

June 2017

Facilities and Operations Planning



**Bonita Springs Fire Control and Rescue District
Bonita Springs, Florida**

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CONSULTANT REPORT

Facilities and Operations Planning Bonita Springs Fire Control and Rescue District

Table of Contents

OVERVIEW OF THE COMMUNITY SERVED	1
LEGAL BASIS AND GOVERNANCE	2
LINES OF AUTHORITY	2
BRIEF HISTORY OF THE AGENCY	3
ORGANIZATIONAL DESIGN	4
Figure 1: BSFD Current Organizational Structure	4
FINANCIAL BASIS	5
Figure 2: Historical Performance of District Revenues and Expenditures	6
POPULATION	7
Figure 3: Population Density by Census Block	8
Figure 4: Annual Population Change 2012-2017	9
Figure 5: District Population Concentration Profile	9
Demographic Features	10
Figure 6: Median Age - 2014	10
Table 1: Demographic Census Data for Lee County and City of Bonita Springs	11
Socioeconomic Features	12
Figure 7: Median Home Value - 2015	12
Table 2: Socioeconomic Census Data for Lee County and City of Bonita Springs	13
Figure 8: Urban and Rural Call Density Map with Current and Proposed Stations	14
OVERVIEW OF CURRENT SERVICES	15
FIRE SUPPRESSION	15
RESCUE	15
EMERGENCY MEDICAL SERVICES	16
HAZARDOUS MATERIALS	16
ORGANIZATIONAL MANAGEMENT AND ADMINISTRATIVE STAFFING ASSESSMENT	17
ADMINISTRATIVE STAFFING	17
MANAGEMENT ASSESSMENT	18
Communications	19
Chain of Command	20
GUIDING DOCUMENTS	21
Planning	22
FIRE PREVENTION AND COMMUNITY RISK REDUCTION	23
Fire Prevention Inspection and Code Enforcement	24
Table 3: NFPA 1730 Inspection Cycle Frequency	24
Plan Review	26
Investigation	26
Public Education	27
Effectiveness of Fire Prevention and Community Risk Reduction Program	28

<i>Analysis of Training Program</i>	28
CURRENT DEPLOYMENT STRATEGIES	32
OVERALL COMMUNITY RESPONSE HISTORY	32
Table 4: Number of Incidents Dispatched by Category	33
Table 5: Number of Calls, Number of Responses, and Total Busy Time by Program	34
Figure 9: All Incident Types Heat Map	34
<i>Temporal Analysis of Demand</i>	35
Figure 10: Overall: Average Calls per Day by Month	35
Figure 11: Overall: Average Calls per Day by Day of Week	36
Figure 12: Overall: Average Calls per Day by Hour of Day	37
<i>Analysis of Assigned Response Areas</i>	37
Table 6: Overall Workload by Station*	37
Table 7: Overall Workload by Unit	38
<i>Response Time Performance</i>	38
Table 8: Average Dispatch, Turnout, Travel, and Response Times in Minutes of First Arriving Units by Program	39
Figure 13: Average Dispatch, Turnout, Travel, and Response Times in Minutes of First Arriving Units by Program	39
Table 9: 90th Percentile Dispatch, Turnout, Travel, and Response Times in Minutes of First Arriving Units by Program	40
Table 10: 85th Percentile Dispatch, Turnout, Travel, and Response Times in Minutes of First Arriving Units by Program	41
FIRE PROGRAM - COMMUNITY RESPONSE HISTORY	41
Figure 14: Heat Map for Fire Related Incidents	42
Figure 15: Hazardous Materials Heat Map	43
Figure 16: Rescue Incidents Heat Map	44
<i>Temporal Analysis of Demand</i>	45
Figure 17: Average Fire Related Calls per Day by Month	45
Figure 18: Average Fire Related Calls per Day by Day of Week	46
Figure 19: Average Fire Related Calls per Day by Hour of Day	47
<i>Analysis of Assigned Response Areas and Workload</i>	48
Table 11: Workload by Unit for Fire Related Calls	48
Table 12: Number of Responding Units by Fire Call Type	49
Figure 20: Percentage of Structure Fire Calls by Number of Responding Units	50
EMS PROGRAM - COMMUNITY RESPONSE HISTORY	50
Figure 21: Heat Map for EMS Related Incidents	51
<i>Temporal Analysis of Demand</i>	52
Figure 22: Average EMS Related Calls per Day by Month	52
Figure 23: Average EMS Related Calls per Day by Day of Week	53
Figure 24: Average EMS Related Calls per Day by Hour of Day	54
<i>Analysis of Assigned Response Areas and Workload</i>	55
Table 13: Workload by Unit for EMS Related Calls	55
Table 14: Number of Responding Units by EMS Call Type	56
THREE-YEAR HISTORICAL WORKLOAD TRENDS	57
Table 15: Number of Incidents Dispatched by Category and Year	57
Table 16: Number of Calls, Number of Responses, and Total Busy Time by Year	57
CURRENT STAFFING STRATEGIES	58

FIRE AND EMS STATION STAFFING	58
OPTIMIZED STAFFING OF CURRENT DEPLOYMENT	58
TEMPORAL ANALYSES OF STAFFING	59
DISTRIBUTION AND CONCENTRATION	59
REVIEW OF THE CURRENT SYSTEM PERFORMANCE	61
CASCADE OF EVENTS	61
Detection	61
Call Processing	61
Turnout Time	62
Travel Time	62
Total Response Time	62
Figure 25: Cascade of Events	62
COMPARISON OF WORKLOAD BY STATION	63
Figure 26: Department Workload by Station	63
Table 17: Number of Responses by Station and Call Type	63
Figure 27: Unit Hour Utilization	65
RESPONSE TIME CONTINUUM	65
Fire	65
Figure 28: Example of Traditional Time Temperature Curve	66
Figure 29: Ventilation Controlled Time Temperature Curve	67
EMS	67
Figure 30: Cascade of Events for Sudden Cardiac Arrest with Shockable Rhythm	68
DESCRIPTION OF FIRST ARRIVING UNIT PERFORMANCE	69
Table 18: Description of First Arriving Unit Performance Times in Minutes	69
Figure 31: Distribution of Turnout Time of First Arriving Unit	69
Figure 32: Distribution of Travel Time of First Arriving Unit	70
Table 19: 90th Percentile First Arriving Unit Performance Times in Minutes by Responding Station	70
Figure 33: 90th Percentile First Arriving Unit Performance Times in Minutes by Station	71
EFFECTIVE RESPONSE FORCE CAPABILITIES	71
Table 20: Average and 90 th Percentile Travel Time Performance in Minutes for ERF	72
Figure 34: Average and 90 th Percentile Travel Time Performance in Minutes for ERF	72
COMPARISON TO NATIONAL REFERENCES	73
Table 21: Marginal Fire Station Contribution for 4-Minute Travel Time	74
Figure 35: BSFD and Neighboring Stations - Current Fire Station Bleed Maps for 4-Minute Travel Time	75
Table 22: Marginal Fire Station Contribution for 4-Minute Travel Time with Stations 26 and 27	75
Figure 36: 4-Minute Travel Time with Current and Proposed Station Locations	76
Figure 37: Optimized Fire Station Locations to Achieve 4-Minute Travel Time	77
Figure 38: 8-Minute ERF – All Current and Proposed	78
Figure 39: 10-Minute ERF from All Current Stations	79
RELIABILITY FACTORS	79
Percentage of Department Compliance	79
Table 23: Department Reliability	80
Overlapped or Simultaneous Call Analysis	80
OPTIMIZATION OF SERVICES	81
VALIDATION OF PLANNING ANALYSIS	81
INTERNAL PERFORMANCE OBJECTIVES	81

Table 24: Marginal Fire Station Contribution for 8-Minute Travel Time	82
Figure 40: Current Stations with an 8-Minute Travel Time at the 90 th Percentile	82
Table 25: Marginal Fire Station Contribution for 7-Minute Travel Time – Current and Proposed	83
Figure 41: BSFD Current and Proposed Stations for 7-Minute Travel Time	83
<i>Optimized Station Distribution Plans</i>	85
Figure 42: Optimized Station Deployment Plan – 7--Minute Travel Time	85
Figure 43: Optimized Station Deployment Plan - 6-Minute Travel Time	86
Table 26: Marginal Fire Station Contribution for 10-Minute Travel Time for EMS Incidents	87
Figure 44: Three Station Model at 10-Minutes - 90th Percentile	88
Figure 45: Optimized Locations for 10-Minute Travel Time	89
LONG TERM SUSTAINABILITY	90
DEMAND PROJECTIONS	90
Figure 46: Projected Call Volume Growth of 10%	91
Figure 47: Projected Workload Growth of 10%	91
CAPITAL ASSETS AND CAPTIAL IMPROVEMENT PROGRAMS	92
Figure 48: Bonita Springs Fire Station 1 (Station 21)	94
Table 27: Apparatus Inventory – Bonita Springs Fire Station 1 (Station 21)	94
Figure 49: Bonita Springs Fire Station 2 (Station 22)	95
Table 28: Apparatus Inventory - Bonita Springs Fire Station 2 (Station 22)	95
Figure 50: Bonita Springs Fire Station 3 (Station 23)	96
Table 29: Apparatus Inventory - Bonita Springs Fire Station 3 (Station 23)	96
Figure 51: Bonita Springs Fire Station 4 and Administration	97
Table 30: Apparatus Inventory - Bonita Springs Fire Station 4 (Station 24)	97
Figure 52: Bonita Springs Fire Station 5 (Station 25)	98
Table 31: Apparatus Inventory - Bonita Springs Fire Station 5 (Station 25)	98
Figure 53: Bonita Springs Fire Station 7 (Station 27)	99
Table 32: Apparatus Inventory - Bonita Springs Fire Station 7 (Station 27)	99
Table 33: Reserve Apparatus Inventory	99
STAKEHOLDER INPUT AND COMMUNITY EXPECTATIONS	100
GUIDING PRINCIPLES: INTERNAL PERFORMANCE EXPECTATIONS AND GOALS	100
Mission Statement	100
Focus Statement	100
Values	100
Goals	101
FIRE AND EMS DISPATCHING SERVICES	102
Table 34: Average Dispatch, Turnout, Travel, and Response Times in Minutes	102
Table 35: 90th Percentile Dispatch, Turnout, Travel, and Response Times in Minutes	102

Attachment A - Data Report

Attachment B - GIS Report

OVERVIEW OF THE COMMUNITY SERVED

The Bonita Springs Fire Control and Rescue District (BSFD) is a career fire department providing full fire suppression, fire prevention, and first response advanced life support (FRALS) EMS services to the residences, visitors and businesses located in the southern most portion of Lee County Florida. The District also provides special operations response for Technical Rescue, Hazardous Material and Marine Rescue incidents. This District augments these capabilities with standing automatic aid agreements between its adjacent Lee County partners as well as the adjacent jurisdiction in Collier County.¹

Lee County Florida rests in the southwest stretch of Florida's gulf coast. Founded in 1887, the County encompasses 1,212 square miles of which 784 square miles are developed, rural and federally protected lands.² The County carries a rich history and was once home to Henry Ford and Thomas Edison. The County's western boundary is the Gulf of Mexico. It is bordered to the north by Charlotte County, to the east by Glades and Hendry Counties, and to the south by Collier County. The County seat is Ft. Myers, the second largest of the County's four municipalities. The City of Bonita Springs is the County's third largest municipality. Lee County has a 2016 population estimate of 722,336, a 16.7% increase from 2010.³

BSFD encompasses 72 square miles⁴ of Lee County including the entire municipal boundary of the City of Bonita Springs totaling just over 53,000 residents in all.⁵ The City of Bonita Springs has seen an 18.1% increase in population over the last five years, just outpacing the growth of Cape Coral, the County's largest municipality. According to the census tract data, the District's territory is primarily rural, accounting for 66 percent of its land area. Of the remaining area, 24 percent is suburban and 10 percent is urban by population concentration.⁶ Service is provided out of six (6) continually staffed fixed facilities. Daily, the department deploys with twenty-seven (27) career uniformed personnel who are supported with (18) administrative, logistics and support staff. The Fire Chief reports directly to an elected five (5) member Fire District Commission.

¹ Bonita Springs Fire Control and Rescue District Automatic Aid Interlocal Agreement and MOU for Automatic Response Aid Agreement with North Naples Fire Control & Rescue District.

² US Gazetteer files: 2010, 2000, and 1990. United States Census Bureau.

³ United States Census Bureau. (2017). *State & County Quick Facts*. Retrieved from Quickfacts.census.gov: <https://www.census.gov/quickfacts/table/AFN120212/12071>

⁴ Laws of Florida. (1998). *Chapter 65-1828*. State of Florida.

⁵ Data obtained at: [USBoundary.com/Bonita Springs](http://USBoundary.com/BonitaSprings) (2017)

⁶ Data obtained at: [USBoundary.com/Bonita Springs](http://USBoundary.com/BonitaSprings) (2017); CFAI Population Density Categories

Legal Basis and Governance

The Bonita Springs Fire Control and Rescue District is a legally established and incorporated Independent Special District originally created by Special Act 65-1828 of the Florida Legislature. In 1998, the Florida Legislature passed Special Act 98-464 reestablishing the Bonita Springs Fire Control and Rescue District in full accordance with Title XIII, Chapter 191 of the Florida Statutes⁷. The District is legally established to provide specialized government services in the form of emergency response fire and EMS services throughout its defined jurisdiction.

As prescribed in Special Act 98-464, the District is governed by a five member board elected by residents of the District. The Board has three officer positions to include a Chairman, Vice-chairman, a secretary, and a treasurer. The Board maintains the special powers prescribed by Chapter 97-340, Laws of Florida and Chapter 191, F.S. The Board appoints a Fire Chief to operate as the Chief Executive Officer of the District. Functioning under the delegated authority of the Board, the Fire Chief is responsible for all administrative and operational functions of the District.

Lines of Authority⁸

The District is subject to the Uniform Special District Accountability Act found in Chapter 189 of the Florida Statutes. This Act prescribes the general requirements for the District's charter, operational requirements, financial practices, taxation and assessments, and election processes. The District's activities and obligations are further prescribed within Chapters 97-340 and 98-464 of the Laws of Florida.

The boundaries of the BSFD are prescribed within Special Act 98-464 subsequently establishing the District's jurisdiction. Within this jurisdiction the District maintains sole authority for the establishment of rules and regulations for the prevention of fires, fire control, and rescue work within the District under the direction of the elected board. The District also maintains authority to provide Emergency Medical Services (EMS) to the District and operates under a Certificate of Public Need and Necessity (COPCN) for the provision of First Response Advance Life Support services. Additionally, through established statute, the District maintains the authority to levy taxes on real and personal property within the established boundary of the district.

⁷ Laws of Florida. (1998). *Chapter 65-1828*. State of Florida.

⁸ 2016 Florida Statutes. (2017). Retrieved from leg.state.fl.us:

<http://www.leg.state.fl.us/Statutes/index.cfm?Mode=View%20Statutes&Submenu=1&Tab=statutes&CFID=133897835&CFTOKEN=24f07625a0fc061b-58C9DF25-A7ED-66C8-8BF8388EC9668CDA>

Brief History of the Agency⁹

Lee County was founded in 1887 as a subdivision of Monroe County and was named after the Confederate General Robert E. Lee. However, prior to this, the Army Corps of Engineers had already begun to survey and map the area in the 1870's. It was because of these efforts that the area came to be known as "Survey". But as the area developed and grew, developers decided the area needed a more appealing label, so the town was renamed "Bonita Springs". In the 1920's the town experienced a land boom thanks to an expanded railway and the completion of Tamiami Trail which resulted in Bonita Springs being briefly incorporated as a city during this period.¹⁰

The growth of the community demanded the establishment of fire protection services. Thus, in October of 1950, the Bonita Springs Volunteer Fire Department was formed. The organization survived on the volunteerism and support of the community. The department constructed its first fire station, Bonita Springs Station 1, with volunteer labor and donated materials in 1955. This station served the community until it was replaced with a new facility in 1985 and most recently remodeled in 2007.

On May 31, 1965, in response to the growing needs of the community, the Bonita Springs Fire Control and Rescue District was formed by Florida Legislative Special Act 65-1828. This allowed the agency to secure the funding necessary to keep pace with the community's needs. Subsequently the District established a second fire station to provide protection to its coastal region and a third fire station was erected in 1994 to protect the booming US41 corridor. As Interstate 75 was widened, residential growth pushed east of highway stretching out the District's resources. Thus the community determined to build a fourth fire station to cover the eastern expansion. In 1999, citizens voted to once again incorporate the City of Bonita Springs residing wholly within the BSFD boundary. Later a fifth station was added in 2003 as the US41 corridor continued to increase its development and population density. Most recently the District has opened a sixth fire station to provide a dedicated resource to the Bonita Beach community.

In the course of the District's physical expansion, the agency has increased its service capabilities from its early days as strictly a suppression force to now being an all hazards mitigation agency.

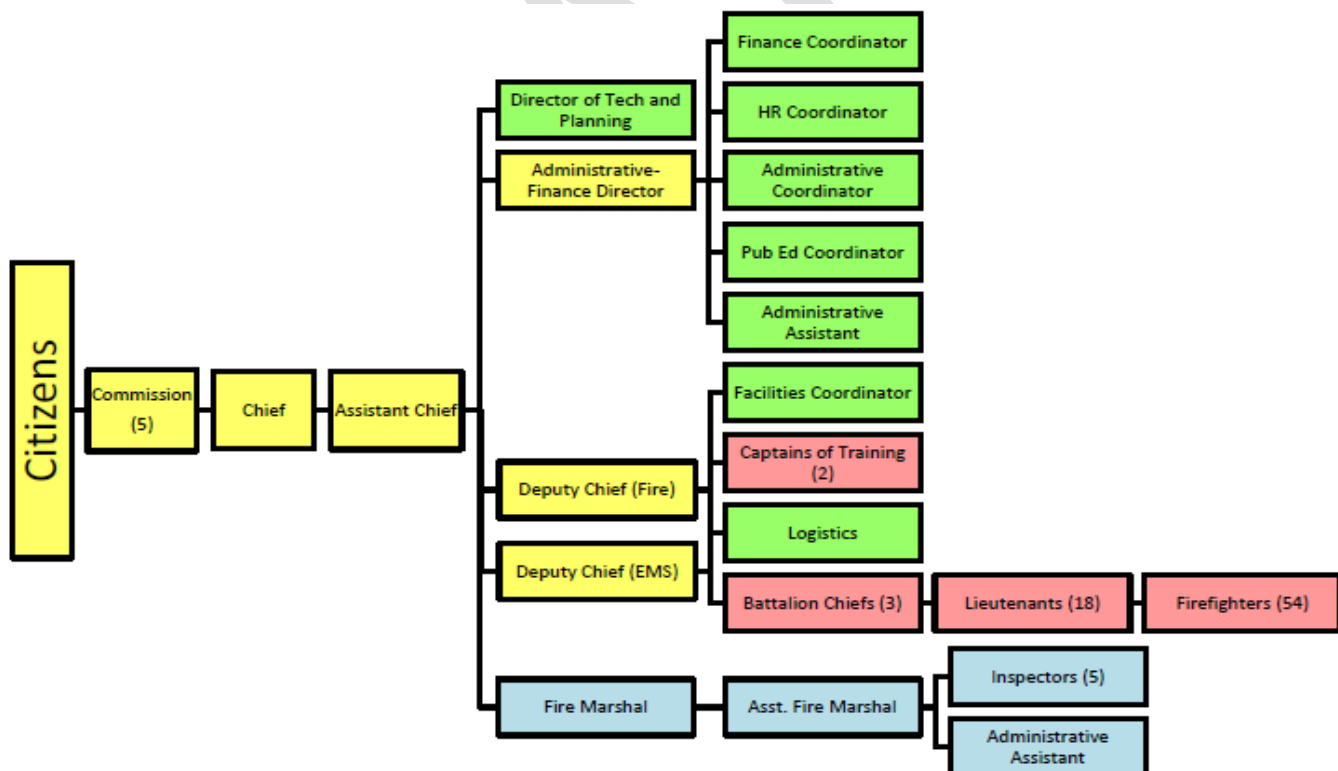
⁹ Bonita Springs Fire Rescue and Control District. (2017). Retrieved from bonitafire.org: www.bonitafire.org/index.cfm?zone=/unionactive/view_article.cfm&HomeID=398358&page=Chief27s20Desk

¹⁰ City of Bonita Springs Florida. (2017). Retrieved from cityofbonitasprings.org: <http://www.cityofbonitasprings.org/discover-bonita-springs/bonita-springs-history/>

Organizational Design

As stated, Bonita Springs Fire Control & Rescue District (BSFD) is an Independent Special Fire Control District in accord with Chapter 191 of the Florida Statutes. As such, the District is ultimately accountable to its constituents who elect the board that governs the District. BSFD's board is made up of five (5) members who serve four (4) year terms. Under the board's direction, the organization is fashioned in a para-military structure with the Fire Chief being appointed directly by the board as the Chief Executive Officer of the District. By formal arrangement, the Fire Chief has one direct report; the Assistant Chief. The Assistant Chief subsequently has four main direct reports accounting for the management of all organizational program areas to include Administration/Finance, Ems, Fire Suppression, and Prevention/Life Safety. Each of these program areas are managed by a sworn chief level officer or civilian director. In all, BSFD fulfills all of its operational and administrative responsibilities with 104 full-time employees; 81 uniformed operations personnel, 18 administrative and support personnel and five (5) fire inspectors. The District's current organizational chart is provided in the figure below.

Figure 1: BSFD Current Organizational Structure



Financial Basis

The District, in accordance with its historical record, maintains a sound financial basis. As an independent special district, the District is lawfully empowered with the ability and responsibility to secure its own funding and establish its own operational budget. The District operates on a fiscal year that runs from October 1st through September 30th of the following year. The District is required to develop and adopt a balanced budget prior to the beginning of each new fiscal year. The District has clearly defined its budget development process in Policy 881 of the District's Policies and Procedures Handbook.

The District utilizes two major funds; the General Fund and the Special Revenue fund. The General Fund is the primary operating fund for the District and is the aggregate of ad-valorem taxes, interest, transfers from Special Revenues fund, fire prevention fess and other miscellaneous fees. The District's primary source of revenue is an ad-valorem assessment, which accounts for approximately 65 percent of new revenues each year. The District establishes its ad-valorem assessment and millage rates in accordance with all applicable Florida statutes and rules of the Florida Administrative Code. The current millage rate for FY 16/17 is 2.3500 assessed against \$9,736,025,904 of property value, well below the 3.0 mil cap established by Florida Statute. Thus, the District presently operates on solid financial footing.

The District maintains several reserve funds to ensure continuity of service. An Operating Reserve fund contains adequate capital to sustain all District operations for a period of 90 days. Additionally, an Emergency Disaster fund is maintained at two (2) percent of the total budget. Finally two additional reserve funds are kept for Insurance Reserve and Debt Service. All of the District's reserves are in accordance with standard practice and District policy.

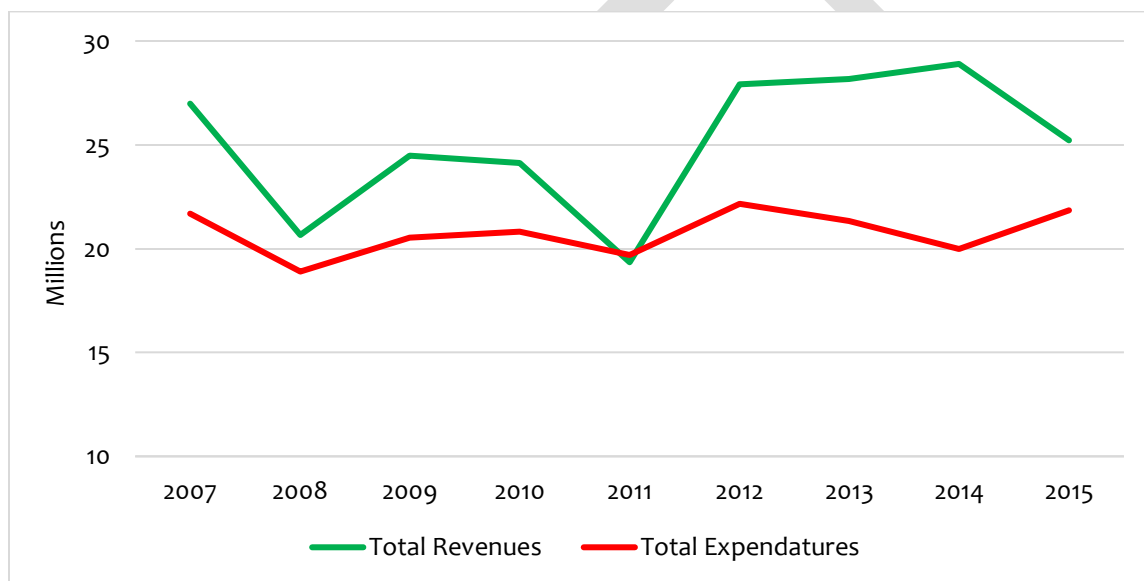
Financial accountability for the District is established through Chapter 189, Florida Statutes – Uniform Special District Accountability Act¹¹ and Rule Chapter 73C-24 of the Florida Administrative Code: Community Development; Special District Accountability Program¹². As part of the Special District Accountability Program, the District is required to file an Annual Financial Audit Report with the Florida Auditor General and the Florida Department of Financial services by June 30th each year. The audit is performed by an independent certified public accountant licensed pursuant to Chapter 473, Florida Statutes and provides for the financial oversight from the Florida Auditor General and the Joint Legislative Auditing Committee.

¹¹ Florida Statutes, Title XIII, Chapter 189 (2016). Retrieved from:
http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0100-0199/0189/0189ContentsIndex.html&StatuteYear=2016&Title=-%3E2016-%3EChapter%20189

¹² Florida Administrative Code, Rule Chapter 73C-24 (2017). Retrieved from:
<https://www.flrules.org/gateway/ChapterHome.asp?Chapter=73C-24>

The District is also required to file an Annual Financial Report with the Florida Department of Financial services by June 30th of each year. This report captures the District's revenue, expenditure, debt, and other financial data. Data from the District's filings was reviewed over a nine-year period to understand the District's current financial position in relation to its pre-recession state.¹³ Figure 2 demonstrates the evolution of the District's revenues and expenditures from 2007 through 2015. As clearly shown, the District suffered a significant 30 percent reduction in revenue in 2008. However, through effective stewardship and management the district was able to reduce its expenditures and maintain financial solvency. The District continues still to recover from the most recent recession with its current revenue levels just recently reaching those of 2007.

Figure 2: Historical Performance of District Revenues and Expenditures



The ability to predict the District's financial solvency over the next ten years is especially challenging. Historical trends indicate that recessions occur on an eight to ten year cycle. This finding would indicate that another recession is near at hand. Furthermore, potential legislative changes to the homestead exemption carry the potential for significant revenue impacts to the District even though the property values have recovered significantly since the 2008 recession. However, the District's management of resources over the last nine years clearly demonstrates their ability to maintain services amidst these challenges. To further the District's ability to stay recession resilient, future growth should be cautiously measured in considered of the potential for significant revenue loss.

¹³ Florida Department of Financial Services (2017). Retrieved from: <https://apps.fldfs.com/LocalGov/Reports/>

Finding #: 1

The District maintains compliance with all applicable requirements of Florida Statutes and the Florida Administrative Code governing the financial practices of Special Districts.

Finding #: 2

The District has demonstrated sound fiscal stewardship in its budgeting and operational practices enabling it to weather significant economic recession.

Recommendation #: 1

Despite its currently held potential for growth, the District should thoroughly consider the impacts of future fiscal threats prior to the expansion of services.

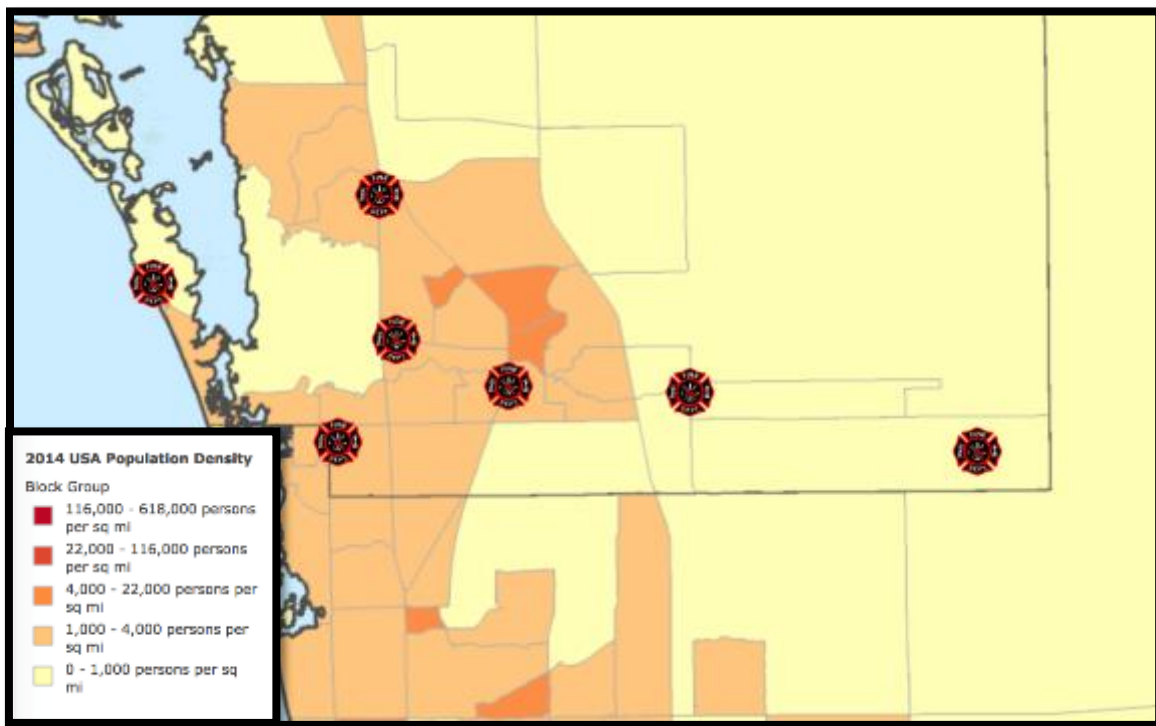
Population

BSFD encompasses 72 square miles¹⁴ of Lee County including the entire municipal boundary of the City of Bonita Springs totaling just over 53,000 residents in all.¹⁵ Although the BSFD incorporates an area much larger than the City of Bonita Springs, the City represents the primary population center within the District. Thus, the demographic profile of the City of Bonita Springs will accurately represent the primary characteristics of the District. According to the census tract data, much of the District's territory outside of the City is rural. In fact, the District is primarily rural, accounting for 66 percent of its land area. Of the remaining area, 24 percent is suburban and 10 percent is urban by population concentration. Figure 3 well illustrates concentration points of the District's population.

¹⁴ Laws of Florida. (1998). Chapter 65-1828. State of Florida.

¹⁵ Bonita Springs Fire Rescue and Control District. (2017). Retrieved from bonitafire.org: www.bonitafire.org/index.cfm?zone=/unionactive/view_article.cfm&HomeID=398358&page=Chief27s20Desk

Figure 3: Population Density by Census Block

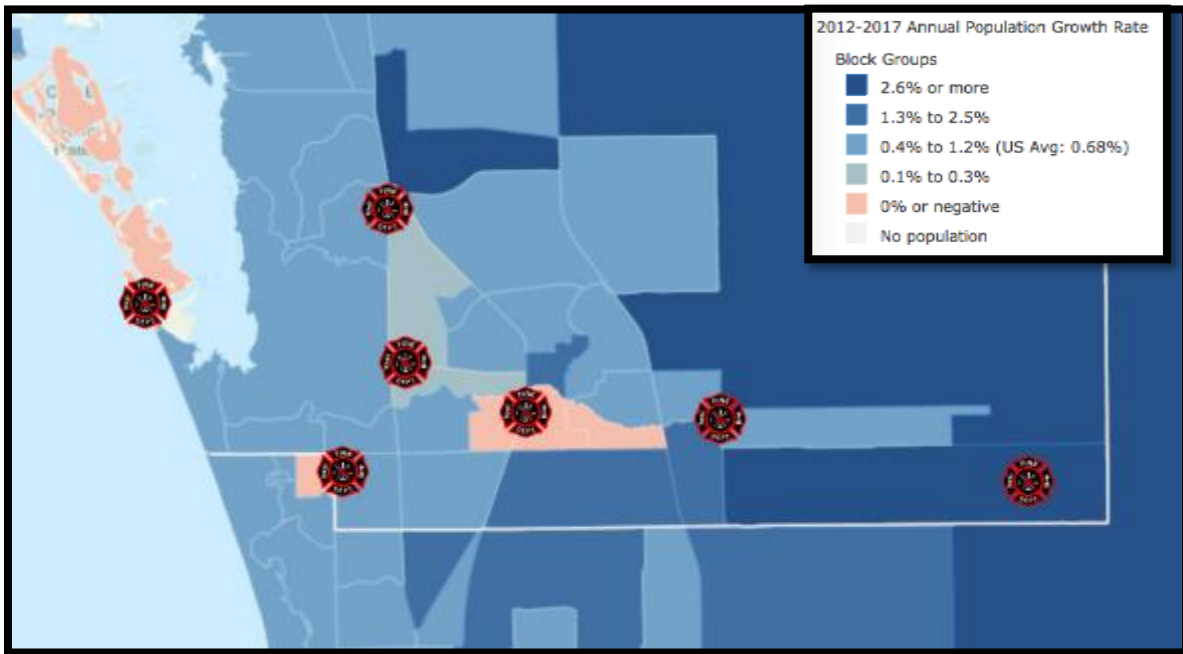


The City of Bonita Springs has seen an estimated 18.1% increase in population from 2010 to 2015, just outpacing the growth of Cape Coral, the County's largest municipality. This five-year trend provides a reliable basis upon which future growth may be predicted. (Figure 4) As the community grows, the population change will continue to be more pronounced in the developing areas to the north central and southeast areas as the historical core of the District is largely built out. Although, some vertical redevelopment is planned that will provide a measure of population growth in the District's developed areas. Furthermore, much of the District's area east of Interstate 75 is challenged for further development as it either falls with the Density Reduction Groundwater Resource Area limiting development to one unit per ten acres or it is protect Lee County preserve and wetland.^{16 17}

¹⁶ Bonita Springs Future Land Use Map 2019, (2017). Retrieved From: http://cityofbonitaspringscd.org/forms/FLU_2019_11x17_20170406.pdf

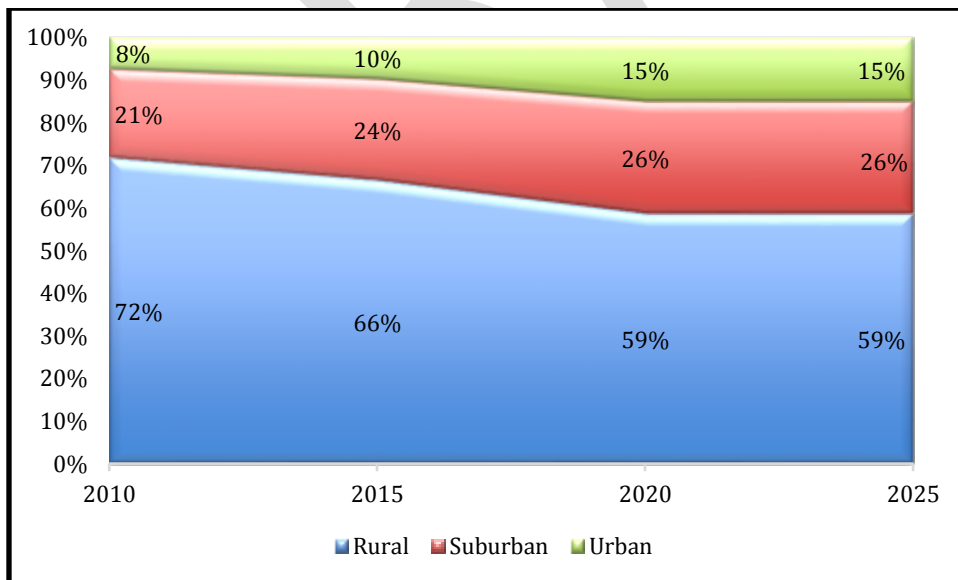
¹⁷ Lee County Future Land Use Map, (2017). Retrieved From: http://www.leegov.com/dcd/Documents/Planning/LeePlan/Maps/Map01_01.pdf

Figure 4: Annual Population Change 2012-2017



Thus over the next ten years, the District's population density will continue to migrate from rural to suburban to urban. By 2025, the District's population could reach as high as 72,000 residents. Figure 5 demonstrates the District's potential density profile by 2025.

Figure 5: District Population Concentration Profile



It's important to recognize that population alone is not the sole variable that influences the demand for services as socioeconomic and demographic factors have a greater influence over demand.

Demographic Features

Generally, older populations and very young populations are considered to be most vulnerable to the frequency and incidents of fire. In addition, older populations historically utilize EMS services with greater frequency. It is important to understand, what field crews often recognize intuitively, is that the distribution of population risks are not uniform across the jurisdiction. The median age distribution is illustrated in Figure 6 below.

Figure 6: Median Age - 2014

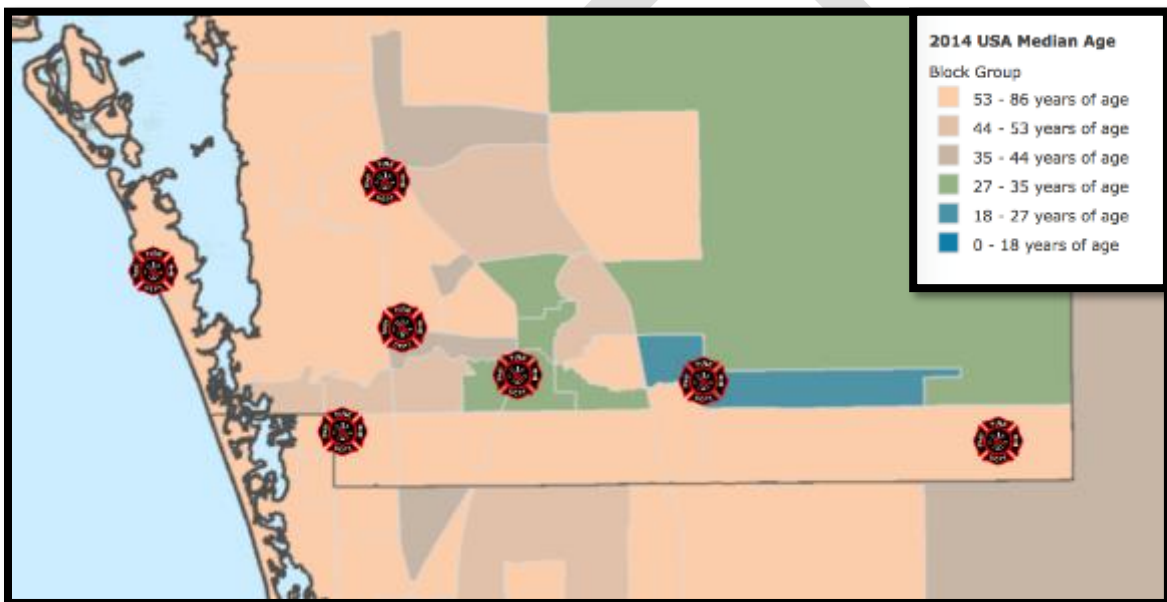


Table 1 below provides additional demographic metrics of census data for Lee County and the City of Bonita Springs.

Table 1: Demographic Census Data for Lee County and City of Bonita Springs¹⁸

U.S. Census Bureau Quick Facts	Lee County, Florida	Bonita Springs City, Florida
Population		
Population estimates, July 1, 2016, (V2016)	722,336	NA
Population estimates, July 1, 2015, (V2015)	701,982	51,704
Population estimates base, April 1, 2010, (V2016)	618,754	NA
Population estimates base, April 1, 2010, (V2015)	618,754	43,795
Population, percent change - April 1, 2010 (estimates base) to July 1, 2016, (V2016)	16.7	NA
Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	13.5	18.1
Population, Census, April 1, 2010	618,754	43,914
Age and Sex		
Persons under 5 years, percent, July 1, 2015, (V2015)	4.7	X
Persons under 5 years, percent, April 1, 2010	5.3	4.4
Persons under 18 years, percent, July 1, 2015, (V2015)	18.4	X
Persons under 18 years, percent, April 1, 2010	19.5	13.8
Persons 65 years and over, percent, July 1, 2015, (V2015)	26.9	X
Persons 65 years and over, percent, April 1, 2010	23.5	33.8
Female persons, percent, July 1, 2015, (V2015)	51.0	X
Female persons, percent, April 1, 2010	50.9	49.6
Race and Hispanic Origin		
White alone, percent, July 1, 2015, (V2015) (a)	87.0	X
White alone, percent, April 1, 2010 (a)	83.0	88.8
Black or African American alone, percent, July 1, 2015, (V2015) (a)	9.1	X
Black or African American alone, percent, April 1, 2010 (a)	8.3	0.8
American Indian and Alaska Native alone, percent, July 1, 2015, (V2015) (a)	0.5	X
American Indian and Alaska Native alone, percent, April 1, 2010 (a)	0.4	0.5
Asian alone, percent, July 1, 2015, (V2015) (a)	1.7	X
Asian alone, percent, April 1, 2010 (a)	1.4	1.0
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2015, (V2015) (a)	0.1	X
Native Hawaiian and Other Pacific Islander alone, percent, April 1, 2010 (a)	0.1	0.1
Two or More Races, percent, July 1, 2015, (V2015)	1.6	X
Two or More Races, percent, April 1, 2010	2.1	1.4
Hispanic or Latino, percent, April 1, 2010 (b)	18.3	22.5
White alone, not Hispanic or Latino, percent, April 1, 2010	71	75.1
Geography		
Population per square mile, 2010	788.7	1137.7
Land area in square miles, 2010	784.51	38.6

¹⁸ US Census Bureau, *Quick Facts* (2017). Retrieved From: <https://www.census.gov/quickfacts/table/POP815215/12071,1207525>

Socioeconomic Features

Research indicates that socioeconomic factors are some of the most influential drivers impacting the demand for emergency services. The most common elements are income, employment rates, poverty rates, housing and education. Housing can be a strong indicator of the socioeconomic status of a community. Thus, the median household income was evaluated to determine the degree to which the community had underprivileged populations. (Figure 7)

Figure 7: Median Home Value - 2015



Table 2 below provides additional socioeconomic metrics for Lee County and the City of Bonita Springs. All things considered, the District's socioeconomic profile is predominantly middle to upper class and therefore its future population growth will unlikely lead to a commensurate increase in service demand. As stated, the most likely driver for increasing demand within the community is the age of the population.

Table 2: Socioeconomic Census Data for Lee County and City of Bonita Springs¹⁹

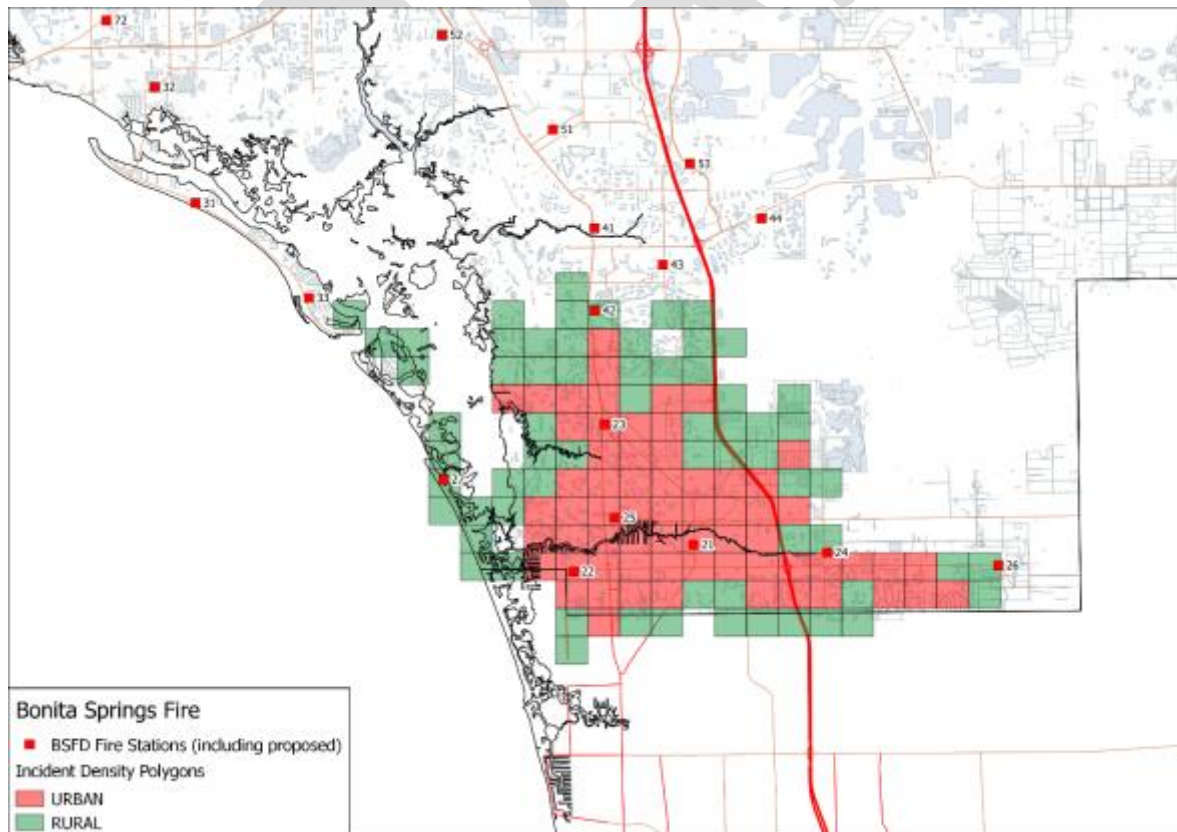
U.S. Census Bureau Quick Facts	Lee County, Florida	Bonita Springs City, Florida
Housing		
Housing units, July 1, 2015, (V2015)	379,018	X
Housing units, April 1, 2010	371,099	31,716
Owner-occupied housing unit rate, 2011-2015	69	74.7
Median value of owner-occupied housing units, 2011-2015	157,400	240,000
Median selected monthly owner costs -with a mortgage, 2011-2015	1,365	1,636
Median selected monthly owner costs -without a mortgage, 2011-2015	520	596
Median gross rent, 2011-2015	951	1,114
Building permits, 2015	6,879	X
Families and Living Arrangements		
Households, 2011-2015	252,287	19,634
Persons per household, 2011-2015	2.59	2.44
Living in same house 1 year ago, percent of persons age 1 year+, 2011-2015	82.2	82.9
Education		
High school graduate or higher, percent of persons age 25 years+, 2011-2015	87.0	84.1
Bachelor's degree or higher, percent of persons age 25 years+, 2011-2015	26.0	31.2
Health		
With a disability, under age 65 years, percent, 2011-2015	8.7	6.5
Persons without health insurance, under age 65 years, percent	19.9	30.1
Economy		
In civilian labor force, total, percent of population age 16 years+, 2011-2015	53.0	45.7
In civilian labor force, female, percent of population age 16 years+, 2011-2015	49.2	39.9
Total accommodation and food services sales, 2012 (\$1,000) (c)	1,346,619	D
Total health care and social assistance receipts/revenue, 2012 (\$1,000) (c)	3,362,058	151,714
Total manufacturer's shipments, 2012 (\$1,000) (c)	812,798	19,476
Total merchant wholesaler sales, 2012 (\$1,000) (c)	2,480,982	373,731
Total retail sales, 2012 (\$1,000) (c)	9,445,269	484,169
Total retail sales per capita, 2012 (c)	14,637	10,448
Income and Poverty		
Median household income (in 2015 dollars), 2011-2015	48,537	53,955
Per capita income in past 12 months (in 2015 dollars), 2011-2015	28,010	39,190
Persons in poverty, percent	15.9	18.5
Businesses		
Total employer establishments, 2015	17,459	X
Total employment, 2015	201,523	X
Total annual payroll, 2015 (\$1,000)	7,655,986	X
Total employment, percent change, 2014-2015	4.1	X

¹⁹ US Census Bureau, *Quick Facts* (2017). Retrieved From: <https://www.census.gov/quickfacts/table/POP815215/12071,1207525>

U.S. Census Bureau Quick Facts	Lee County, Florida	Bonita Springs City, Florida
Total nonemployer establishments, 2014	61,657	X
All firms, 2012	65,221	5,414
Men-owned firms, 2012	34,637	2,886
Women-owned firms, 2012	22,438	1,578
Minority-owned firms, 2012	17,710	960
Nonminority-owned firms, 2012	45,768	4,269
Veteran-owned firms, 2012	6,478	428
Nonveteran-owned firms, 2012	55,852	4,595

So while population, socioeconomic, and demographic factors may all influence the demand for services, the extent to which they do can still vary widely from one community to the next. Therefore, we add further context to help understand the community's demand by calculating urban and rural zones based upon call density. This analysis is constructed upon the relative concentration of incidents per 0.5 square mile geographic grids. For a grid to qualify as urban, it had to average at least two calls for service each month and six of its eight surrounding grids had to average the same. The results demonstrate an urban and rural designation based on call density for services and not based on population. The red areas are designated as urban areas and the green areas are designated as rural areas. Any area that is not colored has less than one call every six months in the 0.5-mile area and the adjacent areas.

Figure 8: Urban and Rural Call Density Map with Current and Proposed Stations



OVERVIEW OF CURRENT SERVICES

Fire Suppression

The District provides high quality fire suppression services within the jurisdiction as well as response to requests for service from adjacent municipalities, counties, and fire districts. Fire suppression services are provided from a total of six (6) fixed facility fire stations distributed throughout the community. All stations are continually staffed with career personnel. All Department members are trained to the minimum standards level as firefighters and emergency medical technicians (EMTs) in accordance with the Florida Statutes and Administrative Code.

In total, the Department staffs the following response units daily: (full staffing of 27/shift)

- 5 ALS Engine companies
- 1 ALS Quint company
- 1 ALS Light Rescue
- 1 Battalion Chief

The Department also cross-staffs the following equipment:

- 2 Brush trucks
- 1 Heavy Rescue
- 1 Haz-Mat unit
- 1 Boat

The Department deploys constant emergency response coverage with three separate shifts working a 24/28 schedule that averages a 56hr work week. Each shift has a Battalion Chief working from Station 1 and serving as the Shift Commander. The District has also established minimum staffing levels in an effort to accommodate employee leave and budget constraints. Therefore, at a minimum, the department will deploy with 24 personnel. The Agency has experienced just an eight percent fire loss from 2013 through 2015. In this same period, the District has experienced no civilian or firefighter casualties representing a highly effective prevention and suppression program.

Rescue

The District maintains substantial Rescue capabilities and equipment. The agency also employs regional partnerships to provide for more specialized rescue services. Fort Myers Fire Department supplies HazMat response capabilities for the District while other incidents requiring highly specialized operations will be addressed with resource options from SWF Urban Search and Rescue or FL-TF6. Thus the District is able to facilitate high quality rescue services in the areas of confined space, swift water, high angle rope, and trench rescue.

Emergency Medical Services

The District has a long history of providing Advanced Life Support (ALS) Emergency Medical Services (EMS). Formally placed into its charter in May of 1998, the agency currently provides ALS First Response services to the community. The District maintains its own Medical Direction and operates under the *Lee County Common Treatment Guidelines*. EMS transport services are provided by Lee County EMS. ALS first responder services are provided with six ALS Engines and one ALS Light Rescue giving the District seven continually deployed ALS units.

Hazardous Materials

The District provides an operational level of response to Hazardous Material incidents. The District has 45 employees trained to the NFPA 472 Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction and the technician level. The Department augments these capabilities with mutual aid from neighboring jurisdictions as needed.

ORGANIZATIONAL MANAGEMENT AND ADMINISTRATIVE STAFFING ASSESSMENT

Through the course of this study, the *FITCH* team has had ample opportunity to observe the organization, management and operation of the District. Through an administrative lens, the District is well run. Ultimate responsibility rests with the five member board of commissioners. The *FITCH* team met with each member individually and universally observed a high level of dedication and commitment to the organization.

The Management team is comprised of an eclectic variety of personnel appointed to their positions from within the organization. The District has benefited from a very low turnover rate for senior management. In the last four years, only four positions have been replaced secondary to the retirement of well tenured members. Additionally, nearly the entire executive staff has been appointed within the last four years. Thus, the current management team is comprised of long time members who promoted up through the organization. The ability to fill senior management positions from within demonstrates the District's ability to maintain an adequate talent pool in addition to providing the level of professional development needed to best leverage the talent of their personnel.

The Fire Chief was appointed in February of 2013 and has been with the Agency since 1993. With the exception of the Fire Marshal, the Chief has appointed his entire executive team. The *FITCH* team observed significant cohesiveness among the executive team that displayed both collaboration and commonality in purpose.

Finding #: 3

The District is operated under the direction of high quality, heavily engaged, progressive leadership.

Administrative Staffing

The factors relevant to determining the proper level of administrative staffing are as numerous as they are variable and unique to each community. Therefore, the *FITCH* team assesses the appropriateness of administrative and support staffing by the processes and outcomes of the agency. Administrative equilibrium is achieved when all essential programs, functions and responsibilities are timely and effectively met within the production capacity of the established workforce.

The Agency's administrative support services and office systems are functioning efficiently and effectively to meet the demands of organizational planning and assessment, human and tangible goods resource management, record keeping and reporting, and finance management. The Agency lost three administrative support positions in the most recent

recession and to date, has only replaced two. The uninterrupted provision of essential services is a testimony to the quality of personnel and processes in place within the Agency. The administrative team did not provide any indication of excessive workloads or inadequate human resources to meet the District's administrative demands.

However, the Agency has strategically taken several force-multiplying approaches to reinforce their administrative support services. Foremost, the Agency has established a sound practice of cross training each administrative position. This provides both operational redundancy and some increased capacity as workloads ebb and flow among the staff. The District has also leveraged the use of third-party services for Information Technology (IT) services, the selection of insurance carriers, and employee assistance (EAP) services

Finding #: 4

The Agency's administrative staffing levels are currently meeting all the operational, regulatory, and compliance needs of the District. The Agency has prudently leveraged third-party partnerships and services to ensure administrative efficiency and effectiveness.

The District maintains current and detailed job descriptions for each position within the organization. The job descriptions clearly articulate the qualifications, requirements, and responsibilities of each position. These clearly stated and documented expectations contribute to the operational effectiveness of the District's staff. While the Agency has developed some training guides for various administrative positions, the FITCH team noted that much of the institutional and systems knowledge in the Agency resides with the tenured individuals currently filling the administrative positions. Thus, it is recommended that the Agency work to clearly define and codify all of the District's essential administrative processes and workflows to ensure a continuity of process that is independent of the current workforce.

Finding #: 5

The District maintains personnel resiliency with detailed job descriptions that establish qualifications and clear expectations for each position within the organization.

Recommendation #: 2

The District should continue its work to clearly define and codify all of the organization's essential administrative processes and workflows to ensure a continuity of process that is independent of the current workforce.

Management Assessment

As previously shown, the management of the District is structured in a para-military style of hierarchy that relies upon a defined chain-of-command. The Fire Chief represents the top of the hierarchy and delegates authority through a civilian director and chief officers. The Assistant Fire Chief directly oversees each of the program areas mentioned below. The Assistant Chief serves as second in command and assumes the Fire Chief's responsibilities in his absence.

Additionally, the Assistant Chief also fills the Director of Tech & Planning role within the organization. A civilian Director of Finance and Administration oversees all administrative functions on the District and supervises a team of six (6) direct reports. The Prevention program is managed by the Fire Marshal who reports to the Assistant Chief. The Fire Marshal oversees all of the District's Life Safety and Code Enforcement activities. The Deputy Chief of EMS primarily manages the EMS related aspects of the District's operation in addition to sharing some special operations responsibilities with the Assistant Chief and Deputy Chief of Fire. The Deputy Chief of Fire oversees all aspects of the District's suppression and daily shift operations. The Training program is managed by two administrative Captains who report in a coordinated fashion to the Deputy Chiefs. Each of the three shifts is managed by a shift based Battalion Chief that reports to the Deputy Chiefs. Each fire company is supervised by a Lieutenant who directly supervises the firefighters assigned to their station and shift. The company Lieutenants report directly to the Battalion Chiefs.

Communications

The FITCH team observe a cohesive horizontal flow of communication and coordination among the command staff. This has enabled the District to continue to care for areas of responsibility once handled by a dedicated manager such as special operations and training. Communications are facilitated at the command level via quarterly planning meetings among the Assistant Chief, Deputy Chiefs and Battalion Chiefs. Additionally, weekly meetings are held among the senior command staff. This has allowed the District to maintain coordinated operations despite some positions having multi-directional oversight.

The District also maintains regular communications with field operational personnel. This is primarily facilitated by electronic and manager direct means. The Battalion Chiefs are tasked with communicating the administrative directives and expectations to the members on their assigned shift. The District also provides each member with an email account and access to Target Solutions, a learning management system, and Power DMS, a record management system. All members are required to check their email and Target Solutions daily and their DMS inbox weekly. Thus, the District has an effective method of both communicating information and documenting the receipt of communications with all members.

Finding #: 6

The Agency has a practice of lateral and vertical communication via a host of established communications mediums enabling all members to keep informed of organizational direction, adjustments, and needs.

Thus overall, the communication pathways within the executive team seem to function effectively and efforts to communicate to the rank and file occur regularly. However, it was observed that the staff level was still challenged to get essential communications effectively transferred to the rank and file. Despite the electronic media, there seems to be an absence of

reinforcement for communications by way of the Battalion Chiefs. Therefore, without consistently ensuring the receipt and comprehension of communications from staff and the stated support of such communications, the District will continue to be challenged in this regard. Subsequently, the District should look for opportunities to improve the Battalion Chief's role and effectiveness in the communications pathway.

Recommendation #: 3

The Agency should work to improve the effectiveness of communication with the rank and file by better leveraging the Battalion Chiefs to ensure supported and closed loop communications.

Chain of Command

The institution of chain-of-command is vital to the success of emergency services as it reinforces a discipline that must be maintained on the emergency scene for the safety of all responders. The regular practice of chain-of-command through the communication, management, and administrative processes works to reinforce a habit that must be formed to find hierarchal success on the emergency scene. Furthermore, organizational accountability is difficult to acquire and maintain independent of a disciplined rank structure as assignments and directives issued outside of the chain-of-command can be overlooked, ignored, or improperly executed without being easily identified.

Despite the District's formalized para-military organizational structure, the operational culture is more familial and less para-militaristic. As a result, the prescribed chain of command is not consistently adhered to. Thus rank and file members are able to regularly communicate up the Chief level command staff without proceeding through their chain of command. Conversely, the Chief level command staff will also issues orders and directives straight to rank and file members without communicating through the Battalion Chiefs. While it is understood why this occurs, it is essential to note that this disrupts the unity of command and undermines accountability throughout all levels of the organization.

Finding #: 7

The District has an established chain-of-command that has given way to a more familial management process that challenges the Agency to leverage the full potential of its hierarchal rank structure.

Since the Battalion Chiefs serve as the direct link between the administration and the rank and file membership, the Battalion Chief position provides the best opportunity to improve chain-of-command compliance. The District's published job description for Battalion Chiefs reads in part:

The purpose of the position is to provide operational coordination and supervision of the Lieutenants in the District. This position provides first-line management over assigned personnel at the fire stations ... Responsibilities include assisting the Executive Officers in assigned duties as necessary; ... ensuring compliance with

standard operating procedures; equipment and facilities maintenance and repair; and preparation and maintenance of required reports.

By the nature of their roll, the Battalion Chiefs are uniquely positioned to ensure the Executive staff's communications and directives are effective at the company level and find compliance. Conversely, mandating that the rank and file communicate to the Executive staff through their Battalion Chief ensures the Battalion stays abreast of the very personnel they are tasked with supervising. Therefore, it is recommended that the District reinforce the established chain-of – command through empowerment and compliance reporting where the Battalion Chiefs manage all company level personnel and processes to demonstrate effective implementation of Executive level direction. This will require organizational discipline at all levels of the District. As the District continues to experience growth, fully leveraging the Battalion position may require the creation of another battalion within the District.

Recommendation #: 4

It is recommended that the District reinforce the established chain-of –command through empowerment and compliance reporting where the Battalion Chiefs manage all company level personnel and processes to demonstrate effective implementation of Executive level direction.

Guiding Documents

The department has published a variety of documents and guidelines to clearly articulate organizational operations and expectations. These publications help facilitate the successful management of the District by providing clear direction to all members and providing operational consistency. The District maintains Policies and Procedures, Standard Operating Procedures/Guidelines (SOG/SOP), Medical Protocols, and three Collective Bargaining Agreements. All of these publications are readily available to each District employ.

The District's Policies and Procedures have been adopted by the District Board of Commissioners and appear to comprehensively cover all employment regulations, work conditions, and finance procedures. The policies also clearly establish the lines of authority within the District and specifically establish the chain-of command. Additionally, they include a Code of Ethics and Employee Code of Conduct. The Policies were last published in 2014 and are considered current.

The District's SOG/SOP's have been developed and adopted in various stages, often on an as-needed basis. The publication does provide operational guidance for each area of the District's all hazards mitigation services, including functional unit assignments by apparatus type. The SOG/SOP's also provide guidance and direction for the operational safety of personnel. Included in the SOG/SOP's is the District's Incident Management System Command Procedures which also contains the District's risk management model. An assessment of these documents reveals an inconsistent approach to ensuring they remain current and applicable. The District has proactively defined within each SOG/SOP the date in which it is due for revision. However,

many of these guidelines are well past their prescribed date of revision. Although this does not necessarily indicate that the guidelines are obsolete or ineffective, it does demonstrate a need for a more structured cycle of revisions. The District should strive to revise all of its SOG/SOPs every two years to ensure they continue to follow operational best practices.

Finding #: 8

The District has clearly articulated its organizational operations and expectations through the publication of detailed guidelines that contribute to the successful management and operation of the District.

Recommendation #: 5

It is recommended that the District develop and implement a revision cycle for all of its guiding document to ensure they remain current with best practice and agency operations.

Planning

Efforts are currently planned or under way to define administrative processes and revise policies, procedures, and standard operating guidelines to improve the organization's level of professionalism and efficiency. Additionally, the agency has just completed the planning and implementation of a new station and is currently working on the planning and logistics of another new station. The District has demonstrated a commitment to planning for both its current needs and future needs, which this study is direct evidence of.

In 2008, the District eliminated several support and command level staff positions amidst the recession, the remaining responsibilities were distributed among the balance of the staff. It's certainly evident that the daily demands of the organization require a significant portion of the staff's time, but all matters of operational necessity and regulatory compliance are being met. However, while assuring the forward motion of major projects, the administrative team is challenged to proactively address seemingly less pressing items such as the guiding documents mentioned above. Therefore, care must be exercised to avoid over extending existing resources with new initiatives and projects. The agency would benefit from a regular review of its strategic goals and priorities to ensure it does not take on more than it can accomplish and that what is undertaken is completed prior to the introduction of new work.

Recommendation #: 6

The District should regularly review its strategic goals and priorities to ensure that it does not overtax its administrative resources or fail to fully complete the projects undertaken.

The executive team has demonstrated a genuine interest in cultivating a good working relationship with the Labor unit. These efforts have produced a collaborative relationship between labor and management. The District has been able to obtain stability with three different bargaining units through the execution of three year collective bargaining agreements. Communications between labor and management seem to be consistent with

neither party being hesitant to establish dialog or collaborative engagements. The Agency is encouraged to continue its efforts for collaborative, working relationships with its labor unit.

Finding #: 9

The Administration has made concerted efforts to cultivate collaborative labor relations and is encouraged to continue these endeavors.

Fire Prevention and Community Risk Reduction

The District operates a robust and highly effective prevention and community risk reduction program. These efforts are facilitated through the Department's Prevention Division. The division is headed by a Fire Marshal who is the Authority Having Jurisdiction (AHJ) for all Fire and Life Safety Code compliance and enforcement within the District's boundaries. The Fire Marshal is assisted by an Administrative Assistant and an Assistant Fire Marshal who directly supervises five additional certified fire inspectors. All personnel are certified State of Florida Fire Safety Inspectors at a minimum. The Agency has clearly articulated a line of professional development for the Inspectors and Plans examiners. These members work collaboratively to enforce the Florida Fire Prevention Code, largely based upon NFPA 1 and 101, in accordance with Chapter 633.202 F.S. The District's comprehensive fire prevention program includes plans reviews, acceptance testing, Certificate of Occupancy inspections, cyclical fire code inspections, and public education.

The District has expressed a desire to align their prevention operations with the guidelines provided in NFPA 1730, *Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations*. Yet, it is noteworthy that the professionalism of the District's Prevention Division is reinforced by the fact that many of its current functions and activities are already reflective of the NFPA 1730 recommendations.

Finding #: 10

The District operates a highly effective and professional Fire Prevention and Community Risk Reduction program.

The published 2016 edition is the first installment of NFPA 1730. The standard would require that the District develop a Fire Prevention Organizational (FPO) Statement that establishes the program, its structure, its membership, and its functions under a defined leadership hierarchy. The statement would also establish the FPO's service delivery objectives for fire prevention inspection and code enforcement, plan review, investigation, and public education.

Fire Prevention Inspection and Code Enforcement

The District maintains a database of all inspectable properties within its jurisdiction via a business intelligence solution called MobileEyes that tracks its occupancy and inspection records. New buildings are entered into an Access database for the construction process and are transitioned into MobileEyes once the CO has been issued. The District currently has 3,188 inspectable occupancies.

At present, the District strives for an 18 month inspection cycle for all inspectable properties but has no formally adopted standard. The Division would have to perform eight compliance inspections per day to meet this goal. Through the last cycle, the District was only able to complete 70 percent of its occupancies. On average, the District finds two violations per inspection. Although the Division's staffing levels would seem to facilitate this goal at 100 percent, consideration must be given to the work load associated with the significant number of plans reviews and new construction inspections being accomplished. Theoretically, two inspectors could likely accomplish eight inspections per day, but this leaves little room for variables such as re-inspections and paid leave. Therefore, the 70 percent cycle performance does not raise significant productivity or process concerns.

However, the District would benefit from a formally adopted inspection cycle for two primary reasons. First, an adopted cycle allows the District to clearly affirm its level of community risk reduction performance and commitment to the community. Secondly, as the District continues to grow, the District can readily identify when additional resources should be added to maintain its adopted level of risk reduction. For instance, following years of cycle compliance and subsequent inability to meet the cycle would be a compelling indicator that an additional inspector is needed.

Adoption of NFPA 1730 would naturally facilitate the formal implementation of an inspection cycle. Chapter 6 of NFPA 1730 recommends a four tiered inspection cycle based upon the Occupancy Risk Classification. Furthermore, this cycle will prove to be a force multiplier for the current prevention staff, effectively prioritizing the occupancy inspections by their designated risk and subsequently enabling the department to achieve full cycle compliance. The NFPA 1730 cycle is reflected in the Table below.

Table 3: NFPA 1730 Inspection Cycle Frequency

Occupancy Risk Classification	Frequency
High	Annually
Moderate	Biennially
Low	Triennially
Critical Infrastructure	Per AHJ

NFPA 1730 also calls for the development of a Community Risk Reduction plan. This plan serves to identify, analyze, and categorize all of the community's risk so that the prevention and mitigation of risk is effectively and efficiently accomplished. The foundation of the plan comes from a comprehensive Community Risk Assessment (CRA) that is performed on a five (5) year cycle. All of the essential components of the plan are detailed within the NFPA 1730 standard. Thus, the District might consider developing a Standards of Cover (SOC) document as it would provide a comprehensive CRA and nearly all components necessary to execute a Community Risk Reduction plan.

The development of a Community Risk Reduction plan will provide two immediate benefits to the organization. First, the CRA would include a classification process for all hazards that ultimately determines each buildings Occupancy Risk Classification. This directly enables the NFPA 1730 inspection cycles and aids in the planning and distribution of resources. The second benefit stems from the 2014 ISO revision that now includes a category for Community Risk Reduction in which the agency could score an additional five (5) points toward their overall Public Protection Classification (PPC). The Community Risk Reduction Plan would help ensure that the Agency maximize its ISO rating within this category.

The agency currently maintains NFPA 101 occupancy classifications within MobileEyes. However, these occupancy classifications do not provide an associated categorization of risk. While a risk category may be assumed for an NFPA 101 occupancy classification, it may not consider influential differences between two occupancies of the same type possessing differing levels of protection allowing it to receive an objective hazard classification. Thus, the agency should consider implementing a procedure for the development of Occupancy Vulnerability Assessment Profile (OVAP) scores for each of its jurisdictional occupancies. The OVAP score is the sum of variables related to the building itself, the life safety hazard, the risks, water supply, and property value. All of these elements comprise a quantifiable risk-rating matrix that categorizes occupancies as critical, high, moderate, or low risks.

Finding #: 11

The District has strategically made use of current business solution technology to facilitate their fire prevention and code enforcement efforts.

Recommendation #: 7

The District should consider implementing a procedure for the development of Occupancy Vulnerability Assessment Profile (OVAP) scores for each of its jurisdictional occupancies, providing an objective and quantifiable approach to classifying risk as critical, high, moderate, or low.

Recommendation #: 8

The District should adopt a formalized inspection cycle in accordance with NFPA 1730 and a comprehensive Community Risk Assessment.

Recommendation #: 9

The District should consider developing a Standards of Cover document to provide for the CRA and risk reduction plan associated with NFPA 1730.

Plan Review

The District conducts plans review for all qualifying new and improved occupancies within its jurisdiction. It also contracts plans review services for San Carlos Park. The plans review covers all major life and fire safety components including water supply, fire flow, emergency vehicle access, and fire protection systems. The agency has established a benchmark performance measure for plans reviews to be complete within five (5) days for City of Bonita Springs applications and 15 days for Lee County applications. The agency currently meets this benchmark with the Fire Marshal, Assistant Fire Marshal, and one Fire Inspector doing the plan reviews. Personnel performing plans review are qualified in accordance with NFPA 1031. As a part of its practice, the Agency holds numerous preconstruction meetings with developers to ensure a collaborative culture in its enforcement of the Fire Code. The District reviewed 1,922 plans in 2015 and 721 plans in 2016. Two of the five inspectors are assigned new construction inspections. The District completes all inspections prior to issuance of a Certificate of Occupancy (CO).

The Prevention Division does assess a fee for building plan reviews, permitting, and new construction fire inspections. These fees produce more than \$300,000 in revenue for the District annually.

Finding #: 12

The District performs comprehensive plans reviews, acceptance testing, and construction inspections ensuring full Life Safety compliance prior to the issuance of a Certificate of Occupancy.

Investigation

The District maintains a current Standard Operating Protocol (SOP) prescribing a uniform system for handling fire investigations. The department maintains an internally qualified and certified Arson Investigator. The SOP also describes when external agencies and resources shall be contacted to assist in investigations. The District's investigation program is appropriately structured and staffed.

Public Education

The District operates an effective Public Education program that is staffed with a full time, dedicated Public Education Specialist presently working under the Administrative Finance Director and ultimately reporting to the Assistant Chief. The Public Education Specialist is the primary provider of the District's programs. Their efforts are supported by staff and company personnel as needed throughout the year. This position is clearly supported at all level of the organization which demonstrates a commendable level of organizational commitment to prevention efforts.

At present, the District offers 34 different prevention and safety programs. In 2015, 324 separate events were provided reaching approximately 21,964 people representing nearly half of the District's population. The District captures its prevention activities with an Excel form. It may benefit the Agency to ensure its tracking system captures the essential data required within ISO's Community Risk Reduction category. Furthermore, the ISO evaluation allows for the consideration of contacts made via social media platforms. Thus the Agency should consider leveraging these platforms to increase the reach of its public education efforts.

Through the course of focused interviews, it became apparent that the Agency's prevention efforts are primarily reactive and absent of a data driven strategy or plan designed to target at risk populations. In accordance with NFPA 1730, the agency should consider basing its public education efforts upon a Community Risk Reduction plan where the CRA identifies target areas for specific program deliveries. Data sets germane to public education include population demographics, historical call demand by location, demographic, and determinant; hospital admission rates and causes; occupancy hazard risk categories in relation to the level of internal fire protection provided. Once the Agency has identified both the at-risk population and the risk they face, efforts can be strategically focused for maximum impact and benefit. Furthermore, efforts can be better aligned with the Agency's organizational goals and objectives. The same data utilized to create the CRA will facilitate a quantifiable analysis of the Public Education program's impact and effectiveness.

Finding #: 13

The Agency operates a robust public education program with commendable effort; yet, in the absence of a quantifiable method for determining the needs of the community.

Recommendation #: 10

The District should establish a quantifiable approach to determining public risk as the guideline for its Public Education program efforts.

Effectiveness of Fire Prevention and Community Risk Reduction Program

The available data demonstrates the District's prevention program efforts are very effective. From 2013 through 2015, the District only suffered losses totaling 8.06% of property value that came under risk from an event, subsequently saving 91.94% or \$91,525,362 of property value. Furthermore, in the same period, there were no firefighter or civilian casualties. All high-rises in the District are fully protected with suppression systems and smoke control with the exception of one that is current in progress. Additionally, the District has not experienced a fire in an inspectable property in last five years. This sampling of findings reinforces the effectiveness of the District's dedicated prevention and risk reduction efforts.

Analysis of Training Program

Through a series of structured interviews with administrative staff and labor, in addition to a review of agency document submissions, the *FITCH* team analyzed the appropriateness and effectiveness of the training program. The District's Training program falls primarily under the direction of the two Deputy Chiefs responsible for Operations and EMS. In 2008, the Training program was directed by a Deputy Chief of Training and facilitated by two dedicated Training Captains. However, in the course of the recession the position was left vacated. The program is still facilitated by two Training Captains who report directly to the Deputy Chiefs and provide for the necessary Fire and EMS training within the organization.

The current organizational structure appears to be meeting the needs of the organization. The District is compliant with the current ISO training requirements and provides all required EMS CEU's for its EMTs and Paramedics. The District's medical director also provides monthly training to the uniformed personnel. The District has outline the training requirements for each position through detailed job descriptions and the associated labor agreements. All required certifications are properly maintained. The Training Division also administers a one month orientation for all new suppression employees in which they cover a broad range of the both technical skills and operational tactics prior to being placed in the companies. The District's training efforts are supported internally with a dedicated training budget of just over \$71,000 in FY17, and dedicated staff as previously stated. The District also maintains an all-hazards training facility that's capable of facilitating training for nearly any type of risk the District is likely to experience.

Finding #: 14

BSFD has demonstrated a commitment to Training through the dedicated efforts of staff and fiscal resources. As a result, the District maintains full compliance with required certifications and ISO requirements.

Finding #: 15

BSFD has successfully articulated a professional development standard for its operational members.

The District's in-service training program is established in department SOG #1003.07.00, *Monthly Training*. This SOG was published in 2008 and has not received an update since. The SOG establishes a regular monthly training program and defines roles and responsibilities associated with it. Training is planned in monthly increments where the content is developed by the Training Captains. The Training Captain's efforts are directed through quarterly planning meetings between the Chief level officers essentially acting as a training group. The quarterly planning meetings are followed up with Monthly meetings among the executive staff.

Lessons plans are distributed at the beginning of each month directly related to the monthly Night Training, Fire related drill/review, or EMS related drill/review. Company Officers are responsible for administering and reviewing the prescribed training with their own personnel prior to being scheduled to attend the drills at the training facility. By policy, the Battalion Chief may schedule up to two units to simultaneously attend training without approval from the Fire Chief. It's noteworthy that the Company Officers are also empowered with the responsibility to conduct daily training with their personnel.

Finding #: 16

The District has published a defined training framework with essential components to establish a regular training program.

Although the aforementioned findings demonstrate a high level of awareness in regards to the District's training needs, a number of focused interviews and stakeholder input has revealed that the agency has been challenged to maximize the program as prescribed. There is commonality in the perception that the agency is not providing consistent, quality training development. So while the training is being delivered and accomplished with little resistance, there is not a perceivable culture of training within the organization. Much of the training effort is falling squarely on the Training Captains rather than the Company Officers spearheading the program with their personnel. These interactions closely mimicked experiences the *FITCH* team has had with other agencies facing similar challenges. This experience has shown that the most frequent factor contributing to struggling training culture is a failure to sustain consistent and high quality training.

Finding #: 17

The District has struggled to establish and cultivate a culture of training within the organization.

The most commonly observed barrier to consistent, high-quality training is the lack of a comprehensive training plan. The agency has demonstrated that it has the professional talent to assemble a comprehensive and intuitive plan with its current Monthly Program. However, the most effective plans cohesively articulate immediate and long range training objectives. Thus, the currently established 'training group' should give strong consideration to the development of a three-year, competency based training plan that progressively builds on each of the competency standards listed below. The plan should not only assign the topic, but should also include specified objectives and content.

The training plan should be designed to reinforce the mission and deployment strategies of the agency. The agency has stated that they are planning a revision of their Policies and SOGs. In this effort, special consideration should be given to aligning the agencies tactics with emerging industry research and best practice. For example, a risk-based approach to residential structure fires should include a deployable risk benefit assessment in concert with validated tactics such as transitional fire attack. All incident operations should be preplanned through the development of standing orders and functional unit assignments. This level of detail will serve to enhance firefighter safety in addition to providing consistency among all three operational shifts. The District already has a solid foundation in place for this with its Engine and Truck Company Operations SOGs. Accomplishing these objectives first, will enable the committee to design a training plan that is specifically catered to the Organization's operational methods and resources.

Recommendation #: 11

The Agency should revise and develop detailed SOGs to include standing orders and functional assignments that effectively standardize incident mitigation through the use of the most current research and tactics.

Recommendation #: 12

The agency should assemble a training group to develop a three year, competency based training plan that progressively builds on each of the competency standards listed below. The plan should be specifically aligned with the agencies Policies and SOGs, and provide detailed objectives and content.

The District is already utilizing one of the industry's leading business intelligence solutions for the development, delivery, and tracking of training. Target Solutions is a Learning Management System (LMS) that provides robust compliance tracking and credentialing services that are customized to the local requirements of the agency and its governing bodies such as the State of Florida in this instance. The advantage of this LMS is threefold. First, the platform is designed to facilitate the following knowledge and skills based competency standards by providing a plethora of fire service developed content.

- Individual Performance Standards (IPS)
- Company Performance Standards (CPS)
- Truck Performance Standards (TPS)
- Driver Performance Standards (DPS)
- Officer Performance Standards (OPS)

The vast library of content provides substantial, quality training opportunities that do not require the organization to develop content. This also provides for consistency in the application of training assignments. Secondly, the platform facilitates full credential tracking that can be customized to the organization's needs or be aligned with the professional standards published by the NFPA. This will firm up the agencies already established professional development guidelines. Finally, the platform provides industry leading tracking and reporting capabilities that will help the agency maintain full compliance with the ISO training requirements with a minimal commitment of staff time. Furthermore, the platform easily provides for accountability to ensure assigned training is actually being performed.

Recommendation #: 13

Ensure full optimization and use of the current LMS to provide the District with substantial content, professional credentialing, and training record management. The system should enable to District to facilitate a three year training plan.

CURRENT DEPLOYMENT STRATEGIES

The District's current deployment strategy consists of six (6) fixed facility stations and associated response territories or demand zones. The department deploys seven continually staffed response units and one shift commander from these facilities providing all hazards mitigation and ALS First Response EMS services. The following discussion will examine the historical demand and performance for this deployment model.

The FITCH team utilized a merged data set from three years of CAD data for all agencies that responded within the District (2013-2015). We cross-validated Bonita Springs Fire Control and Rescue District (BSFD) and Lee County EMS CAD data. For the Community Response History, we primarily focused our analysis on the 2015 calendar year to establish baseline performance upon the most recent community experience. We provide deeper historical perspective with three year workload trends presented in a later section.

In this report, we utilized two distinct measures of call volume and workload. First is the number of requests for service that are defined as either "dispatches" or "calls." Dispatches or calls are the number of times a distinct incident was created involving BSFD units or calls in the District's jurisdiction. Conversely, "responses" are the number of times that an individual unit (or units) responded to a call. Responses will be utilized on all Unit and Station level analyses, which account for all elements of workload and performance. Calls have been categorized as EMS, Fire, Hazmat, Mutual Aid, Public Service, and Rescue. We used CAD final incident type to assign EMS, MVC, and fire category, rescue, and hazmat call types. Similarly, we utilized CAD data to identify transport calls, and break down transport calls into two categories: BSFD responded, then transferred to Lee County EMS for transport, and BSFD responded and the call did not result in a patient transport.

Overall Community Response History

In the year 2015, BSFD responded to a total of 6,155 requests for service, or dispatches with five-stations. (Table 4) EMS service requests totaled 4,842, accounting for 78.7% of the total number of incidents. The number of fire related calls were 884, which accounted for 14.4% of the dispatched incidents. A total of 47 incidents (0.8%) were mutual aids outside BSFD's jurisdiction.

Table 4: Number of Incidents Dispatched by Category

Call Category	Number of Calls	Average Calls per Day	Call Percentage ¹
Illness and other	1,284	3.5	20.9
Fall and injury	1,168	3.2	19.0
Cardiac and stroke	724	2.0	11.8
Seizure and unconsciousness	582	1.6	9.5
MVC ²⁰	455	1.2	7.4
Breathing difficulty	451	1.2	7.3
Overdose and psychiatric	132	0.4	2.1
Fire alarm – Medical alarm	46	0.1	0.7
EMS Total	4,842	13.3	78.7
Fire alarm – All others	591	1.6	9.6
Outside fire	113	0.3	1.8
Structure fire	86	0.2	1.4
Vehicle fire	39	0.1	0.6
Investigation	33	0.1	0.5
Fire other	22	0.1	0.4
Fire Total	884	2.4	14.4
Hazmat	29	0.1	0.5
Mutual Aid	47	0.1	0.8
Public Service	287	0.8	4.7
Rescue	66	0.2	1.1
Total	6155	16.9	100.0

¹Individual percentages may not sum to call category and overall totals due to rounding.

The number of individual unit responses are more reflective of total department workload since 20.3% of the calls (1,247/6,155) resulted in multiple BSFD units responding. As summarized in Table 5, all units in BSFD combined made 8,548 responses²¹, and were busy on emergency calls 2,720 hours. On average, each response lasted 19.1 minutes from dispatched to clear.

²⁰ This report classified MVC incidents within the EMS program area. It is understood that the District may internally classify MVC's as fire suppression incidents. The choice by *FITCH* to classify these incidents as EMS is a matter of practice and is not intended to serve as a recommendation to adjust current practices for the District. The intent is to acknowledge potential differences from internal reporting practices.

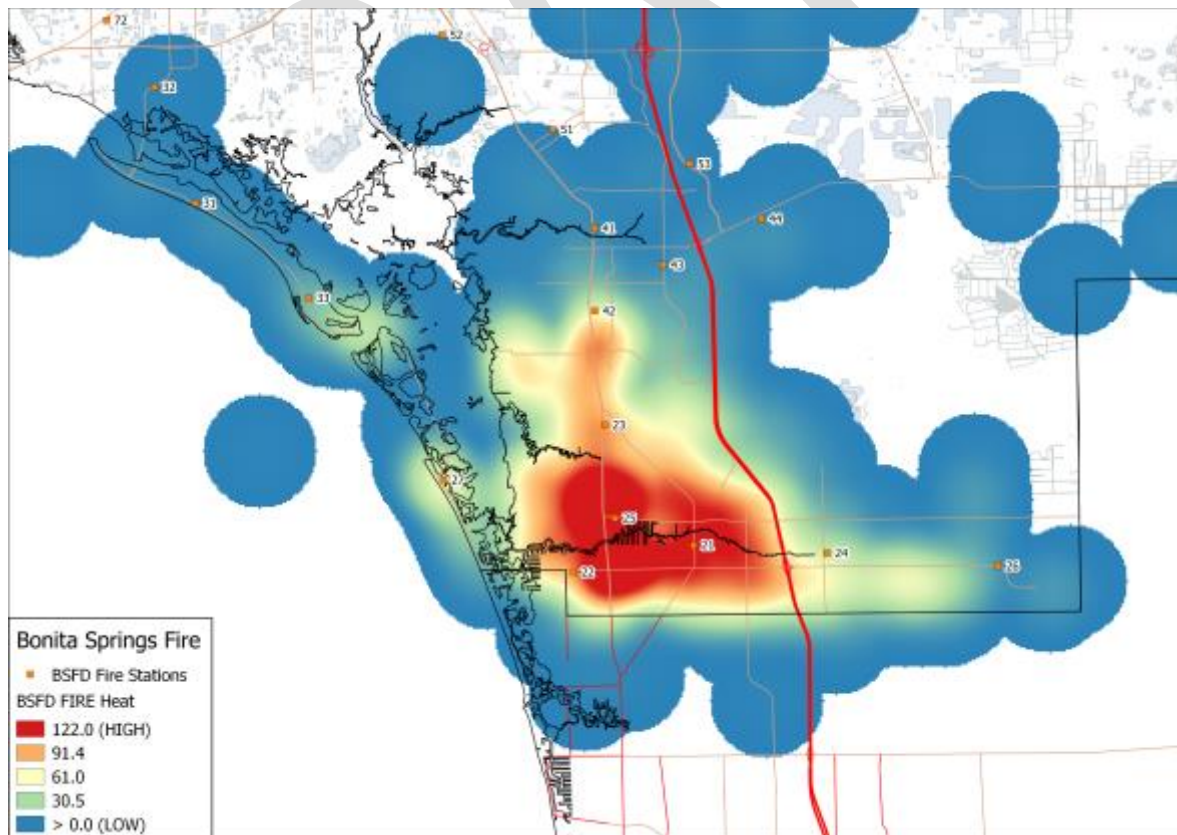
²¹ There were actually 8,708 entries for Bonita Springs for 2015, but only 8,641 had both a dispatch time and a clear time to be able to calculate busy time. Of the 8,641, 93 were duplicate entries in the original data file; these 93 duplicates were removed from all analyses related to "responses."

Table 5: Number of Calls, Number of Responses, and Total Busy Time by Program

Program	Number of Calls	Number of Responses	Average Responses per Call	Total Busy Hours	Average Busy Minutes per Response	Percentage of Total Busy Hours
EMS	4,842	5,419	1.1	1,672	18.5	61.5
Fire	884	2,613	3.0	838	19.2	30.8
Hazmat	29	56	1.9	23	24.7	0.8
Mutual Aid	47	58	1.2	41	42.2	1.5
Public Service	287	309	1.1	96	18.6	3.5
Rescue	66	93	1.4	50	32.4	1.8
Total	6155	8548	1.4	2720	19.1	100.0

Heat maps were also created to identify the concentration of the historic demand for services. Therefore, the following map presents the relative concentration of service demands for all incidents. The Blue areas have the least demand and the dark red areas have the highest concentration of demand. When reviewing the heat map, it is clear that the relative density of service demands is generally located near Stations 21, 22, and 25. This finding provides a compelling visual representation for the tabular data presented below.

Figure 9: All Incident Types Heat Map

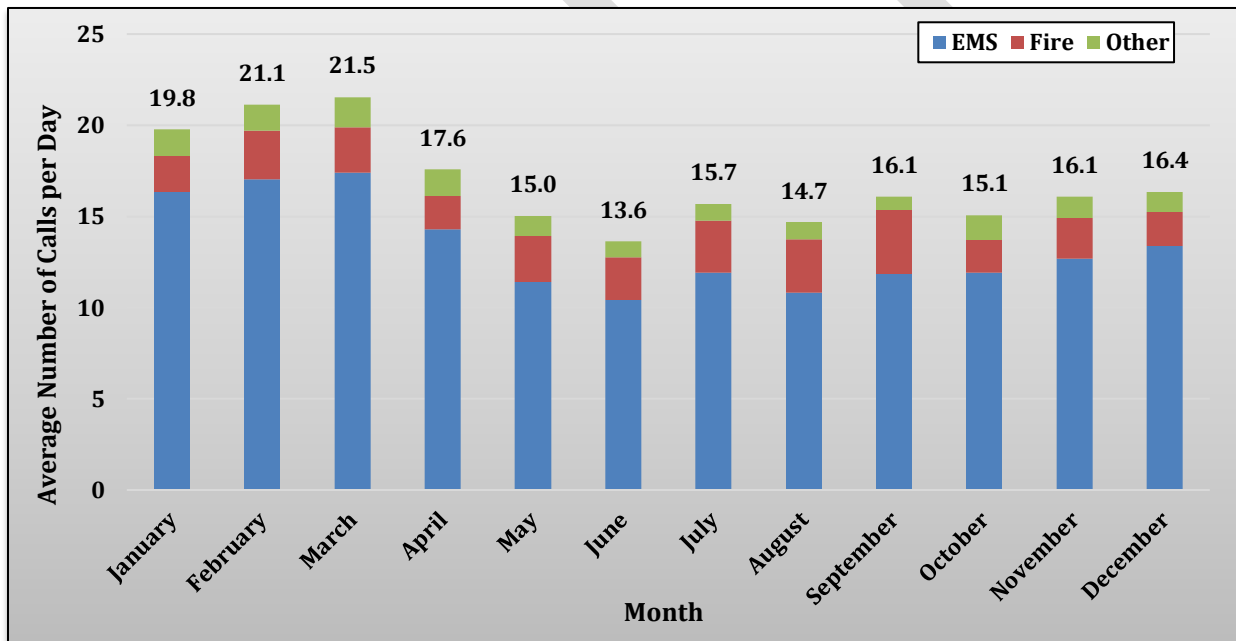


Temporal Analysis of Demand

Temporal analyses are conducted to evaluate patterns in community demands. These patterns, when identified, can provide a reliable basis upon which to predict risk and subsequent deployment. These measures examined the frequency of requests for service by month, day of week, and hour of day. In the following temporal analysis, hazmat, mutual aid, public service, and rescue calls were grouped into the “Other” category for presentation purpose.

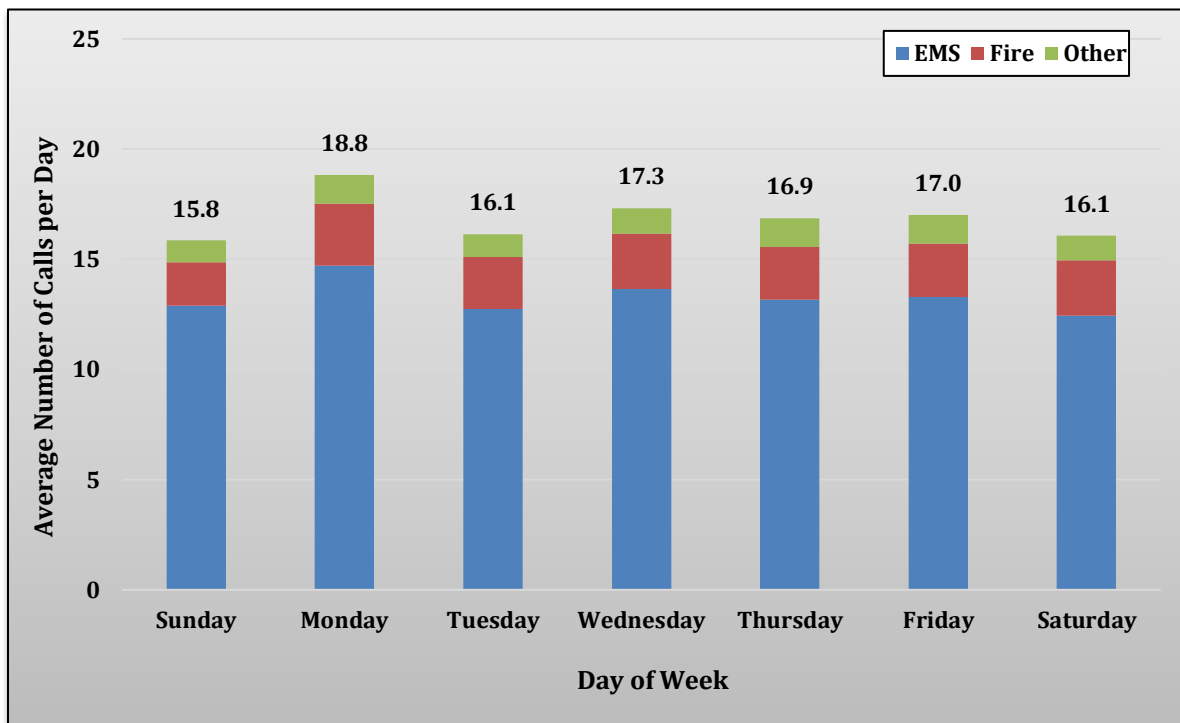
Overall, average requests per month ranged from a low of 13.6 per day in June to a high of 21.5 per day in March (Figure 10). The top three months with the most demands in descending order are: March (21.5 per day), February (21.1 per day) and January (19.8 per day), clearly demonstrating that the District’s busy season population surge accounts for an average demand increase of three to five calls per day.

Figure 10: Overall: Average Calls per Day by Month



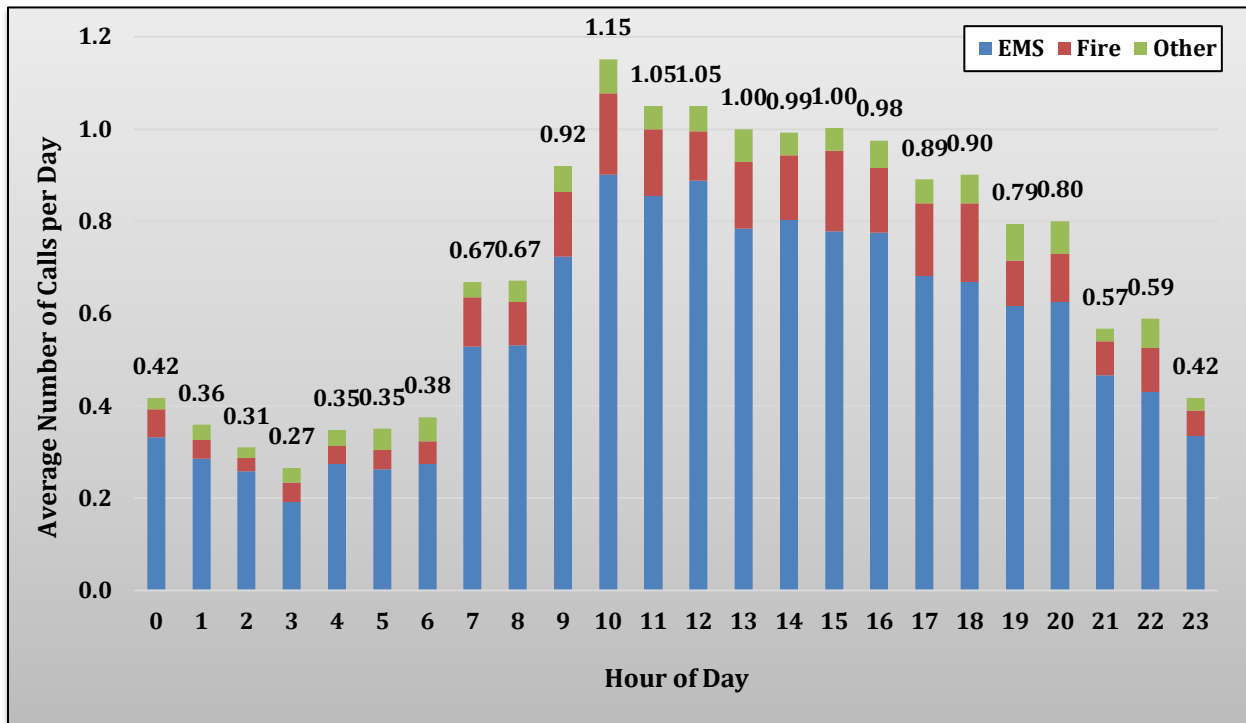
Similar analyses were conducted for requests by day of week (Figure 11). Sunday was the lowest for the week at 15.8 calls per day. Monday had the highest frequency of requests for services at 18.8 calls per day. However, it's important to note that the relatively small space between the highest and lowest frequency days provides a marginally sufficient predictive pattern for the demand by day of week.

Figure 11: Overall: Average Calls per Day by Day of Week



Overall demands were evaluated by the hour of the day (Figure 12). Considerable variability exists in the time of day that requests for emergency services are received. While the overall average number of calls per hour is 256 or 0.70 per day, the middle of the day has the greatest frequency of calls, with the hours from 1000 to 1600 averaging approximately one call per hour per day. So in order to provide a more granular understanding of the community's demand for emergency services, this temporal analysis included the average number of calls for each hour of the day. In other words, when referring to Figure 12 below, the busiest hour is at 1000 with 420 calls during that hour in 2015. The average number of calls per hour is a daily average for those 420 calls if they were equally distributed across the year (i.e., $420/365 = 1.15$). Therefore, the busiest hour per day would be at 1000 with an average hourly call volume of 1.15 calls per day. The second busiest hours occur at 1100 and 1200, each with 383 calls during that hour in 2015, with an average hourly call volume of 1.05 calls per day. The considerable difference between the peak and off-peak demand presents a highly reliable predictive pattern for demand.

Figure 12: Overall: Average Calls per Day by Hour of Day



Analysis of Assigned Response Areas

Overall, BSFD's units made 8,548 unit responses, and the total busy hours were 2,720 hours. The station level demand is more reflective for deployment decisions (Table 6). The unit level workload will help evaluate the utilizations of physical apparatus, and help apparatus procurement or maintenance decisions (Table 7). Station 21 was the busiest of the five stations, making 3,247 of BSFD's 8,548 (38.0%) annual total responses.

Table 6: Overall Workload by Station*

Station	Average Busy Minutes per Response	Annual Busy Hours ¹	Annual Total Responses
21	17.7	960	3,247
22	20.1	438	1,305
23	18.1	336	1,113
24	22.3	462	1,244
25	17.7	445	1,508
Admin	45.7	68	89
Not Identified	15.0	10	42
BSFD Total	19.1	2,720	8,548

*Individual hours will not sum to 2720 due to rounding.

Table 7: Overall Workload by Unit

Station	Unit	Unit Type	Average Busy Minutes per Response	Annual Busy Hours¹	Annual Total Responses
21	BSBC20	BC	18.0	224	746
	BSBC29	BC	9.9	1	8
	BSE21	Engine	16.6	290	1,044
	BSMA21	Marine	16.2	1	3
	BSR21	Rescue	19.1	432	1,357
	BSSQ21	Squad	8.5	13	89
	Station 21 Total		17.7	960	3,247
22	BSE22	Engine	18.5	389	1,263
	BSMA22	Marine	69.8	49	42
	Station 22 Total		20.1	438	1,305
23	BSB23	Brush	85.0	21	15
	BSE23	Engine	17.2	315	1,098
	Station 23 Total		18.1	336	1,113
24	BSB24	Brush	132.4	79	36
	BSE24	Engine	19.2	350	1,093
	BSE29	Engine	17.0	33	115
	Station 24 Total		22.3	462	1,244
25	BSTK25	Truck	17.7	445	1,508
	Station 25 Total		17.7	445	1,508
Admin	Admin Total		45.7	68	89
Not Identified	Not Identified Total		15.0	10	42
BSFD Total			19.1	2,720	8,548

Response Time Performance

Response time performance analyses include both emergency and non-emergency responses since the CAD does not differentiate between the response modes. Therefore, minor variations may exist between BSFD internal reporting and this report.

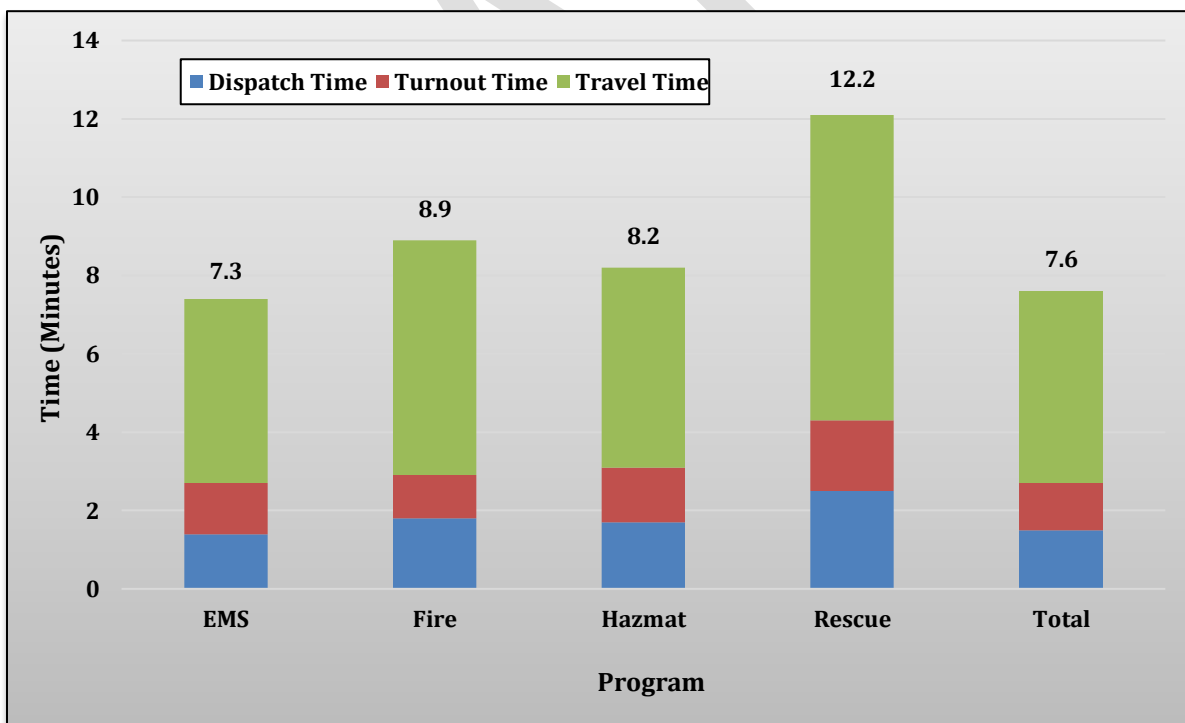
This analysis utilized the first arriving units of all distinct incidents excluding mutual aid and public service incidents (N=5,821). Thirty-seven incidents were excluded from analyses because the reported first unit arrival time was earlier than the reported first unit enroute time. Additionally, due to missing time data, the total sample size available for these analyses was 5,171.

Across all BSFD programs, the average dispatch time was 1.5 minutes, average turnout time was 1.2 minutes, and average travel time was 4.9 minutes (Table 8; Figure 13). Response time was calculated from the time the call was received to the time of first unit arrival, and is equivalent to the sum of dispatch, turnout, and travel times. The average response time across BSFD programs was 7.6 minutes.

Table 8: Average Dispatch, Turnout, Travel, and Response Times in Minutes of First Arriving Units by Program

Program	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
EMS	1.4	1.3	4.7	7.3	4,346
Fire	1.8	1.1	6.0	8.9	748
Hazmat	1.7	1.4	5.1	8.2	27
Rescue	2.5	1.8	7.8	12.2	50
Total	1.5	1.2	4.9	7.6	5171

Figure 13: Average Dispatch, Turnout, Travel, and Response Times in Minutes of First Arriving Units by Program



The response time performance was also measured on the percentile. This approach provides a more robust and reliable measure of performance as it is less influenced by outliers than measures of central tendency such as the average. Best practice is to measure at the 90th percentile. In other words, 90% of all performance is captured expecting that 10% of the time

the department may experience abnormal conditions that would typically be considered an outlier. For example, if the department were to report an average response time of six minutes, then in a normally distributed set of data, half of the responses would be longer than six minutes and half of the responses would be shorter than six minutes. Utilizing six minutes as the example, the 90th percentile communicates that 9 out of 10 times the department performance is 6 minutes or better (faster), and is therefore more predictable and more clearly articulated to policy makers and the community.

Across BSFD programs, the performance at the 90th percentile was 2.9 minutes for dispatch time, 2.0 minutes for turnout time, 7.7 minutes for travel time, and 10.9 minutes for response time (Table 6). Please note that the sum of the 90th percentile values for dispatch, turnout, and travel times is not equivalent to the 90th percentile response time.

Typically, performance varies across call types or categories due to a variety of reasons. For example, the turnout time may be longer for fire related calls because the crews have to dress in their personal protective ensemble (bunker gear) prior to leaving the station, whereas on an EMS incident, they do not.

Similarly, the larger fire apparatus may require longer response times due to their size and lack of maneuverability. Data indicate that average and 90th percentile travel times for fire calls were slightly longer than for EMS calls. As expected, significant variability is introduced in responses for hazmat and rescue calls due to their relatively small sample sizes.

Table 9: 90th Percentile Dispatch, Turnout, Travel, and Response Times in Minutes of First Arriving Units by Program

Program	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
EMS	2.8	2.1	7.3	10.5	4,346
Fire	2.9	1.8	9.6	12.6	748
Hazmat	3.2	2.2	9.0	13.2	27
Rescue	4.3	3.0	14.6	20.6	50
Total	2.9	2.0	7.7	10.9	5,171

Currently, the District utilizes an 85th percentile measure for internal reporting. Therefore, a table with 85th percentile performance is provided for the purposes of demonstrating the relationship between measures and to validate available data sets. It is important to note that the performance is identical and that only the point at which it is measured on the cumulative distribution is different.

Table 10: 85th Percentile Dispatch, Turnout, Travel, and Response Times in Minutes of First Arriving Units by Program

Program	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
EMS	2.5	1.8	6.6	9.7	4346
Fire	2.6	1.6	8.7	11.6	748
Hazmat	3.0	2.0	7.4	10.9	27
Rescue	3.8	2.8	11.3	14.6	50
Total	2.5	1.8	7.0	10.0	5171

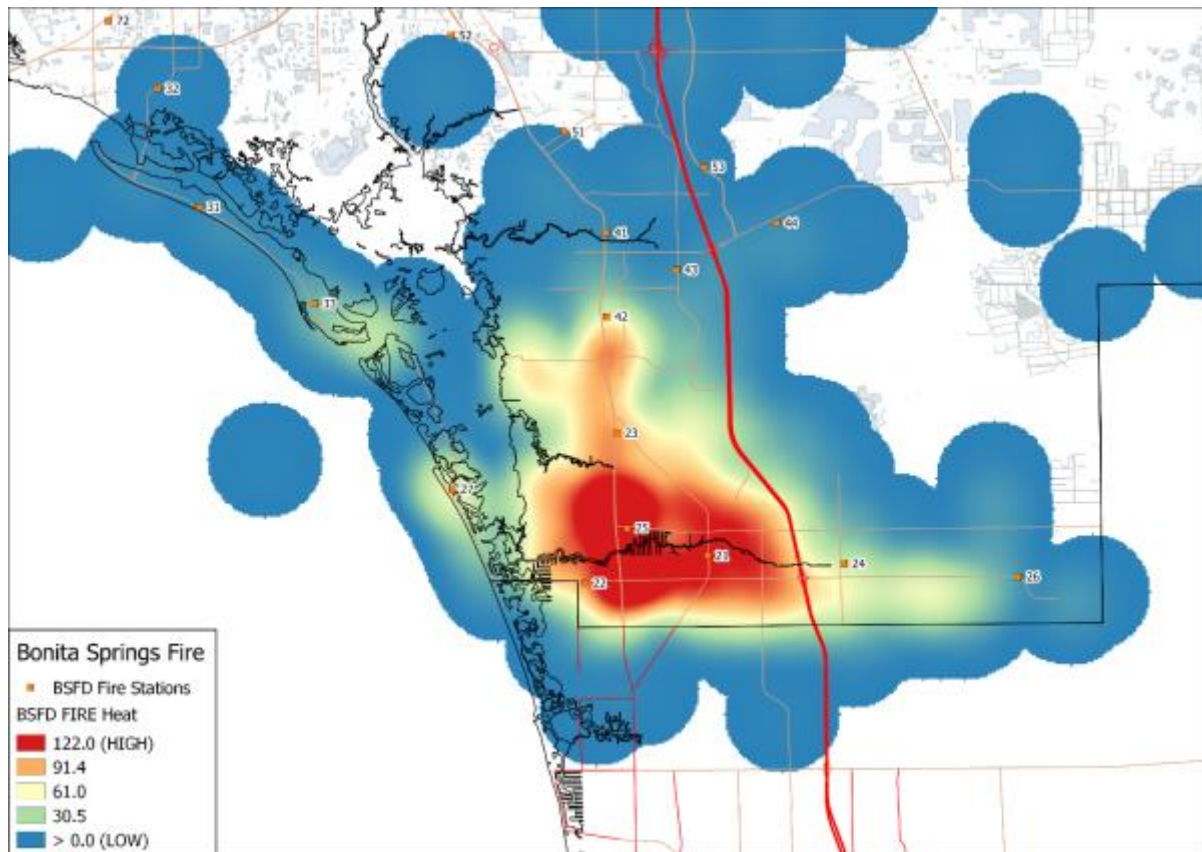
Fire Program - Community Response History

The number of fire related calls in 2015 were 884, which accounted for 14.4% of the dispatched incidents (Table 4). “Fire Related” incidents are an aggregated category of the various final incident types available in the CAD databases. Table 10 of the Data Report provides details of these fire related incidents by nature of the call. The analysis showed that “Alarms-Comm/Ind Bld” was the most frequent fire related community demand (303/884 or 34.3% of calls in 2015), followed by “Alarms-Residential” (203/884 or 23.0% of calls in 2015).²²

Heat maps were created to identify the concentration of the historic demand for services by program area. As stated, the fire program consist of several generalized fire related call categories. Thus, the following mapping will present the relative concentration of service demands by fire, hazmat, and rescue, respectively. The Blue areas have the least demand and the dark red areas have the highest concentration of demand. For strictly fire related incidents, there is still a clear concentration of service demands located near Stations 21, 22, and 25 (Figure 14).

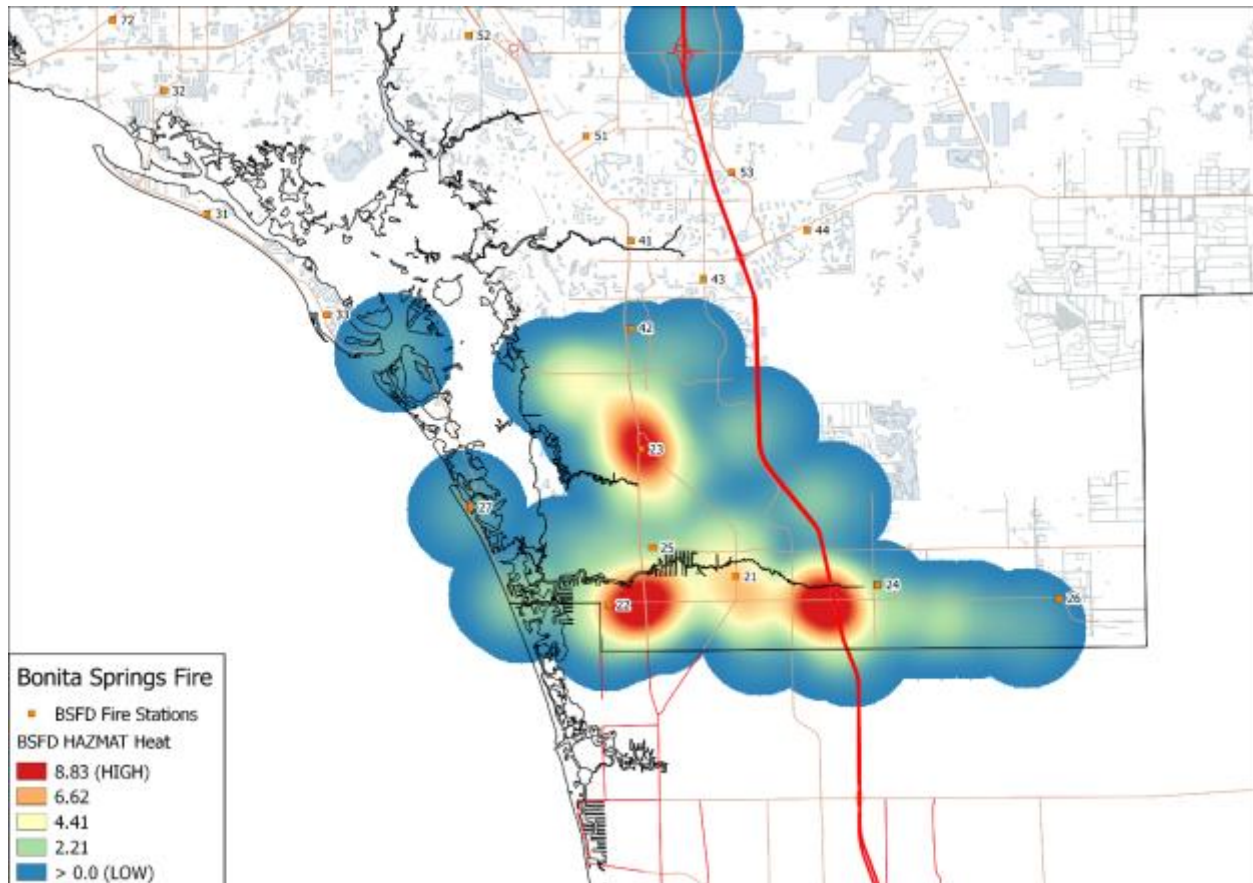
²² Bonita Springs Fire Control & Rescue District, Data Analysis, FITCH (2017)

Figure 14: Heat Map for Fire Related Incidents



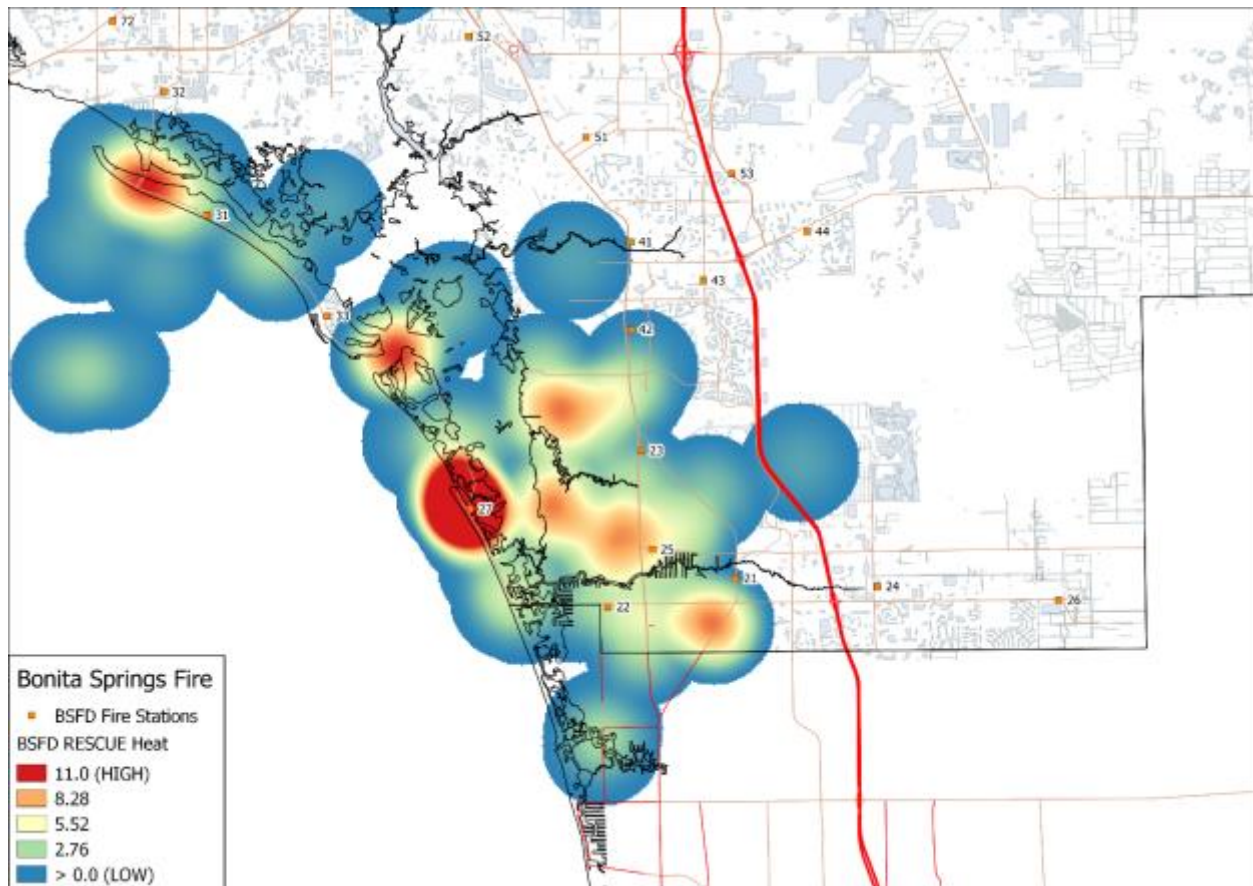
The distribution of hazardous materials calls do not have a singular focused concentration, rather, there are three distinct areas of concentrated calls around stations 22, 23, and between 21 and 24 (Figure 15). It is important to recognize that the sample size of hazardous materials calls is comparatively low to fire and EMS.

Figure 15: Hazardous Materials Heat Map



Similarly, the technical rescue incidents were mapped. Again, the call frequency is relatively infrequent for technical rescue incidents (Figure 16).

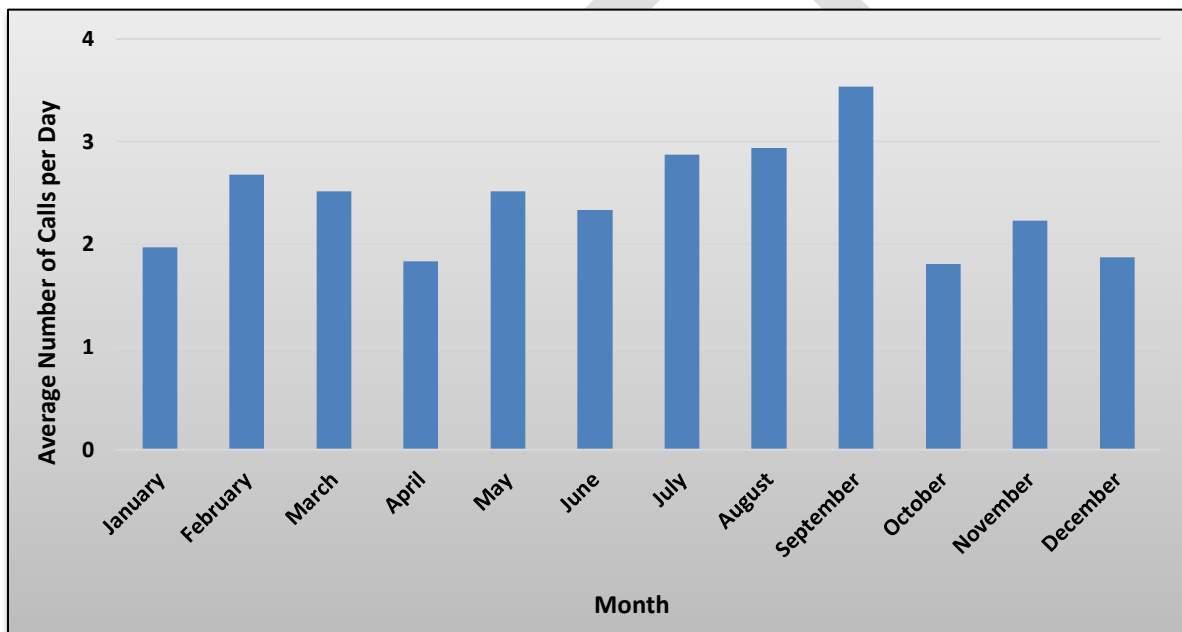
Figure 16: Rescue Incidents Heat Map



Temporal Analysis of Demand

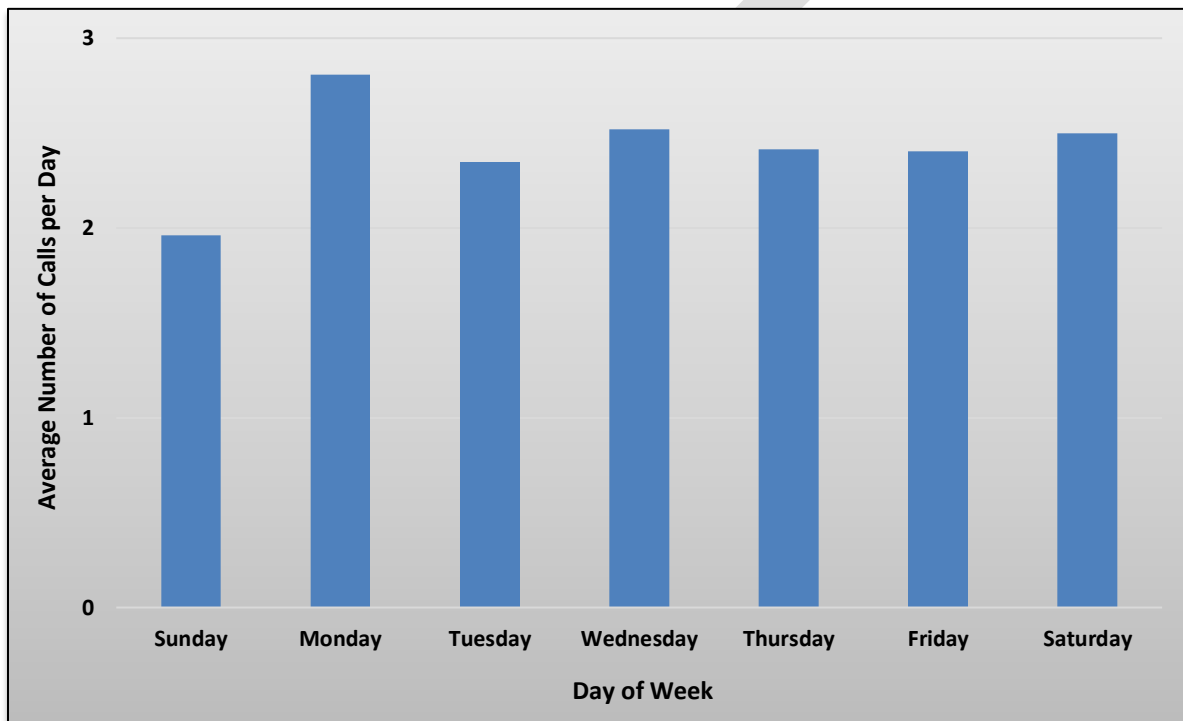
To better understand how this program area specifically impacts the District's demand, temporal analyses were conducted to evaluate patterns in community demands specifically for fire related services. Results indicate that there was variability by month (Figure 17). The three months with the highest numbers of average fire calls per day in descending order were: September (3.5 per day), August (2.9 per day), and July (2.9 per day). The three months with the lowest numbers of average fire calls per day in ascending order were: October (1.8 per day), April (1.8 per day), and December (1.9 per day). Despite this variability, the chart clearly demonstrates the random nature of the fire related demand on a monthly basis, thus no predictive pattern is demonstrated.

Figure 17: Average Fire Related Calls per Day by Month



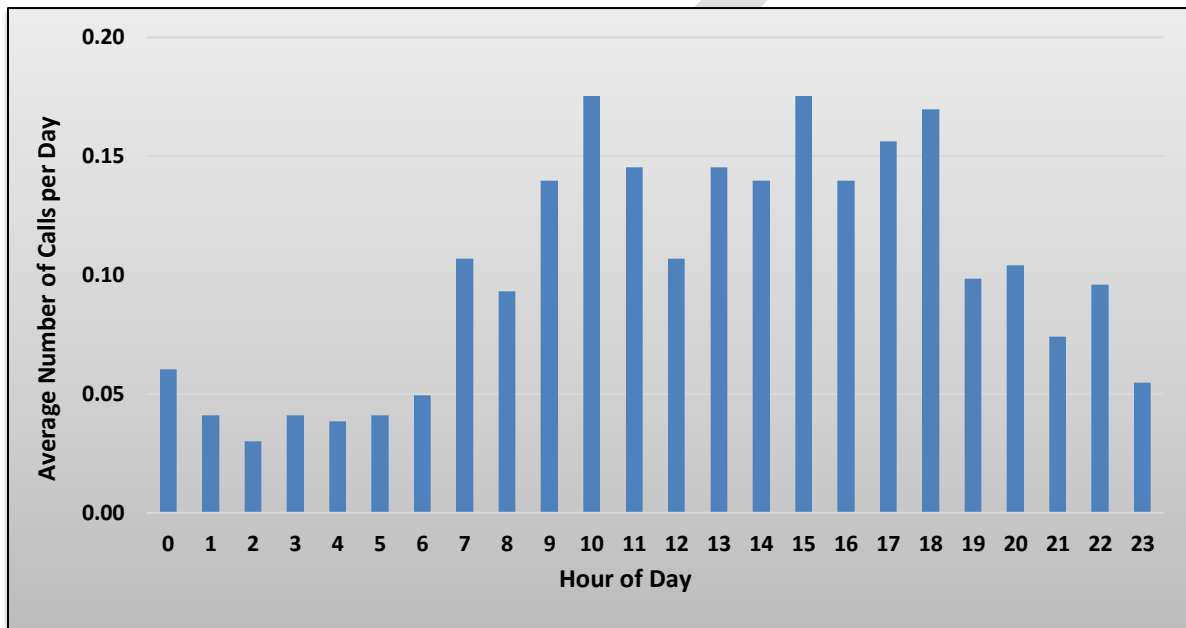
Similar analyses were conducted for fire related calls per day of week (Figure 18). The data revealed that there is some variability in the demand for services by day of week. Monday had the highest frequency of requests for fire related services, averaging 2.8 calls per day and accounting for 16.5% of all fire related calls. Sunday had the lowest frequency of requests for fire related services, averaging 2.0 calls per day and accounting for 11.5% of all fire related calls. Again, the relatively small space between the highest and lowest frequency days provides a marginally sufficient predictive pattern for the fire demand by day of week.

Figure 18: Average Fire Related Calls per Day by Day of Week



Fire related calls were also evaluated by hour of the day (Figure 19). Variability exists in the time of day that requests for fire related services were received. The hours from 0100 to 0600 had the lowest demands, where total number of calls for 2015 during these hours ranged from 11 to 18. The highest demand for fire related services occurred at 1000 and 1500. There were 64 fire related calls in 2015 at each of those hours. The next busiest times occurred at 1800 (62 fire related calls in 2015) and at 1700 (57 fire related calls in 2015). Again, the considerable difference between the peak and off-peak demand presents a highly reliable predictive pattern for demand.

Figure 19: Average Fire Related Calls per Day by Hour of Day



Analysis of Assigned Response Areas and Workload

BSFD made a total of 2,613 responses to fire related calls. The total time on task was 838 hours, and the average time on task per response was 19.2 minutes. Station 21 was the busiest station in this program area providing a little over 39% of the District's fire related responses followed by Station 25 at nearly 30%. The remaining stations effectively split the remaining workload.

Table 11: Workload by Unit for Fire Related Calls

Station	Unit	Unit Type	Average Busy Minutes per Response	Annual Busy Hours¹	Annual Total Responses
21	BSBC20	BC	18.3	176	576
	BSBC29	BC	1.5	0.2	7
	BSE21	Engine	16.7	120	430
	BSMA21	Marine	--	--	0
	BSR21	Rescue	23.4	6	15
	BSSQ21	Squad	--	--	0
	Station 21 Total		17.6	301	1028
22	BSE22	Engine	16.7	100	358
	BSMA22	Marine	31.8	3	6
	Station 22 Total		16.9	103	364
23	BSB23	Brush	85.0	21	15
	BSE23	Engine	15.0	95	380
	Station 23 Total		17.6	116	395
24	BSB24	Brush	127.8	64	30
	BSE24	Engine	21.9	69	188
	BSE29	Engine	14.8	6	24
	Station 24 Total		34.3	138	242
25	BSTK25	Truck	14.8	129	522
	Station 25 Total		14.8	129	522
Admin	Admin Total		52.4	44	50
Not Identified	Not Identified Total		33.6	7	12
BSFD Total			19.2	838	2613

*Individual hours may not sum to station totals or BSFD total due to rounding.

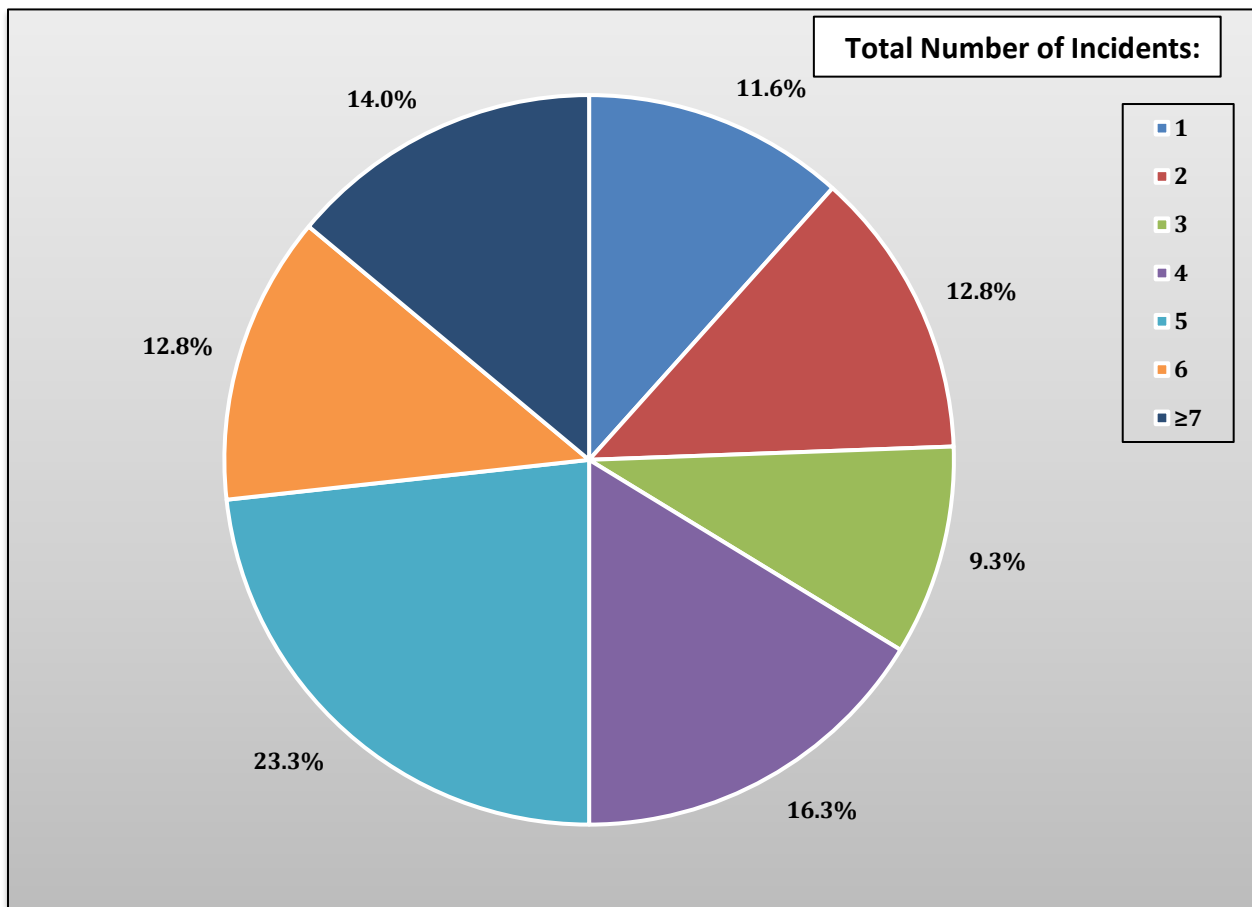
We also analyzed number of responding BSFD units by fire call type (Table 12). This analysis adds further insight into the impact that each fire call type has on the organization. Overall, 28.3% of fire calls (250/884) were responded to by one unit. Seventy-four of 113 (65.5%) outside fires were responded to by one unit, and 21 of 39 (53.8%) vehicle fires were also responded to by one unit. However, for structure fire calls, 66.3% of calls (57/86) were responded to by four or more units (Figure 20).

BSFD's fire response experience is very similar to the national experience for similar communities. To illustrate, the structure fire incidents that were responded to by four or more units represent incidents that likely presented with the potential or the reality of intensive mitigation. These are high-risk risk events the agency must be ready for, but in this example, these incidents represent less than 1% of the department's total demand. Furthermore, the random nature of these events make their occurrence highly unpredictable. Thus, the deployment of suppression resources follows a readiness model rather than a purely demand driven approach.

Table 12: Number of Responding Units by Fire Call Type

Call Category	Number of BSFD Responding Units							Total
	1	2	3	4	5	6	7 or more	
Fire alarm – All others	106	29	107	324	21	4	0	591
Outside fire	74	16	14	5	2	2	0	113
Structure fire	10	11	8	14	20	11	12	86
Vehicle fire	21	10	6	1	1	0	0	39
Investigation	23	9	1	0	0	0	0	33
Fire other	16	4	2	0	0	0	0	22
Total	250	79	138	344	44	17	12	884
Percentage	28.3	8.9	15.6	38.9	5.0	1.9	1.4	100.0

Figure 20: Percentage of Structure Fire Calls by Number of Responding Units



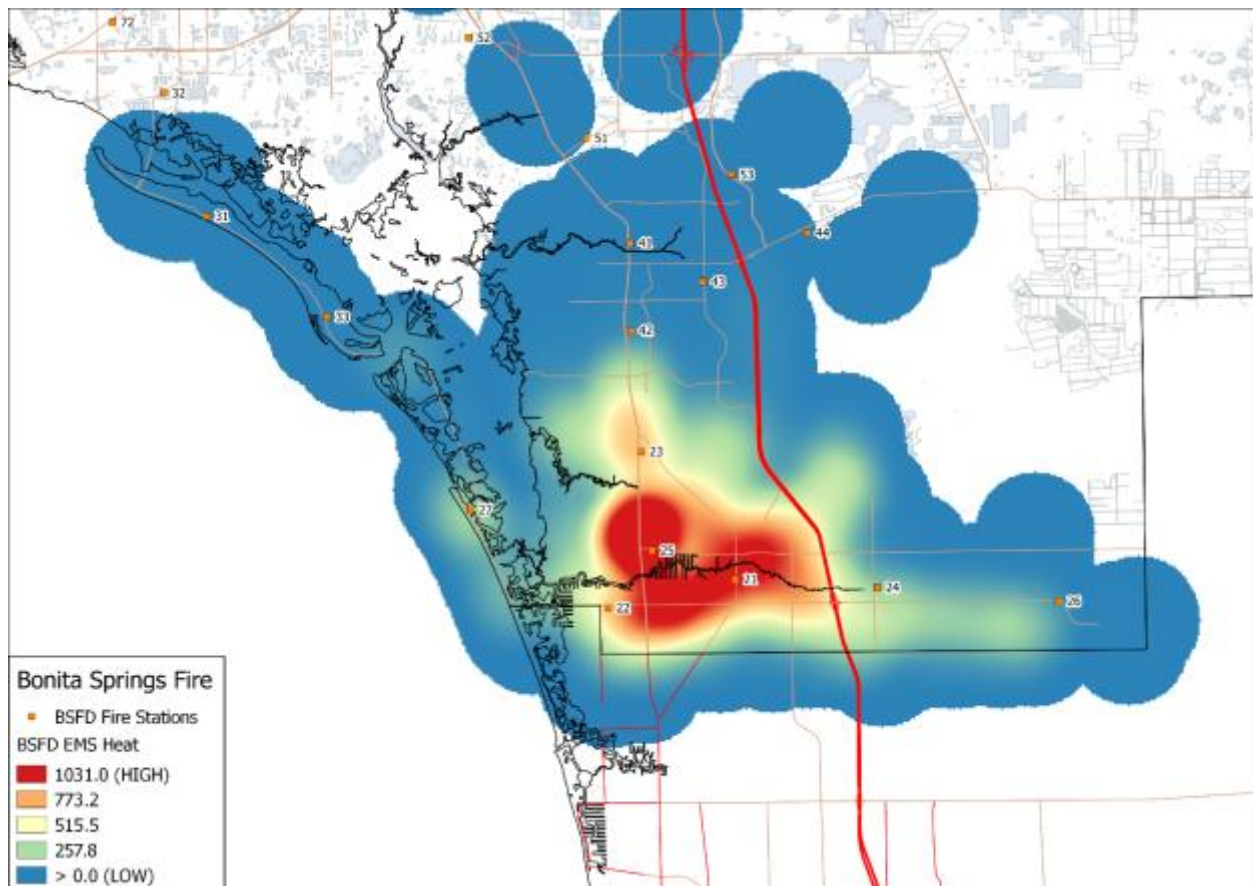
EMS Program - Community Response History

BSFD provides emergency medical services (EMS) as an ALS first responder. As such, BSFD does not transport patients. Instead, patient transportation services are provided by Lee County EMS. For these analyses, EMS incidents are an aggregated category of the various granular EMS requests categorized based upon CAD call description. The number of EMS service requests totaled 4,842 in 2015, accounting for 78.7% of the total number of incidents and averaging 13.3 requests per day (Table 4). Table 17 of the Data Report provides details of these EMS related incidents by nature of the call. Illness and other was the most frequent community demand (1284 total requests in 2015, averaging 3.5 requests per day), followed by fall and injury (1168 total requests in 2015, averaging 3.2 requests per day). Cardiac and stroke requests totaled 724 for 2015, averaging 2.0 requests per day and “Sick Person” was the most frequent community demand (733/4842 or 15.1% of calls in 2015), followed by “Falls” (608/4842 or 12.6% of calls in 2015).²³

²³ Bonita Springs Fire Control & Rescue District, Data Analysis, FITCH (2017)

A heat maps was created to identify the concentration of the historic demand for EMS services. The Blue areas have the least demand and the dark red areas have the highest concentration of demand. The distribution of EMS calls follow a similar pattern as the fire related incidents, there is still a clear concentration of service demands located near Stations 21, 22, and 25 (Figure 21). However, the distribution may be more concentrated than with the fire incidents.

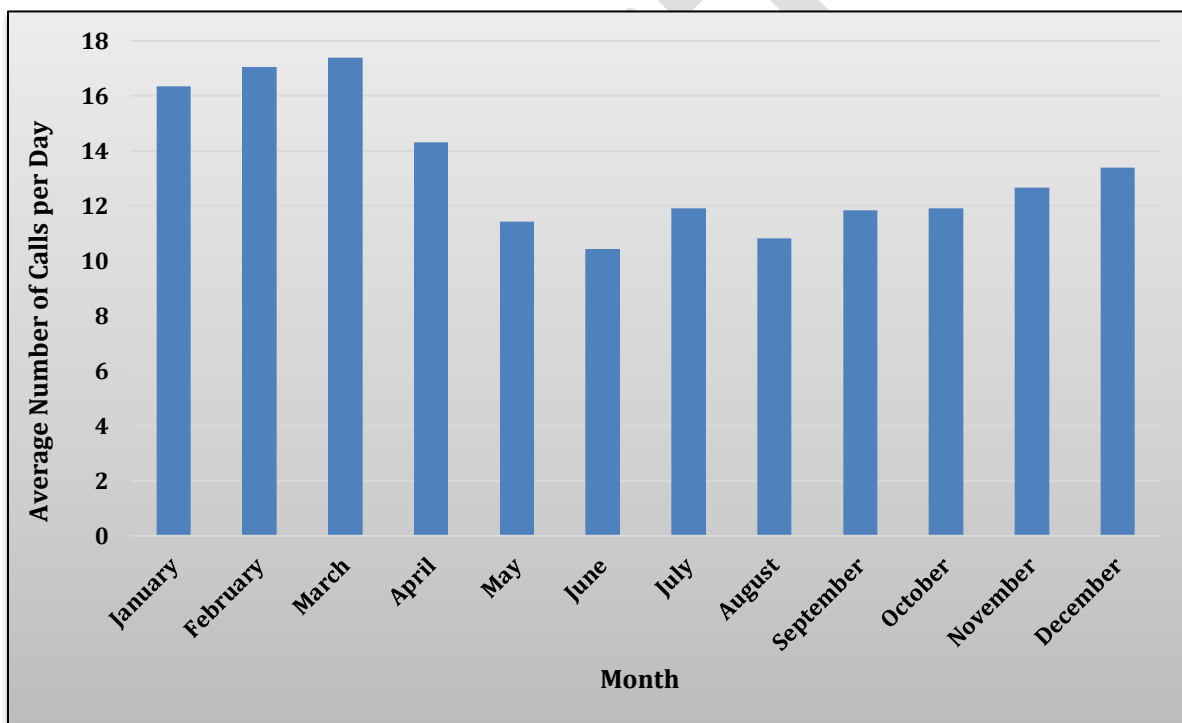
Figure 21: Heat Map for EMS Related Incidents



Temporal Analysis of Demand

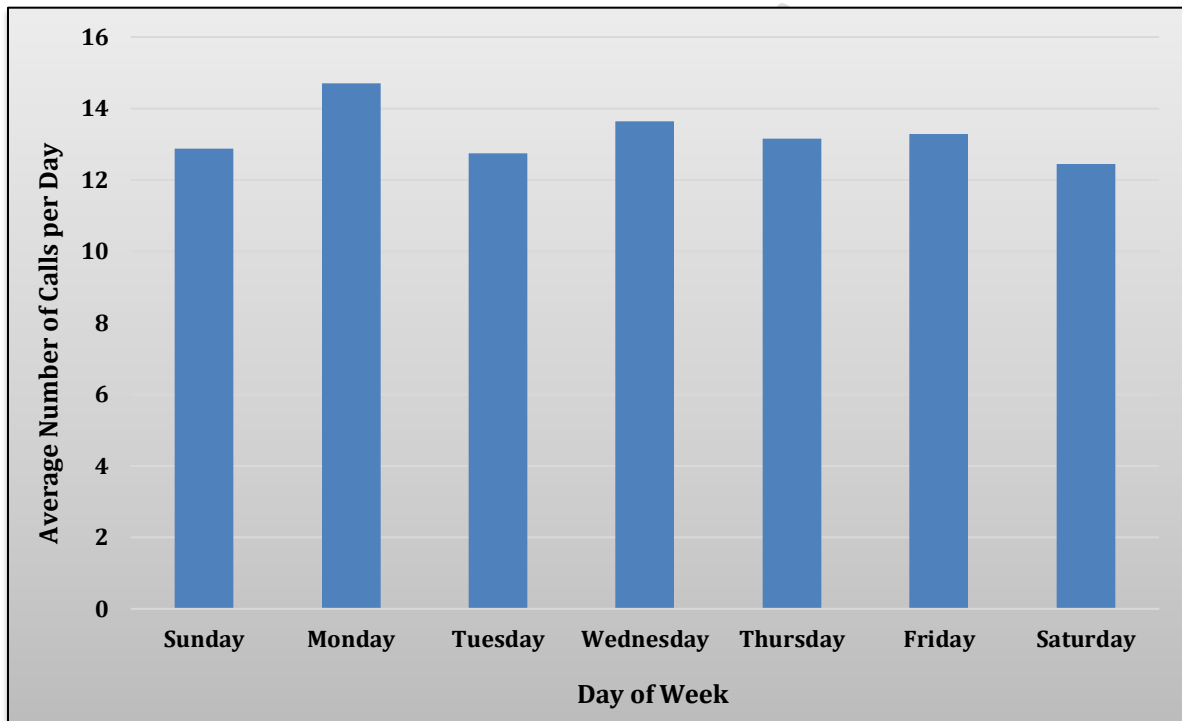
To better understand how this program area specifically impacts the District's demand, temporal analyses were conducted to evaluate patterns in community demands specifically for EMS services. These analyses were completed by month of year, day of week, and hour of day. There is some variability in demand across months of the year with March receiving the most requests for service (17.4 average calls per day), and June receiving the fewest requests for service (10.4 calls per day; Figure 22). Since the EMS program area is the primary driver of the Districts' demand, it's logical that the EMS demand by month demonstrates the same busy season demand increase seen with the overall monthly demand.

Figure 22: Average EMS Related Calls per Day by Month



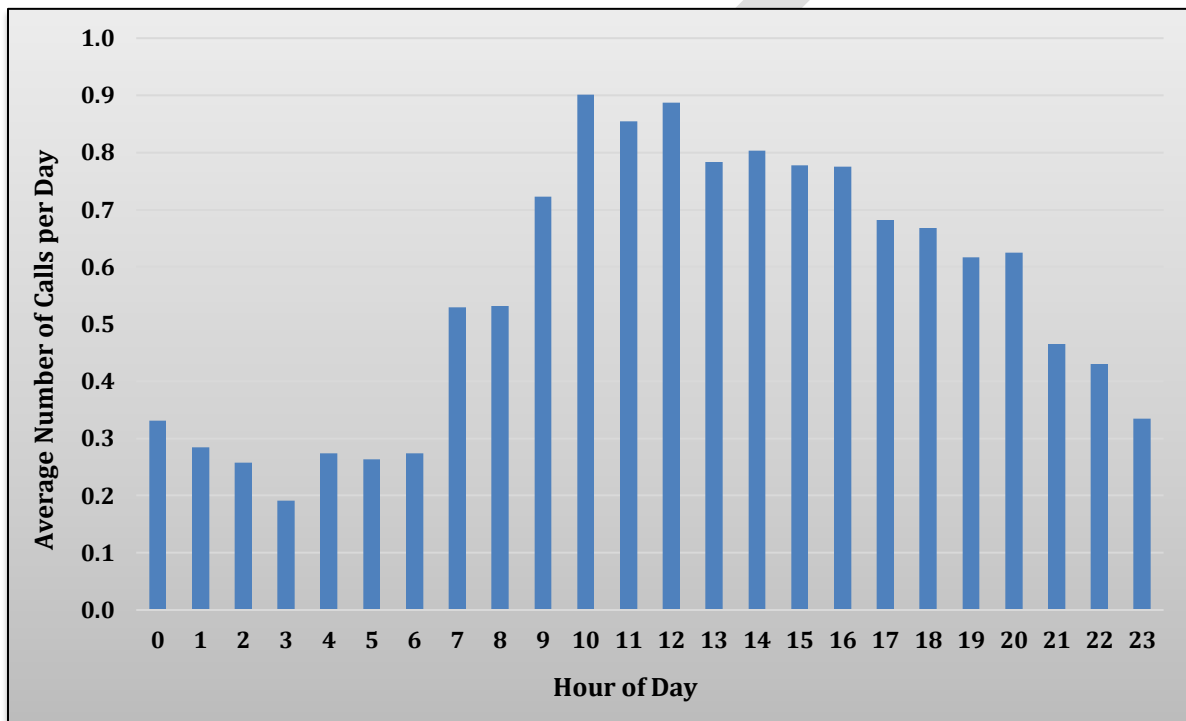
Similar analyses were conducted examining the frequency of requests for service by the day of the week. There is little variability in the demand for services by the day of the week. Monday received the most requests for service (14.7 average calls per day), and Saturday received the fewest requests for service (12.4 average calls per day; Figure 23). Still, the relatively small space between the highest and lowest frequency days provides a marginally sufficient predictive pattern for the EMS demand by day of week.

Figure 23: Average EMS Related Calls per Day by Day of Week



Finally, EMS calls were examined by hour of day and the average hourly rate of EMS calls per hour. The demand curve for requests for EMS service follows an expected pattern experienced in similar communities across the nation. The highest frequency of service calls occurred between 1000 and 1600 (Figure 24). The demand peaked at 1000 with 329 calls in 2015 (0.90 average calls per day at this hour). Call frequency was lowest between the hours of 100 and 600. In this instance, the considerable difference between the peak and off-peak demand presents a highly reliable predictive pattern for demand.

Figure 24: Average EMS Related Calls per Day by Hour of Day



Analysis of Assigned Response Areas and Workload

BSFD units made a total of 5,419 responses to EMS calls (Table 13). The total time on task was 1,672 hours, and the average time on task was 18.5 minutes. This is appropriately aligned with their role as an ALS First Responder agency. BSFD sent multiple units to just 9.1% (440/4842) of the EMS incidents (Table 14) subsequently handling more than 90% of their EMS demand with a single BSFD unit. On average overall, 1.1 units were dispatched per EMS call.

Table 13: Workload by Unit for EMS Related Calls

Station	Unit	Unit Type	Average Busy Minutes per Response	Annual Busy Hours¹	Annual Total Responses
21	BSBC20	BC	16.2	38	139
	BSBC29	BC	68.9	1	1
	BSE21	Engine	16.2	138	511
	BSMA21	Marine	--	--	--
	BSR21	Rescue	19.1	424	1,328
	BSSQ21	Squad	8.4	12	88
	Station 21 Total		17.8	613	2067
22	BSE22	Engine	19.6	267	819
	BSMA22	Marine	23.2	2	5
	Station 22 Total		19.6	269	824
23	BSB23	Brush	--	--	--
	BSE23	Engine	18.1	198	655
	Station 23 Total		18.1	198	655
24	BSB24	Brush	--	--	--
	BSE24	Engine	18.8	255	814
	BSE29	Engine	17.5	24	83
	Station 24 Total		18.6	279	897
25	BSTK25	Truck	19.1	296	930
	Station 25 Total		19.1	296	930
Admin	Admin Total		25.9	15	36
Not Identified	Not Identified Total		11.4	2	10
BSFD Total			18.5	1,672	5,419

Table 14: Number of Responding Units by EMS Call Type

Call Category	Number of BSFD Responding Units					Total
	1	2	3	4	5 or more	
Illness and other	1,204	77	3	0	0	1,284
Fall and injury	1,098	66	1	1	2	1,168
Cardiac and stroke	651	66	5	0	2	724
Seizure and unconsciousness	544	37	1	0	0	582
MVC	310	58	70	13	4	455
Breathing difficulty	427	24	0	0	0	451
Overdose and psychiatric	123	9	0	0	0	132
Fire alarm – Medical alarm	45	0	1	0	0	46
Total	4,402	337	81	14	8	4,842
Percentage	90.9	6.9	1.7	0.3	0.2	100.0

Finally, although Lee County EMS provides the transport services, we analyzed the outcomes for EMS requests to determine which percentage of the District's demand resulted in a patient transport. Overall, approximately half of all the District's calls resulted in a transport and nearly 64% of EMS calls. We also analyzed the relationship between total EMS calls and transport requests by hour of the day. The data showed that the variation between total EMS requests and EMS transport reports followed a similar pattern. This helps demonstrate that the District maintains a clinically based decision process in regards to transport regardless of the hour the request is made.

Three-Year Historical Workload Trends

From 2013 to 2015, the total number of calls responded to by BSFD increased from 5,080 to 6,155, or from 13.9 to 16.9 average calls per day (Table 15). This represented a compound annual growth rate of approximately 10.6% from 2013 to 2015. The total unit responses increased from 7,516 in 2013 to 8,548 in 2015, or from 20.6 average unit responses per day to 23.4 average unit responses per day (Table 16).

Table 15: Number of Incidents Dispatched by Category and Year

Call Category	Number of Calls		
	2013	2014	2015
Illness and other	1,005	1,036	1,284
Fall and injury	943	1,009	1,168
Cardiac and stroke	691	737	724
Seizure and unconsciousness	486	510	582
MVC	366	407	455
Breathing difficulty	366	424	451
Overdose and psychiatric	164	131	132
Fire alarm – Medical alarm	55	75	46
EMS Total	4,076	4,329	4,842
Fire alarm – All others	411	451	591
Outside fire	112	105	113
Structure fire	83	64	86
Vehicle fire	30	25	39
Investigation	20	35	33
Fire other	19	19	22
Fire Total	675	699	884
Hazmat	28	25	29
Mutual Aid	29	55	47
Public Service	233	322	287
Rescue	39	47	66
Total	5,080	5,477	6,155
Average Calls per Day	13.9	15.0	16.9
YoY Growth	NA	7.8%	12.4%

Table 16: Number of Calls, Number of Responses, and Total Busy Time by Year

Year	Number of Calls	Number of Responses	Average Responses per Call	Total Busy Hours	Average Busy Minutes per Response	Average Calls per Day	Average Responses per Day
2013	5,080	7,516	1.5	2,438	19.5	13.9	20.6
2014	5,477	8,182	1.5	2,642	19.4	15.0	22.4
2015	6,155	8,548	1.4	2,720	19.1	16.9	23.4

CURRENT STAFFING STRATEGIES

Fire and EMS Station Staffing

BSFD utilizes continuous staffing to cover 24 hours a day 365 days a year with a full staffing strength of 27 personnel each shift, 21 at a minimum, distributed over six (6) fire stations. Personnel work a rotating 24/48 work schedule on one of three shifts that result in a 56-hour average workweek. Currently the District has 90 personnel assigned to the companies on shift work. These staffing levels are in line with the District's level of historical and tangible risks. The agency maintains adequate daily staffing to deliver an effective response force to a primary alarm incident with residual capacity for escalation or ancillary calls.

Optimized Staffing of Current Deployment

Utilizing the 2015 average annual leave for all shift based personnel, that includes all time away from work assignments, the optimized staffing for 21 positions per shift is approximately 74 personnel. A more conservative approach takes into consideration the maximum leave that could be taken annually. In this approach, the personnel required to continuously staff 21 seats is approximately 77. Divided evenly, this would require 25 to 26 personnel assigned to each shift to adequately cover all forms of average leave and limit overtime liabilities through a continuous staffing model. In other words, for each single position, i.e. firefighter, it will require 3.49 to 3.63 personnel to continuously staff the one firefighter position 24 hours per day 365 days per year assuming the average annual leave and 56 hour average workweek. It is understood that allocated staffing numbers fluctuate across budget cycles and the number of actual personnel varies through attrition throughout each budget cycle. Therefore, the optimized staffing multiplier suggests that the District should have a minimum of 75 personnel, or 25 per shift, assigned in order to reliably staff 21 positions per shift.

The District is currently working to open a seventh station that will house a Truck company with a minimum staffing of three firefighters. Additionally, a second battalion chief position will also be added to the daily deployment. In total, this increases the Agency's minimum staffing to 25 positions. Applying the staffing multiplier, the agency will need to maintain 88 (optimal) to 91 (conservative) company personnel to reliably staff 25 positions per shift.

Finding #: 18

The District maintains adequate staffing numbers to ensure the continual delivery of emergency services.

Temporal Analyses of Staffing

Temporal analyses were conducted to evaluate patterns in community demands. These measures examined the frequency of requests for service in 2015 by month, day of week, and hour of day. Cancelled calls were also included. The results of these analyses were presented in the Overall Community Response History. These analyses demonstrated that there are some predictable temporal patterns to the demand. Overall, the first quarter shows a reliable increase in demand for the year with an increase of approximately seven calls per day from the slowest to the busiest month. This pattern is mirrored by the EMS program but more random with the Fire program. The demand by day of week presents a less reliable pattern due to the small margin of variability from the slowest to the busiest day. However, the hourly demand analysis produced the greatest variability and the most predictive pattern of demand. Like nearly all other agencies, the District experiences a spike in demand, across all program areas, during the daytime period from approximately 1000-1800 hours.

In many communities, alternative deployment strategies or configurations may be considered during the peak or non-peak periods once the baseline service levels have been met. For example, peak load units may be deployed only during the busiest parts of the day to absorb the increased demand. This is most appropriate when the community's resources are challenged to meet the workload; fiscal constraints require a realignment of resources and when the distribution model is adequately provided for according to the community's expectations.

As discussed within this report, BSFD's current distribution of resources is appropriate to meet the desired level of performance within the District. To maintain this desired level of readiness, each facility needs to provide a continually staffed unit. Furthermore, the District's resources are not challenged by workload. In other words, the units deployed to meet the geographical demand are also able to absorb the concentration demand. Thus, peak load units would not be an effective deployment alternative for the District.

Distribution and Concentration

The most appropriate approach to determining the level of staffing required to cover the risk is to consider the distribution and concentration of resources. The distribution of resources is the geographical deployment of units to cover the jurisdiction within a prescribed travel time performance. Once these units are in place, the concentration of resources is considered to ensure that an adequate number of resources exists to handle the volume of service requests.

The District's current distribution and concentration of resources is appropriate to meet the community's demand and expectations. GIS analyses indicate that the District's current six station deployment plan can achieve an 8-minute travel time for nearly 90% of all incidents. This distribution is further discussed later in this report. The concentration of resources is evaluated

through the lens of how many units are needed in each hour to handle the volume of calls. The peak time of 1000hrs experiences 1.15 calls per hour on average. Hence, one demand unit is needed to handle the concentration of risks.

In Summary, the distribution of risk suggests that the vast majority of risk is concentrated within the historic core of Bonita Springs around stations 21, 22, and 25. Yet, that demand for services will require just over one resource per hour and the geographic limitations will require a minimum of six fixed facilities. Therefore, the combination of supply (resources) and Demand (requests for service) suggest that the District will require a minimum of seven resources to cover the demand for services. In other words, six geographic units and one demand unit would require a total of seven units across the six fixed facilities. This is reflective of the District's current deployment with six fixed stations covering the geographic requirements and one station (Station 21) deploying two units to cover the demand.

Finding #: 19

The District's current deployment is aligned well with its risk which requires seven units over six fixed locations to effectively cover the community's risk.

REVIEW OF THE CURRENT SYSTEM PERFORMANCE

The first step in determining the current state of the District's deployment model is to establish baseline measures of performance. This analysis is crucial to the ability to discuss alternatives to the system deployment and in identifying opportunities for improvement. This portion of the analysis will focus efforts on elements of response time and the cascade of events that lead to timely response with the appropriate apparatus and personnel to mitigate the event. Response time goals should be looked at in terms of total reflex time, or total response time, which includes the dispatch or call processing time, turnout time, and travel time, respectively.

Cascade of Events

The cascade of events is the sum of the individual elements of time beginning with a state of normalcy and continuing until normalcy is once again returned through the mitigation of the event. The elements of time that are important to the ultimate outcome of a structure fire or critical medical emergency begin with the initiation of the event. For example, the first on-set of chest pain begins the biological and scientific time clock for heart damage irrespective of when 911 is notified. Similarly, a fire may begin and burn undetected for a period of time before the fire department is notified. The emergency response system does not have control over the time interval for recognition or the choice to request assistance.

Therefore, BSFD utilizes quantifiable "hard" data points to measure and manage system performance. These elements include alarm processing, turnout time, travel time, and the time spent on-scene. An example of the cascade of events and the elements of performance utilized by BSFD is provided in Figure 25 below.²⁴

Detection

This is the element of time between the time an event occurs and the time that someone detects it and the emergency response system has been notified. This is typically accomplished by calling the 911 Primary Safety Answering Point (PSAP).

Call Processing

This is the element of time measured between when 911 answers the 911 call, processes the information, and subsequently dispatches BSFD.

²⁴ Olathe Fire Department. (2012). Adapted from Community Risk and Emergency Services Analysis: Standard of Cover. Olathe, Kansas: Author.

Turnout Time

This is the element of time that is measured between the time the fire department is dispatched or alerted of the emergency incident, indicated in the CAD as “Department Notified,” and the time when the fire apparatus or ambulance is enroute to the call.

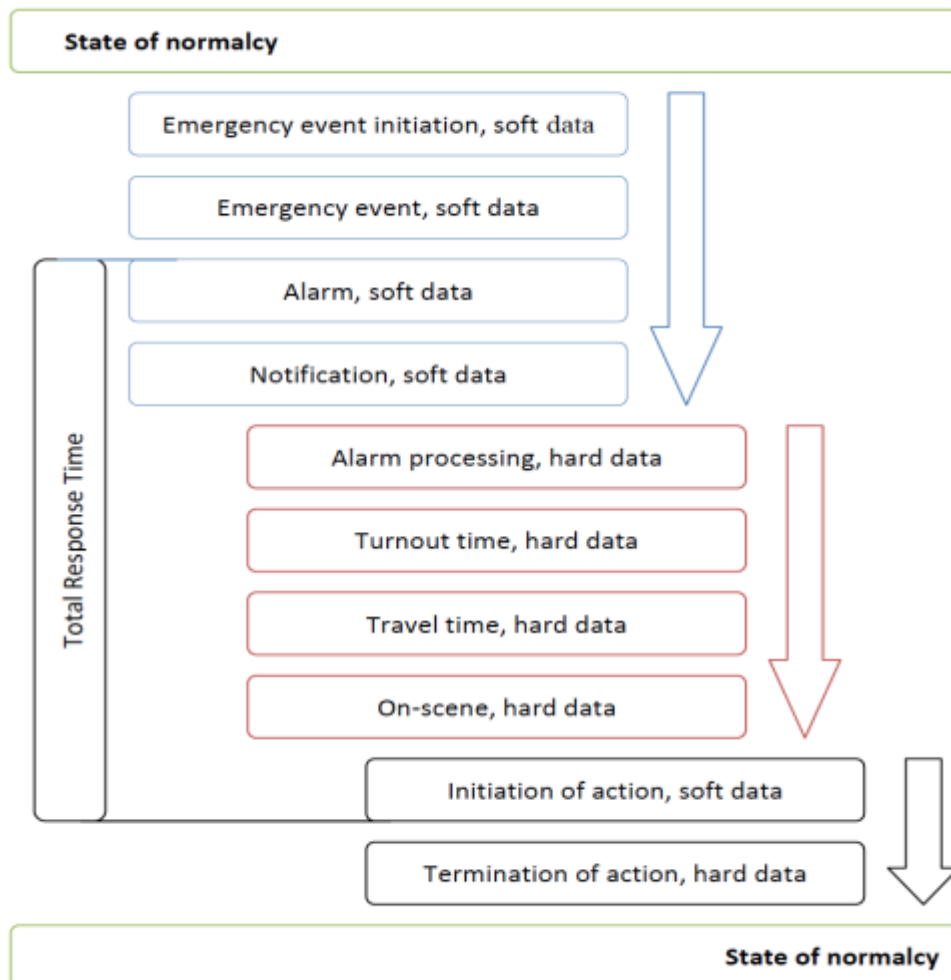
Travel Time

The travel time is the element of time between when the unit went enroute, or began to travel to the incident, and their arrival on-scene.

Total Response Time

The total response time, or total reflex time, is the total time required to arrive on-scene beginning with 911 answering the phone request for service and the time that the units arrive on-scene.

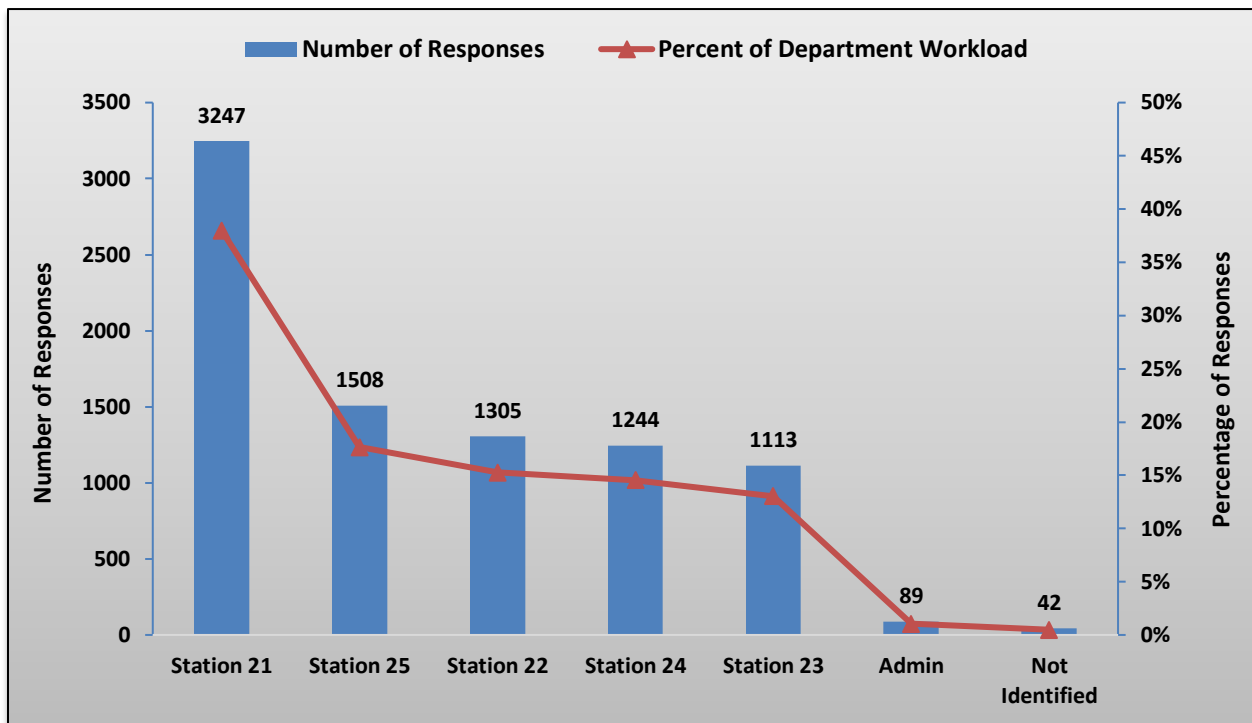
Figure 25: Cascade of Events



Comparison of Workload by Station

Another method of assessing the effectiveness of the distribution model is to analyze the demand for services across the distribution model. Analyses illustrate that Station 21 was the busiest station, accounting for 38.0% of the total BSFD workload (Figure 26).

Figure 26: Department Workload by Station



Finally, workload by station and call type were analyzed for comparative purposes as well as for introspection into potential system failures (Table 17). Station 21 made the most total responses (3,247), as well as the most EMS (2,067) and Fire (1,028) responses.

Table 17: Number of Responses by Station and Call Type

Station	EMS	Fire	Hazmat	Mutual Aid	Public Service	Rescue	Total
Station 21	2,067	1,028	31	7	97	17	3,247
Station 25	930	522	2	2	43	9	1,508
Station 22	824	364	4	19	49	45	1,305
Station 24	897	242	8	22	74	1	1,244
Station 23	655	395	10	1	45	7	1,113
Admin	36	50	1	1	1	0	89
Not Identified	10	12	0	6	0	14	42
Total	5,419	2,613	56	58	309	93	8,548

Another measure, time on task, is necessary to evaluate best practices in efficient system delivery and consider the impact workload has on personnel. Unit Hour Utilization (UHU) determinants were developed by mathematical model. This model includes both the proportion of calls handled in each major service area (EMS, Fire, Hazmat, and Rescue) and total unit time on task for these service categories in 2015. The resulting UHUs represent the percentage of the work period (24 hours) that is utilized responding to requests for service. Historically, the International Association of Fire Fighters (IAFF) has recommended that 24-hour units utilize 0.30, or 30% workload as an upper threshold.²⁵ In other words, this recommendation would have personnel spend no more than eight hours per day on emergency incidents. These thresholds take into consideration the necessity to accomplish non-emergency activities such as training, health and wellness, public education, and fire inspections. The 4th edition of the IAFF EMS Guidebook no longer specifically identifies an upper threshold. However, *FITCH* recommends that an upper unit utilization threshold of approximately 0.30, or 30%, would be considered best practice. In other words, units and personnel should not exceed 30%, or eight hours, of their work day responding to calls. These recommendations are also validated in the literature. For example, in their review of the City of Rolling Meadows, the Illinois Fire Chiefs Association utilized a UHU threshold of 0.30 as an indication to add additional resources.²⁶ Similarly, in a standards of cover study facilitated by the Center for Public Safety Excellence, the Castle Rock Fire and Rescue Department utilizes a UHU of 0.30 as the upper limit in their standards of cover due to the necessity to accomplish other non-emergency activities.²⁷

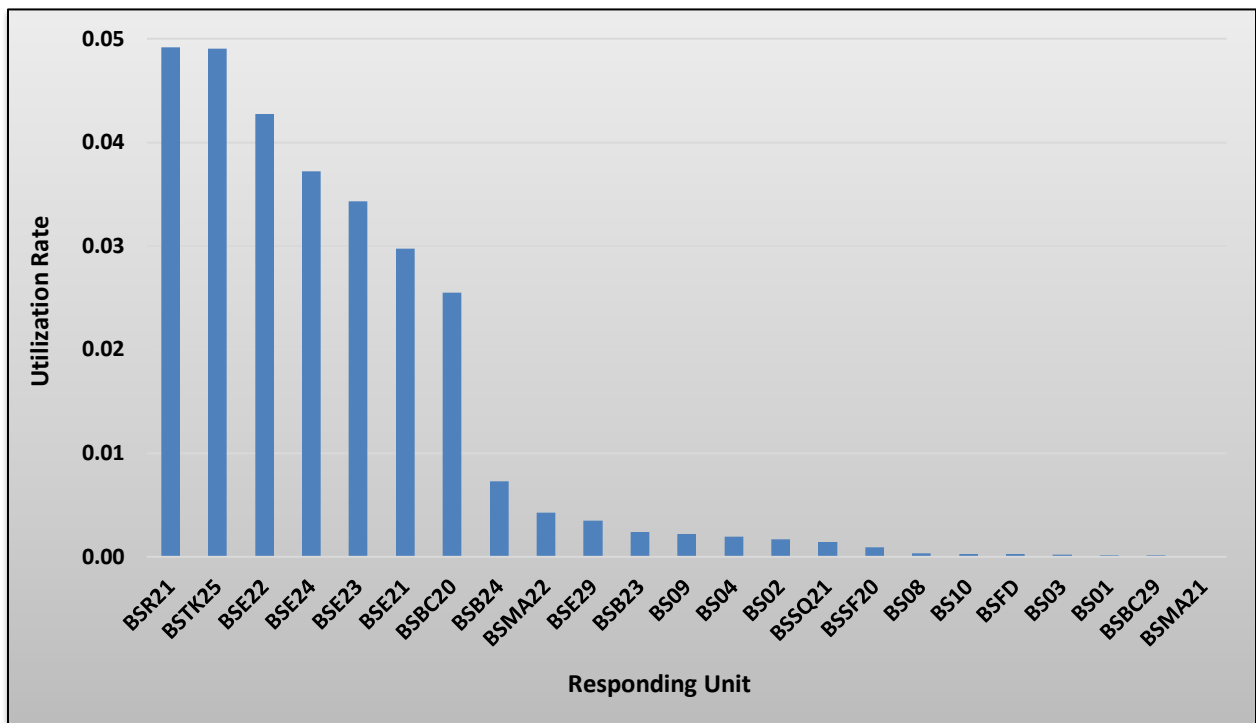
These thresholds take into consideration the necessity to accomplish non-emergency activities such as training, health and wellness, public education, and fire inspections. In BSFD, the most utilized units were BSR21, BSTK25, and BSE22. All unit utilizations were below 0.30 (Figure 27). At the current levels, the workload utilization rates should have limited impact on BSFD's level of readiness or system performance.

²⁵ International Association of Firefighters. (1995). *Emergency Medical Services: A Guidebook for Fire-Based Systems*. Washington, DC: Author. (p. 11)

²⁶ Illinois Fire Chiefs Association. (2012). *An Assessment of Deployment and Station Location: Rolling Meadows Fire Department*. Rolling Meadows, Illinois: Author. (pp. 54-55)

²⁷ Castle Rock Fire and Rescue Department. (2011). *Community Risk Analysis and Standards of Cover*. Castle Rock, Colorado: Author. (p. 58)

Figure 27: Unit Hour Utilization



Response Time Continuum

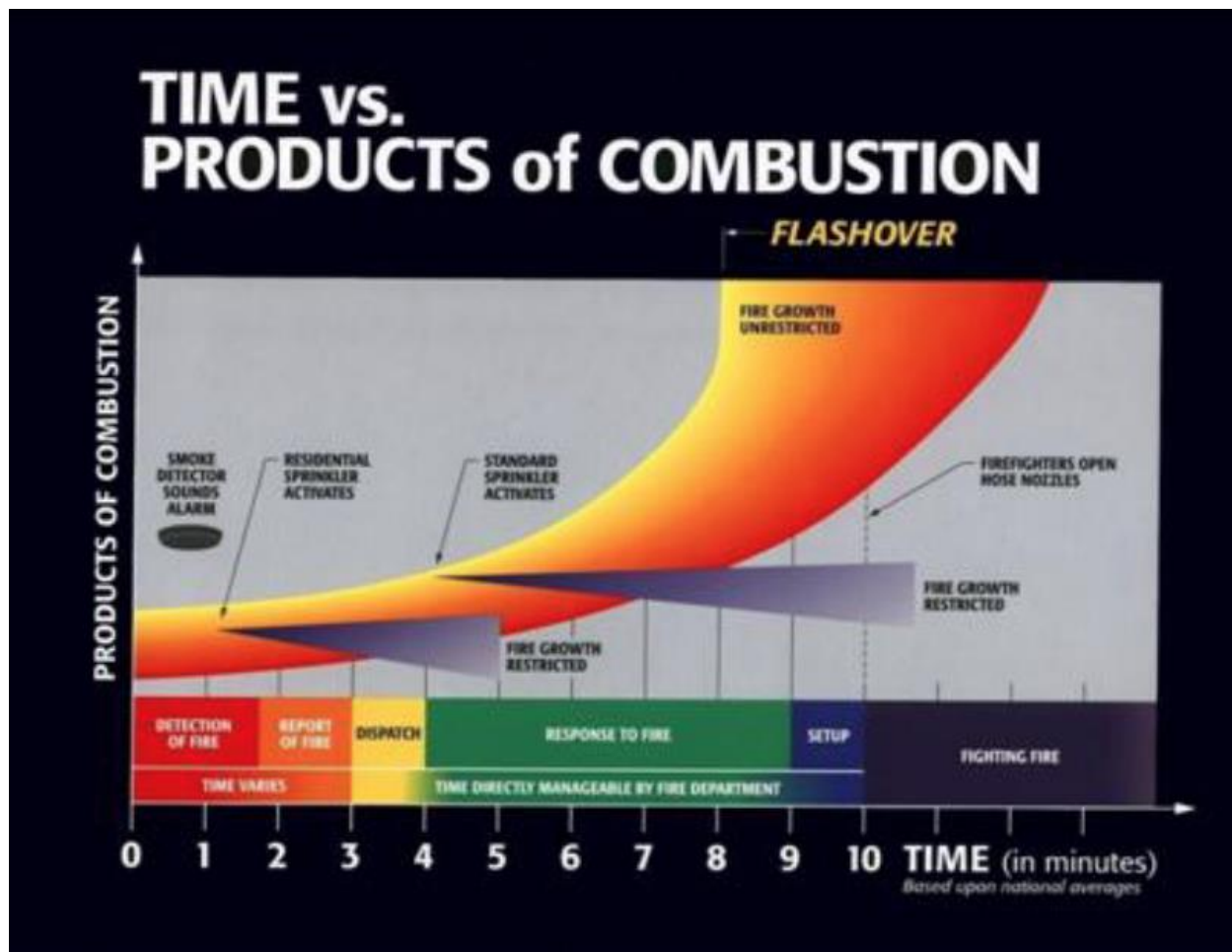
Fire

The number one priority with structural fire incidents is to save lives, followed by the minimization of property damage. A direct relationship exists between the timeliness of the response and the survivability of unprotected occupants and property damage. The most identifiable point of fire behavior is flashover.

Flashover is the point in fire growth where the contents of an entire area, including the smoke, reach their ignition temperature, resulting in a rapid-fire growth rendering the area unsurvivable by civilians and untenable for firefighters. Best practices would result in the fire department arriving and attacking the fire prior to the point of flashover. A representation of the traditional time temperature curve and the cascade of events is displayed in Figure 28 below.²⁸

²⁸ Example of Traditional Time Temperature Curve. Retrieved at <http://www.usfa.fema.gov/downloads/pdf/coffee-break/time-vs-products-of-combustion.pdf>

Figure 28: Example of Traditional Time Temperature Curve



Recent studies by Underwriter's Laboratories (UL) have found that in compartment fires such as structure fires, flashover occurs within four minutes in modern fire environment. In addition, the UL research has identified an updated time temperature curve due to fires being ventilation controlled rather than fuel controlled, as represented in the traditional time temperature curve. While this ventilation controlled environment continues to provide a high risk to unprotected occupants of exposure to smoke and high heat, it does provide some advantage to property conservation efforts as water may be applied to the fire prior to ventilation and the subsequent flashover. An example of UL's ventilation controlled time temperature curve is presented in Figure 29 below.²⁹

²⁹ UL/NIST Ventilation Controlled Time Temperature Curve. Retrieved from http://www.nist.gov/fire/fire_behavior.cfm

Figure 29: Ventilation Controlled Time Temperature Curve



EMS

The effective response to EMS incidents also has a direct correlation to the ability to respond within a specified period of time. However, unlike structure fires, responding to EMS incidents introduces considerable variability in the level of clinical acuity. From this perspective, the association of response time and clinical outcome varies depending on the severity of the injury or the illness. Research has demonstrated that the overwhelming majority of requests for EMS services are not time sensitive between five minutes and 11 minutes for emergency incidents and up to 13 minutes for non-emergency responses.³⁰ The 12-minute upper threshold is only the upper limit of the available research and is not a clinically significant time measure, as patients were not found to have a significantly different clinical outcome when the 12-minute threshold was exceeded.³¹

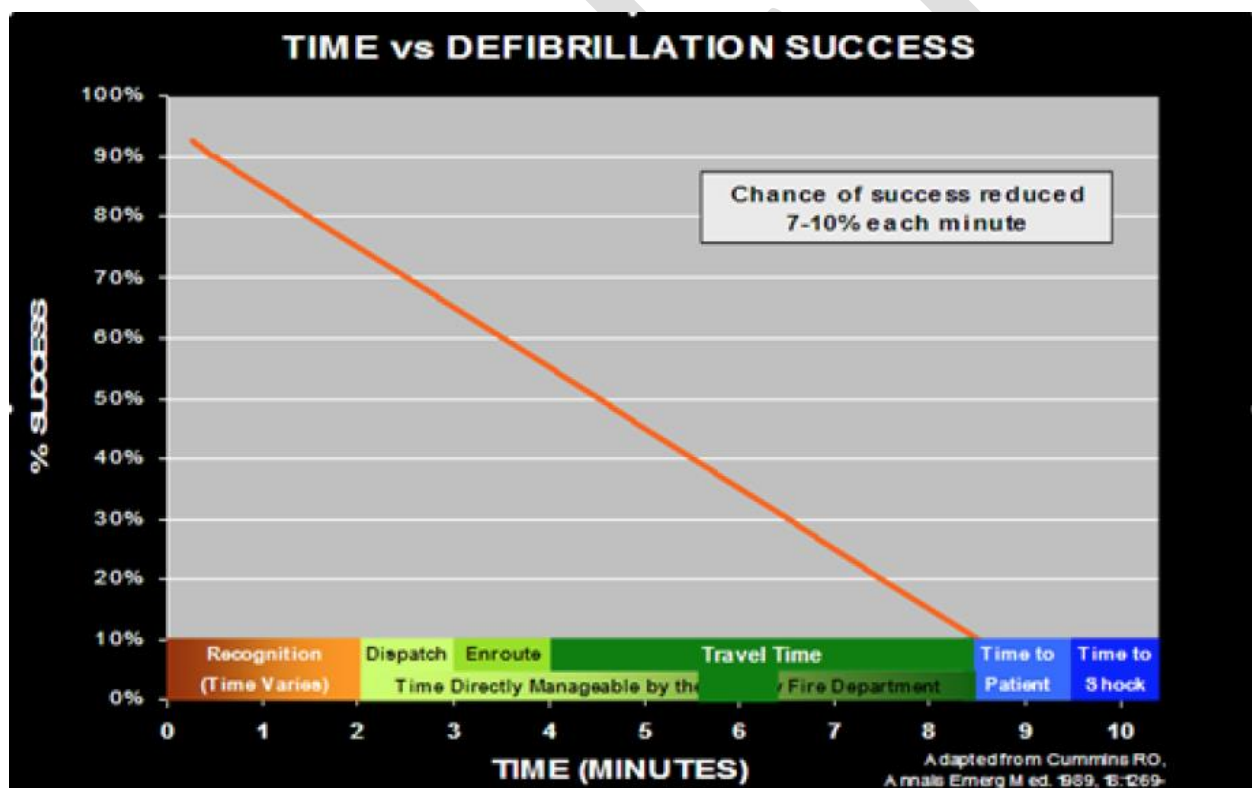
³⁰ Blackwell, T.H., & Kaufman, J.S. (April 2002). Response time effectiveness: Comparison of response time and survival in an urban emergency medical services system. *Academic Emergency Medicine*, 9(4): 289-295.

³¹ Blackwell, T.H., et al. (Oct-Dec 2009). Lack of association between prehospital response times and patient outcomes. *Prehospital Emergency Care*, 13(4): 444-450.

Out of hospital sudden cardiac arrest is the most identifiable and measured incident type for EMS. In an effort to demonstrate the relationship between response time and clinical outcome, a representation of the cascade of events and the time to defibrillation (shock) is displayed in Figure 19. The American Heart Association (AHA) has determined that brain damage will begin to occur between four and six minutes and become irreversible after 10 minutes without intervention.

Modern sudden cardiac arrest protocols recognize that high quality Cardio-Pulmonary Resuscitation (CPR) at the Basic Life Support (BLS) level is a quality intervention until defibrillation can be delivered in shockable rhythms. Figure 30³² is representative of a sudden cardiac arrest that is presenting in a shockable heart rhythm such as Ventricular Fibrillation or Ventricular Tachycardia.

Figure 30: Cascade of Events for Sudden Cardiac Arrest with Shockable Rhythm



³² Olathe Fire Department. (2012). Adapted from Community Risk and Emergency Services Analysis: Standard of Cover. Olathe, Kansas: Author.

Description of First Arriving Unit Performance

Analyses of the response characteristics of the first arriving units were conducted. These analyses utilized the first arriving units of all distinct incidents excluding mutual aid and public service incidents (N=5,821). Thirty-seven incidents were excluded from analyses because the reported first unit arrival time was earlier than the reported first unit enroute time.

Additionally, due to missing time data, total sample size available for these analyses was 5,171.

BSFD's overall first arriving unit performance times are presented again for review in Table 18. Additional details related to turnout and travel time are presented in Figures 31 and 32, respectively. Overall average dispatch time was 1.5 minutes (90 seconds). Overall average turnout time was 1.2 minutes (72 seconds), with 39.6% of calls recording turnout times of 60 seconds or less. Overall average travel time was 4.9 minutes; 21.2% of calls recorded travel times of three minutes or less, and 41.9% of calls recorded travel times of four minutes or less.

Table 18: Description of First Arriving Unit Performance Times in Minutes

Measure	Average	90th Percentile
Dispatch Time	1.5	2.9
Turnout Time	1.2	2.0
Travel Time	4.9	7.7
Response Time	7.6	10.9

Figure 31: Distribution of Turnout Time of First Arriving Unit

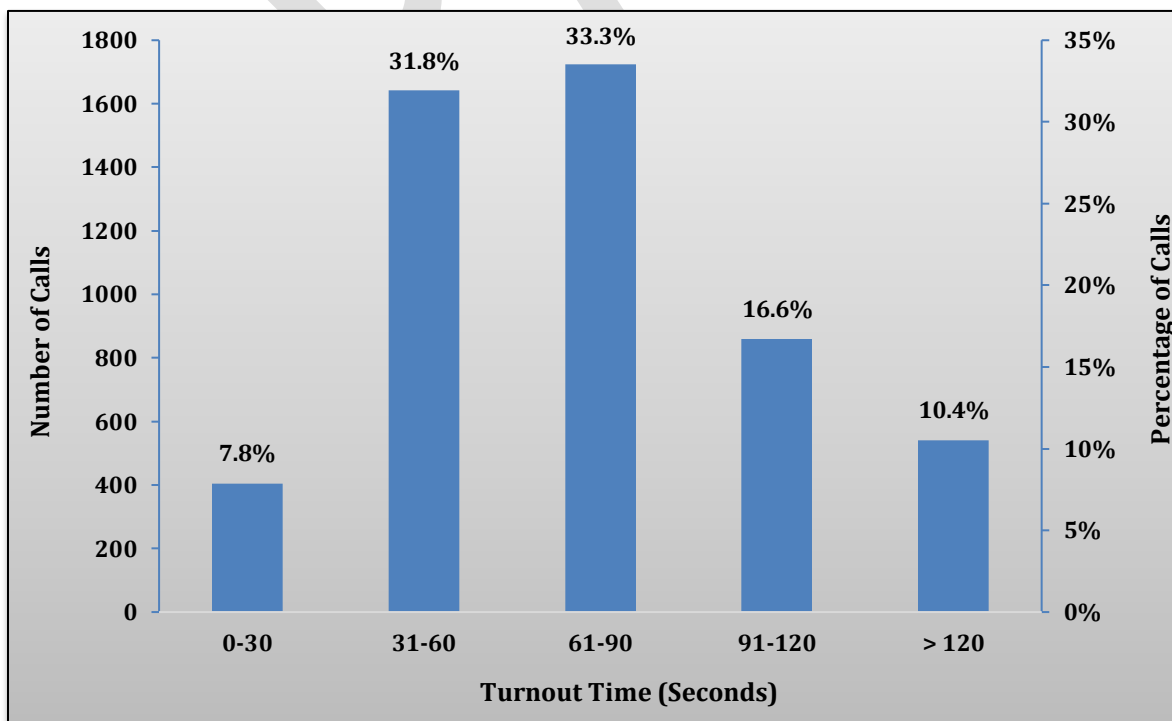
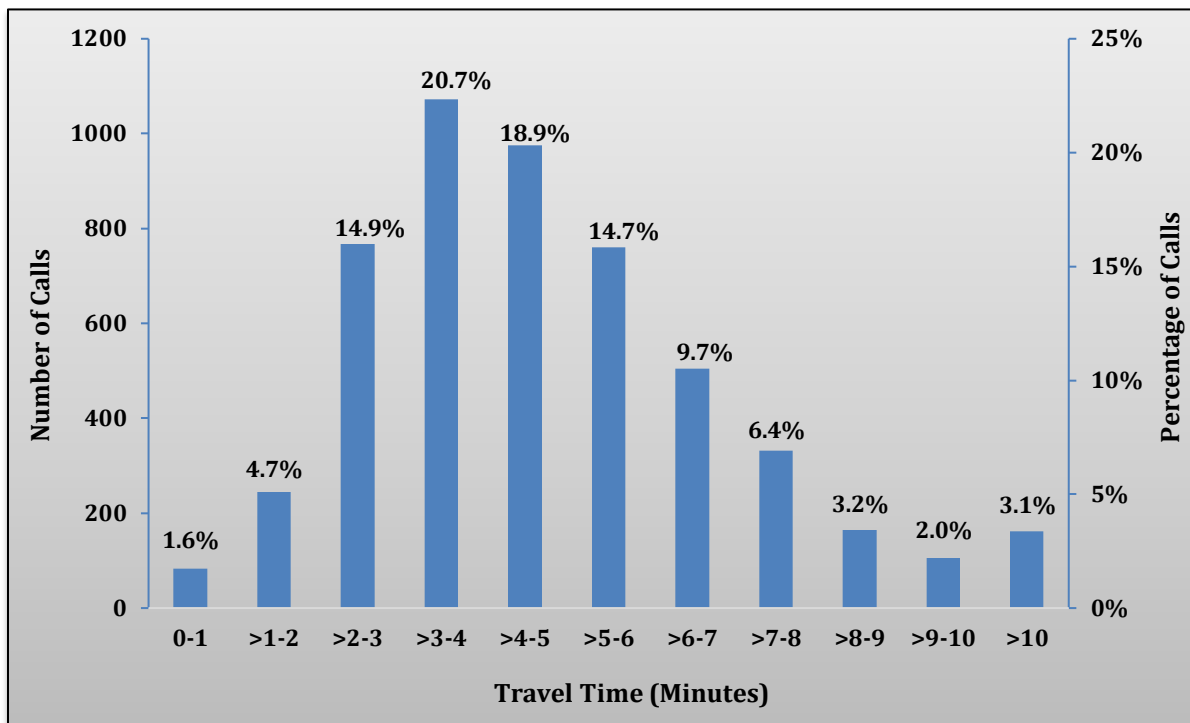


Figure 32: Distribution of Travel Time of First Arriving Unit



Finding #: 20

The District's current aggregate Travel time performance is 7.7 minutes at the 90th percentile.

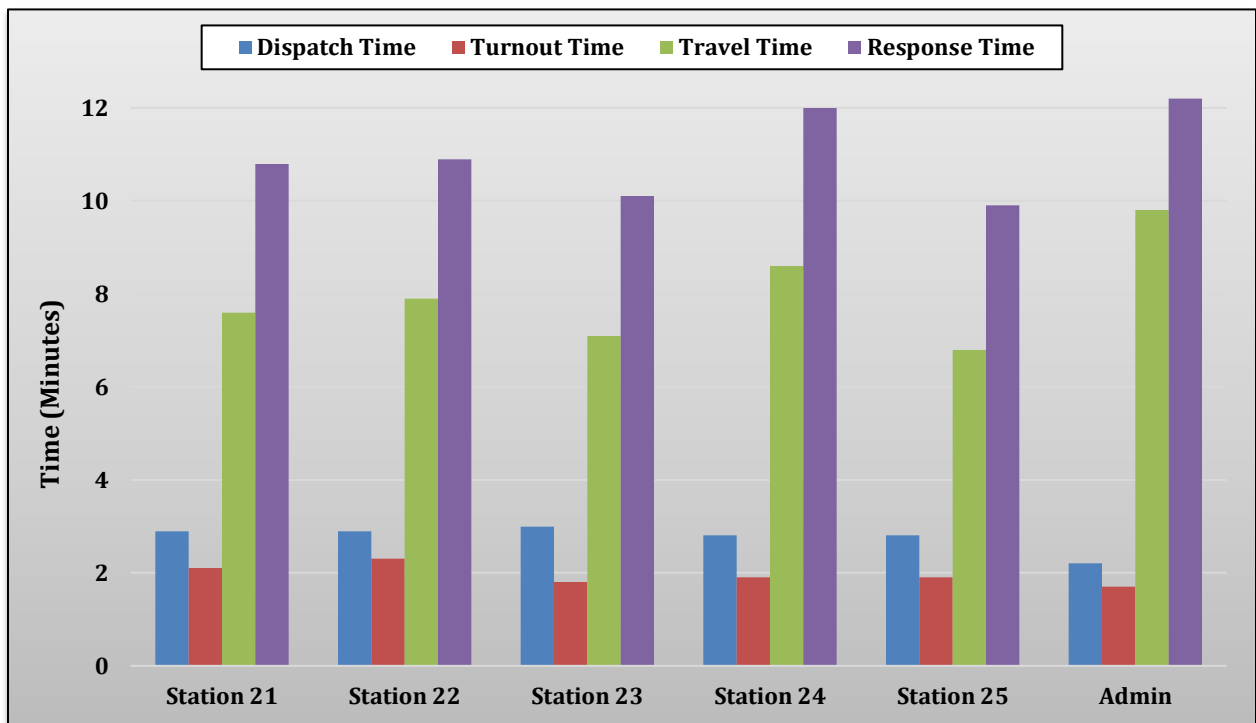
First Arriving Unit Performance Time by Station

Further analyses were conducted to measure the performance of the first arriving units by station. Response times are reported below as 90th percentile values (Table 19; Figure 33). Averages are also reported in the associated Data report. Examination of the overall performance at the 90th percentile reveals that Station 25 had the shortest response times, followed by Station 23, primarily due to comparatively shorter travel times for both stations.

Table 19: 90th Percentile First Arriving Unit Performance Times in Minutes by Responding Station

Station	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
Station 21	2.9	2.1	7.6	10.8	1,961
Station 22	2.9	2.3	7.9	10.9	802
Station 23	3.0	1.8	7.1	10.1	713
Station 24	2.8	1.9	8.6	12.0	789
Station 25	2.8	1.9	6.8	9.9	870
Admin	2.2	1.7	9.8	12.2	30
Not Identified	--	--	--	--	6
Total	2.9	2.0	7.7	10.9	5171

Figure 33: 90th Percentile First Arriving Unit Performance Times in Minutes by Station



Effective Response Force Capabilities

The capability of an Effective Response Force (ERF) to assemble in a timely manner with the appropriate personnel, apparatus, and equipment is important to the success of a significant structural fire event. Therefore, it is important to measure the capabilities of assembling an ERF. In most fire departments, the distribution model performs satisfactorily, but it is not uncommon to be challenged to assemble an ERF in the recommended timeframes.

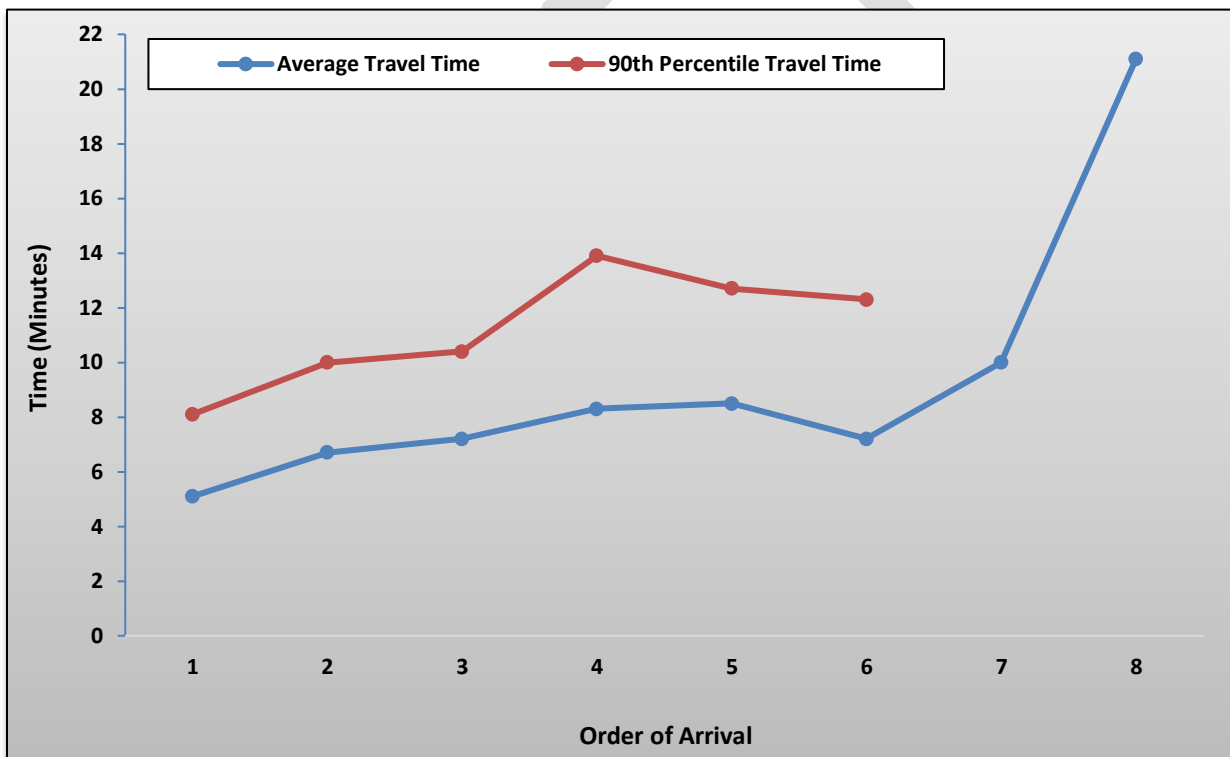
Several factors affect the capabilities to assemble an ERF such as the number of fire stations, number of units, and number of personnel on each unit. Each of these policy decisions should be made in relation to the community's specific risks and the willingness to assume risk.

BSFD made 371 responses to 86 structure fire calls in 2015. Two hundred sixty of these responses (70.1%) resulted in on-scene arrivals, but nine cases were missing enroute times that precluded travel time calculations ($n=251$ available for analysis). Performance times of the resulting 251 on-scene arrivals are presented by order of arrival in Table 20 and Figure 34.

Table 20: Average and 90th Percentile Travel Time Performance in Minutes for ERF

Outcome	Order of Arrival								Overall
	1	2	3	4	5	6	7	8	
Average Travel Time	5.1	6.7	7.2	8.3	8.5	7.2	10.0	21.1	6.9
90 th Percentile Travel Time	8.1	10.0	10.4	13.9	12.7	12.3	--	--	10.4
Sample Size	79	59	44	34	18	10	4	3	251

Figure 34: Average and 90th Percentile Travel Time Performance in Minutes for ERF



Comparison to National References

There are two notable references for travel time available to the fire service in National Fire Protection Association (NFPA) 1710³³ and the Commission on Fire Accreditation International (CFAI)³⁴.

NFPA 1710 suggests a 4-minute travel time at the 90th percentile for first due arrival of Basic Life Support (BLS) and Fire incidents and the CFAI recommends a 5 minute and 21 seconds travel time for first due arrival in an urban population density and 13 minutes travel time in rural population densities. The arrival of an Advanced Life Support (ALS) unit is recommended at 8-minutes travel time by NFPA 1710. It is important to note that the latest edition (9th edition) of the CFAI guidelines have de-emphasized response time and only reference the legacy standards with a separately provided companion document.³⁵

The CFAI recommendations are more closely aligned with the department's historical performance as Fire related incidents are currently at 9.6 minutes at the 90th percentile and are generally more randomly distributed across the jurisdiction. Additionally, the department is not currently capable of meeting the more restrictive recommendation of 4 minutes travel time or less at the 90th percentile. GIS analyses were conducted to determine the requisite distribution model (fire stations) to overcome the geographic limitations within the District's jurisdiction.

When utilizing only current BSFD fire stations, the current configuration is only capable of delivering a 4-minute travel time to 52% of the requests for service across all call types. When referring to the marginal utility analysis provided below, the ascending rank order is the station's capability to cover risk (incidents) in relation to the total historical call volume of the sample period (2015). The Station number is the current BSFD fire station identifier. The station capture is the number of calls the station would capture within a 4-minute travel time. The total capture is the cumulative number of calls captured with the addition of each fire station. The percent capture is the total cumulative percentage of risk covered by each station. The goal would be to achieve at least 90 percent capture.

Therefore, the station that contributed the most to the overall system's performance was Station 25 in the first column and would capture 25.15% of the risks within four minutes. Station 21 would cover an additional 15.75% of the risk bringing the cumulative total to 40.9% between Stations 25 and 21. In total, with all five fixed fire stations, 52% of the incidents could be responded to within four minutes travel time. The adjacent stations included in the run history were evaluated as well to determine their relative and cumulative capacity to assist the District

³³ National Fire Protection Association. (2010). 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*. Boston, MA: National Fire Protection Association.

³⁴ CFAI. (2009). *Fire & emergency service self-assessment manual*, (8th ed.). Chantilly, Virginia: Author. (page 71)

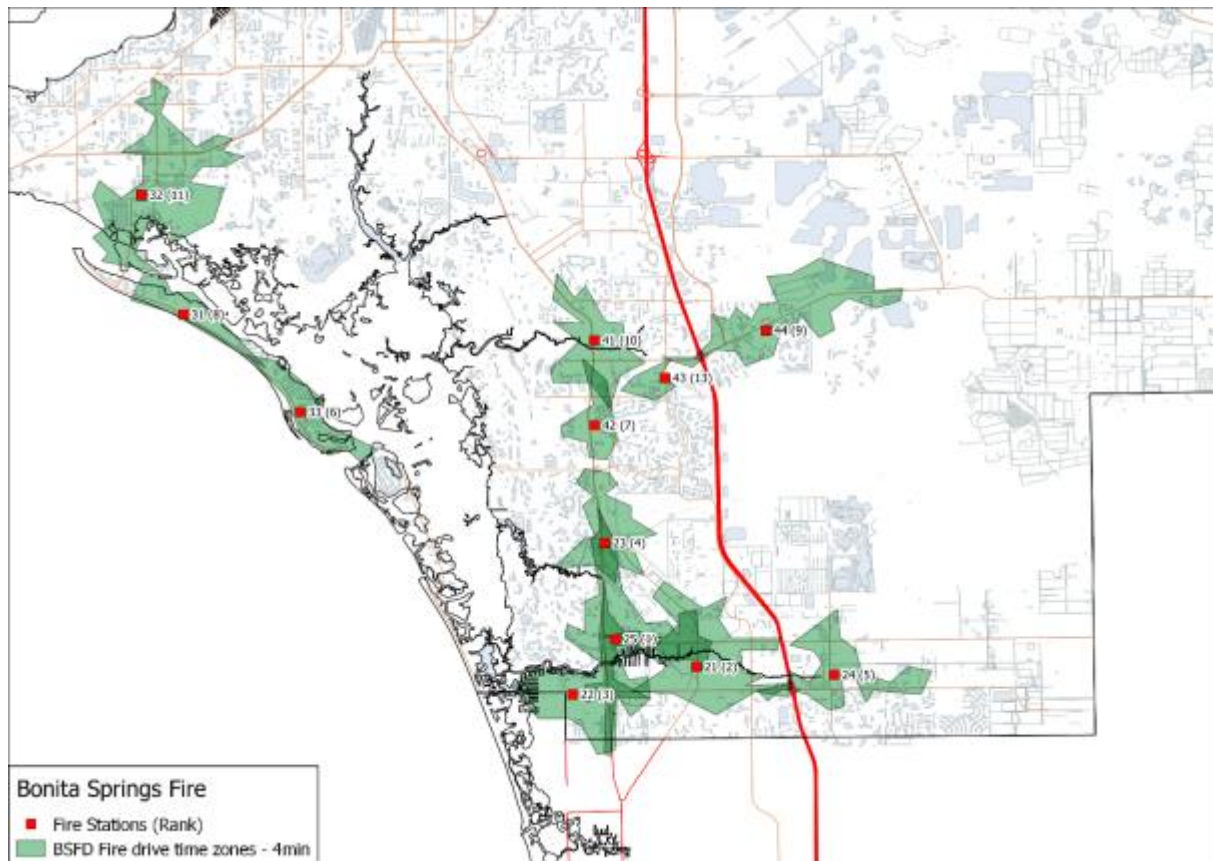
³⁵ CFAI. (2016). *Fire & emergency service self-assessment manual*, (9th ed.). Chantilly, Virginia: Author.

in meeting NFPA 1710. The combined contribution would be approximately 2% improvement. Results are provided as Table 21 and in drive time mapping format as Figure 35 below.

Table 21: Marginal Fire Station Contribution for 4-Minute Travel Time

Rank	Station Number	Station Capture	Total Capture	Percent Capture
1	Bonita Springs Fire & Rescue - Station #25	4,353	4,353	25.15%
2	Bonita Springs Fire & Rescue - Station #21	2,726	7,079	40.90%
3	Bonita Springs Fire & Rescue - Station #22	922	8,001	46.22%
4	Bonita Springs Fire & Rescue - Station #23	665	8,666	50.07%
5	Bonita Springs Fire & Rescue - Station #24	334	9,000	52.00%
6	Fort Myers Beach Fire - Station #33	138	9,138	52.79%
7	Estero Fire - Station #42	81	9,219	53.26%
8	Fort Myers Beach Fire - Station #31	16	9,235	53.35%
9	Estero Fire - Station #44	9	9,244	53.41%
10	Estero Fire - Station #41	6	9,250	53.44%
11	Fort Myers Beach Fire - Station #32	2	9,252	53.45%
12	Sanibel Fire - Station #171	1	9,253	53.46%
13	Estero Fire - Station #43	1	9,254	53.46%
14	South Trail Fire - Station #61	1	9,255	53.47%
15	South Trail Fire - Station #64	1	9,256	53.48%
16	Iona McGregor Fire - Station #71	1	9,257	53.48%
17	Cape Coral Fire - Station #1	1	9,258	53.49%

Figure 35: BSFD and Neighboring Stations - Current Fire Station Bleed Maps for 4-Minute Travel Time

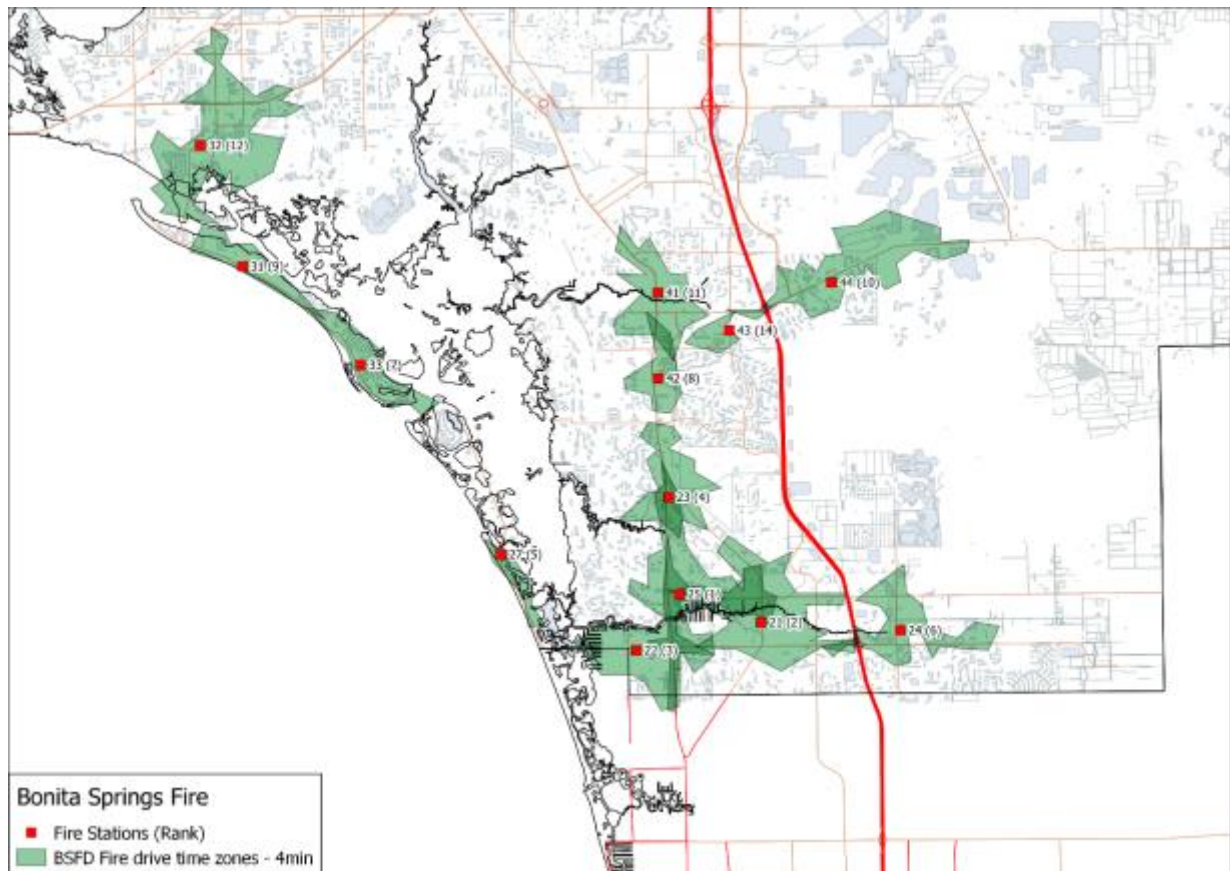


It is understood that the District recently placed a new station (Station 27) in service that is not included in this data set in addition to preparing to place another station (Station 26) in service by 2018. Therefore, analyses were conducted to determine the degree of improvement in system performance with the addition of these two stations. The addition of Station 27 would improve system performance within 4 minutes by approximately 2.25% based on 2015 incident data. Consider remains for the additional expansion in the eastern portion of the district over the last two years.

Table 22: Marginal Fire Station Contribution for 4-Minute Travel Time with Stations 26 and 27

Rank	Station Number	Station Capture	Total Capture	Percent Capture
1	Bonita Springs Fire & Rescue - Station #25	4,353	4,353	25.15%
2	Bonita Springs Fire & Rescue - Station #21	2,726	7,079	40.90%
3	Bonita Springs Fire & Rescue - Station #22	922	8,001	46.22%
4	Bonita Springs Fire & Rescue - Station #23	665	8,666	50.07%
5	Proposed BSFD Station #27	390	9,056	52.32%
6	Bonita Springs Fire & Rescue - Station #24	334	9,390	54.25%
7	Fort Myers Beach Fire - Station #33	138	9,528	55.05%
8	Estero Fire - Station #42	81	9,609	55.51%

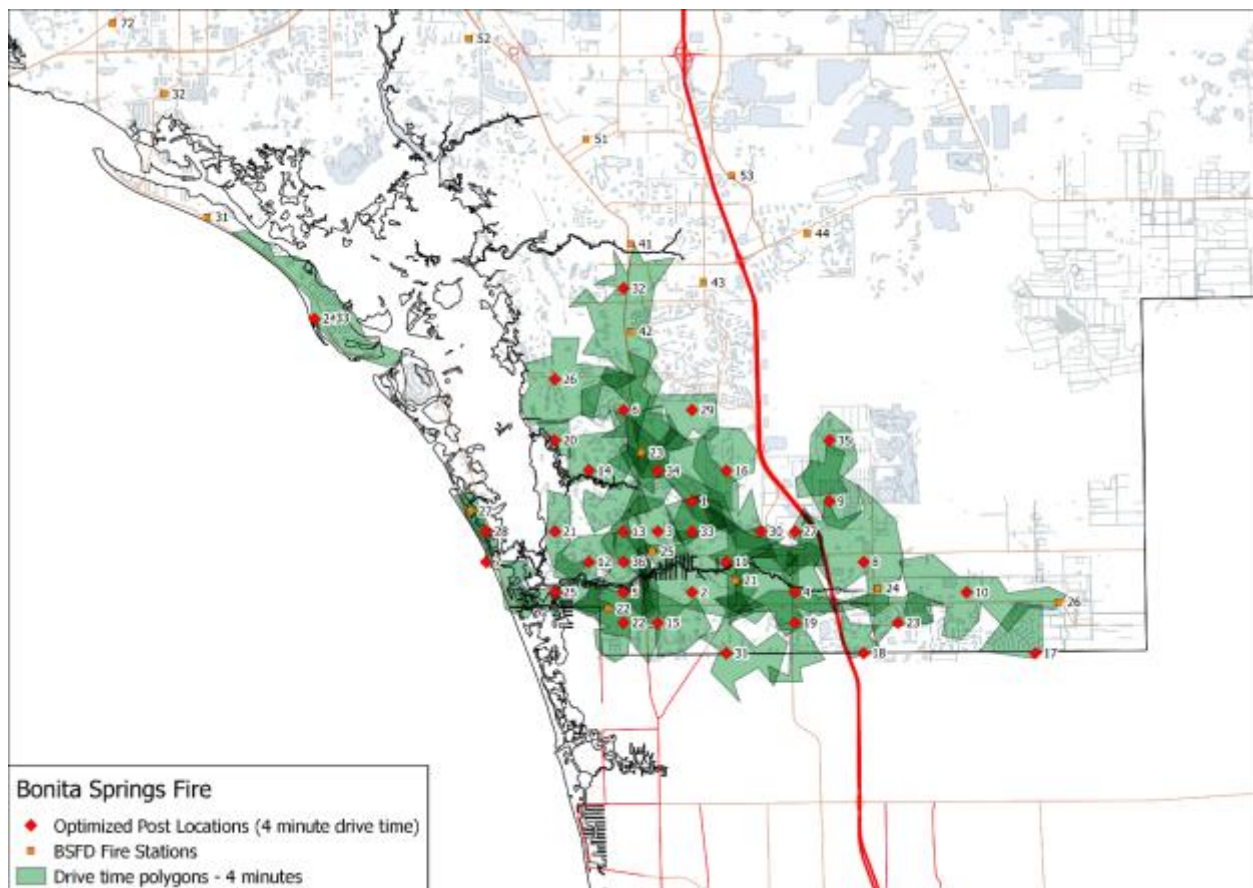
Figure 36: 4-Minute Travel Time with Current and Proposed Station Locations³⁶



GIS analyses were conducted to determine the requisite distribution model (fire stations) to overcome the geographic limitations within the Department's jurisdiction. Therefore, analyses were conducted to determine what would be required for the District to meet the 4-minute NFPA 1710 recommendations. Analyses suggest that the department would need a minimum of 32 stations to meet a 4-minute travel time for 90 percent of the incidents. However, an optimized eight-station model could achieve approximately 60% coverage within a 4-minute travel time.

³⁶ Station 6 is not included within this urban analysis.

Figure 37: Optimized Fire Station Locations to Achieve 4-Minute Travel Time

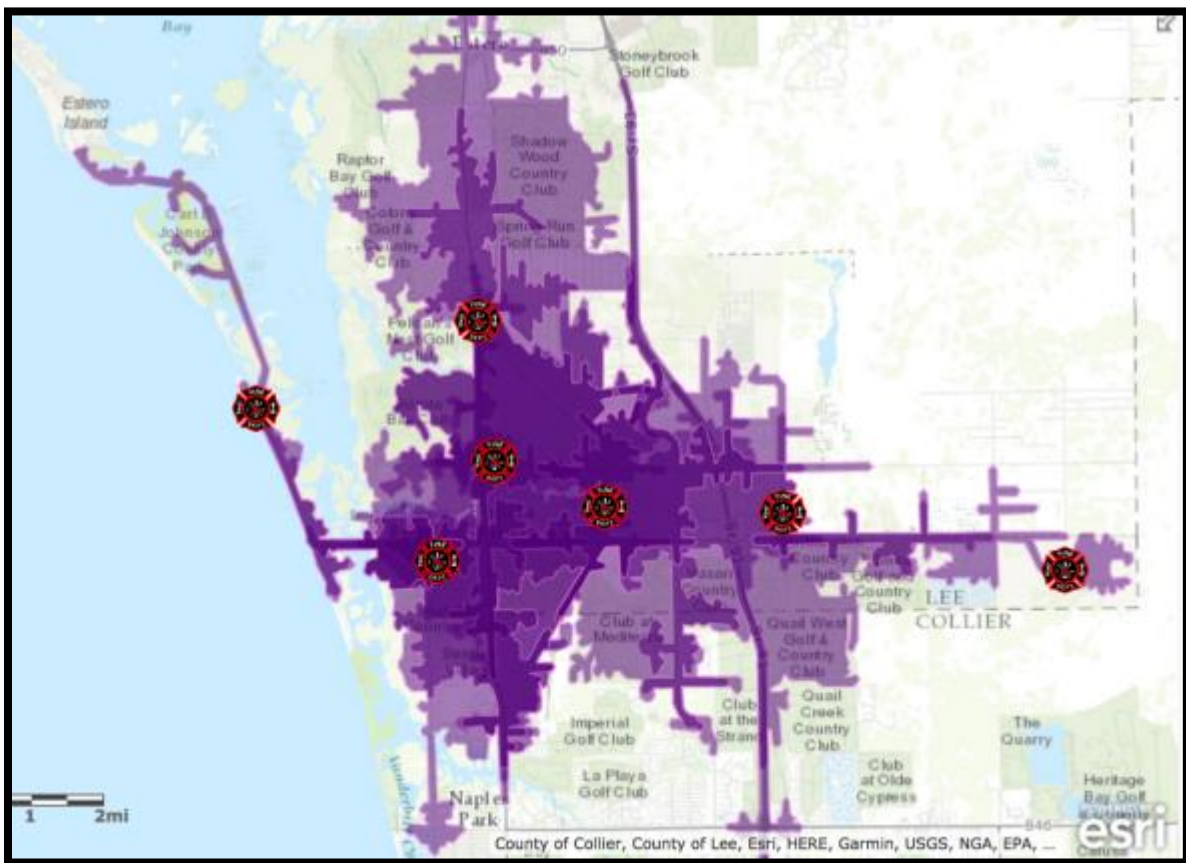


Therefore, a more reasonable performance objective is needed to closely mirror current department performance and capabilities. As stated, the current overall performance is 7.7 minutes or 7 minutes and 42 seconds for 90% of the calls in 2015. This will be discussed further in a later section.

Furthermore, similar to the previous discussion, there are two prevailing recommendations for the time to assemble an effective response force for structure fires. First, NFPA 1710 suggests that the Effective Response Force (ERF) should arrive in eight (8) minutes travel time or less. Second, the CFAI provides a baseline travel time performance objective of 10 minutes and 24 seconds 90% of the time or less. Therefore, both 8-minute and 10-minute travel times were created to demonstrate the relative coverage throughout the jurisdiction.

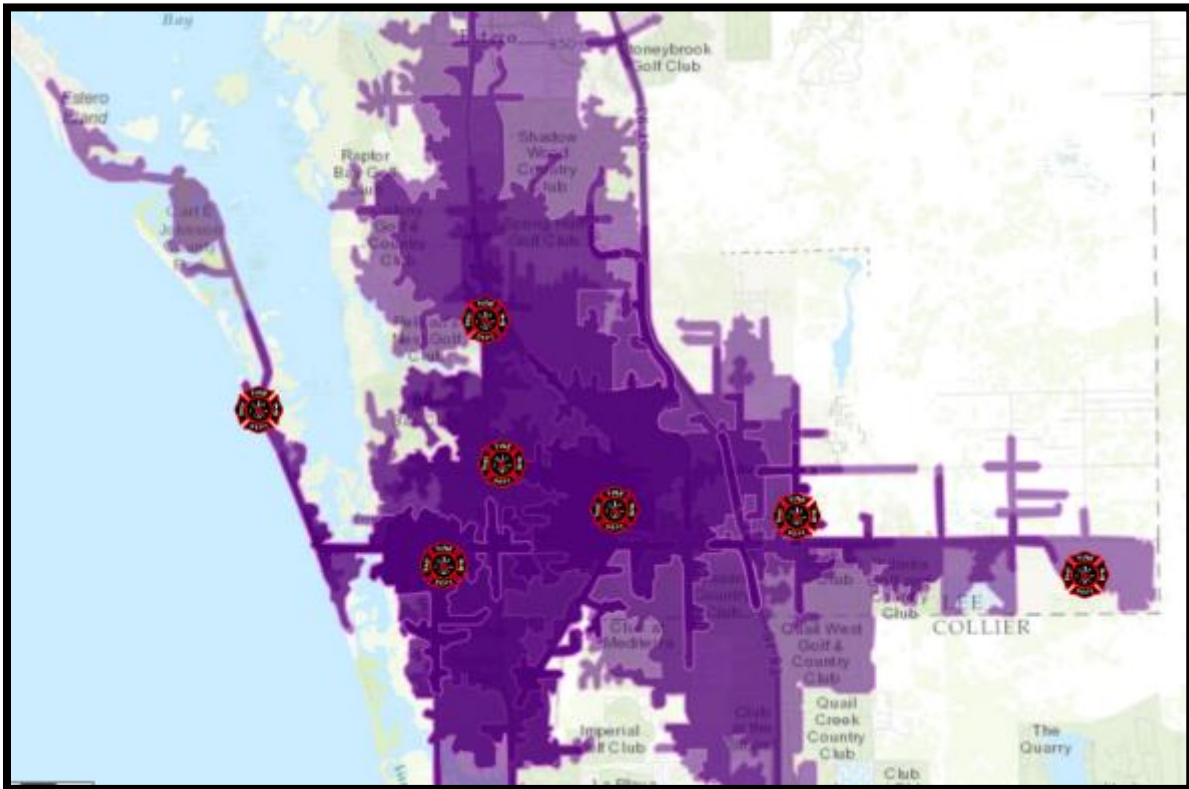
Overall, the ERF coverage is very good throughout the jurisdiction, with a very robust coverage in the core of the District where the greatest historical demand exists. The areas of new growth such as in the proposed Station 26 area and new Station 27 area are challenged since they do not benefit from concentric response zones.

Figure 38: 8-Minute ERF – All Current and Proposed³⁷



³⁷ The GIS analysis would not allow Station 3's full response territory due to a gated community. Actual coverage for Station 3 would be much expanded for this example.

Figure 39: 10-Minute ERF from All Current Stations³⁸



Reliability Factors

Percentage of Department Compliance

The first step in assessing the reliability of the deployment model or system performance is to understand the department's availability to handle the requests for service that occur within the department's jurisdiction. BSFD responded to 6,155 of 6,312 incidents (97.5%) in 2015 (Table 23); 47 of 6,155 incidents (0.1%) responded to by BSFD were mutual aid calls.

³⁸ Ibid.

Table 23: Department Reliability

Responding Agency	Number of Incidents	Percentage of Incidents
Bonita Springs	6,155	97.51
Collier County	1	0.02
Estero	117	1.85
Fort Myers Beach	29	0.46
Iona McGregor	1	0.02
LeHigh Acres	1	0.02
Naples	1	0.02
San Carlos Park	3	0.05
Sanibel	1	0.02
South Trail	3	0.05
Total	6,312¹	100.0

¹There were 6,329 unique incidents reported in the database for 2015; however, 17 of these incidents had MLC-prefix incident numbers only, and had no identified agency.

Overlapped or Simultaneous Call Analysis

Overlapped or simultaneous call rate is defined as the rate at which a call was received for BSFD while there were already one or more ongoing calls being handled by BSFD.

Understanding the rate at which overlapped or simultaneous calls occur will help to determine the number of BSFD units to staff. In general, the larger the call volume, the more likely it is to have overlapped or simultaneous calls. The distribution of the demand throughout the day will impact the chance of having overlapped or simultaneous calls. The duration of a call will also have major influences, since the longer it takes to clear a request, the more likely it is to have an overlapped request.

Recall that BSFD responded to 6,155 unique incidents during 2015 (Table 21). Two of these incidents did not have dispatch times reported, such that the number of unique incidents available for this analysis was 6,153. During 2015, BSFD experienced a rate of overlapped or simultaneous calls of 25.8% (1,588 of 6,153 calls).

Finding #: 21

The District's deployment is extremely reliable covering better than 97% of its demand and only experiencing a 26% call concurrency overall.

OPTIMIZATION OF SERVICES

Validation of Planning Analysis

The first step in this analysis is to utilize the historical performance to validate the planning analyses utilized by the GIS system. The historical performance demonstrated a 7.7 overall department performance and a 9.6-minute Fire travel time capability from the existing fire stations at the 90th percentile. The planning assessments estimated approximately 89% at 8-minutes and 95% at 10-minutes travel time. Therefore, there is high degree of agreement between the planning tools and the actual historical performance.

Internal Performance Objectives

The Bonita Springs Fire Department Board has adopted a 6-minute travel time performance goal at the 85th percentile. However, as shown, the District's current overall travel time performance at the 85th percentile is 7 minutes. Thus, an 8-minute travel time plan was developed to understand the current configuration and to validate the current configuration for the aggregate response time performance. This plan was considered at the 90th percentile to align with best practice.

The analysis demonstrates that the current station configuration can achieve approximately 88% of the incidents within 8 minutes, and 89% if Station 33 was included. This validates the department's current performance at 7.7 minutes. The planning tools utilize average road speeds and current road networks that will more closely replicate the large fire apparatus. As commonly found, the smaller and more maneuverable apparatus will continue to outperform the planning analyses as well as the Department exceeding average speeds during emergency responses.

While it is understood that fire stations may be placed for a wide variety of options, from a purely operational standpoint, BSFD could maintain an 8-minute travel time performance for 88% of the incidents with a total of five (5) fixed facilities. In other words, the District is appropriately deployed to maintain the current performance.

Finding #: 22

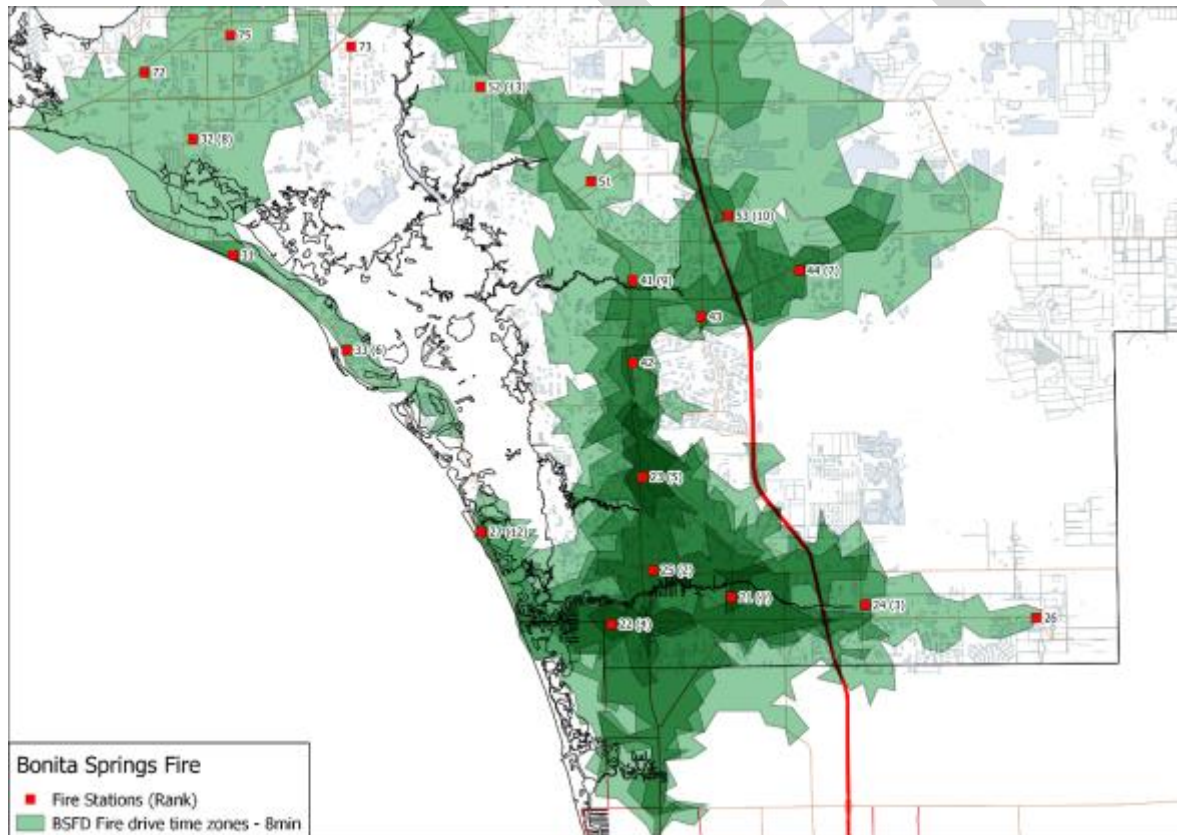
The Districts is appropriately deployed to maintain the current performance with its existing stations.

Additionally, we evaluated the relative impact of the new and proposed stations. When referring to the table and figure below, Station 27 is projected to provide an additional one (1%) percent in coverage. The coverage map with only the eight (8) contributing stations is provided below.

Table 24: Marginal Fire Station Contribution for 8-Minute Travel Time

Rank	Station Number	Station Capture	Total Capture	Percent Capture
1	Bonita Springs Fire & Rescue - Station #21	12,509	12,509	72.27%
2	Bonita Springs Fire & Rescue - Station #25	1,406	13,915	80.39%
3	Bonita Springs Fire & Rescue - Station #24	724	14,639	84.57%
4	Bonita Springs Fire & Rescue - Station #22	385	15,024	86.80%
5	Bonita Springs Fire & Rescue - Station #23	235	15,259	88.16%
6	Fort Myers Beach Fire - Station #33	188	15,447	89.24%
7	Estero Fire - Station #44	43	15,490	89.49%
8	Fort Myers Beach Fire - Station #32	26	15,516	89.64%
9	Estero Fire - Station #41	14	15,530	89.72%
10	San Carlos Park Fire - Station #53	12	15,542	89.79%
11	South Trail Fire - Station #61	7	15,549	89.83%
12	Proposed BSFD Station #27	5	15,554	89.86%

Figure 40: Current Stations with an 8-Minute Travel Time at the 90th Percentile

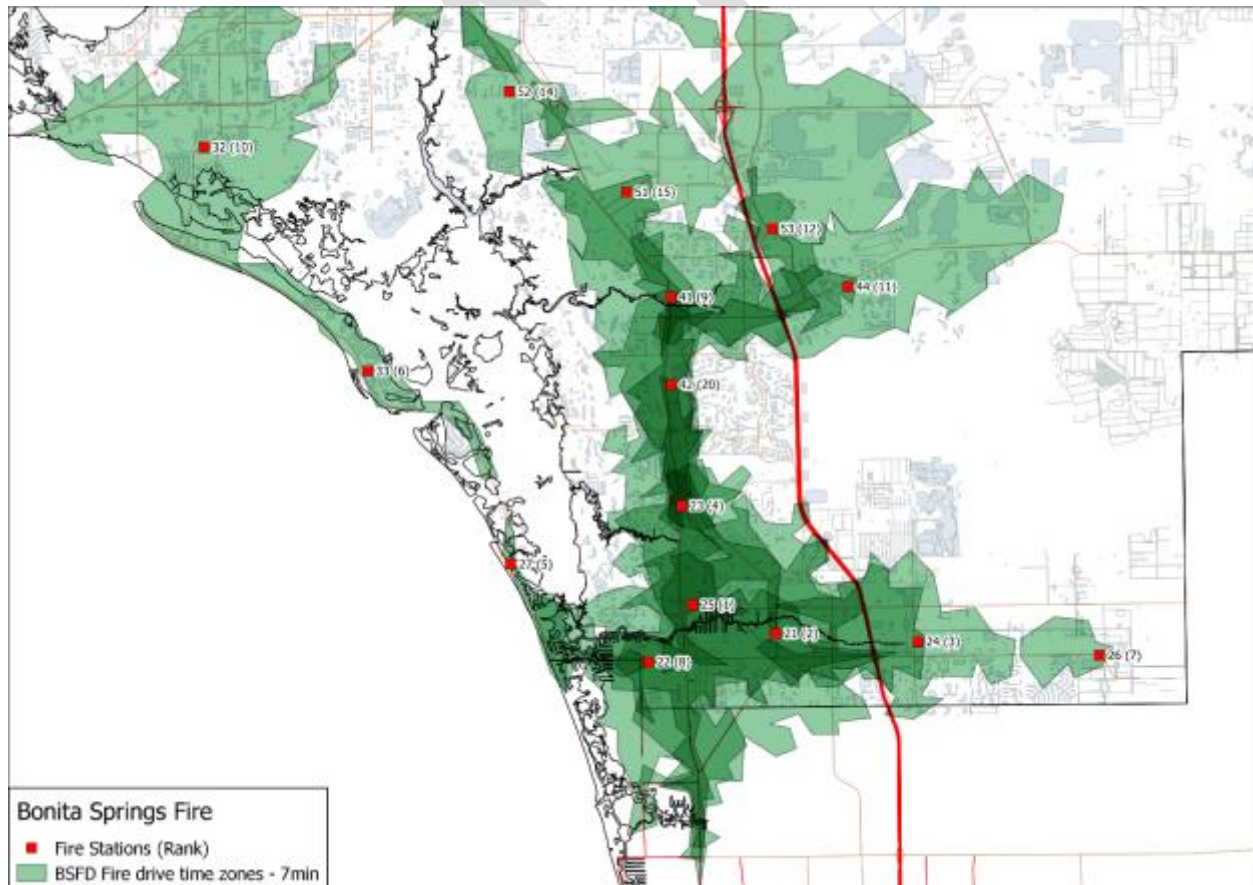


However, considering that the current overall performance is 7.7 minutes and that the EMS performance is 7.3 minutes, accounting for 78% of the incidents, a 7-minute plan was evaluated. The 7-minute assessment demonstrates the relative capacity to improve overall response time with the new and proposed stations. The fully implemented deployment plan would achieve approximately 82.5% coverage within 7 minutes or less. Data is provided below.

Table 25: Marginal Fire Station Contribution for 7-Minute Travel Time – Current and Proposed

Rank	Station Number	Station Capture	Total Capture	Percent Capture
1	Bonita Springs Fire & Rescue - Station #25	11,073	11,073	63.97%
2	Bonita Springs Fire & Rescue - Station #21	1,570	12,643	73.04%
3	Bonita Springs Fire & Rescue - Station #24	549	13,192	76.21%
4	Bonita Springs Fire & Rescue - Station #23	453	13,645	78.83%
5	Proposed BSFD Station #27	310	13,955	80.62%
6	Fort Myers Beach Fire - Station #33	185	14,140	81.69%
7	Proposed BSFD Station #26	91	14,231	82.22%
8	Bonita Springs Fire & Rescue - Station #22	49	14,280	82.50%

Figure 41: BSFD Current and Proposed Stations for 7-Minute Travel Time



Finding #: 23

The District will be able to improve its overall response time performance with the addition of Stations 26 and 27 to approximately 82.5% coverage within 7 minutes travel or less.

Recommendation #: 14

The District should consider realigning its overall performance objectives to a 90th percentile measurement that reflects its current performance capacity.

Marginal Utility of Optimized Resource Allocation

The marginal utility model is designed help the District understand the balance between response time performance, the community's willingness to assume risk, and the costs associated with comparative service levels. This analyses will help facilitate the District's efforts to strike the optimal balance between community expectations for service, costs, and outcomes. Therefore, in the following models, an optimal number of fixed facility fire station locations are identified for each level of performance. These optimized station plans demonstrate the ideal station locations for attaining each associated level of performance.

As previously discussed, these analyses utilized 2015 historical performance as the desired performance for system designs. Therefore, the 7-minute travel time will be utilized to most closely represent future performance considering full implementation of Stations 26 and 27 will achieve approximately 82.5% coverage within 7 minutes or less. The following additional analyses are utilized to compare and contrast further potential distribution models.

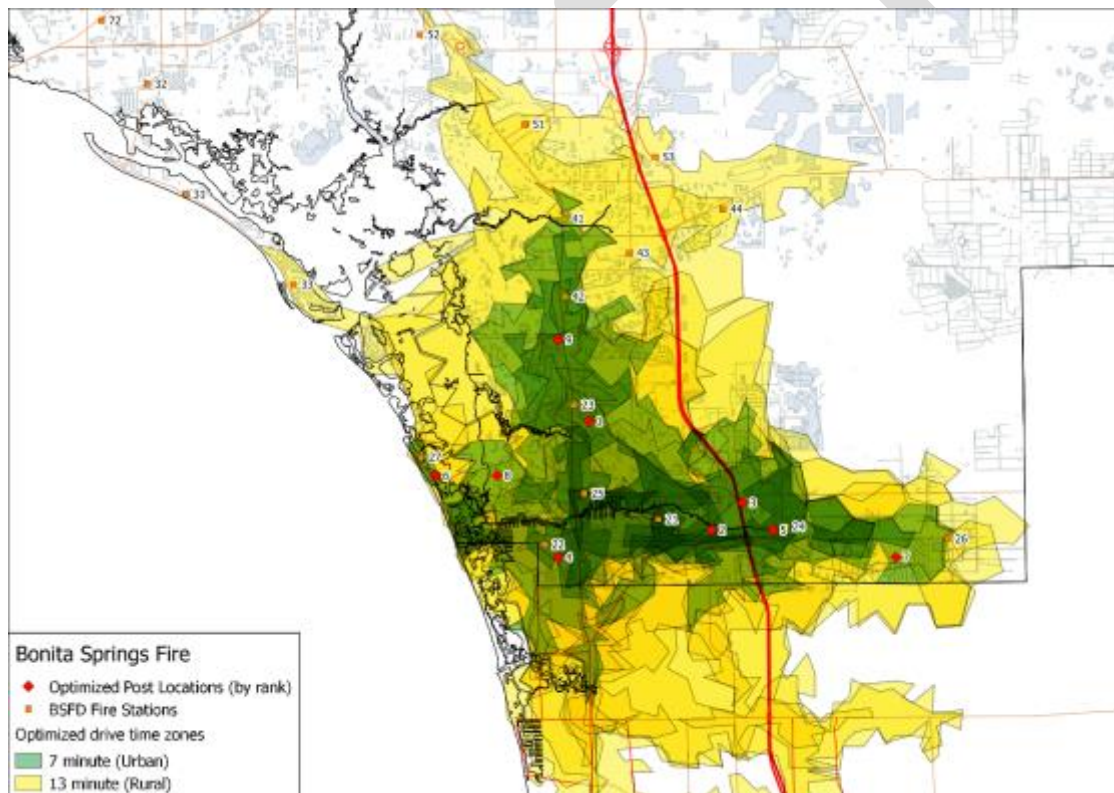
Optimized Station Distribution Plans

7-Minute Travel Time

Analyses were completed to develop an optimized station distribution model for a 7-minute travel time. This evaluation suggests, that an optimized 9-station model can provide for greater than 90% effectiveness covering all incidents within 7-minutes. A graphic illustration is presented below.

When referring to the figure below, it is evident that the optimized station locations would require 9 fixed facilities to meet the geographic limitations within the response jurisdiction. This optimized configuration improves performance by approximately eight (8%) percent, from 82% to 90%, compared to the seven station proposed District model.

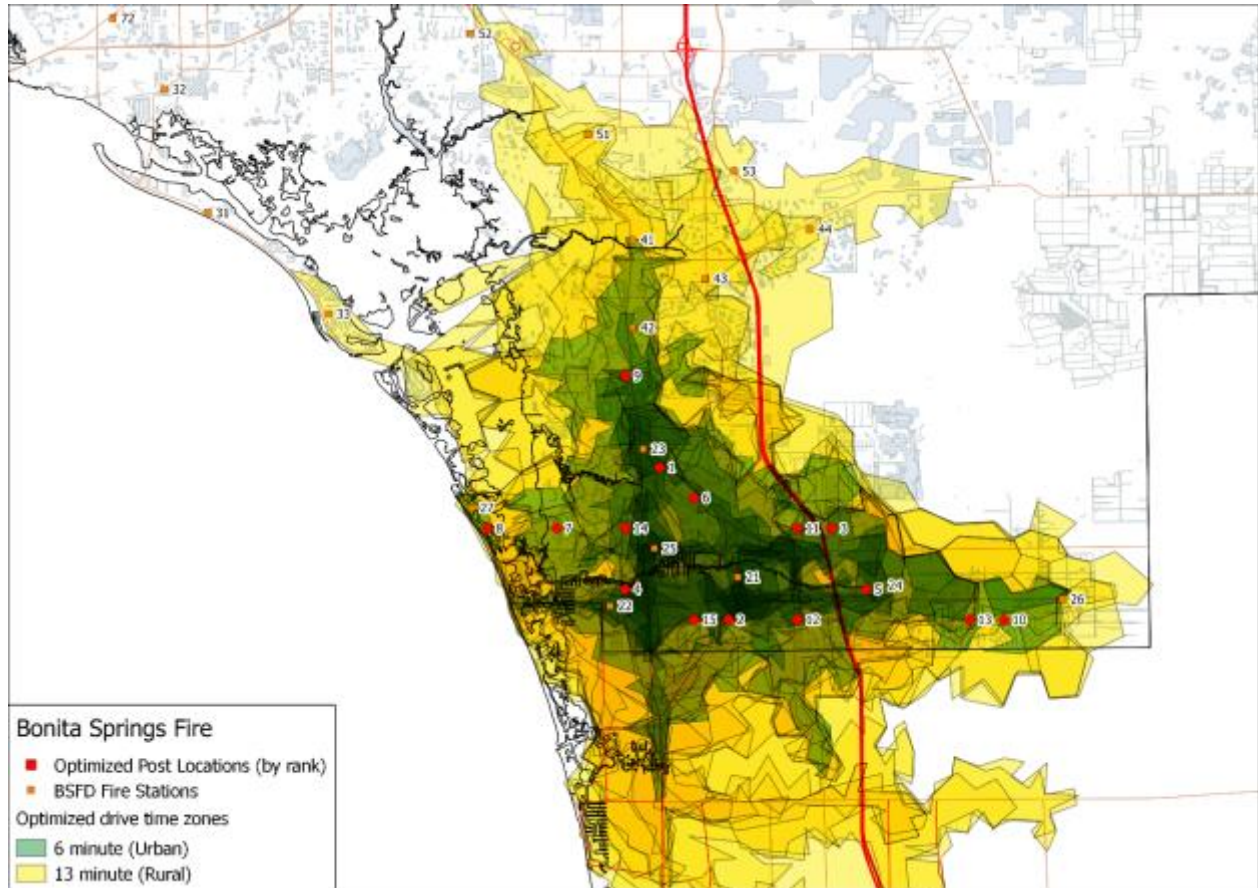
Figure 42: Optimized Station Deployment Plan – 7--Minute Travel Time



6-Minute Travel Time

Analyses were completed to develop an optimized station distribution model for a 6-minute travel time as well. This evaluation suggests, that an optimized 15-station model can provide for greater than 90% effectiveness covering all incidents within 6-minutes or less travel time nearly 90% of the time. In comparison, the proposed BSFD seven-station configuration achieved 6 minutes or less approximately 78% of the time. A graphic illustration is presented below.

Figure 43: Optimized Station Deployment Plan - 6-Minute Travel Time



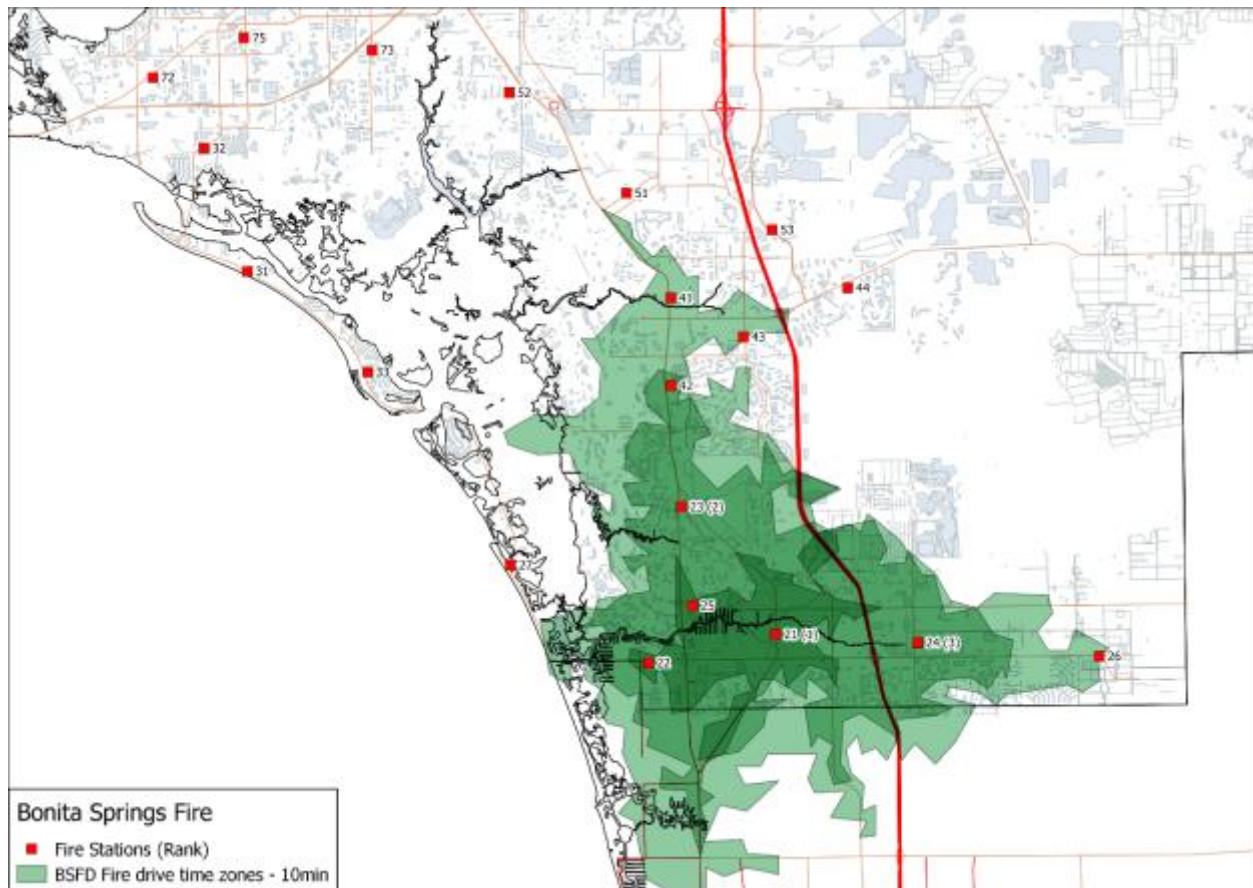
10-Minute Travel Time

As previously discussed, the 2015 Fire travel time was 9.6 minutes at the 90th percentile. Therefore, an analysis of a 10-minute travel time was completed. This analysis demonstrates that the proposed seven-station configuration can achieve greater than 95% coverage within 10 minutes or less. However, a three-station model will achieve 91% coverage in ten minutes.

Table 26: Marginal Fire Station Contribution for 10-Minute Travel Time for EMS Incidents

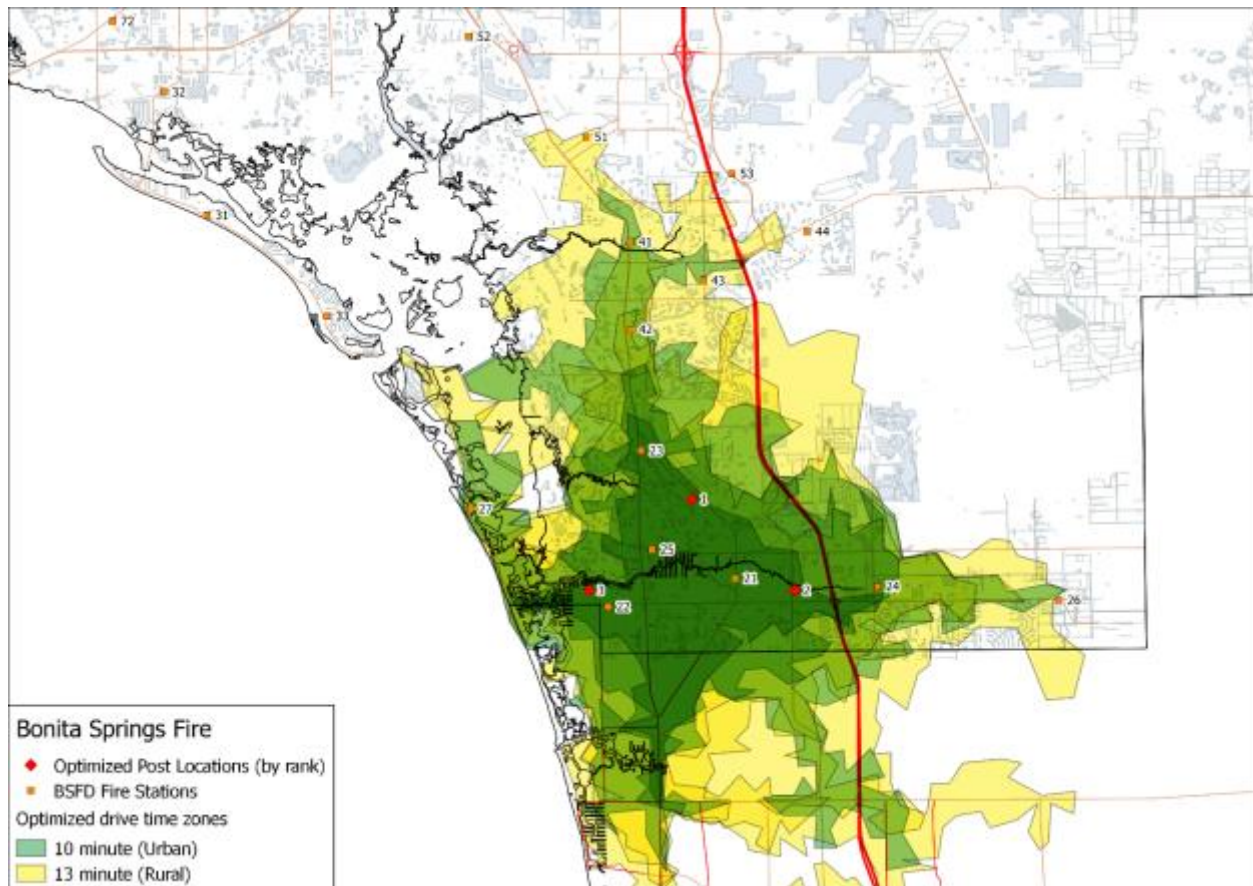
Rank	Station Number	Station Capture	Total Capture	Percent Capture
1	Bonita Springs Fire & Rescue - Station #21	14,675	14,675	84.78%
2	Bonita Springs Fire & Rescue - Station #23	585	15,260	88.16%
3	Bonita Springs Fire & Rescue - Station #24	508	15,768	91.10%
4	Proposed BSFD Station #27	413	16,181	93.48%
5	Fort Myers Beach Fire - Station #33	216	16,397	94.73%
6	Bonita Springs Fire & Rescue - Station #25	167	16,564	95.70%
7	Estero Fire - Station #41	86	16,650	96.19%
8	Proposed BSFD Station #26	30	16,680	96.37%
9	Fort Myers Beach Fire - Station #32	21	16,701	96.49%
10	Estero Fire - Station #44	17	16,718	96.59%
11	Bonita Springs Fire & Rescue - Station #22	15	16,733	96.67%

Figure 44: Three Station Model at 10-Minutes - 90th Percentile



An optimized 10-minute travel plan still requires three fixed facilities, but the overall system performance was within 1% of the current station locations. This validates the existing station locations for Station's 21, 23, and 24 when considering a 10-minute travel time. While the fiscal investment would not be warranted, the mapping is provided for future planning considerations.

Figure 45: Optimized Locations for 10-Minute Travel Time



LONG TERM SUSTAINABILITY

It is important to understand that the distribution models are restrictive to the geographic limitations of the jurisdiction and the historical demand for services. Therefore, the number of stations is descriptive of the number of fixed facilities required from which to deploy resources. These analyses do not specifically describe the concentration of resources required at each fire station facility to adequately handle the demand for services. For example, some stations may require two or more units in order to handle the demand for services.

As demonstrated earlier (Staffing considerations), the District currently maintains a more than adequate concentration of resources within its distribution.

With respect to the long-term sustainability of the deployment models presented here, the models will remain accurate for as long as the jurisdictions' overall coverage area has not expanded. In other words, if the District's square mileage remains, then the deployment strategy will be sustainable indefinitely with respect to the coverage area. As other variables such as population density or changes in socioeconomic status change over time, there may be a need for a higher concentration of resources necessary to meet the growing demand for services, but not additional stations. The most prominent reason that the geographic distribution model would need to be updated is for changes in traffic impedance that significantly limit the historical average travel speed. Monitoring travel time performance, system reliability, and call concurrency will provide timely feedback for changes in the environment that could impact the distribution model.

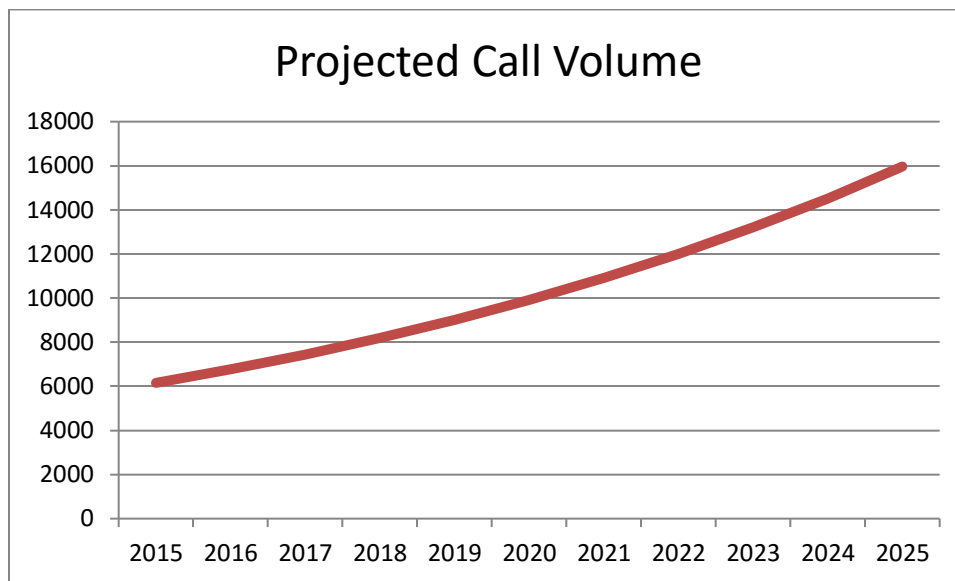
Recommendation #: 15

The District should establish a process for the quarterly review of its travel time performance, system reliability, call concurrency, and volume to ensure the ability of existing resources to cover the demand.

Demand Projections

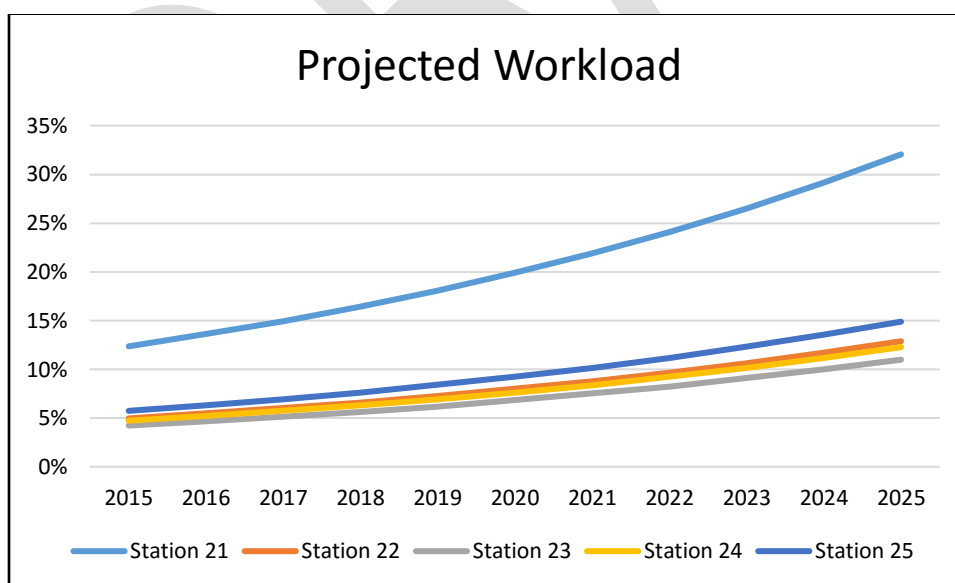
The available data set was restricted to two years with an annualized growth of approximately 10%. The following straight-line projections should be used with caution due to the two year limitation. A more accurate projection can be obtained from a minimum of five years growth. However, in all cases, data must be reviewed annually to ensure timely updates to projections.

Figure 46: Projected Call Volume Growth of 10%



Assuming that future demands will be reasonably distributed across the various stations in the system, the system will require a redistribution of workload and ultimately reinvestment in resources to meet the growing demand. However, this is unlikely to be needed prior to 2025 (Figure 47). Still, the system should be evaluated continuously for performance and desired outcomes and the department should specifically re-evaluate workload and performance indicators for every 1,000-call increase to ensure system stability.

Figure 47: Projected Workload Growth of 10%



Finding #: 24

The District's current resources should be adequate to absorb the projected demand growth through 2025. .

CAPITAL ASSETS AND CAPTIAL IMPROVEMENT PROGRAMS

Fire and EMS services are delivered throughout the District via six (6) fixed facilities and host of apparatus and other response capable capital equipment. The District's operations are based out of a shared facility that acts as a fire station, fire administration headquarters, and the fire commission chamber.

The District maintains a Capital Expenditure Budget for the purpose of building and replacing new stations, apparatus, and equipment with estimated useful lives of greater than one year. This budget is adjusted as needed as part of the annual budget process to address the District's capital needs. This approach is bolstered by two reserve funds (Replacements Reserve, Land & Building Reserve) that help the District continue to meet capital needs in the face of economic recession or a subsequent loss in revenues. The used of these funds for new or renovated facilities is based upon long term planning and assessment. Currently, the District is constructing its seventh facility, Station 26, with an expected completion in 2018.

Finding #: 25

The District has demonstrated sound capital planning and fiscal responsibility with short, mid, and long range planning that has enabled them to maintain service with reliable and current capital assets.

The District has demonstrated a strategic and mindful approach to their facilities and apparatus. Although one station is approaching a need for renovation, the District has been proactive in providing excellent quarters for their apparatus and personnel. The balance of fire stations/facilities are well organized and meet or exceed best practices in their layout, functionality and design. For instance, in the newer stations, a separation of sleeping and shower facilities has been provided to accommodate a diverse workforce. These stations are also exemplary in their storage of firefighter PPE meeting recommendations within NFPA1851. The District employs a full time Facilities Manager to oversee the maintenance and repair of these assets.

The layout of each station was evaluated through direct observation and quantitative analysis of station performance based upon turnout time; defined as the time increment from when the crews are notified of a call and when they are actually enroute, or wheels rolling, to the incident. This analysis provides insight into the design and functionality of the station layout as both factors impact the crews' ability to quickly muster at the apparatus and travel out of the facility.

Finding #: 26

The majority of District's facilities align with current standards for best proactive in fire station use and design. These facilities are well maintained and will service the District for decades. The District is already planning for addressing the few elements that fall just short of current standards.

Apparatus in the system is also well provided for. The District also maintains a capital replacement plan for its front line apparatus that runs from 2016 thru 2021. The District plans for the replacement of all engines and trucks after 15 years of service. Once a unit is replaced, it is evaluated for reserve status based upon its aggregated cost of ownership. All of the District's front line apparatus is in compliance with the requirements of NFPA 1901 (2009). The District provides for all the repair, maintenance, and testing required of these vehicles through a dedicated fleet maintenance program housed at Station 25. Work is performed by a total of (3) in-house EVT certified mechanics. A regular schedule of maintenance is maintained based upon mileage and date with all records of maintenance and repair being kept in FLEETMATE. FLEETMATE is a business intelligence solution specifically designed for the comprehensive maintenance and tracking of vehicle operational histories. The use of this tool enables the District to effectively track cost of ownership, cost of operation, and failure rates. Thus the District is collecting and utilizing all necessary data to make fiscally and operationally responsible decision regarding their fleet.

Finding #: 27

The District maintains a plan and program to ensure the reliability and safety of its apparatus fleet. As a result, the front-line fleet meets the requirements of NFPA 1901.

The following provides an overview of facilities and apparatus within the BSFD system. Units in blue provide Advance Life Support (ALS) services while all others are Basic Life Support (BLS) capable.³⁹

³⁹ Images retrieved from: http://www.bonitafire.org/?zone=/unionactive/office_locations.cfm

Figure 48: Bonita Springs Fire Station 1 (Station 21)



BoSFD Station 21 received an extensive remodel and addition in 2007. It has adequate space and facilities to house 16 members simultaneously, including necessary office, learning, exercise and rest/recovery spaces. Facilities are gender neutral. All apparatus is housed inside and protected. This station is home to the specialty HazMat and TRT services. Overall, the station is in excellent shape and will easily serve the District's needs over the next 10 years.

Table 27: Apparatus Inventory – Bonita Springs Fire Station 1 (Station 21)

Apparatus Type	Unit ID	Year	Make/Model
Engine	Engine 21	2009	Pierce/Velocity
Light-Rescue	Rescue 21	2008	Ford/F550
Heavy-Rescue	Squad 21	2004	Pierce/Quantum
Van	HazMat 21	1998	Chevy/P30

Figure 49: Bonita Springs Fire Station 2 (Station 22)



BSFD Station 22 was built new in 2005. It has adequate space and facilities to house 9 members simultaneously including necessary office, learning, exercise, and rest/recovery spaces. Facilities are gender neutral. All apparatus is housed inside and protected. Overall, the station is in excellent shape and will easily serve the District's needs over the next 10 years.

Table 28: Apparatus Inventory - Bonita Springs Fire Station 2 (Station 22)

Apparatus Type	Unit ID	Year	Make/Model
Engine	Engine 22	2015	Pierce/Velocity
Boat	Marine 22	N/A	RIB, 22'

Figure 50: Bonita Springs Fire Station 3 (Station 23)



BSFD Station 23 was built 1994. It has adequate space and facilities to house 7 members simultaneously including necessary office, learning, exercise, and rest/recovery spaces. There are separate genders specific bathroom facilities however the sleeping quarters are open space without adequate gender separation. All apparatus is housed inside and protected. The station used to house the Prevention Division offices. The relocation of these offices to Station 24 opened a large second floor space currently be used in part as an exercise space. Overall, the station is in fair shape and will likely require renovation or replacement in the next ten years.

Table 29: Apparatus Inventory - Bonita Springs Fire Station 3 (Station 23)

Apparatus Type	Unit ID	Year	Make/Model
Engine	Engine 23	2004	Pierce/Quantum
Brush Truck	Brush 23	1992	International/4x4

Figure 51: Bonita Springs Fire Station 4 and Administration



BSFD Station 24 was completed in 2006. It has adequate space and facilities to house 9 members simultaneously including necessary office, learning, exercise, and rest/recovery spaces. Facilities are gender neutral. All apparatus is housed inside and protected. The building also houses all fire administration divisions and functions in addition to the commission chamber and public meeting space. The property is also home to the training facility and drill grounds. The facility and property is in excellent shape and will easily serve the District's needs over the next 10 years.

Table 30: Apparatus Inventory - Bonita Springs Fire Station 4 (Station 24)

Apparatus Type	Unit ID	Year	Make/Model
Engine	Engine 24	2007	Pierce/Contender
Brush Truck	Brush 24	1993	International/4x4

Figure 52: Bonita Springs Fire Station 5 (Station 25)



BSFD Station 25 was built new in 2010. It has adequate space and facilities to house 11 members simultaneously including necessary office, learning, exercise, and rest/recovery spaces. Facilities are gender neutral. All apparatus is housed inside and protected. The station also houses the District’s apparatus maintenance program. The station is in excellent shape and will easily serve the District’s needs over the next 10 years.

Table 31: Apparatus Inventory - Bonita Springs Fire Station 5 (Station 25)

Apparatus Type	Unit ID	Year	Make/Model
Truck	Truck 25	2009	Sutphen/SP70

Figure 53: Bonita Springs Fire Station 7 (Station 27)



BSFD recently opened this station to service the Bonita Beach Community. The station occupies a leased space at the end of a commercial strip center. The interior was completely renovated to accommodate a three (3) person crew. The space adequately provides for all essential living and working conditions, minus exercise facilities. The Apparatus is kept outside at the present time. However, the station location has enabled the District to place Marine 27 in the water, greatly improving their marine response time capabilities.

Table 32: Apparatus Inventory - Bonita Springs Fire Station 7 (Station 27)

Apparatus Type	Unit ID	Year	Make/Model
Mini Pumper	Engine 27	2016	Ford/F550
Boat	Marine 27	2013	Twin Vee, 26'

The District also maintains reserve apparatus to ensure continuity of service during repairs and maintenance. (Table 33)

Table 33: Reserve Apparatus Inventory

Apparatus Type	Unit ID	Year	Make/Model
Engine	Reserve	2001	Pierce/Quantum
Engine	Reserve	2001	Pierce/Contender
Light-Rescue	Reserve	2008	Ford/F550

STAKEHOLDER INPUT AND COMMUNITY EXPECTATIONS

BSFD facilitates an ongoing process for obtaining stakeholder input. Externally, the department regularly engages with the public at public meetings, businesses, and homes. Feedback from community members is brought to the attention of both the department's commission and executive staff. Internally, all members are empowered to communicate needs and expectations through an established chain of command.

Thus through a series of on-site structured interviews with key stakeholders, the FITCH team was able to gather a solid understanding of the both the internal and external stakeholder expectations. The evaluation and assessment of the District strongly indicates that the agency is well informed and understands the needs and expectations of its community. Thus, the agency has been able to align its mission, vision, values, and goals with the community's expectations.

Guiding Principles: Internal Performance Expectations and Goals⁴⁰

Mission Statement

It is the mission of the Bonita Springs Fire Control and Rescue District to preserve life and property and promote public safety through strong leadership, management, professionalism and integrity.

Focus Statement

The District will focus its efforts on responding rapidly and safely to emergencies, providing appropriate interventions, community outreach and rigorous training to constantly improve our safety, skills and readiness.

Values

To Residents: We owe the residents of Bonita Springs the highest quality of service possible, characterized by responsiveness, integrity and professionalism. We will continually strive for quality improvement.

To The District: We owe the Bonita Springs Fire Control and Rescue District our full commitment and dedication. We will always look beyond the traditional scope of our individual positions to promote teamwork and safe organizational effectiveness.

⁴⁰ Retrieved From: <http://bonitafire.org/Final%20Budget%202016-2017.pdf>

To Each Other: We owe each other a working environment characterized by trust and respect for the individual, fostering open and honest communication at all levels.

To Ourselves: We owe ourselves personal and professional growth. We will seek new knowledge and greater challenges, and strive to be at the leading edge of our profession.

Goals

- Develop or improve our organization to effectively administer and manage the resources of the District.
- Develop or improve a system for minimizing the impact of fires, disasters, and other emergencies on life and property.
- Provide an effective Emergency Medical Service to lessen the morbidity and mortality of the sick or injured.
- Provide an effective Fire Prevention and Public Education System to improve the quality of the lives and safety of the citizens we protect.
- All personnel and staff will do their best, enjoy their job, and promote safety for themselves, their co-workers, and the organization.

FIRE AND EMS DISPATCHING SERVICES

The Lee County Emergency Dispatch Center (Lee Control) is the primary PSAP and Dispatch center for BSFD. The Center is a Dual Accredited Center of Excellence (Dual Ace) by the International Academies of Emergency Dispatch (IAED) making it one of only 25 agencies in the world to achieve this designation. All Lee Control call takers and dispatchers are certified Emergency Medical Dispatchers (EMD) and Emergency Fire Dispatchers (EFD). The following tables represent the dispatch performance for all major program areas in Bonita Springs.

Table 34: Average Dispatch, Turnout, Travel, and Response Times in Minutes

Program	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
EMS	1.4	1.3	4.7	7.3	4,346
Fire	1.8	1.1	6.0	8.9	748
Hazmat	1.7	1.4	5.1	8.2	27
Rescue	2.5	1.8	7.8	12.2	50
Total	1.5	1.2	4.9	7.6	5171

Table 35: 90th Percentile Dispatch, Turnout, Travel, and Response Times in Minutes

Program	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
EMS	2.8	2.1	7.3	10.5	4,346
Fire	2.9	1.8	9.6	12.6	748
Hazmat	3.2	2.2	9.0	13.2	27
Rescue	4.3	3.0	14.6	20.6	50
Total	2.9	2.0	7.7	10.9	5,171

Overall, the dispatch center performance is within two minutes of NFPA or CFAI recommendations of 60 seconds at the 90th percentile and up to 80 seconds if the first call was answered by another PSAP and was transferred.^{41 42} For the purposes of this study, the dispatch interval is the time from phone ring at 911 to the dispatching and alerting of the unit. The average dispatch time in 2015 was 90 seconds, and the 90th percentile was 174 seconds (two minutes and fifty-four seconds). It was also noted that the CAD data could not identify emergency versus non-emergency responses.

⁴¹ National Fire Protection Association. (2010). 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*. Boston, MA: National Fire Protection Association.

⁴² CFAI. (2009). *Fire & emergency service self-assessment manual*, (8th ed.). Chantilly, Virginia: Author. (page 71)

While it appears there may be some room for improvement in the dispatch performance, it is important to acknowledge that these national recommendations were created prior to the proliferation of cellular phones and both medical and fire call triage systems. The communications centers time commitment to get a correct location on cellular callers can be considerably longer than the traditional Automatic Number Identification (ANI) and Automatic Location Identification (ALI) process. In the modern environment, greater than 70% of the requests for service are cellular callers. Therefore, the overall performance by the communications center is reasonably aligned with our national experience. Again, the overall dispatch performance is within reasonable limits, but the fire performance should be monitored closely to identify areas for improvement.

Recommendation #: 16

The District should work with the Communication Center to monitor and improve performance where possible with particular attention to the dispatch times and the capture of response mode categorization.

ATTACHMENT A

Data Report

ATTACHMENT B

GIS Report



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