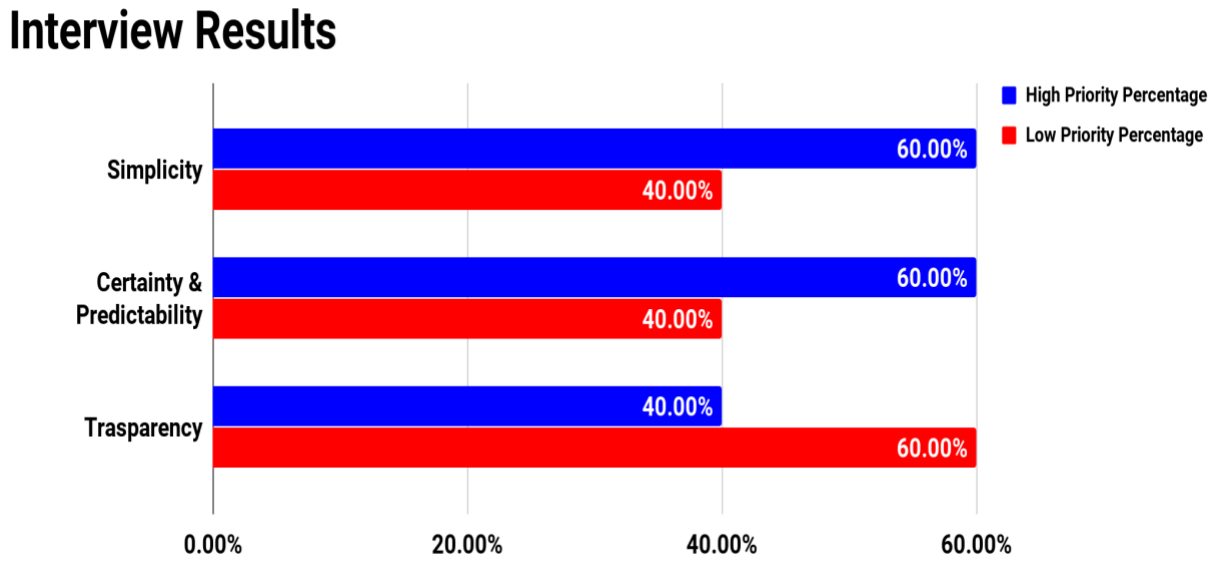


Figure 38: Interview response for we QSPs to rank what they wanted most out of the process

8.2. Quantitative

As mentioned in previous sections, departments have expressed that securing adequate personnel is a significant issue in Monroe County. In this section, we introduce a framework for evaluating the personnel needs of Monroe County departments. The mathematical and statistical details of the model described here can be found in the appendix.

The data used for the model was obtained from PSAP. The unit of analysis of the data we evaluated is the department. This results in the model over or underestimating the needs of departments. This can be rectified in the future by the use of data that has the responding station as the unit of analysis.

As shown in Table 1, we assigned service areas outside of each station and service providers. To predict the likelihood that service providers experience consecutive calls in a specific timeframe, the total number of events must be counted for each year. However, depending on the counting method, the number of events can be overestimated or underestimated. For example, assume that the time frame for counting is forty minutes, and we found three calls at 3:00 PM, 3:15 PM, and 3:50 PM. One can count two events because the time intervals between each event are all less than forty minutes. However, this can also be counted as one event because the station would be ready to respond at 3:50 PM. In that sense, we adopted the conservative counting methods that treat such cases as one single event. Further explanation of the methodology for this analysis, which relies on mathematics and statistics, is provided in the appendix.

Providers	Stations	Service Area Outside of Stations
MFPD	FD11	Polk Township
	FD21	Salt Creek, CFD, FD09
	FD23	FD19
EVFD	FD07	Bean Blossom, FD05
	FD08	FD09, FD19, CFD, MFPD, and FD15
NMFT	FD05	F1402, F1403, F1404
	FD15	F1401, F1404, F1405, FD14, CFD
VBFD	FD09	Ellettsville, FD21, CFD
	FD19	FD23, FD11

Table 1: Variable designation

Table 2 depicts the result of our modeling. Several stations seem overloaded compared to other stations. For example station #07 in Ellettsville, is expected to receive more than two calls within in a 90-minute timeframe between 139 to 190 times in a single year. This is significant because between 139 to 190 households or businesses in the service area of station #07 will end up getting service from stations further away. The delay of service will result in a significant loss of property and life.

Furthermore, surrounding stations of the are burdened with taking a call outside of their area 139 to 190 times in a given year due to station #07 alone. In such cases, the supporting stations will not be able to serve their community. This is not to say that the mutual aid between stations or service providers is not proper. It is rather to say that having a station with overloaded calls can affect residents in and out of the service area of the overloaded station. However, merely adopting the figures in the table is not recommended. For example, station #07 responds to about 70 calls from the Bean Blossom area because the Bean Blossom area has only one part-time employee during the day time. In such a case, determining that station #07 will be in more need of personnel only from the figures on the table would be misleading. The modeling is useful when the narrative that explains numbers is also considered.

	20 minutes		40 minutes		60 minutes		90 minutes	
Stations	lower	upper	lower	upper	lower	upper	lower	upper
Bean Blossom	0	0	0	3	0	4	1	8
Benton	0	3	0	6	0	8	3	14
Station #09 VBFD	19	41	49	80	70	107	106	150
Station #19 VBFD	0	3	0	6	0	8	1	9
Station #05 NMFT	9	25	28	53	46	76	72	109
Station #15 NMFT	0	0	0	0	0	2	0	3
Station #07 EVFD	29	54	63	97	97	139	139	190
Station #08 EVFD	3	14	7	22	13	31	18	39
Station #11 MFPD	24	47	48	79	71	107	99	142
Station #21 MFPD	3	15	8	24	12	30	21	43
Station #23 MFPD	0	2	0	2	0	2	0	2

Table 2: Model results

Recommendations

9. Recommendations

During the January-April 2019 period, the O'Neil Capstone Team conducted an in-depth analysis of the PS LIT application process. For this analysis, we held interviews with stakeholders, collected survey results, analyzed Fire Department's budgets, conducted legal analysis, studied dispatch records, and took into consideration best practices from other case studies and federal guidelines. Based on the combined input from these sources, we present our final set of recommendations. These are put forward for the consideration of the Committee; the recommendations were constructed by the O'Neil Capstone Team and are not binding or accountable to any actor participating in the process. However, we do believe that incorporating some of these suggestions to the PS LIT application process would benefit participating stakeholders.

9.1. Summary of Recommendations

- ❖ Simplify Application Process
  - ➢ Changes to the Application Process
    - ■ Modify Application Time Frame
    - ■ Additional Guidelines for Applicants
      - ● Apply for funding of commonly used equipment and resources
      - ● Apply for funding of resources that would otherwise come out of each unit's General Fund
  - ➢ Multi-Year Plan: consider allowing QSPs to propose a joint multi-year plan for PS LIT funds with the support of the Committee
- ❖ In-Depth Understanding of Fire/Emergency Services' Needs
  - ➢ Bridge the distance between stakeholders: get to know the actors, work requirements and service characteristics across the County
  - ➢ Unify budget reporting format
  - ➢ Higher reliance on data for decision-making: increase the use of NFPA standards to evaluate needs whiles taking into consideration the heterogeneous nature of the services provided
- ❖ Priorities During the Decision-Making Process
  - ➢ Under-staffed departments
  - ➢ Fulfilling NFPA standards
  - ➢ Cost-saving initiatives

Reasoning for Recommendations

10. Reasoning for Recommendations

10.1. Simplify Application Process

One of the critical areas for improvement is the application process itself. Interviewees have reported that the process is overly bureaucratic, changes too much year-over-year and there is uncertainty regarding the decision-criteria. To simplify the application process, reduce workload and decrease uncertainty without compromising on decision-quality, we propose the following changes:

Changes to the Application Process:

There are two specific changes to the application process:

- Modify Application Time Frame: there are legal constraints towards extending the due date, but there are no legal barriers to starting the application process earlier in the year. There is a majority consensus amongst interviewees that starting the application earlier would improve the process.
- Additional Guidelines for Applicants: one of the PS LIT allocation challenges rises from having to choose between specialized equipment for the heterogeneous needs of QSPs. As funding is fungible, we suggest that Fire Departments rely on PS LIT for common expenditures, freeing up their own resources for their specialized needs. The guidelines for instrumenting these are:
  - Apply for funding of commonly used equipment and resources. This will simplify decision making as needs are similar across service providers and proportional to the size of service coverage.
  - Apply for funding of resources that would otherwise come out of each unit's General Fund. Relying on PS LIT funds for common expenditures will free-up the Fire Department's resources which, in turn, can be redirected to cover their specialized needs. For this to be viable for the Fire Departments, the PS LIT committee would have to commit to a consistent pattern; this is not to be confused with an amount, of funding, year to year.

Multi-Year Plan:

Another approach, compatible with those previously stated, is to consider allowing QSPs to propose a joint multi-year plan for PS LIT funds. A joint multi-year plan would have Fire Departments agree on common priority expenditures over a set of years and present a shared proposal to the PS LIT Committee. The Committee would, in turn, agree to a plan for the budget

in subsequent years. It is important to note the Committee would not pledge a specific dollar amount to the QSPs. Instead, the Committee would promise to fund the request for the first year as they deem appropriate, and give a projection for funding for the subsequent years. This process is very similar to composing a multi-year budget for a governmental body. This alternative would require higher up-front efforts, but diminish overall workload for the period. Other benefits are widespread support from stakeholders, reducing uncertainty and increasing planning efficiency.

10.2. In-Depth Understanding of Fire/Emergency Services' Needs

A key learning aspect of the PS LIT application process is the asymmetry of information between applicants and decision makers due to the highly-specialized nature of fire and emergency service requirements. The following suggestions aim at increasing understanding of QSPs needs in a way that may aid the Committee in decision-making:

- Bridge the distance between stakeholders though acknowledging the demanding nature of public representative's jobs, the understanding of QSPs specific needs can be enhanced by getting to know firefighters, workplaces, service requirements and characteristics across the County. Ride-alongs and on-site meetings may prove valuable tools in this effort.
- Unifying the budget reporting format is needed as fire/emergency service requirements are highly specific. The required equipment, funding priorities, and resource renovation timelines vary between departments. One way of improving the general understanding of QSPs' needs is to unify budget reporting formats. Budgets are vital documents for funding allocation decision-making. Setting a unified form would help clarify for the Committee members the current resources and requirements across departments.
- A higher reliance on data for decision-making can significantly improve the process. The framework we proposed for evaluating run type data, and personnel needs are examples of data-driven decision making. Though a purely data-driven choice model is not recommended due to the heterogeneous nature of services provided, we do suggest an increase in the reliance on NFPA standards to evaluate needs. We recommend including all stakeholders on deciding key indicators for use in fund allocation decision-making.

10.3. Priorities During the Decision-Making Process

The following are suggestions for factors determining priority allocation of resources during the decision-making process in cases where there is no clear consensus:

- Results from interviews and data analyzed seem to indicate that service in some areas of the County may be constrained due to understaffed Fire Departments. Additionally, though volunteer firefighters are a source of pride for the community, it is becoming increasingly challenging to recruit and retain new volunteers. Prioritizing understaffed departments could positively impact service provision in those areas and free-up resources for additional staff.
- NFPA standards are designed to ensure high-quality service provision. Funding Department's efforts to comply with NFPA standards would lead to a stronger reliance on data-driven decision-making and, if priority is given to areas lagging in service quality, would improve equity in fire services.
- As the allocating body, the Committee is concerned about the efficient use of taxpayers resources. In consequence, an additional factor in fund allocation decisions could be prioritizing applications for cost-saving initiatives. Cost-savings can adopt many forms if adequately implemented these strategies can help maximize the positive impact of PS LIT on fire and emergency service providers.

Research Improvements

11. Research Improvements

The Capstone team identified some areas that could have improved the research. Sometimes it was challenging to communicate with the stakeholders who we needed to interview or obtain information from. Better communication with the townships could have improved the research. We realized early on that communication would be challenging due to the different schedules of students and public sector employees. Having more time to spend at the fire stations shadowing or talking to firefighters instead of selectively interviewing the Chiefs may have enabled us to work more effectively or efficiently on this project and improved our research results. We also believe having more information on the individual QSPs budgets, and dispatch data would have been beneficial.

References

References

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9. National Fire Protection Association. *NFPA 1710, standard for the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by career fire departments*. National Fire Protection Association, 2010.

Appendix

Chapter 1 - Administration

Section	Subtitle	NFPA 1710	Section	Subtitle	NFPA 1720
1.1	Scope	Given in Section 1.1.1			
1.1.1		This standard contains minimum requirements relating to the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by substantially all career fire departments.	1.1	Scope	This standard contains minimum requirements relating to the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by substantially all volunteer fire departments.
1.1.2		The requirements address functions and objectives of fire department emergency service delivery, response capabilities, and resources.	1.1.1		The requirements address functions and outcomes of fire department emergency service delivery, response capabilities, and resources.
1.1.3		This standard also contains minimum requirements for managing resources and systems, such as health and safety, incident management, training, communications, and pre-incident planning.	1.1.2		This standard also contains minimum requirements for managing resources and systems, such as health and safety, incident management, training, communications, and pre-incident planning.
1.1.4		This standard addresses the strategic and system issues involving the organization, operation, and deployment of a fire department and does not address tactical operations at a specific emergency incident.	1.1.3		This standard addresses the strategic and system issues involving the organization, operation, and deployment of a fire department and does not address tactical operations at a specific emergency incident.
		NO CORRESPONDING LANGUAGE	1.1.4		This standard does not address fire prevention, community education, fire investigations, support services, personnel management, and budgeting.
1.2	Purpose		1.2	Purpose	
1.2.1		The purpose of this standard is to specify the minimum criteria addressing the effectiveness and efficiency of the career public fire suppression operations, emergency medical service, and special operations delivery in protecting the public of the jurisdiction and the occupational safety and health of fire department employees.	1.2.1		The purpose of this standard is to specify the minimum criteria addressing the effectiveness and efficiency of the volunteer public fire suppression operations, emergency medical service, and special operations delivery in protecting the citizens of the jurisdiction.
1.2.2		Nothing herein is intended to restrict any jurisdiction from exceeding these minimum requirements.	1.2.2		Nothing herein is intended to restrict any jurisdiction from exceeding these minimum requirements.

		NFPA 1710			NFPA 1720
		NO CORRESPONDING LANGUAGE	1.2.3		The authority having jurisdiction determines if this standard is applicable to their fire dept.
		Chapter 2 - Referenced Publications			
2.1		The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this document.	2.1		The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this document.
2.1.1	NFPA Publications	National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-1901	2.1.1	NFPA Publications	National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-1901
		NFPA 295, *Standard for Wildfire Control*, 1998 edition			Not referenced
		NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*, 1998 edition			Not referenced
		NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents,* 1997 edition.			NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents,* 1997 edition.
		NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 1999 edition.			NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 1999 edition.
		NFPA 1500, *Standard of Fire Department Occupational Safety and Health Program*, 1997 edition.			NFPA 1500, *Standard of Fire Department Occupational Safety and Health Program*, 1997 edition.
		NFPA 1561, *Standard of Emergency Services Incident Management System*, 2000 edition.			NFPA 1561, *Standard of Emergency Services Incident Management System*, 2000 edition.
		NFPA 1670, *Standard of Operations and Training for Technical Rescue Incidents*, 1999 edition.			Not referenced
2.1.2	Other Publications				Not referenced
2.1.2.1		U.S. Government Publications, U.S. Government Printing Office, Washington, D.C. 20402			Not referenced
		Title 29, *Code of Federal Regulations*, Part 1910.120, "Hazardous Waste Operations and Emergency Response," 1986			Not referenced
		Title 29, *Code of Federal Regulations*, Part 1910.146, "Permit-Required Confined Space."			Not referenced

	NFPA 1710			NFPA 1720	
		Chapter 3 - Definitions			
3.1	General Terms	The definitions contained in this section shall apply to the terms as used in this standard. Where terms are not included in this section, common usage of the term shall apply.	3.1	General Terms	The definitions contained in this section shall apply to the terms as used in this standard. Where terms are not included in this section, common usage of the term shall apply.
3.1.1	Aid		3.1.1	Aid	
3.1.1.1	Automatic Aid	A plan developed between two or more fire departments for immediate joint response on first alarms.	3.1.1.1	Automatic Aid	The pre-determined response of personnel and equipment for an alarm to a neighboring jurisdiction.
3.1.1.2	Mutual Aid	Reciprocal assistance by emergency services under a prearranged plan.	3.1.1.2	Mutual Aid	A written policy or contract to allow for the deployment of personnel and equipment to respond to an alarm in another jurisdiction. (See also definition 3.1.1.1, Automatic Aid)
3.1.2	Aircraft Rescue and Fire Fighting	The fire-fighting actions taken to rescue persons and to control or extinguish fire involving or adjacent to aircraft on the ground.			NO CORRESPONDING LANGUAGE
3.1.3	Aircraft Rescue and Fire-Fighting (ARFF)Vehicle	A vehicle intended to carry rescue and fire-fighting equipment for rescuing occupants and combating fires in aircraft at, or in the vicinity of, an airport.			NO CORRESPONDING LANGUAGE
3.1.4	Airport Fire Dept. Personnel	Personnel under the operational jurisdiction of the chief of the airport fire department assigned to aircraft rescue and fire fighting.			NO CORRESPONDING LANGUAGE
3.1.5	Alarm	A signal or message from a person or device indicating the existence of a fire, medical emergency, or other situation that requires fire department action.	3.1.2	Alarm	A signal or message from a person or device indicating the existence of a fire, medical emergency or other situation that requiresemergency services response.
3.1.6	Apparatus	A motor-driven vehicle or group of vehicles designed and constructed for the purpose of fighting fires.			NO CORRESPONDING LANGUAGE
3.1.6.1	Fire Apparatus	A fire department emergency vehicle used for rescue, fire suppression, or other specialized functions.	3.1.7	Fire Apparatus	A fire department emergency vehicle used for rescue, fire suppression, or other specialized functions.

		NFPA 1710			NFPA 1720
3.1.6.2	Quint Apparatus	A fire department emergency vehicle with a permanently mounted fire pump, a water tank, a hose storage area, an aerial device with a permanently mounted waterway, and a complement of ground ladders.			NO CORRESPONDING LANGUAGE
3.1.6.3	Specialized Apparatus	A fire department emergency vehicle that provides support services at emergency scenes, including command vehicles, rescue vehicles, hazardous material containment vehicles, air supply vehicles, electrical generation and lighting vehicles, or vehicles used to transport equipment and personnel.			NO CORRESPONDING LANGUAGE
3.1.7	Attack				NO CORRESPONDING LANGUAGE
3.1.7.1	Initial Attack	Fire-fighting efforts and activities that occur in the time increment between the arrival of the fire department on the scene of a fire and the tactical decision by the incident commander that the resources dispatched on the original response will be insufficient to control and extinguish the fire, or that the fire is extinguished.	3.1.17	Initial Attack	Fire-fighting efforts and activities which occur in the time increment between the arrival of the fire department on the scene of a fire and the tactical decision by the Incident Commander that the resources dispatched on the original response will be insufficient to control and extinguish the fire, or that the fire is extinguished.
3.1.7.2	Sustained Attack	The activities of fire confinement, control, and extinguishment that are beyond those assigned to the initial responding companies.			NO CORRESPONDING LANGUAGE
3.1.8	Company	A group of members: (a) Under the direct supervision of an officer (b) Trained and equipped to perform assigned tasks (c) Usually organized and identified as engine companies, ladder companies, rescue companies, squad companies, or multi-functional companies (d) Operating with one piece of fire apparatus (engine, ladder truck, elevating platform, quint, rescue, squad, ambulance), except where multiple apparatus are assigned that are dispatched and arrive together, are continuously operated together, and are managed by a single company officer.	3.1.3	Company	A group of members within the following characteristics: (1) Under the direct supervision of an officer (2) Trained and equipped to perform assigned tasks (3) Usually organized and identified as engine companies, ladder companies, rescue companies, squad companies, or multi-functional companies (4) Usually operating with one piece of fire apparatus (engine, ladder truck, elevating platform, quint, rescue, squad, ambulance) (5) Arriving at the incident scene on fire apparatus. Company, as used in this standard, is synonymous with company unit, response team, crew, and response group, rather than a synonym for a fire department.

		NFPA 1710			NFPA 1720
		(e) Arriving at the incident scene on fire apparatus. "Company", as used in this standard is synonymous with company unit, response team, crew, and response group, rather than a synonym for a fire department.			(6) Company configurations shall be permitted to allow for multiple apparatus that are dispatched and arrive together and continuously operations together and are managed by a single company officer.
3.1.9	Emergency Incident	A specific emergency operation.	3.1.4	Emergency Incident	A specific emergency operation.
3.1.10	Emergency Medical Care	The provision of treatment to patients, including first aid, cardiopulmonary resuscitation, basic life support (EMT level), advanced life support (Paramedic level), and other medical procedures that occur prior to arrival at a hospital or other health care facility.	3.1.5	Emergency Medical Care	The provision of treatment to patients, including first aid, cardiopulmonary resuscitation,First Responder, Basic Life Support, Advanced Life Support, and other medical procedures that occur prior to arrival at a hospital or other health care facility.
3.1.11	Emergency Operations	Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene.	3.1.6	Emergency Operations	Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene.
3.1.12	Fire Chief	The highest ranking officer in charge of a fire department.			NO CORRESPONDING LANGUAGE
3.1.13	Fire Department Member	See definition 3.1.28, Member.	3.1.8	Fire Department Member	See Definition 3.1.19, Member.
3.1.14	Fire Department Vehicle	Any vehicle, including fire apparatus, operated by a fire department.	3.1.9	Fire Department Vehicle	Any vehicle, including fire apparatus, operated by a fire department.
3.1.15	Fire Protection	Methods of providing for fire control or fire extinguishment.	3.1.10	Fire Protection	Methods of providing firedetection, control, and extinguishment.
3.1.16	Fire Suppression	The activities involved in controlling and extinguishing fires.	3.1.11	Fire Suppression	The activities involved in controlling and extinguishing fires.
3.1.17	First Responder (EMS)	Functional provision of initial assessment (I.e. airway, breathing, and circulatory systems) and basic first aid intervention, including CPR and automatic external defibrillator (AED) capability.	3.1.12	First Responder (EMS)	Functional provision of initial assessment (airway, breathing, and circulatory systems) and basic first aid intervention, including CPR and automatic external defibrillator (AED) capability.
3.1.18	Forcible Entry	Techniques used by fire personnel to gain entry into buildings, vehicles, aircraft, or other areas of confinement when normal means of entry are locked or blocked.			NO CORRESPONDING LANGUAGE

	NFPA 1710			NFPA 1720	
3.1.19	Hazard	The potential for harm or damage to people, property, or the environment.	3.1.13	Hazard	The potential for harm or damage to people, property, or the environment.
3.1.20	Hazardous Material	A substance that presents an unusual danger to persons due to properties of toxicity, chemical reactivity, or decomposition, corrosivity, explosion or detonation, etiological hazards, or similar properties.	3.1.14	Hazardous Material	A substance that presents an unusual danger to persons due to properties of toxicity, chemical reactivity, or decomposition, corrosivity, explosion or detonation, etiological hazards, or similar properties.
3.1.21	High Hazard Occupancy	Building that has high hazard materials, processes, or contents.			NO CORRESPONDING LANGUAGE
3.1.22	Incident Commander	The fire department member in overall command of an emergency incident.	3.1.15	Incident Commander	The fire department member in overall command of an emergency incident.
3.1.23	Incident Management System (IMS)	An organized system of roles, responsibilities, and standard operating procedures used to manage emergency operations.	3.1.16	Incident Management System (IMS)	An organized system of roles, responsibilities, and standard operating procedures used to manage emergency operations.
3.1.24	Initial Full Alarm Assignment	Those personnel, equipment, and resources ordinarily dispatched upon notification of a structural fire.			NO CORRESPONDING LANGUAGE
3.1.25	Initial Rapid Intervention Crew (IRIC	Two members of the initial attack crew who are assigned for rapid deployment to rescue lost or trapped members.			NO CORRESPONDING LANGUAGE
3.1.26	Life Support		3.1.18	Life Support	
3.1.26.1	Advanced Life Support (ALS)	Functional provision of advanced airway management, including intubation, advanced cardiac monitoring, manual defibrillation, establishment and maintenance of intravenous access, and drug therapy.	3.1.18.1	Advanced Life Support (ALS) (EMS)	Functional provision of advanced airway management, including intubation, advanced cardiac monitoring, manual defibrillation, establishment and maintenance of intravenous access, and drug therapy.
3.1.26.2	Basic Life Support (BLS)	Functional provision of patient assessment, including basic airway management; oxygen therapy; stabilization of spinal, musculo-skeletal, soft tissue, and shock injuries; stabilization of bleeding; and stabilization and intervention or sudden illness; poisoning and heat/cold injuries, childbirth, CPR, and automatic external defibrillator (AED) capability.	3.1.18.2	Basic Life Support (BLS)	Functional provision of patient assessment; basic airway management; oxygen therapy; stabilization of spinal, musculo-skeletal, soft tissue; and shock injuries; stabilization of bleeding; stabilization and intervention for sudden illness; poisoning and heat/cold injuries, childbirth, CPR, and automatic external defibrillator (AED) capability.

	NFPA 1710			NFPA 1720	
3.1.27	Marine Rescue and Fire Fighting	The fire-fighting action taken to prevent, control, or extinguish fire involved in or adjacent to a marine vessel and the rescue actions for occupants using normal and emergency routes for egress.			NO CORRESPONDING LANGUAGE
3.1.28	Member	A person involved in performing the duties and responsibilities of a fire department under the auspices of the organization.	3.1.19	Member	A person(s) involved in performing the duties and responsibilities of a fire department under the auspices of the organization. A fire department member can be a full time or part time employee or a paid or unpaid volunteer, can occupy any position or rank within the fire department, and can engage in emergency operations.
3.1.29	Officer		3.1.20	Officer	
3.1.29.1	Company Officer	A supervisor of a crew/company of personnel.	3.1.20.1	Company Officer	A supervisor of a crew/company of personnel.
3.1.29.2	Supervisory Chief Officer	A member whose responsibility is to assume command through a formalized transfer of command process and to allow company officers to directly supervise personnel assigned to them.	3.1.20.2	Supervisory Chief Officer	A member whose responsibility is above that of a company officer, who responds automatically and/or is dispatched to an alarm beyond the initial alarm capabilities, or other special calls. The purpose of their response is to assume command, through a formalized transfer of command process, and to allow company officers to directly supervise personnel assigned to them.
3.1.30	Public Fire Department	An organization providing rescue, fire suppression, emergency medical services, and related activities to the public.	3.1.21	Public Fire Department	An organization providing rescue, fire suppression, emergency medical services and related activities to the public. The term *fire department* shall include any public, governmental, private, or military organization engaging in this type of activity.
3.1.31	Public Safety Answering Point (PSAP)	Any facility where 911 calls are answered, either directly or through rerouting.			NO CORRESPONDING LANGUAGE
3.1.32	Rapid Intervention Crew (RIC)	A dedicated crew of fire fighters who are assigned to rapid deployment to rescue lost or trapped members.	3.1.22	Rapid Intervention Crew (RIC)	A dedicated crew of fire fighters who are assigned to account for and rescue trapped or lost members.
3.1.33	Related Activities	Any and all functions that fire department members can be called upon to perform in the performance of their duties.			NO CORRESPONDING LANGUAGE

		NFPA 1710			NFPA 1720
3.1.34	Rescue	Those activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health care facility.	3.1.23	Rescue	Those activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health care facility.
3.1.35	Special Operations	Those emergency incidents to which the fire department responds that require specific and advanced training and specialized tools and equipment.	3.1.24	Special Operations	Those emergency incidents to which the fire department responds that require specific and advanced training and specialized tools and equipment.
3.1.36	Staff Aide	A fire fighter or fire officer assigned to a supervisory chief officer to assist with the logistical, tactical, and account-ability functions of incident, division, or sector command.			NO CORRESPONDING LANGUAGE
3.1.37	Standard Oper-ating Procedure	An organizational directive that establishes a standard course of action.	3.1.25	Standard Oper-ating Procedure	An organizational directive that establishes a standard course of action.
3.1.38	Structural Fire Fighting	The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures,aircraft interiors, vehicles, vessels, aircraft, or like properties that are involved in a fire or emergency situation.	3.1.26	Structural Fire Fighting	The activities of rescue, fire suppression, and property conservation involving buildings, enclosed structures, vehicles, vessels, aircraft, or like properties that are involved in a fire or emergency situation.
3.1.39	Tactical Considerations	Specific fire-fighting objectives that will present an unusually significant fire or life safety hazard when they are conducted in a fire or other emergency.			NO CORRESPONDING LANGUAGE
3.1.40	Team	Two or more individuals who have been assigned a common task and are in communication with each other, coordinate their activities as a work group, and support the safety of one another	3.1.27	Team	Two or more fire fighters operating in the buddy system.
3.1.41	Time				NO CORRESPONDING LANGUAGE
3.1.41.1	Alarm Time	The point of receipt of the emergency alarm at the public safety answering point to the point where sufficient information is known to the dispatcher to deploy applicable units to the emergency.			NO CORRESPONDING LANGUAGE
3.1.41.2	Call Processing Time	See definition 3.1.41.3, Dispatch Time			NO CORRESPONDING LANGUAGE

		NFPA 1710			NFPA 1720
3.1.41.3	Dispatch Time	The point of receipt of the emergency alarm at the public safety answering point to the point where sufficient information is known to the dispatcher and applicable units are notified of the emergency.			NO CORRESPONDING LANGUAGE
3.1.41.4	Response time	The time that begins when units are en-route to the emergency incident and ends when units arrive at the scene.			NO CORRESPONDING LANGUAGE
3.1.41.5	Turnout Time	The time beginning when units acknowledge notification of the emergency to the beginning point of response time.			NO CORRESPONDING LANGUAGE
3.2	Official NFPA Definitions		3.2	Official NFPA Definitions	
3.2.1	Approved	Acceptable to the authority having jurisdiction.	3.2.1	Approved	Acceptable to the authority having jurisdiction.
3.2.2	Authority Having Jurisdiction	The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.	3.2.2	Authority Having Jurisdiction	The organization, office, or individual responsible for approving equipment, materials, an installation or a procedure.
3.2.3	Shall	Indicates a mandatory requirement.	3.2.3	Shall	Indicates a mandatory requirement.
3.2.4	Should	Indicates a recommendation or that which is advised but not required	3.2.4	Should	Indicates a recommendation or that which is advised but not required and its use is limited to the appendix.
		Chapter 4 - Organization			**Chapter 4 - Organization, Operation and Deployment**
4.1	Fire Department Organizational Statement		4.1	Fire Suppression Organization	Fire suppression operations shall be organized to ensure the fire department's fire suppression capability includes sufficient personnel, equipment, and other resources to efficiently, effectively, and safely deploy fire suppression resources.

	NFPA 1710		NFPA 1720
4.1.1	The authority have jurisdiction shall maintain a written statement or policy that establishes the following: (1) Existence of the fire department (2) Services that the fire department is required to provide (3) Basic organizational structure (4) Expected number of fire department members (5) Functions that fire department members are expected to perform	4.1.1	The authority having jurisdiction shall promulgate the fire department's organizational, operational, and deployment procedures by issuing written administrative regulations, standard operating procedures, and departmental orders.
4.1.2	The fire department organizational statement shall include service delivery objectives.	4.1.2	The fire department shall participate in a process that develops a community risk management plan with respect to the risks associated with the storage, use, and transportation of hazardous materials. The specific role of the fire department and other responding agencies shall be defined by the community risk management plan for hazardous materials and other special operations.
4.1.2.1	These objectives shall include specific response time objectives for each major service component (I.e. fire suppression, EMS, special operations, aircraft rescue and fire fighting, marine rescue and fire fighting, and/or wildland fire fighting) and objectives for the percentage of responses that meet the response time objectives.		NO CORRESPONDING LANGUAGE
4.1.2.1.1	The fire department shall establish the following time objectives of: (1) The time objective for turnout time shall be one-minute (60 seconds) (2) Four minutes (240 seconds) or less for the arrival of the first arriving engine company at a fire suppression incident and/or 8 minutes (480 seconds) or less for the deployment of a full first alarm assignment at a fire suppression incident. (3) Four minutes (240 seconds) or less for the arrival of a unit with first responder or higher level capability at an emergency medical incident (4) Eight minutes (480 seconds) or less for the arrival of an advanced life support unit at an emergency medical incident, where this service is provided by the fire dept.	4.2.2.1	Upon assembling the necessary resources, at the emergency scene, the fire department shall have the capability to safely initiate an initial attack within 2 minutes 90 percent of the time.

	NFPA 1710		NFPA 1720
4.1.2.1.2	The fire department shall establish a performance objective of not less than 90 percent for the achievement of each response time objective specified in 4.1.3.2.1.		NO CORRESPONDING LANGUAGE
4.1.2.1.3	The fire department shall evaluate their level of service and deployment delivery and response time objectives on an annual basis. The evaluations shall be based on data relating to level of service, deployment, and the achievement of each response time objective in each geographic area within the jurisdiction of the fire department.		NO CORRESPONDING LANGUAGE
4.1.2.1.4	The fire department shall provide the authority having jurisdiction with a written report, quadrennially, which shall be based on the annual evaluations required by 4.1.2.1.3.		NO CORRESPONDING LANGUAGE
4.1.2.1.4.1	The quadrennial report shall define the geographic areas and/or circumstances in which the requirements of this standard are not being met.		NO CORRESPONDING LANGUAGE
4.1.2.1.4.2	This report shall explain the predictable consequences of these deficiencies and address the steps that are necessary to achieve compliance.		NO CORRESPONDING LANGUAGE
	NO CORRESPONDING LANGUAGE	4.1.3	Fire department procedures shall clearly state the succession of command responsibility.
	NO CORRESPONDING LANGUAGE	4.1.4	Personnel responding to fires and other emergencies shall be organized into company units or response teams and shall have appropriate apparatus and equipment.
	NO CORRESPONDING LANGUAGE	4.1.5	The fire department shall identify minimum staffing requirements to ensure that a sufficient number of members are available to operate safely and effectively.
	NO CORRESPONDING LANGUAGE	4.1.6	The fire department shall maintain a standard report containing specified information for each response. These reports shall include the location and nature of the fire or emergency and describe the operations performed. This report shall identify the members responding to the incident.

		NFPA 1710			NFPA 1720
		NO CORRESPONDING LANGUAGE	4.1.7		Standard response assignments and procedures, including mutual aid response and mutual aid agreements predetermined by the location, and nature of the reported incident shall regulate the dispatch of companies, response groups, and command officers to fires and other emergency incidents.
		NO CORRESPONDING LANGUAGE	4.1.8		The number and type of units assigned to respond to a reported incident shall be determined by either risk analysis and/or pre-fire planning.
4.2	Fire Suppression Services	The fire department organizational statement shall set forth the criteria for the various types of fire suppression incidents to which the fire department is required to respond.	4.2	Fire Suppression Operations	
		NO CORRESPONDING LANGUAGE	4.2.1	Incident Commander	One individual shall be assigned as the incident commander
		NO CORRESPONDING LANGUAGE	4.2.1.1		The assumption and identification of command shall be communicated to all units responding to or involved at the incident scene.
		NO CORRESPONDING LANGUAGE	4.2.1.2		The incident commander shall be responsible for the overall coordination and direction of all activities for the duration of the incident.
		NO CORRESPONDING LANGUAGE	4.2.1.3		The incident commander shall ensure that a personnel accountability system is immediately utilized to rapidly account for all personnel at the incident scene.
		NO CORRESPONDING LANGUAGE	4.2.1.4		The company officer/crew leader shall at all times be aware of the identity, location, and activity of each member assigned to the company.
		NO CORRESPONDING LANGUAGE	4.2.1.5		Each member of the company shall be aware of the identity of the company officer/crew leader.
		NO CORRESPONDING LANGUAGE	4.2.1.6		Orders addressed to individual members, particularly verbal orders and orders at incident scenes, shall be transmitted through the company officer.

NFPA 1710				NFPA 1720
		NO CORRESPONDING LANGUAGE	4.2.2 Initial Attack	
		NO CORRESPONDING LANGUAGE	4.2.2.2	Initial attack operations shall be organized to ensure that at least four members shall be assembled before initiating interior fire suppression operations at a working structural fire.
		NO CORRESPONDING LANGUAGE	4.2.2.2.1	In the hazardous area two individuals shall work as a team.
		NO CORRESPONDING LANGUAGE	4.2.2.2.2	Outside the hazardous area two individuals shall be present for assistance or rescue of the team operating in the hazardous area. One of the two individuals assigned outside the hazardous area shall be permitted to be engaged in other activities.
		NO CORRESPONDING LANGUAGE	4.2.2.2.3	The assignment of any individuals shall not be permitted if abandoning their critical task(s) to perform rescue clearly jeopardizes the safety and health of any fire fighter operating at the incident.
		NO CORRESPONDING LANGUAGE	4.2.2.3	Initial attack operation shall be organized to ensure that if, upon arrival at the emergency scene, initial attack personnel find an imminent life-threatening situation where immediate action could prevent the loss of life or serious injury, such action shall be permitted with less than four personnel when conducted in accordance with NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program.*
4.3	Emergency Medical Svcs.		4.4 Emergency Medical Svcs.	
4.3.1		The fire department organizational statement shall set forth the criteria for the various types of emergency medical incidents to which the fire department is required and/or expected to respond.		NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
4.3.2		The fire department organizational statement shall ensure the fire department's emergency medical response capability includes personnel, equipment, and resources to deploy at the first responder level with automatic external defibrillator (AED) or higher treatment level.	NO CORRESPONDING LANGUAGE
4.3.2.1		Where emergency medical services beyond the first responder with automatic defibrillator level are provided by another agency or private organization, the authority having jurisdiction based upon recommendations from the fire department, shall include the minimum staffing, deployment and response criteria as required in Section 5.3 in: (1) The fire department organizational statement (2) Any contract, service agreement, governmental agreement or memorandum of understanding between the authority having jurisdiction and the other agency or private organization.	NO CORRESPONDING LANGUAGE
4.4	Special Operations		NO CORRESPONDING LANGUAGE
4.4.1		The fire department organizational statement shall set forth the criteria for the various types of special operations response and mitigation activities to which the fire department is required and/or expected to respond.	NO CORRESPONDING LANGUAGE
4.4.2		The fire department organizational statement shall ensure the fire department's hazardous materials response capability includes personnel, equipment, and resources to deploy at the first responder operational level as required by 29 CFR 1910.120.	NO CORRESPONDING LANGUAGE
4.4.3		The fire department organizational statement shall ensure the fire department's confined space response capability includes personnel, equipment, and resources to deploy at the confined space operational level as required by 29 CFR 1910.146.	NO CORRESPONDING LANGUAGE

		NFPA 1710			NFPA 1720
4.4.4		The fire department organizational statement shall set forth the criteria for the various types of fire department response during natural disasters or terrorism incidents, weapons of mass destruction incidents, or large scale or mass casualty events.			NO CORRESPONDING LANGUAGE
4.5	Airport Rescue and Fire-Fighting Services	The fire department organizational statement shall set forth the criteria for the various types of airport rescue and fire-fighting incidents to which the fire department is required and/or expected to respond.			NO CORRESPONDING LANGUAGE
4.6	Marine Rescue and Fire-Fighting Services	The fire department organizational statement shall set forth the criteria for the various types of marine rescue and fire-fighting incidents to which the fire department is required and/or expected to respond.			NO CORRESPONDING LANGUAGE
4.7	Wildland Fire Suppression Services	The fire department organizational statement shall set forth the criteria for the various types of wildland fire suppression incidents to which the fire department is required and/or expected to respond.			NO CORRESPONDING LANGUAGE
4.8	Intercommunity Organization		4.3	Intercommunity Organization	
4.8.1		Mutual aid, automatic aid, and fire protection agreements shall be in writing and shall address such issues as liability for injuries and deaths, disability retirements, cost of service, authorization to respond, staffing, and equipment, including the resources to be made available and the designation of the incident commander.	4.3.1		Mutual aid, automatic aid, and fire protection agreements shall be in writing and shall address such issues as liability for injuries and deaths, disability retirements, cost of service, authorization to respond, staffing, and equipment, including the resources to be made available and the designation of the incident commander.
4.8.2		Procedures and training of personnel for all fire departments in mutual aid, automatic aid, and fire protection agreement plans shall be comprehensive to produce an effective fire force and to ensure uniform operations.	4.3.2		Procedures and training of personnel for all fire departments in mutual aid, automatic aid, and fire protection agreement plans shall be comprehensive to produce an effective fire force and to ensure uniform operations.
4.8.3		Companies responding to mutual aid incidents shall be equipped with communications equipment that allow personnel to communicate with incident commander and division supervisors, group supervisors, or sector officers.	4.3.3		Companies responding to mutual aid incidents shall be equipped with communications equipment that allow personnel to communicate with incident commander and division officers, group officers, or sector officers.

		NFPA 1710	NFPA 1720
		Chapter 5 - Fire Department Services	
5.1	Purpose		NO CORRESPONDING LANGUAGE
5.1.1		The services provided by the fire department shall include those activities as required by Chapter 4.	NO CORRESPONDING LANGUAGE
5.1.2		The procedures involved in these services, including operations and deployment, shall be established through written administrative regulations, standard operating procedures, and departmental orders.	NO CORRESPONDING LANGUAGE
5.2	Fire Suppression Services	Fire suppression operations shall be organized to ensure the fire department's fire suppression capability includes personnel, equipment, and resources to deploy the initial arriving company, the full initial alarm assignment, and additional alarm assignments. The fire department shall be permitted to use established automatic mutual aid and mutual aid agreements to comply with the requirements of Section 5.2.	NO CORRESPONDING LANGUAGE
5.2.1	Staffing		NO CORRESPONDING LANGUAGE
5.2.1.1		On-duty fire suppression personnel shall be comprised of the numbers necessary for fire-fighting performance relative to the expected fire-fighting conditions. These numbers shall be determined through task analyses that take the following factors into consideration: (1) Life hazard to the populace protected (2) Provisions of safe and effective fire-fighting performance conditions for the fire fighters (3) Potential property loss (4) Nature, configuration, hazards, and internal protection of the properties involved (5) Types of fireground tactics and evolutions employed as standard procedure, type of apparatus used, and results expected to be obtained at the fire scene	NO CORRESPONDING LANGUAGE
5.2.1.2		On-duty personnel assigned to fire suppression shall be organized into company units and shall have appropriate apparatus and equipment assigned to such companies.	NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
5.2.1.2.1		The fire department shall identify minimum company staffing levels as necessary to meet the deployment criteria required in 5.2.3 to ensure that a sufficient number of members are assigned, on-duty, and available to safely and effectively respond with each company.	NO CORRESPONDING LANGUAGE
5.2.1.2.2		Each company shall be led by an officer who shall be considered a part of the company.	NO CORRESPONDING LANGUAGE
5.2.1.2.3		Supervisory chief officers shall be dispatched or notified to respond to all full alarm assignments.	NO CORRESPONDING LANGUAGE
5.2.1.2.4		The supervisory chief officer shall ensure that the incident management system is established as required in Section 6.2.	NO CORRESPONDING LANGUAGE
5.2.1.2.5		Supervisory chief officers shall have staff aides deployed to them for purposes of incident management and accountability at emergency incidents.	NO CORRESPONDING LANGUAGE
5.2.2	Operating Units	Fire company staffing requirements shall be based on minimum levels for emergency operations for safety, effectiveness, and efficiency.	NO CORRESPONDING LANGUAGE
5.2.2.1		Fire companies whose primary functions are to pump and deliver water and perform basic fire fighting at fires, including search and rescue, shall be known as engine companies.	NO CORRESPONDING LANGUAGE
5.2.2.1.1		These companies shall be staffed with a minimum of four on-duty personnel.	NO CORRESPONDING LANGUAGE
5.2.2.1.2		In jurisdictions with tactical hazards, high hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors as identified by the authority having jurisdiction, these companies shall be staffed with a minimum of five or six on-duty members.	NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
5.2.2.2		Fire companies whose primary functions are to perform the variety of services associated with truck work, such as forcible entry, ventilation, search and rescue, aerial operations for water delivery and rescue, utility control, illumination, overhaul, and salvage work, shall be known as ladder or truck companies.	NO CORRESPONDING LANGUAGE
5.2.2.2.1		These companies shall be staffed with a minimum of four on-duty personnel.	NO CORRESPONDING LANGUAGE
5.2.2.2.2		In jurisdictions with tactical hazards, high hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors as identified by the authority having jurisdiction, these companies shall be staffed with a minimum of five or six on-duty personnel.	NO CORRESPONDING LANGUAGE
5.2.2.3		Other types of companies equipped with specialized apparatus and equipment shall be provided to assist engine and ladder companies where deemed necessary as part of established practice.	NO CORRESPONDING LANGUAGE
5.2.2.3.1		These companies shall be staffed with a minimum number of on-duty personnel as required by the tactical hazards, high hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors as identified by the authority having jurisdiction.	NO CORRESPONDING LANGUAGE
5.2.2.4		Fire companies that deploy with quint apparatus, designed to operate as either an engine company or a ladder company, shall be staffed as specified in 5.2.2. If the company is expected to perform multiple roles simul-taneously, additional staffing, above the levels specified in 5.2.2, shall be provided to ensure that those operations can be performed safely, effectively, and efficiently.	NO CORRESPONDING LANGUAGE
5.2.3	Deployment		NO CORRESPONDING LANGUAGE
5.2.3.1	Initial Arriving Company		NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
5.2.3.1.1		The fire department's fire suppression resources shall be deployed to provide for the arrival of an engine company within a 4-minute response time and/or the initial full alarm assignment within an 8-minute response time to 90 percent of the incidents as established in Chapter 4.	NO CORRESPONDING LANGUAGE
5.2.3.1.2		Personnel assigned to the initial arriving company shall have the capability to implement an initial rapid intervention crew (IRIC).	NO CORRESPONDING LANGUAGE
5.2.3.2	Initial Full Alarm Assignment Capability		NO CORRESPONDING LANGUAGE
5.2.3.2.1		The fire department shall have the capability to deploy an initial full alarm assignment within an 8-minute response time to 90 percent of the incidents as established in Ch. 4.	NO CORRESPONDING LANGUAGE
5.2.3.2.2		The initial full alarm assignment shall provide for the following: (a) Establishment of incident command outside of the hazard area for the overall coordination and direction of the initial full alarm assignment. A minimum of one individual shall be dedicated to this task. (b) Establishment of an uninterrupted water supply of a minimum 1480 L/min (400 gpm) for 30 minutes. Supply line(s) shall be maintained by an operator who shall ensure uninterrupted water flow application. (c) Establishment of an effective water flow application rate of 1110 L/min (300 gpm) from two handline, each of which shall have a minimum of 370 L/min (100 gpm). Attack and backup lines shall be operated by a minimum of two personnel each to effectively and safely maintain the line. (d) Provision of one support person for each attack and backup line deployed to provide hydrant hookup, assist in line lays, utility control, and forcible entry. (e) A minimum of one victim search and rescue team shall be part of the initial full alarm assignment. Each search and rescue team shall consist of a minimum of two personnel.	NO CORRESPONDING LANGUAGE

		NFPA 1710		NFPA 1720
		(f) A minimum of one ventilation team shall be part of the initial full alarm assignment. Each ventilation team shall consist of a minimum of two personnel. (g) If an aerial device is used in operations, one person shall function as an aerial operator who shall maintain primary control of the aerial device at all times. (h) Establishment of an IRIC that shall consist of a minimum of two properly equipped and trained personnel.		
5.2.3.3	Additional Alarm Assignments			NO CORRESPONDING LANGUAGE
5.2.3.3.1		The fire department shall have the capability for additional alarm assignments that can provide for additional personnel and additional services, including the application of water to the fire; engagement in search and rescue, forcible entry, ventilation, and preservation of property; accountability for personnel; and provision of support activities for those situations that are beyond the capability of the initial full alarm assignment.	4.2.2.4	The fire department shall have the capability for sustained operations, including fire suppression; engagement in search and rescue, forcible entry, ventilation, and preservation of property; accountability for personnel; a dedicated rapid intervention crew (RIC); and provision of support activities for those situations that are beyond the capability of the initial attack.
5.2.3.3.2		When an incident escalates beyond an initial full alarm assignment or when significant risk is present to fire fighters due to the magnitude of the incident, the incident commander shall upgrade the IRIC to a full rapid intervention crew(s) (RIC) that consists of four fully equipped and trained fire fighters.		NO CORRESPONDING LANGUAGE
5.2.3.3.3		A safety officer shall be deployed to all incidents that escalates beyond an initial full alarm assignment or when significant risk is present to fire fighters. The safety officer shall ensure that the safety and health system is established as required in Section 6.1.		NO CORRESPONDING LANGUAGE
5.3	Emergency Medical Svcs.			

		NFPA 1710			NFPA 1720
5.3.1	Purpose	EMS operations shall be organized to ensure the fire department's emergency medical capability includes personnel, equipment, and resources to deploy the initial arriving company and additional alarm assignments. The fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 5.3.	4.4.1		EMS operations shall be organized to ensure the fire department's emergency medical capability includes personnel, equipment, and resources to deploy the initial arriving company and additional alarm assignments. The fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 4.4.
5.3.1.1		The purpose of this section shall be to provide standards for the delivery of EMS by fire departments.	4.4.1.1		The provisions of this chapter shall apply to fire departments that are involved in the delivery of emergency medical services.
5.3.1.2		The fire department shall clearly document its role, responsibilities, functions, and objectives for the delivery of EMS.	4.4.1.2		The fire department shall clearly document its role, responsibilities, functions, and objectives for the delivery of EMS.
5.3.2	System Components				
5.3.2.1		The basic treatment levels within an EMS system, for the purposes of this standard, shall be categorized as first responder, basic life support (BLS), and advanced life support (ALS). The specific patient treatment capabilities associated with each level shall be determined by the authority having jurisdiction for the approval and licensing of EMS providers within each state and province.	4.4.2	System Components	The basic treatment levels within an EMS system, for the purposes of this standard, shall be categorized as first responder, basic life support (BLS), and advanced life support (ALS). The specific patient treatment capabilities associated with each level shall be determined by the authority having jurisdiction for the approval and licensing of EMS providers within each state and province.
5.3.2.2		The minimal level of training for all fire fighters that respond to emergency incidents shall be to the first responder/ AED level. The authority having jurisdiction shall determine if further training is required.			
5.3.3	EMS System Functions		4.4.3	EMS System Functions	
5.3.3.1		The five basic functions within a career fire department EMS system shall be as follows: (1) Initial response to provide medical treatment at the location of the emergency(first responder with AED capability or higher) (2) BLS response	4.4.3.1		The following shall be considered the five basic functions within an EMS system: (1) First Responder (2) BLS response (3) ALS response (4) Patient transport in an ambulance or alternative

		NFPA 1710		NFPA 1720
		(3) ALS response (4) Patient transport in an ambulance or alternative vehicle designed to provide for uninterrupted patient care at the ALS or BLS level while en route to a medical facility (5) Assurance of response and medical care through a quality management program.		vehicle designed to provide for uninterrupted patient care at the ALS or BLS level while en route to a medical facility (5) Assurance of response and medical care through a quality management program.
5.3.3.2		The fire department shall be involved in providing any or all of the functions as identified in 5.3.3.1 (1) through 5.3.3.1 (5)	4.4.3.2	The fire department shall be involved in providing any or all of the functions as identified in 4.4.3.1 (1) through 4.4.3.1 (5)
5.3.3.3	Staffing			
5.3.3.3.1		On-duty EMS units shall be staffed with the minimum numbers of personnel necessary for emergency medical care relative to the level of EMS provided by the fire dept.		NO CORRESPONDING LANGUAGE
5.3.3.3.2		EMS staffing requirements are based on the minimum levels needed to provide patient care and member safety. Units that provide emergency medical care shall be staffed at a minimum with personnel that are trained to the first responder/AED level.		NO CORRESPONDING LANGUAGE
5.3.3.3.2.1		Units that provide BLS transport shall be staffed and trained at the level prescribed by the state or provincial agency responsible for providing emergency medical services licensing.		NO CORRESPONDING LANGUAGE
5.3.3.3.2.2		Units that provide ALS transport shall be staffed and trained at the level prescribed by the state or provincial agency responsible for providing emergency medical services licensing.		NO CORRESPONDING LANGUAGE
5.3.3.4	Service Delivery Deployment			NO CORRESPONDING LANGUAGE
5.3.3.4.1		The fire department shall adopt service delivery objectives based on time standards for the deployment of each service component for which it is responsible.		NO CORRESPONDING LANGUAGE

		NFPA 1710			NFPA 1720
5.3.3.4.2		The fire department's EMS for providing first responder with AED shall be deployed to provide for the arrival of a first responder with AED company within a 4-minute response time to 90 percent of the incidents as established in Ch. 4.			NO CORRESPONDING LANGUAGE
5.3.3.4.3		When provided, the fire department's EMS for providing ALS shall be deployed to provide for the arrival of an ALS company within an 8-minute response time to 90 percent of the incidents as established in Chapter 4.			NO CORRESPONDING LANGUAGE
5.3.3.4.4		Personnel deployed to ALS emergency responses shall include a minimum of two members trained at the emergency medical technician-paramedic level and two members trained at the emergency medical technician - basic level arriving on the scene within the established response time.			NO CORRESPONDING LANGUAGE
5.3.4	Quality Management		4.5	Quality Management	
		The fire department shall institute a quality management program to ensure that the service has appropriate response times as required in 4.1.2.1.1 for all medical responses.	4.5.1		The fire department shall institute a quality management program.
5.3.4.2		All first responder and BLS medical care provided by the fire department shall be reviewed by the fire department medical personnel. This review process shall be documented.	4.5.2		All first responder and BLS medical care provided by the fire department shall be reviewed by the fire department medical personnel. This review process shall be documented.
5.3.4.3		All fire departments with ALS services shall have a named medical director with the responsibility to oversee and ensure quality medical care in accordance with state or provincial laws or regulations. This review process shall be documented.	4.5.3		All fire departments with ALS services shall have a named medical director with the responsibility to oversee and ensure quality medical care in accordance with state or provincial laws or regulations. This review process shall be documented.
5.3.4.4		Fire departments providing ALS services shall provide a mechanism for immediate communications with EMS supervision and medical oversight.	4.5.4		Fire departments providing ALS services shall provide a mechanism for immediate communications with EMS supervision and medical oversight.

	NFPA 1710		NFPA 1720
5.4	Special Operations Response	4.6	Special Operations Response
5.4.1	Special operations shall be organized to ensure the fire department's special operations capability includes personnel, equipment, and resources to deploy the initial arriving company and additional alarm assignments providing such services. The fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 5.4.	4.6.1	Special operations shall be organized to ensure the fire department's special operations capability includes sufficient personnel, equipment, and resources toefficiently, effectively, and safelydeploy the initial arriving company and additional alarm assignments providing such services. The fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 4.6.
	NO CORRESPONDING LANGUAGE	4.6.1.1	The provisions of this chapter shall apply to fire departments that are involved in the delivery of special operations response.
5.4.2	The fire department shall adopt a special operations response plan and standard operating procedures that specify the role and responsibilities of the fire department and the authorized functions of members responding to hazardous materials emergency incidents.	4.6.2	The fire department shall adopt a special operations response plan and standard operating procedures that specify the role and responsibilities of the fire department and the authorized functions of members responding to hazardous materials emergency incidents.
5.4.3	All fire department members who are expected to respond to emergency incidents beyond the first responder operations level for hazardous materials response shall be trained to the applicable requirements of NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents.*	4.6.3	All fire department members who are expected to respond to emergency incidents beyond the first responder operations level for hazardous materials response shall be trained to the applicable requirements of NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents.
5.4.4	All fire department members who are expected to respond to emergency incidents beyond the confined space operations level for confined space operations shall be trained to the applicable requirements for NFPA 1670,*Standard on Operations and Training for Technical Rescue Incidents.*		NO CORRESPONDING LANGUAGE
5.4.5	The fire department shall have the capacity to implement an RIC during all special operations incidents that would subject fire fighters to immediate danger of injury, or in the event of equipment failure or other sudden events, as required by NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program.*	4.6.4	The fire department shall have the capacity to implement an RIC during all special operations incidents that would subject fire fighters to immediate danger of injury, or in the event of equipment failure or other sudden events, as required by NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program.*

		NFPA 1710		NFPA 1720
5.4.6		If a higher level of emergency response is needed beyond the capability of the fire department for special operations, the fire department shall determine the availability of outside resources that deploy these capabilities and the procedures for initiating their response. The fire department shall be limited to performing only those specific special operations functions for which its personnel have been trained and are properly equipped.	4.6.5	If a higher level of emergency response is needed beyond the capability of the fire department for special operations, the fire department shall determine the availability of outside resources that deploy these capabilities and the procedures for initiating their response. The fire department shall be limited to performing only those specific special operations functions for which its personnel have been trained and are properly equipped.
5.5	Airport Rescue and Fire-Fighting Services			NO CORRESPONDING LANGUAGE
5.5.1		Airport fire departments shall adopt operations response plan and standard operating procedures (SOPs) that specify the roles and responsibilities for non-aircraft incidents as required by Section 1.1.2.		NO CORRESPONDING LANGUAGE
5.5.2		Airport rescue and fire-fighting operations shall be organized to ensure the fire department's capability includes personnel, equipment, and resources to deploy the initial arriving company, the full initial alarm assignment, and additional alarm assignments as required in Sect. 5.2.3		NO CORRESPONDING LANGUAGE
5.5.3		Airport fire departments shall have access to special tools, equipment, supplies, personal protective equipment (PPE), and other airport resources that are required to perform operations safely and effectively in their assigned roles and responsibilities.		NO CORRESPONDING LANGUAGE
5.5.4	Deployment			NO CORRESPONDING LANGUAGE
5.5.4.1		The airport fire department's ARFF resources shall deploy the required number of vehicles as required for the airport assigned category as established by NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports* , 1998 edition.		NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
5.5.4.2		Airport fire department companies equipped with specialized apparatus and equipment shall be provided to assist ARFF companies where deemed necessary as identified in 5.5.1.	NO CORRESPONDING LANGUAGE
5.5.4.3		Airport fire department companies that deploy to structural incidents on airport property shall meet the response time requirements of 4.1.2.1.1.	NO CORRESPONDING LANGUAGE
5.5.4.4		Airport fire department companies that deploy to emergency medical incidents on airport property shall meet the response time requirements of 5.3.3.4.	NO CORRESPONDING LANGUAGE
5.5.4.5		The airport fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 5.5	NO CORRESPONDING LANGUAGE
5.5.5	Staffing		NO CORRESPONDING LANGUAGE
5.5.5.1		Airport fire department ARFF companies shall be staffed as required by NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports,* 1998 edition.	NO CORRESPONDING LANGUAGE
5.5.5.2		Airport fire department companies that deploy to structural incidents on airport property shall meet the staffing requirements of 5.2.1.	NO CORRESPONDING LANGUAGE
5.5.5.3		Airport fire department companies that deploy to emergency medical incidents on airport property shall meet the staffing requirements of 5.3.3.3.	NO CORRESPONDING LANGUAGE
5.5.6	Emergency Operations		NO CORRESPONDING LANGUAGE
5.5.6.1		At all emergency scene operations an Incident Management System shall be used that meets the requirements of Section 6.2	NO CORRESPONDING LANGUAGE
5.5.6.2		Incident command shall be established outside of the hazard area for the overall coordination and direction of the initial full alarm assignment	NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
5.5.6.3		An individual shall be dedicated to this task of Incident Commander	NO CORRESPONDING LANGUAGE
5.5.6.4		A safety officer shall be deployed to all incidents that escalates beyond a full alarm assignment or when there is a significant risk to fire fighters. The safety officer shall ensure that the safety and health system is established as required in Section 6.1	NO CORRESPONDING LANGUAGE
5.6	Marine Rescue and Fire-Fighting (MRFF) Services		NO CORRESPONDING LANGUAGE
5.6.1		MRFF operations shall be organized to ensure the fire department's marine capability includes personnel, equipment, and resources to deploy to the alarm assignments associated with a marine emergency incident.	NO CORRESPONDING LANGUAGE
5.6.2		The fire department shall adopt a marine operations response plan and SOPs that specify the roles and responsibilities of the fire department and the authorized functions of members responding to marine emergencies.	NO CORRESPONDING LANGUAGE
5.6.2.1		Fire department marine SOPs shall be coordinated with the applicable agencies, such as the port or harbor authority and supporting agencies	NO CORRESPONDING LANGUAGE
5.6.3		Marine fire departments shall have access to special tools, equipment, supplies, PPE, and other marine resources that are required to perform operations safely and effectively in their assigned roles and responsibilities.	NO CORRESPONDING LANGUAGE
5.6.4	Staffing		NO CORRESPONDING LANGUAGE
5.6.4.1		On-duty marine personnel shall be comprised of the numbers necessary for safe and effective fire-fighting performance relative to the expected MRFF conditions.	NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
5.6.4.1.1		These numbers shall be determined through task analyses as required for types of marine vessels and through additional task analyses that take the following factors into consideration: (1) Life hazard to the populace protected (2) Provisions of safe and effective fire-fighting performance conditions for the fire fighters (3) Potential property loss (4) Nature, configuration, hazards, and internal protection of the properties involved (5) Types of tactics and evolutions employed as standard procedure, type of marine vessel used, and results expected to be obtained at the fire scene (6) Requirements of the regulatory authorities having jurisdiction over navigable waters, ports, and harbors	NO CORRESPONDING LANGUAGE
5.6.4.2		On-duty personnel assigned to marine fire fighting shall be organized into company units and shall have appropriate vessels and equipment assigned to such companies.	NO CORRESPONDING LANGUAGE
5.6.4.2.1		Each marine company shall be led by an officer who shall be considered a part of the company.	NO CORRESPONDING LANGUAGE
5.6.5	Operating Units		NO CORRESPONDING LANGUAGE
5.6.5.1		Fire companies whose primary function is to deliver and pump water and extinguishing agents at the scene of a marine incident shall be known as marine companies.	NO CORRESPONDING LANGUAGE
5.6.5.2		These companies shall be staffed with a minimum number of on-duty personnel as required by the tactical and occupancy hazards to which the marine vessel responds and by the regulatory authorities having jurisdiction over navigable waters, ports, and harbors	NO CORRESPONDING LANGUAGE
5.7	Wildland Fire Suppression Services		NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
5.7.1		Wildland fire suppression operations shall be organized to ensure the fire department's wildland fire suppression capability includes personnel, equipment, and resources to deploy wildland direct operations that can address marginal situations before they get out of control and wildland indirect fire-fighting operations that can be assembled and placed into operation against major wildland fires.	NO CORRESPONDING LANGUAGE
5.7.2		Fire departments performing wildland operations shall adopt a wildland fire-fighting operations response plan and SOPs that specify the roles and responsibilities of the fire department and the authorized functions of members responding to wildland fire emergencies	NO CORRESPONDING LANGUAGE
5.7.2.1		All wildland fire suppression operations shall be organized to ensure compliance with NFPA 295,*Standard for Wildfire Control*	NO CORRESPONDING LANGUAGE
5.7.3		Fire departments performing wildland operations shall have access to special tools, equipment, supplies, PPE, and other wildland resources that are required to perform operations safely and effectively in their assigned roles and responsibilities.	NO CORRESPONDING LANGUAGE
5.7.4	Staffing		NO CORRESPONDING LANGUAGE
5.7.4.1		On-duty wildland fire-fighting personnel shall be comprised of the numbers necessary for safe and effective fire-fighting performance relative to the expected wildland fire-fighting conditions.	NO CORRESPONDING LANGUAGE
5.7.4.1.1		These numbers shall be determined through task analyses that take the following factors into consideration: (1) Life hazard to the populace protected (2) Provisions of safe and effective fire-fighting performance conditions for the fire fighters (3) The number of trained response personnel available to the department including mutual aid resources (4) Potential property loss	NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
		(5) Nature, configuration, hazards, and internal protection of the properties involved (6) Types of wildland tactics and evolutions employed as standard procedure, type of apparatus used, and results expected to be obtained at the fire scene (7) Topography, vegetation, and terrain in the response area(s)	
5.7.4.2		On-duty personnel assigned to wildland operations shall be organized into company units and shall have appropriate apparatus and equipment assigned to such companies	NO CORRESPONDING LANGUAGE
5.7.4.2.1		The fire department shall identify minimum company staffing levels as necessary to meet the deployment criteria to ensure that a sufficient number of members are assigned, on-duty, and available to safely and effectively respond with each company	NO CORRESPONDING LANGUAGE
5.7.4.2.2		Each company shall be led by an officer who shall be considered a part of the company.	NO CORRESPONDING LANGUAGE
5.7.4.2.3		Supervisory chief officers shall be dispatched or notified to respond to all full alarm assignments. The supervisory chief officer shall ensure that the incident management system is established as required in Section 6.2	NO CORRESPONDING LANGUAGE
5.7.5	Operating Units		NO CORRESPONDING LANGUAGE
5.7.5.1		Fire companies whose primary function is to deliver and pump water and extinguishing agents at the scene of a wildland fire shall be known as wildland companies	NO CORRESPONDING LANGUAGE
5.7.5.1.1		These companies shall be staffed with a minimum of four on-duty personnel.	NO CORRESPONDING LANGUAGE
5.7.5.2		Engine and ladder (truck) companies that respond to a wildland fire-fighting and/or urban interface wildland fire-fighting incidents shall be staffed as required by 5.2.2.	NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
5.7.5.3		Other types of companies equipped with specialized apparatus and equipment for wildland fire fighting, including aircraft, heavy equipment, mini pumpers, and fast attack vehicles shall be provided to assist wildland engine and ladder companies where deemed necessary as part of established practice.	NO CORRESPONDING LANGUAGE
5.7.5.3.1		These companies shall be staffed with a minimum number of on-duty personnel as required by the tactical, topographical, environmental, fuel (vegetation), and occupancy hazards	NO CORRESPONDING LANGUAGE
5.7.6	Deployment		NO CORRESPONDING LANGUAGE
5.7.6.1	Required Number of Vehicles	The fire department's wildland resources shall deploy the required number of vehicles as required for a direct and/or an indirect attack.	NO CORRESPONDING LANGUAGE
5.7.6.1.1		Prior to the initiation of any wildland fire attack, the fire department shall have the capacity to establish a lookout(s), communications with all crew members, escape route(s), and safety zone(s) for vehicles and personnel.	NO CORRESPONDING LANGUAGE
5.7.6.2	Direct Attack		NO CORRESPONDING LANGUAGE
5.7.6.2.1		The fire department shall have the capability to safely initiate a direct wildland attack within 10 minutes after arrival of the initial company or crew at the fire scene.	NO CORRESPONDING LANGUAGE
5.7.6.2.2		One individual in the first arriving company or crew shall be assigned as the incident commander for the overall coordination and direction of the direct attack activities.	NO CORRESPONDING LANGUAGE
5.7.6.2.3		The direct wildland attack shall include the following: (a) Establishment on an effective water flow application rate of 111 L/min (30 gpm) from at least two 150-m (500 ft) 1 1/2" in diameter attack handlines from two engines. Each attack handline shall be operated by a minimum of two personnel to effectively and safely deploy and maintain the line.	NO CORRESPONDING LANGUAGE

		NFPA 1710	NFPA 1720
		(b) Provision of one operator who shall remain with each fire apparatus supplying water flow to ensure uninterrupted water flow application (c) Provision of a wildland crew leader or company officer with each crew who shall be responsible for overall supervision of each of the crew and for maintaining personnel accountability and crew safety.	
5.7.6.3	Indirect Attack		NO CORRESPONDING LANGUAGE
5.7.6.3.1		The fire department providing wildland fire suppression operations shall have the capability to deploy an indirect attack, including application of water to the fire, engagement in search and rescue and preservation of property, accountability for personnel, and provision of support activities for those situations that are beyond the capability of the direct attack	NO CORRESPONDING LANGUAGE
5.7.6.3.2		A safety officer shall be deployed to all incidents that escalates beyond a direct attack alarm assignment or when there is significant risk to fire fighters	NO CORRESPONDING LANGUAGE
5.7.7	Nonwildland Emergencies		NO CORRESPONDING LANGUAGE
5.7.7.1		Wildland companies that deploy to structural incidents shall meet the response time requirements of 4.1.2.1.1	NO CORRESPONDING LANGUAGE
5.7.7.2		Wildland companies that deploy to emergency medical incidents shall meet the response time requirements of 4.1.2.1.1	NO CORRESPONDING LANGUAGE

	NFPA 1710			NFPA 1720	
	Chapter 6 - Systems			**Chapter 5 - Systems**	
6.1	Safety and Health System	A fire-fighter occupational safety and health program shall be provided in accordance with NFPA 1500,*Standard on Fire Department Occupational Safety and Health Program*	5.1	Safety and Health System	A fire-fighter occupational safety and health program shall be provided in accordance with NFPA 1500,*Standard on Fire Department Occupational Safety and Health Program*, to form the basic structure of protecting the health and safety of fire fighters, regardless of the scale of the department or the emergency.
6.2	Incident Management System		5.2	Incident Management System	
6.2.1		An incident management system shall be provided in accordance with NFPA 1561,*Standard on Emergency Services Incident Management System,* to form the basic structure of all emergency operations of the fire department, regardless of the scale of the department or the emergency.	5.2.1		An incident management system shall be provided in accordance with NFPA 1561,*Standard on Emergency Services Incident Management System*, to form the basic structure of all emergency operations of the fire department, regardless of the scale of the department or the emergency.
6.2.2		An effective incident management system shall be designed to manage incidents of different types, including structure fires, wildland fires, hazardous materials incidents, emergency medical operations, and other types of emergencies that could be handled by the department.	5.2.2		An effective incident management system shall be designed to manage incidents of different types, including structure fires, wildland fires, hazardous materials incidents, emergency medical operations, and other types of emergencies that could be handled by the department.
6.3	Training Systems	The fire department shall have a training program and policy that ensures that personnel are trained and competency is maintained to execute all responsibilities consistent with the department's organization and deployment as addressed in Chapters 4 and 5.	5.3	Training Systems	The fire department shall have a training program and policy that ensures that personnel are trained and competency is maintained toeffectively, efficiently, and safely execute all responsibilities consistent with the department's organization and deployment as addressed in Chapter 4.
6.4	Communications Systems		5.4	Communications Systems	
6.4.1		The fire department shall have a reliable communications system to facilitate prompt delivery of public fire suppression, emergency medical services, and special operations	5.4.1		The fire department shall have a reliable communications system to facilitate prompt delivery of public fire suppression, emergency medical services, and special operations

		NFPA 1710			NFPA 1720
6.4.2		All communications facilities, equipment, staffing, and operating procedures shall comply with NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*	5.4.2		All communications facilities, equipment, staffing, and operating procedures shall comply with NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*
6.4.3		Operating procedures for radio communications shall provide for the use of standard protocols and terminology at all types of incidents	5.4.3		Operating procedures for radio communications shall provide for the use of standard protocols and terminology at all types of incidents
6.4.3.1		Standard terminology, in compliance with NFPA 1561, *Standard on Emergency Services Incident Management System* , shall be established to transmit information, including strategic modes of operation, situation reports, and emergency notifications of imminent hazards	5.4.3.1		Standard terminology, in compliance with NFPA 1561, *Standard on Emergency Services Incident Management System* , shall be established to transmit information, including strategic modes of operation, situation reports, and emergency notifications of imminent hazards
6.5	Pre-Incident Planning	The fire department shall set forth operational requirements to conduct pre-incident planning. Particular attention shall be provided toall target hazards.	5.5	Pre-Incident Planning	The fire department shall set forth operational requirements to conduct pre-incident planning. Particular attention shall be provided to target hazards.

Monroe County Fire Service Capstone Pre-Interview Questionnaire

* Required

1. **Email address** *

2. **Provide your name and the organization you represent** *

3. **How many Full Time Fire/EMS Employees do you have?** *

4. **How many Part Time Fire/EMS Employees do you have?** *

5. **How many Fire/EMS Volunteer workers do you have?** *

6. **What percent of your fire/EMS budget goes to capital expenditures?** *

7. **What are the township's/department's main capital expenditures?** *

8. **What are the recurring fire/EMS capital expenditures not covered by the PS LIT? This could be every 1-5 years.** *

9. **What are the township's/department's high priority non-capital expenditures? This refers to expenditures that are essential to providing adequate service.** *

10. **Are you aware of any common capital expenditures for fire services across different townships? If so what are they?** *

11. **Mark only one oval.**

- ◯ Option 1

12. **Are you able to provide us with a copy of your an itemized budget before the interview?** *
Mark only one oval.

- ◯ Yes
- ◯ No

13. **Please upload your most recent budget**
Files submitted:

Interview Responses

Record your responses to your interviews here.

Introduction/General Questions

1. **History of their fire service**

2. **As is, are there parts of your township that do not receive optimal fire/EMS service/coverage? If not: why?**

3. **Confirm that they're in a group(district, territory, contract, etc.). If possible get some details on if there is collaboration, cross-service provision, joint planning, borrowing of equipment, etc.**

4. **What's the relationship with the group you're in?**

5. **What's the relationship with neighboring groups?**

6. **What's the relationship with the county government?**

7. **What's the relationship with Bloomington?**

8. **Are there any other important actors?**

Performance Evaluation

9. **Are fire services / EMS evaluated on performance?**

10. **Do you get reports?**

11. **What kind of information is provided in those reports?**

12. **What do you care about in these reports?**

13. **If the answer is yes: Ask for fire-related statistics that get reported (going back 5 years?)**

14. **What do you believe are some things that are or should be measured and used as performance measures for evaluating your fire department?**

Finance

15. **Ask for access to detailed, itemized budgets for each township (going back 5 years?)**

16. **Roughly what percent of your budget goes to fire and EMS?**

17. **In previous years, have you applied to receive funding from PS LIT?**

18. **What years did you apply?**

19. **If you applied, how did you decide what expenses to cover with PS LIT vs other sources?**

20. **How dependent is your budget on receiving PS LIT funding?**

21. **Follow up: what percentage of your budget is expected to be covered by PS LIT funding?**

22. **When applying for PS LIT funding, what percentage of requested funds do you expect to receive out of the entire applied amount?**

PS LIT Process

23. **Tell us about your experience with the application process to receive PS LIT money.**

24. **What aspect of the previous application process do you like?**

25. **What aspect of the previous application process do you not like?**

26. **For the PS LIT process, of the following characteristics, which do you think the committee should consider? (Please rank them)**
Mark only one oval per row.

	Simplicity (to make the process simple and straightforward)	Transparency (to make the way decisions are made clear and understandable)	Logical (to have the most logically sound decisions)	Certainty and Predictability (participants can predict the outcome beforehand based on the situation everyone are aware of)
Rank 1				
Rank 2				
Rank 3				
Rank 4				

27. **For the following set of questions please provide the answer that best represents your opinion. (1=strongly disagree, 5=strongly agree). Only if they've applied to PS LIT in the past.**

28. **A menu of options you can apply for**
Mark only one oval.

	1	2	3	4	5	
Very little use						Very Useful

29. **A longer application period**
Mark only one oval.

	1	2	3	4	5	
Very little use						Very Useful

30. **Start application process earlier**
Mark only one oval.

	1	2	3	4	5	
Very little use						Very Useful

31. **A detailed instruction packet for how to apply**
Mark only one oval.

	1	2	3	4	5	
Very little use	⬭	⬭	⬭	⬭	⬭	Very Useful

32. **A meeting of the chiefs where they decide on a 5 year unified plan for what they're going to ask for**
Mark only one oval.

	1	2	3	4	5	
Very little use	⬭	⬭	⬭	⬭	⬭	Very Useful

33. **A set amount that the committee pledges to set aside for the township/territory**
Mark only one oval.

	1	2	3	4	5	
Very little use	⬭	⬭	⬭	⬭	⬭	Very Useful

Ending Questions

34. **If I knew better what I was doing, what should I have asked you?**

Quantitative Analysis

Capstone Group

3/31/2019

```
## <section 1> importing data

library(readr)
library(tidyverse)
```

```
## ── Attaching packages ─────────────────────────────────────────
─────────────────────────────── tidyverse 1.2.1 ──
```

```
## ✔ ggplot2 3.1.0     ✔ purrr   0.2.5
## ✔ tibble  2.0.1     ✔ dplyr   0.7.8
## ✔ tidyr   0.8.2     ✔ stringr 1.4.0
## ✔ ggplot2 3.1.0     ✔ forcats 0.3.0
```

```
## ── Conflicts ──────────────────────────────────────────────────
──────────────────────────── tidyverse_conflicts() ──
## ✖ dplyr::filter() masks stats::filter()
## ✖ dplyr::lag()    masks stats::lag()
```

```
Data <- read_csv("Data.csv", col_types = cols(Reported = col_datetime(format = "%H:%M:%S %m/%d
/%Y ")))


## Creating a column for numeric time values (Unit = second)
Data['numdate'] = as.numeric(Data$Reported)
```

```
## <section 2> creating data frames for each department
## Sorting out and creating a vector of time value for each station

by_area = function(name){subset(Data, Data$Area == name)}
by_agency = function(name){subset(Data, Data$Agency == name)}

## Create tables for each service providers
MFPD = by_agency('MFPD')
MFPD = MFPD[order(MFPD$numdate),]
#MFPD15 = MFPD[MFPD$year == 2015,]
#MFPD16 = MFPD[MFPD$year == 2016,]
#MFPD17 = MFPD[MFPD$year == 2017,]
#MFPD18 = MFPD[MFPD$year == 2018,]

VBFD = by_agency('VBFD')
VBFD = VBFD[order(VBFD$numdate),]
#VBFD15 = VBFD[VBFD$year == 2015,]
```

```
#VBFD16 = VBFD[VBFD$year == 2016,]
#VBFD17 = VBFD[VBFD$year == 2017,]
#VBFD18 = VBFD[VBFD$year == 2018,]

EVFD = by_agency('EVFD')
EVFD = EVFD[order(EVFD$numdate),]
#EVFD15 = EVFD[EVFD$year == 2015,]
#EVFD16 = EVFD[EVFD$year == 2016,]
#EVFD17 = EVFD[EVFD$year == 2017,]
#EVFD18 = EVFD[EVFD$year == 2018,]

## BBFD is Bean Blossom
BBFD = by_agency('BBFD')
BBFD = BBFD[order(BBFD$numdate),]
#BBFD15 = BBFD[BBFD$year == 2015,]
#BBFD16 = BBFD[BBFD$year == 2016,]
#BBFD17 = BBFD[BBFD$year == 2017,]
#BBFD18 = BBFD[BBFD$year == 2018,]

NMFT = by_agency('NMFT')
NMFT = NMFT[order(NMFT$numdate),]
#NMFT15 = NMFT[NMFT$year == 2015,]
#NMFT16 = NMFT[NMFT$year == 2016,]
#NMFT17 = NMFT[NMFT$year == 2017,]
#NMFT18 = NMFT[NMFT$year == 2018,]

BNFD = by_agency('BNFD')
BNFD = BNFD[order(BNFD$numdate),]
#BNFD15 = BNFD[BNFD$year == 2015,]
#BNFD16 = BNFD[BNFD$year == 2016,]
#BNFD17 = BNFD[BNFD$year == 2017,]
#BNFD18 = BNFD[BNFD$year == 2018,]

City = by_agency('BFD')
City = City[order(City$numdate),]
#City15 = City[City$year == 2015,]
#City16 = City[City$year == 2016,]
#City17 = City[City$year == 2017,]
#City18 = City[City$year == 2018,]
```

```
## <section 3> gerating data frames for each station
## For MFPD, VBFD, EVFD, and NMFT, we need to identify calls from each station
## I need more information to proceed this seciton
## bofore then, I analyze by each department

station_transform = function(df, l, name){
  df1 = df
  vec = df$Area
  x = rep(FALSE, length(vec))
  for (r in 1:length(l)){
    y = ifelse(vec == l[r], TRUE, FALSE)
    x = x|y
  }
```

```
  z = ifelse(x == TRUE, name, "hello")
  df1$Area = z
  return(subset(df1, subset= df1$Area == name))
}


## Let's create arrays of areas for each stations
cMFPD_11 = c('FD11','F1101', 'F1102','F1103','F1104','F1105','F1106','F1107','F1108','F1109','F1110','E1101','E1102','E1103','E1104','E1105','E1106','E1107','E1108','E1109','E1110', 'FDCBP')
cMFPD_21 = c('FD21','E2101','E2102','E2103','E2104','F2101','F2102','F2103','F2104', 'FDCBS','FDCB2','FDCB1','FDCB5','FDCB4','FDCB3','FC204','FC405','FC404','FC501','FC105','FC402','FC403','FC502','FC108','FC107','FC109','FC106','FC202','FC101','FC201','FC104','FC103','FC301','FC304','FC303','FC302','FC305','FC401','FC306','FC505','FC102','FC203','FC504','FC507','FC506','FC207','FC206','FC205','FC503','FDCS2','FDCS3','FDCS1','FDCS4','FDCS5','F0901','F0902','F0903','F0904','F0905','F0906','F0907','F0908','F0909','FD09','FD14','F1401','F1402','F1403','F1404')
cMFPD_23 = c('FD10','F1901','F1902','FD19')
cEVFD_07 = c('FD06','F0604','F0601','F0602','F0603', 'FD05','F0501','F0502','F0503','F0504','F0505','F0506','F0507','F0508','F0509','F0510','F0511','F0512','FD07','F0701','F0702','F0703','F0704','F0705','F0706','F0707','F0708','ELEX7')
cEVFD_08 = c('FD08','F0801','F0802','F0803','F0804','F0805','F0806','F0807','F0808','ELEX8', 'F0901','F0902','F0903','F0904','F0905','F0906','F0907','F0908','F0909','FD09','F1901','F1902','FD19','FD10','FD21','E2101','E2102','E2103','E2104','F2101','F2102','F2103','F2104','FDCB2','FDCB1','FDCB5','FDCB4','FDCB3','FC204','FC405','FC404','FC501','FC105','FC402','FC403','FC502','FC108','FC107','FC109','FC106','FC202','FC101','FC201','FC104','FC103','FC301','FC304','FC303','FC302','FC305','FC401','FC306','FC505','FC102','FC203','FC504','FC507','FC506','FC207','FC206','FC205','FC503','FDCS2','FDCS3','FDCS1','FDCS4','FDCS5')
cNMFT_05 = c('F1402','F1403','F1404','FD05','FDBWE','FDBWW','F0501','F0502','F0503','F0504','F0505','F0506','F0507','F0508','F0509','F0510','F0511','F0512')
cNMFT_15 = c('FD15','F1401','F1405','F1406','FD14','FDCB2','FDCB1','FDCB5','FDCB4','FDCB3','FC204','FC405','FC404','FC501','FC105','FC402','FC403','FC502','FC108','FC107','FC109','FC106','FC202','FC101','FC201','FC104','FC103','FC301','FC304','FC303','FC302','FC305','FC401','FC306','FC505','FC102','FC203','FC504','FC507','FC506','FC207','FC206','FC205','FC503','FDCS2','FDCS3','FDCS1','FDCS4','FDCS5')
cVBFD_09 = c('FD08','F0801','F0802','F0803','F0804','F0805','F0806','F0807','F0808','ELEX8','FD07','F0701','F0702','F0703','F0704','F0705','F0706','F0707','F0708','ELEX7','FD21','E2101','E2102','E2103','E2104','F2101','F2102','F2103','F2104','FDCB2','FDCB1','FDCB5','FDCB4','FDCB3','FC204','FC405','FC404','FC501','FC105','FC402','FC403','FC502','FC108','FC107','FC109','FC106','FC202','FC101','FC201','FC104','FC103','FC301','FC304','FC303','FC302','FC305','FC401','FC306','FC505','FC102','FC203','FC504','FC507','FC506','FC207','FC206','FC205','FC503','FDCS2','FDCS3','FDCS1','FDCS4','FDCS5','F0901','F0902','F0903','F0904','F0905','F0906','F0907','F0908','F0909','FD09')
cVBFD_19 = c('F1901','F1902','FD19','FD10','FD11','F1101', 'F1102','F1103','F1104','F1105','F1106','F1107','F1108','F1109','F1110','E1101','E1102','E1103','E1104','E1105','E1106','E1107','E1108','E1109','E1110', 'FDCBP')




MFPD_11 = station_transform(MFPD, cMFPD_11, 'Station #11 (MFPD)')
MFPD_21 = station_transform(MFPD, cMFPD_21, 'Station #21 (MFPD)')
MFPD_23 = station_transform(MFPD, cMFPD_23, 'Station #23 (MFPD)')
EVFD_07 = station_transform(EVFD, cEVFD_07, 'Station #07 (EVFD)')
```

```
EVFD_08 = station_transform(EVFD, cEVFD_08, 'Station #08 (EVFD)')
NMFT_05 = station_transform(NMFT, cNMFT_05, 'Station #05 (NMFT)')
NMFT_15 = station_transform(NMFT, cNMFT_15, 'Station #15 (NMFT)')
VBFD_09 = station_transform(VBFD, cVBFD_09, 'Station #09 (VBFD)')
VBFD_19 = station_transform(VBFD, cVBFD_19, 'Station #19 (VBFD)')

## Disclosure

## by seperating the departmental data into station data, we lose some data due to unclassifie
d or value other than FD Zone
## Therefore, the result for stations must be conservative.
```

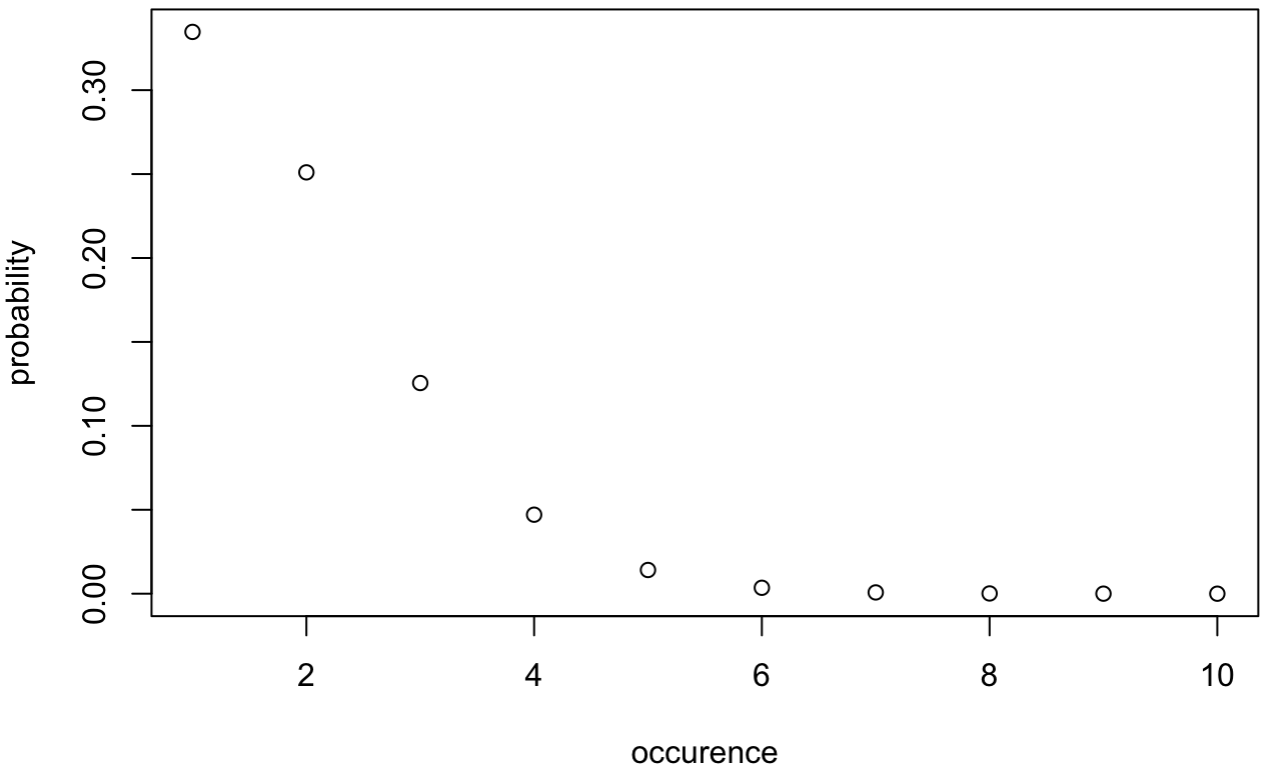
```
## <section> Straight Poisson Process
## We only need time gap between calls for each department and for each station
## we are going to first create vectors for each station


#the name is vector_generator, it is actually creaing a dataframe... :p
vector_generator = function(df, k=2){
  x = df$numdate
  cc = c()
  for (i in 1:k-1){
    cc[i] = length(df$year)+i-k+1
  }
  interval = rep(0, length(x)-k+1)
  for(n in 1:length(x)-k+1){
    interval[n]= x[n+k-1]-x[n]
  }
  return(interval)}



# Creating vectors for departments and stations
V.MFPD = vector_generator(MFPD)
V.MFPD_11 = vector_generator(MFPD_11)
V.MFPD_21 = vector_generator(MFPD_21)
V.MFPD_23 = vector_generator(MFPD_23)
V.VBFD = vector_generator(VBFD)
V.VBFD_09 = vector_generator(VBFD_09)
V.VBFD_19 = vector_generator(VBFD_19)
V.EVFD = vector_generator(EVFD)
V.EVFD_07 = vector_generator(EVFD_07)
V.EVFD_08 = vector_generator(EVFD_08)
V.BBFD = vector_generator(BBFD)
V.NMFT = vector_generator(NMFT)
V.NMFT_05 = vector_generator(NMFT_05)
V.NMFT_15 = vector_generator(NMFT_15)
V.BNFD = vector_generator(BNFD)
V.City = vector_generator(City)


## Calculating rates
## unit of t is hour
```

```
rate = function(vec, t){
  n = length(vec)
  x = c()
  m1 = length(vec[vec<t*60*60])/4
  for(i in 1:n-1){
    x[i] = vec[i+1]+vec[i]
  }
  m2 = length(x[x<t*60*60])/4
  result = m1-m2
  return(result)
}


## How many times do we have the situations where we have at least two calls in twenty minutes
?

# Answer: use qpois(p, lambda = x)
# but.. let's make a function that streamline the process
range = function(df, t){
  r = rate(df, t)
  result = c(qpois(.025, lambda = r), qpois(.975, lambda = r))
  return(result)
}



## lists for departmental analysis and stational analysis
dep = list(V.BBFD, V.BNFD, V.VBFD, V.NMFT, V.EVFD, V.MFPD, V.City)
sta = list(V.BBFD, V.BNFD, V.VBFD_09, V.VBFD_19, V.NMFT_05, V.NMFT_15, V.EVFD_07, V.EVFD_08, V
.MFPD_11, V.MFPD_21, V.MFPD_23)

dep_result = function(ti){
  r = lapply(dep, range, t = ti)
  x1 = c()
  x2 = c()
  for( i in 1:7){
    x1[i]=r[[i]][1]
    x2[i]=r[[i]][2]
  }
  df = cbind(x1, x2)
  rownames(df) = c('BBFD', 'BNFD', 'VBFD','NMFT','EVFD','MFPD','B-City')
  colnames(df) = c('lower', 'upper')
  return(df)
}

sta_result = function(ti){
  r = lapply(sta, range, t = ti)
  x1 = c()
  x2 = c()
  for( i in 1:11){
    x1[i]=r[[i]][1]
    x2[i]=r[[i]][2]
```

```
  }
  df = cbind(x1, x2)
  rownames(df) = c('BBFD', 'BNFD', 'VBFD_09','VBFD_19','NMFT_05','NMFT_15','EVFD_07','EVFD_08'
,'MFPD_11','MFPD_21','MFPD_23')
  colnames(df) = c('lower', 'upper')
  return(df)
}
```

```
################################### results ########################################

## dep_result(minutes/60)
## sta_result(minutes/60)
```

```
## drawing graphs of poisson distribution
ra = rate(V.BBFD, 60/60)
occurence= 1:10
probability = dpois(occurence, lambda = ra)
plot(occurence, probability)
```



Example of Unified Budget

Townships/City	2019					
Townships/City	Ellettsville	Bloomington Township (northern Territory)	Monroe Fire District	Van Buren	Benton	City Bloomington
Equipment (include uniform, computer)	114,750		30,000	78,965	4,621	60,205
Office Supplies	4,500					135,594
Automotive Supplies (Gas and Oil,, tires, batterties)	14,000			173,408	409,159	70,155
Building supplies	8,000					55,624
Operating, repair, main,rental	12,000					67,370
Insurance	13,150		397,000			
Training, certification	2,000		68,900			
Utilities, Subs, emer, OT	34,980		104,700			114,734
Volunteer Fire Contract	1,500		33,000			306,650
Professional service (legal service, computer support, Medical service)			22,000			228,047
TOTAL	**204,880**	**-**	**655,600**	**252,373**	**413,780**	**1,038,379**

INDIANA UNIVERSITY BLOOMINGTON
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FULFILLING *the* PROMISE