



BARNSTABLE FIRE DEPARTMENT Organizational Analysis - 2019

This document provides a detailed analysis of the history, organization, and future projections of the Barnstable Fire Department
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I. Overview of the Barnstable Fire District

Historical Overview

In the late 1800's, discussions began within the Town of Barnstable on the possibility of establishing a town-wide fire department, following a major fire in the Hyannis downtown business district. On at least two separate occasions, petitions were brought forward during town meeting requesting the formation of a town-wide fire department. These petitions were rejected both times, citing that there were no plans to provide fire protection outside the Village of Hyannis, and that equipment responding from Hyannis would not help residents in other villages in town, 12 – 14 miles away. Following these failed attempts to form a town fire department, the Hyannis Fire District was the first fire district to form within the Town of Barnstable in 1896.

In 1926, when Barnstable Village residents requested streetlights be added to the village, they were turned down by the governing boards in Hyannis and told to “tax your own people.” A petition driven by the residents in Barnstable Village was presented to the legislature to form the Barnstable Fire District and on March 12, 1926 the petition was granted. The Barnstable Fire District was officially formed following a meeting with Barnstable district residents on August 5, 1927 at 7:30 p.m. at the Village Hall. At this meeting, District residents voted to accept Chapter 109 of the Acts of 1926 titled, “An Act to Establish the Barnstable Fire District in



the Town of Barnstable.” Although the Barnstable Fire District had officially been formed, there was no organized fire protection until 1935.

Prior to establishing an organized fire department in Barnstable Village, the Hyannis Fire District was charging Barnstable Village for any emergency response it was providing to the village.

During the Barnstable Village District Meeting in April 1932, residents authorized a committee of three people, Paul M. Swift, William A. Jones, and Frederick Kent “to confer with the Hyannis Fire Department to secure an adjustment, reduction, or compromise in connection with bills received from the Hyannis Fire Department.” The issue was settled when three people were designated as the only village residents allowed to call the Hyannis Fire Department in case of fire. Their actions could then bind the District for payment to Hyannis for any services that were provided. Those entrusted with this responsibility were Edward L. Harris, Harry Ryder, and Frederick S. Kent.

In 1934, two major fires in Barnstable Village provided the impetus to establish and combine a fire department and a water department to form the Barnstable Fire District. One of the two fires was at the Blue Tavern, which was located across from the present-day Barnstable House on Main Street. This was a large inn and their rooms were all named after towns on the Cape. The second fire was at the Jail, which was located behind the Superior Court. The fire at the jail was started when a flue pipe overheated and started the roof on fire. The jail burned to the ground and was rebuilt in 1935.



At the March 11, 1935 Barnstable District Meeting, a question was raised as to whether the fire district could legally establish a fire department. The meeting was adjourned for one week. Following some research into the matter, the district residents voted to adopt Massachusetts General Law Chapter 48, Sections 64 and 65 and the Barnstable Fire Department became a reality.

The Barnstable Fire Department was officially established on July 14, 1935 under the command of the first fire chief, Chief Fire Engineer Raymond J. Neil, and Assistant Chief Engineers W. Dana Holmes and Harrison Kent. At the 1935 Barnstable District Meeting, voters approved \$9,000.00 to purchase a fire engine, and \$7,000.00 for land and construction of a firehouse. On a plot of land donated by Alfred Crocker in memory of his father, a fire station was constructed, located on Main Street in the center of the Village. This is the same location of the present Barnstable fire station that operates today. The District's first fire engine was purchased shortly after the District Meeting, a 1935 Mack fire engine which served as Barnstable Engine 1 until her retirement in 1965. The 1935 Mack is still owned and operated by the Barnstable Firefighter's Association and is usually on display during special events and parades. The first organized meeting and training session in the Barnstable Fire Department was held on September 14, 1935, where it is recorded that the members conducted a drill involving pumping operations.



The Barnstable Fire Department was an on-call fire department from 1935 until 1985. In 1985, Richard Lizotte was hired as the departments first full-time firefighter working a day-shift schedule. Although the department had taken initial steps to staff with full-time personnel, the on-call firefighting staff was still active and very much needed. Firefighter Lizotte worked for the department until 1987 when he left to work in private industry. In 1987, the department was approved to hire two (2) additional firefighters bringing the daytime staffing up to three (3) personnel. Firefighter Robert Stansifer was hired to replace Firefighter Lizotte, and Firefighters Glenn Coffin and Firefighter Blaire Greenhalgh were hired as the two additional firefighters.

In 1988, Chief William A. Jones III became the first full-time fire chief of the Barnstable Fire District. Chief Jones had been an active member on the call firefighter force for over twenty (20) years and served as Assistant Fire Engineer from 1976 to 1981. He was appointed Chief Fire Engineer in 1981 and served as Chief of Department until his retirement in 2002.

In July 1989, the Barnstable Fire Department began staffing 24 hours a day/7 days a week/365 days a year with the addition of six (6) full-time personnel. This level of staffing on a 24-hour schedule provides for two (2) full-time personnel to be on duty at all times. Even with 24-hour/full-time coverage, the on-call firefighting force was still heavily relied upon to provide additional manpower at emergency incident scenes.



Three (3) years later in 1992 as emergency incidents were rising, the department added four (4) full-time personnel. This brought the shift staffing up to three per shift around the clock. Then again in 2004 as the department was experiencing another increase in emergency incidents an additional four (4) full-time personnel were hired. The on-call firefighting force was slowly fluctuating due to increased demands on professional training and standards as well as the strains of limited time availability from on-call firefighters who had full-time employment outside the fire service and family commitments. In January 2006 due to the limited number of on-call firefighters in the department coupled with rising costs of equipment maintenance and insurance for the call firefighting force, the decision was made to transition to an all-career fire department.

As the fire department continued to grow, the need for administrative help was imminent. At the May 14, 2001 Annual District Meeting, voters approved funding for a part-time clerk for the Prudential Committee and the fire department. In 2001, local resident Karen Hickey was hired as the first part-time clerk. This position remained part-time for the next thirteen (13) years under different personnel. As administrative demands, emergency incidents, and local development were increasing in the District, a transition to a full-time administrative assistant was desperately needed. In 2014, Karen Hickey was once again hired as the first full-time administrative assistant for the department. Since returning, she has completely transformed the position and seamlessly manages all the administrative functions of the department.



Community Description

The Town of Barnstable is the second oldest town on Cape Cod incorporating seven villages within the town boundaries. Barnstable Village is the oldest of all seven villages and is rich in history with settlements dating back to the early 1600's. Early settlements by native Indians were located along the shores as this provided an abundant amount of fish and shellfish. In 1639, European settlements began to form along what is known as Old King's Highway.

Barnstable Harbor with its sheltered waters became a desirable area for maritime trade. Many Sea Captains resided in Barnstable Village and built houses along Old King's Highway and the roads leading to Barnstable Harbor. Later, in 1686, the village became the hub of county government, building the area's first courthouse located at Pine Lane and Main Street. In 1774 a second courthouse was constructed at Main Street and Rendezvous Lane, which is known today as the "Olde Colonial Courthouse." Barnstable Superior Court, located on Main Street in the village center, was constructed in 1831. The First District Court, also on Main Street in the village center, was constructed in 1971. Today much of Barnstable County government including the courthouses, District Attorney's Office, Cape Cod Commission, and County administrative offices are still located in the center of Barnstable Village.

The Barnstable Fire Department protects a 14 square mile area in the historic villages of Barnstable and Cummaquid, with a year-round population of approximately 3500 residents. Located in the Southeast portion of Massachusetts on Cape Cod and bordering the Atlantic Ocean in Cape Cod Bay, this area is susceptible to severe weather including high wind, tidal flooding, extreme cold, blizzards, and hurricanes. Sandy Neck Beach also falls within the



Barnstable Fire District boundaries. Located approximately one-mile North of Barnstable Harbor and accessed exclusively by marine watercraft and four-wheel drive vehicles, Sandy Neck is a 7-mile, 4700-acre barrier beach with sand dunes, marshes, and forests. Sandy Neck Beach is also home to approximately thirty-eight (38) cottages (mostly known locally as the Cottage Colony) and the historic Sandy Neck Lighthouse. Cottages on Sandy Neck were mostly designed as hunting cabins, and many have transformed into habitable cottages with no running water or electricity. Due to the remoteness and accessibility concerns, emergency incidents on Sandy Neck can involve delayed response and manpower challenges.

As a seaside vacation destination, the seasonal population in Barnstable Village increases nearly 200% from late Spring to early Fall. Barnstable is also a popular location that hosts several charitable events that draw thousands of participants and spectators each year. Barnstable has a very diverse mix of residential, commercial, and industrial properties. Situated in the heart of Barnstable Village are three (3) courthouses including District, Superior, and Probate Court, as well as many county government offices. In addition, there are numerous businesses, restaurants, and retail shops in the downtown area that exponentially increase the day-time business population. The fire department also protects an industrial park located remotely from the downtown area which is home to office buildings, medical centers, retail strip malls, and several multi-story apartment housing developments. The recent rapid development in the industrial park has dramatically increased the amount of daily traffic, business population, and emergency incidents in our response area. There are three major roadways located in



Barnstable; Route 6, which is a divided highway, as well as Route 132 and Route 6A which are all heavily traveled main roadways. In addition, Barnstable has a passenger and freight railway that traverses through the villages and a passenger bus system which is managed by the Regional Transit Authority. Barnstable also has an active waterfront marina and harbor with numerous commercial fishing vessels, a large passenger ferry, and recreational watercraft. The Barnstable Fire Department currently protects our residents, business owners, and visitors with a nineteen-member career fire department consisting of one Fire Chief, one Deputy Fire Chief, one Administrative Assistant, four Captains, and twelve Firefighters. The four Captains and twelve Firefighters are divided into four equal groups to provide 24-hour coverage. With the exception of the Administrative Assistant, all members are cross-trained as EMT's and Paramedics. The department operates out of one (1) fire station 24 hours/day, 7 days/week, 365 days/year. Our services to the community include fire suppression, BLS and ALS level ambulance service, HazMat Operations and Technician level response, maritime response, and technical rescue response. Barnstable Fire Department is active in the county mutual aid system, and we are on automatic aid with our bordering partners during high risk emergencies. In addition, the department provides a vast amount of fire safety, inspectional, and educational programs and support within the community.

Community Demographics

Barnstable Village is one of seven (7) villages within the Town of Barnstable and is the oldest of all seven (7) villages. Early settlements by native Indians were located along the shores of



Barnstable Harbor as this provided an abundant amount of fish and shellfish as a source of food. In 1639, European settlements began to form along Route 6A, which is also known as Old King's Highway. Barnstable Harbor became a desirable area for maritime trade in the 18th and 19th centuries. In fact, many Sea Captains built large houses along Old King's Highway and the roads leading to Barnstable Harbor. Barnstable Village has made great efforts to preserve the historic values and landscape that once was a robust Sea Captains home port.

Today, Barnstable Village is one of the most desirable areas to live on Cape Cod. A thriving community, Barnstable Village is a safe and quaint village fostering small town values making it welcome to residents, business owners, and visitors alike. The residential population of Barnstable Village is approximately 3,500 and rising. According to the US Census 2010, the median age in Barnstable Village is 53 years of age, compared with the entire Town of Barnstable which is 48.2 years of age. A significant portion (70%) of Barnstable Village residents have achieved college-level educations yielding a white-collar workforce of 81%. The median household income in Barnstable Village is \$100,274.00, which is significantly higher than the median household income in the Town of Barnstable at \$66,864.00. The median home value with a mortgage in Barnstable Village is \$491,800.00 compared with the Town of Barnstable at \$344,300.00. Given these local economic factors, the poverty level in Barnstable Village is currently at 5%. The poverty level in the Town of Barnstable is at 9%, which is slightly under the state average of 11.4%.



While Barnstable Village is an economically thriving community, it is important to note that approximately 62% of our resident population is 65 years of age or older and are on a fixed income such as social security or retirement, which is 17% higher than the rest of the state of Massachusetts. Barnstable Village is comprised of three different property types: residential, commercial, and industrial properties consisting of \$1.2 Billion in property value. Residential properties make up the majority of property in the village at 81.56%, while the remaining 18.44% consists of commercial and industrial property in the village. It is also interesting to note that of the \$1.2 Billion in total property value, \$177 Million (15%) of the total property value in Barnstable Village is tax-exempt. This is especially important to consider when discussing community infrastructure and capital improvements where results may have an impact on the fluctuation in taxes.

Growth Projections:

In the past year, several large-scale commercial building projects have begun construction in the Barnstable Fire District. These projects consist of several multi-story, multi-unit apartment buildings, two (2) parking garages, a new major financial institution headquarters, and an additional power sub-station terminal. The apartment buildings when complete, will add nearly seven-hundred (700) apartments consisting of market value, low income, and senior living units. This rapid population growth will yield an estimated one thousand eight hundred (1,800) residents of different demographic backgrounds. In addition to the increase in population,



increased vehicular traffic can be expected which will impact several traffic patterns throughout the District.

A proposed off-shore wind power will involve the transmission of two (2) - 800 kw power cables that will run for several miles underground from Covell's Beach in Centerville to the power substation terminal in the Industrial Park. The additional underground transmission lines will have access vaults at various points creating confined space challenges for emergency responders.

Although infrastructure impacts and traffic mitigation were discussed during site plan review with town regulatory boards, emergency services will most certainly be impacted after the build-out. Examining several projects of similar size and scope, we are projecting a twenty-percent (20%) increase in emergency incidents from this recent construction.

At the present time, there has been further discussion on additional apartment complexes being built in the Industrial Park, as well as expansion of the Cape Cod Rail Trail. The Cape Cod Rail Trail provides an off-road, paved walking and cycling path that will extend from Barnstable to Wellfleet. At the present time, nearly twenty-eight percent (28%) of our overall emergency incidents originate from the Industrial Park. It is expected that a greater increase in incident volume will impact this area as additional projects are constructed.

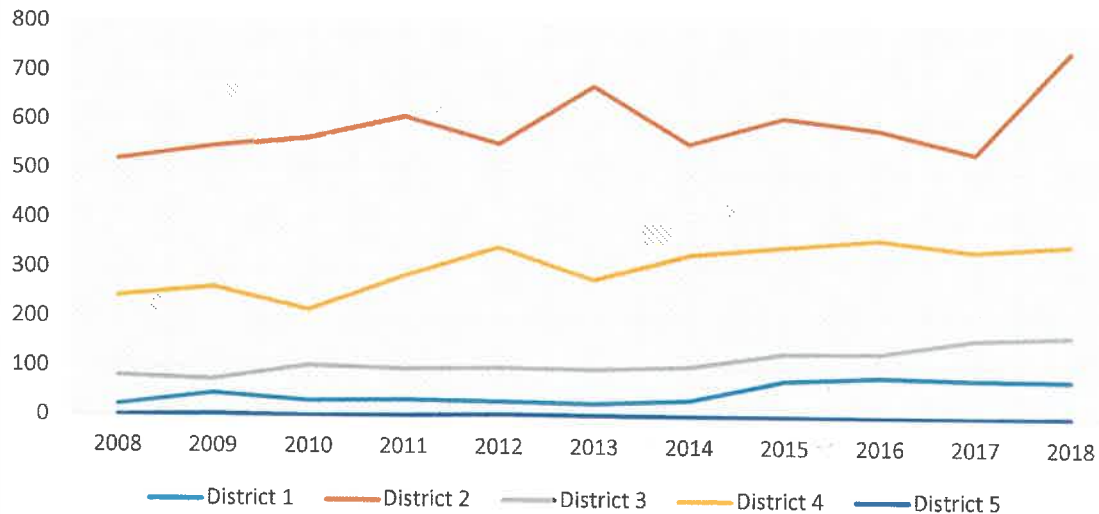


The Barnstable Fire District is broken down into five separate geographic areas (districts). The main reason for this is for mutual aid response during emergencies so that we are calling the closest available resources based on the geographic address of an incident. It is also used to define the appropriate resources needed at an incident based on a specific hazard. As an example, different resources would be needed for a single-family structure fire in a residential area, as opposed to a fire in a large commercial property with hazardous materials on site. One of the administrative benefits of using this method is that we are able to run data specific to geographical areas for trend comparison.

As illustrated in the chart below (*BFD-Chart 1-1*), we have seen a steady increase in emergency incidents in all districts within the last 10 years, with a sharp increase in emergency incidents in District 2 in the last two years. Emergency incidents within District 2 and District 4 make up 81.88% of all emergency incidents within the Barnstable Fire District.



Incidents by District 2008 - 2018



(BFD- Chart 1-1)

- District 1: Rt. 132 to West of Railroad Bridge; Rt. 6 and Shootflying Hill Rd.
- District 2: Railroad Bridge to Mary Dunn Rd; North of Rt.6
- District 3: Mary Dunn Road to Yarmouth
- District 4: Industrial Park; South of Route 6
- District 5: Sandy Neck

Percentage of Incidents by District (Avg.) 2008 – 2018

- District 1: 4.20%
- District 2: 54.18%
- District 3: 10.06%
- District 4: 27.70%
- District 5: 1.10%
- Out of District: 2.76%



Recommendations:

1. The department should continue to monitor growth projections in the District and their impact on emergency services.
2. The department should develop expanded automatic aid agreements with bordering communities to manage large-scale events at these multi-unit apartment complexes.
3. The department should continue to monitor response times of emergency apparatus to the area of the Industrial Park. Emergency responses to this area of the District represent nearly twenty-eight (28%) percent of total incident volume. Anticipated commercial development will likely shift a greater percentage of incidents to this response district, impacting overall response times in the fire department.
4. The department should start the planning process for implementing a feasibility study to determine whether a Headquarters fire station relocation or moving to a two-station model is in the best interest of the District.

II. Financial Overview

Overview:

The Barnstable Fire Department has maintained short-term, medium-term, and long-term capital improvement plans to maintain current needs of the department, facilitate a realistic and predictable replacement schedule, and continually meet ongoing compliance with



occupational standards. Each year, the capital improvement plan is reviewed and revised by the Fire Chief and Deputy Fire Chief to meet the current and future demands of the organization. These plans include the repair, replacement, and upgrading of the department's infrastructure and incorporate high-value items such as building and grounds, vehicles, and operating equipment, into a manageable, fluid, and working document.

Operating Budget:

Each year, at an Annual District Meeting (typical of a traditional New England annual town meeting), voters of the Barnstable Fire District have the opportunity to hear and vote on the requested operating and capital expenses of the entire Barnstable Fire District for the following fiscal year. The fire department operating budget is a traditional line item budget that consists of the salary and operating expenses for all fire and rescue operations for the Barnstable Fire District. Approximately ninety percent (90%) of our operating expenses are earmarked for salary and personnel related costs, with the remaining ten percent (10%) used for maintenance of the station and equipment, utilities, contractual services obligations, and daily office and medical supplies.

Capital Improvement Planning

A formal Capital Improvement Plan (CIP) is a valuable tool that is used in forecasting the future needs and costs of an organization and is used by fiscal planning groups within a municipality to spread out costs over a specific period of time and across multiple departments. It is typical for



an organization to have one (1), five (5), and ten (10) year plans, also considered short, medium, and long-range plans. Some organizations even attempt to plan out capitol expenses upwards of twenty to twenty-five (20-25) years. One of the difficult things to predict with long-range planning is the cost of goods and services beyond a one (1) year period. Capitol Planning involves looking at financial trends in the economy as well as projecting cost increases for these goods and services over multiple years, while at the same time maintaining fiscal responsibility to the local taxpayer.

The following illustration (*BFD-Chart 2-1*), shows the current five (5) year Capitol Plan for the Barnstable Fire Department. Capitol improvement plans are fluid documents and change frequently based on the needs of the organization, changes in operations, and safety requirements as dictated by industry standards and best practices.

Barnstable Fire Department
Organizational Analysis - 2019
 Prepared by Francis M. Pulsifer - Fire Chief



<u>Capitol Planning/ Strategic Financial Planning</u>			
<u>January 2020</u>			
	<u>Age of Equipt.</u>	<u>Est. Amount</u>	<u>Possible Funding</u>
<u>Fiscal Year 2021</u>			
Personal Protective Equipment	(10 Years)	\$ 65,000.00	AFG Funding
Station Generator	(25 years)	\$ 30,000.00	
Add One Firefighter	(New)	\$100,000.00	SAFER Grant
400 Mhz Radio Implementation	(New)	\$100,000.00	
<u>Fiscal Year 2022</u>			
E-205 Replacement	(25 years)	\$700,000.00	EMS Account
Ambulance 204 Replacement	(15 Years)	\$350,000.00	
Kitchen/ Bath Station Renovations	(22 Years)	\$ 70,000.00	
Plan one firefighter retirement	(32 Years)	\$ 50,000.00	
<u>Fiscal Year 2023</u>			
SCBA Replacement 20 bottles	(15 Years)	\$ 90,000.00	AFG Funding
SCBA Filling Station Replacement	(28 Years)	\$ 60,000.00	AFG Funding
Plan one Firefighter retirement	(32 Years)	\$ 50,000.00	
<u>Fiscal Year 2024</u>			
Lifepack 15 Replacement	(10 Years)	\$ 50,000.00	EMS Account
SCBA Replacement 20 Bottles	(15 Years)	\$ 90,000.00	AFG Funding
Patrol 200 Replacement	(18 Years)	\$100,000.00	
<u>Fiscal Year 2025</u>			
Lifepack 15 Replacement	(10 Years)	\$ 50,000.00	EMS Account
Personal Protective Equipment	(10 Years)	\$ 80,000.00	
Station Roof Replacement	(25 Years)		

(BFD-Chart 2-1)

Ambulance Revenue:

During the April 27, 1987 Annual District Meeting, voters approved Article 13, authorizing the District to enter into third-party billing to recover expenses incurred during the operation of the District's Rescue Squad. The recovered funds were to be placed into a special account to be used for rescue apparatus and equipment. It appears as if billing did not start however, until February 1994. At the May 12, 1997 Annual District Meeting, voters approved Article 3 modifying the provisions of Article 13 from the 1987 District Meeting, to include the use of



ambulance revenue to be used for “the operation of the fire department.” The revenue generated from ambulance transports is used to purchase medical supplies, equipment, training, and to offset the operating expenses of the fire department.

The Barnstable Fire District has a very generous fee-forgiveness policy as it relates to ambulance billing. This policy was drafted by the Fire Chief and District Treasurer, and was approved by the Prudential Committee in August 2015. All billing is done through a third-party vendor and the patients insurance company is billed directly. Patients who do not have insurance, or whose insurance company does not authorize payment, will be sent a series of three bills. Hardship applications are offered for consideration of reduced or monthly payments. Using the fee-forgiveness policy, outstanding balances are evaluated for write-off purposes. The Barnstable Fire District does not currently contract with a collection agency to solicit payment of outstanding balances.

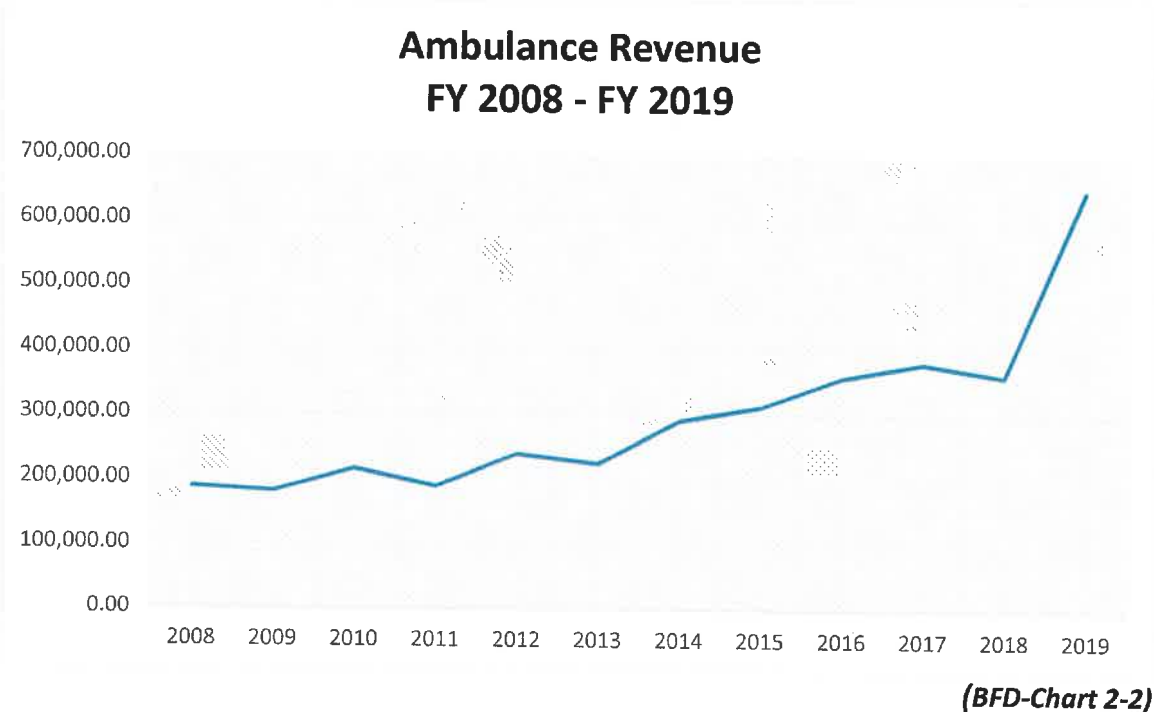
From 2003 to 2008, the average rate of return on our ambulance billing was 59% which equates to an average annual recovery of \$173,240.00 per year. Over the next three years (2009-2011), the fire department implemented an in-house quality assurance program in conjunction with a new patient care reporting software. Implementing these changes increased our rate of return on ambulance billing to 82% which equates to an annual recovery of approximately \$194,677.00 per year. In 2013, we transitioned our billing rate to what is known as a “bundled rate” rather than using a traditional percentage-based metric. Then in 2016, the department began the annual process of applying for reimbursement under the Centers for Medicare and



Medicaid Services (CMS)-Certified Public Expenditure program, and in 2017 we completed a revalidation process with the CMS. These changes improved our performance metric to an average rate of return of eighty-four percent (84%) and an annual recovery of approximately \$309,742.00 per year.

To put this data into perspective, there has been a fifteen percent (15%) increase in emergency medical incidents in the ten years from 2008 to 2018. In that same ten-year timeframe, the improvements that we have made relative to ambulance billing, have increased our annual ambulance revenue by seventy-nine percent (79%). This information is very significant relative to financial planning as we are projecting an increased number of emergency medical service incidents with the acquisition of the Cape Cod Hospital-Urgent Care Medical Center and the recent senior living complex being developed in the industrial park.

The following chart (*BFD-Chart 2-2*) shows the amount of ambulance revenue over the ten-year period from 2008 to 2018. As illustrated, there has been a gradual and steady increase in ambulance revenue since making several operational changes between 2013 and 2018. The sharp spike in ambulance revenue from 2018 to 2019 is directly related to both increased call volume at the Cape Cod Hospital Urgent Care Center as well as the addition of our second ambulance (Ambulance 204) in August 2018.



Challenges:

The Barnstable Fire District has faced many financial challenges over the years. As a fire district by statute, the Barnstable Fire District is not eligible for any of the annual state aid (commonly known as Cherry Sheets) that is provided to other municipalities to offset operating budget expenses. Funding from the Commonwealth of Massachusetts goes directly to the Town of Barnstable, but because we are a separate and independent governed agency, we are not eligible to receive funds either from the state or through the town. This puts the fire district at a disadvantage when calculating revenue because without state aid, virtually all our expenses are funded through direct taxation of our residents and business owners. On a positive note, the District does not compete with other municipal agencies in town for sharing state funding.



In 1982, the Commonwealth of Massachusetts implemented MGL Chapter 59, Section 21C, also known as "Proposition 2 ½". This statute limits property tax assessments and secondarily, automobile excise tax levies by Massachusetts municipalities. The name of the initiative refers to the two-and one-half percent (2.5%) ceiling on total property taxes annually, as well as the 2.5% limit on property tax increases. While one of the benefits of being a fire district is exemption from Proposition 2 ½, we are often challenged to stay within the 2.5% increases that other municipalities are limited to. This is especially challenging when the fire district does not receive state aid as other municipalities do.

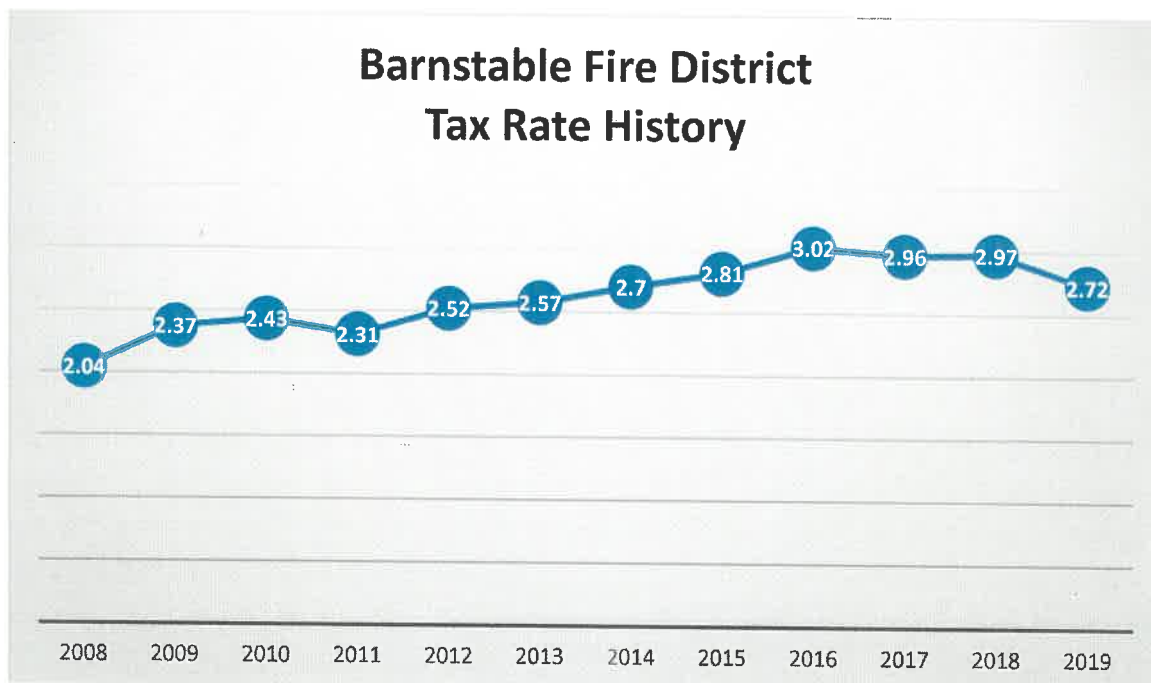
Another funding challenge we have encountered is the amount of tax-exempt property in the Barnstable Fire District. Approximately fifteen percent (15%) of the properties in the Barnstable Fire District are tax-exempt, which places an even larger burden on the taxpayers to fund the operating expenses. Another considerable factor is that approximately seventeen percent (17%) of our total annual incidents are derived from our tax-exempt properties.

Tax Rate:

An evaluation of the Barnstable Fire District tax rate over a ten-year span from 2008 – 2018 (*BFD-Chart 2-3*) shows that there has been a thirty-three percent (33%) increase over this ten-year period, or an average of 3.3% per year. The fire district tax rate includes all of the operating and capital expenses of the entire Barnstable Fire District including fire and emergency medical services, water services, streetlights, Prudential Committee, and Treasurer



expenses. The tax rate is dependent upon a number of different factors including not only the operating expenses of the district, but also, factors such as anticipated revenue to offset expenses, grant funding to pay for certain capitol purchases, property value assessments, and new growth. Aggressive efforts are continually being made to reduce the tax rate to our residents while maintaining the highest level of emergency services for the community. In the last year the District was able to experience an eight percent (8%) reduction in the tax rate.



(BFD-Chart 2-3)

Additional Revenue Sources:

For the past ten (10) years, the Barnstable Fire Department has been very active in seeking out forms of additional revenue that may be used to offset the operating costs of the department.



As previously stated, the operating budget is largely funded through direct taxation of our residents and business owners. Our largest form of revenue is through ambulance billing, which we have continued to improve in the last ten years. Permits and fees generate a small amount of annual revenue and have remained low in comparison with other cities and towns. Through a variety of different funding sources, we have been very successful in the past ten (10) years in offsetting the operating and capital costs of the Barnstable Fire District. With an aggressive push to apply for funding through the Federal Emergency Management Agency (FEMA), Massachusetts Emergency Management Agency (MEMA), Southeast Regional Planning and Economic Development District (SRPEDD), Centers for Medicare and Medicaid Services (CMS), and Hazardous Materials (HAZMAT) reimbursement, the Barnstable Fire Department has been able to recover over \$450,000.00 in revenue to support our mission. In addition, by aggressively applying for grant funding through the Federal Emergency Management Agency (FEMA), Department of Homeland Security (DHS), Massachusetts Department of Fire Services (DFS), Massachusetts Interlocal Insurance Association (MIIA), and the Andrea Holden Foundation, the Barnstable Fire Department has been awarded more than \$365,000.00 in grant opportunities in the past ten (10) years. Although all of these funding opportunities are subject to individual agency fiscal appropriation and contingent on successful applications, we continue to seek funding sources that will supplement our operations and reduce the fiscal burden on our taxpayers.



Another initiative that we explored was to evaluate and renegotiate several of our service contracts with our outside vendors. By renegotiating contracts, we have successfully been able to reduce several line items in our operating budget, while increasing other line items that desperately needed additional funding. This financial shift between line items resulted in little to no additional impact on our taxpayers.

Recommendations:

1. The governing boards, treasurer, and the senior management staff should meet to discuss, develop, and implement a long-term financial strategy for the Barnstable Fire District. This long-term financial plan would help to govern fiscal stability and sustainability relative to future needs of the District.
2. The department should continue to search and apply for alternative grant funding to help off-set large capitol expenses.
3. The department should continue to renegotiate annual contracts with outside vendors to ensure the most cost-effective approach to operations.
4. The department should continue to evaluate ambulance billing rates and adjust, as needed, to remain competitive with other municipalities in the Commonwealth.
5. The department should continue to work on ways to improve quality assurance relative to generating accurate and expedient patient care reports for billing.
6. The department should consider exploring the feasibility of implementing a Community EMS or Community Paramedicine program. There are government funds available to



assist with implementation, and recent legislation from Medicare appears to favor the service having the ability to bill for these services. With the increase in senior living in the District, this initiative would benefit a large portion of our residents and has the potential to yield additional insurance revenue through our emergency medical services.

7. The department should explore avenues to bill insurance carriers for hazardous materials incidents during response to motor vehicle accidents to offset operating costs. Several departments are already performing this with great success.

III. Fire Department Infrastructure

Fire Station:

The Barnstable Fire Station located on Main Street in the heart of the Village is the Barnstable Fire Districts original fire station and dates back to 1935. In 1974 Fire Chief John (Jack) Veterino began discussions relative to the fire department outgrowing the current station. After forming a committee to review the status of the building and viable options, the Barnstable Fire District completed an addition/renovation project on the Barnstable Fire Station in 1976. This project consisted mainly on the addition of the three apparatus bays and a meeting room above on the South side of the building.



As the fire district transitioned from an all call/volunteer organization to a combination career/call fire department, the needs of the fire station began evolving as well. For eleven (11) years following the appointment of the first full-time/career employees, members and citizens served on various building committees studying what would be in the best interest of the fire district and our residents. In May 2000, Fire Chief William A. Jones III spearheaded the initiative to complete an addition/renovation to the fire station. This \$1.2M project modernized the apparatus bays, living areas, and exterior grounds of the existing fire station which included limited mobility accessibility, separate male and female washrooms and bunkrooms, vehicle exhaust capturing system, new heating/ventilation/air conditioning equipment, turnout gear extracting equipment, and a clean-room for medical biohazard decontamination.

While these fire station projects were successful in helping the department expand with the growing demands of the community, it is once again time to review the feasibility and location of the current building. The current building, while functioning very well, has significant space concerns. The size of fire apparatus being built today creates challenges relative to height, length, and turning radius restrictions in the current station. In addition, the current station design was not configured for the addition of a second ambulance, creating more space concerns. For many years the fire station, located in District 2 was perfectly situated to meet acceptable response times defined by NFPA for the majority of our emergency incidents. With recent development in the Industrial Park (District 4), we are now experiencing a greater number of incidents shifting to that area of the District. Response times to District 4 from the



current station will often exceed NFPA standards. (NFPA response standards is discussed in ***Section IV. Emergency Incidents and Operations.***) With the expanded development and increased demands in the Industrial Park, coupled with rising call volume experienced in both Districts 2 and 4, the location of the current station will need to be evaluated.

Apparatus and Vehicle Fleet:

The Barnstable Fire Department currently has a vehicle fleet which consists of the following:

- Two (2) Fire Engines
- One (1) Ladder Truck
- Two (2) ALS Ambulances
- Two (2) Marine Units
- Two (2) Command Vehicles
- Two (2) Service Vehicles
- One (1) Military Surplus Hi-Water Vehicle

The fleet has historically been maintained in very good condition. Within the last ten (10) years, the fire department has purchased four (4) new vehicles including an ambulance (2013), a structural fire engine (2011), and two command vehicles (2018 and 2019). In addition to the new purchases, the department has invested funding for the refurbishment of the aerial ladder truck (2012), the larger of the two marine units (2013), and the purchase of a used second ambulance (2018). The net cost of these fleet improvements totaled \$1,437,000.00. By



utilizing funds received from ambulance billing coupled with successful grant applications, \$925,100.00 (64.4%) was funded using alternative funding sources, and \$511,900.00 (35.6%) was funded through a raise and appropriation of property taxes.

In August 2018, following an internal risk analysis and in response to the rising number of emergency medical incidents in the District, the fire department purchased a (used) second ambulance. The ambulance was purchased from the West Barnstable Fire Department for \$10,000.00 as they took delivery of a new ambulance for their department. An additional \$70,000.00 was invested in equipment to operate the vehicle at the EMT-Paramedic level. Typical discussion points on purchasing used vehicles generally revolves around the questions of “why is the department getting rid of the vehicle?” and “why would we want to inherit another departments problems with the vehicle?” The answers in this case were simple. The vehicle had served the West Barnstable Fire Department well as a primary ambulance, however given the age and operational wear on the eleven (11) year old vehicle, it was better served as a second due ambulance to extend the service life of the vehicle. In addition, being a neighboring department to West Barnstable and having a common mechanic that works on both the Barnstable and West Barnstable fleets, we were very educated of the complete mechanical history and could anticipate any immediate repair needs of the vehicle. Given the age and condition of the vehicle, this ambulance fits in very nicely with a two (2) ambulance system and further provides the District a firm level of continuity when the department encounters simultaneous ambulance calls, or when one of the ambulances is out for service for



maintenance reasons. Implementing a second ambulance into the fleet also reduces the reliance on mutual aid resources from other municipalities.

A one (1) year review was completed in August 2019 to determine the effectiveness of running a two (2) ambulance system in Barnstable Village. In our review, we experienced extremely positive results from adding a second ambulance including:

1. The second ambulance responded on one hundred forty-four (144) emergency incidents in twelve (12) months. This accounts for approximately fifteen percent (15%) of our total EMS run volume, which would have previously been handled by mutual aid ambulances from other communities.
2. The fire department experienced a forty-six percent (46%) reduction in mutual aid received from other departments, despite having a twelve percent (12%) increase in emergency incident volume.
3. The fire department benefitted from a thirty-seven percent (37%) increase in ambulance revenue to the District. This thirty-seven percent (37%) increase equates to more than \$187,000.00 of additional annual revenue, which is used to maintain our EMS fleet, supplies, and equipment.

According to the long-term capitol plan for the fire department, we will be requesting two large vehicle purchases for replacement in the next seven (7) years. Engine 205 which was purchased



new in 1996 will be twenty-five (25) years old in FY 2021. Ladder 206, which was purchased new in 1992 and refurbished in 2012, will be thirty-five (35) years old in FY 2027. According to the *Fire Apparatus Duty Cycle White Paper*, authored by the Fire Apparatus Manufacturers' Association (FAMA), the total life expectancy for a fire engine (pumper) in a suburban community is twenty-seven (27) years. The FAMA further suggests that the total life expectancy of an aerial ladder in a suburban community is thirty (30) years. The daily wear and tear on emergency apparatus is much different than passenger-type motor vehicles. Many times, emergency vehicles are being run at high RPM's for extended lengths of time, with quick start/stop actions, and in harsh environments. As emergency equipment ages, repair costs can quickly escalate and repair parts can become difficult to find or even obsolete. Reliability of the vehicles operational performance is one of the most important factors to consider. In emergency services where seconds count in life-threatening situations, mechanical failure of any kind will have a negative impact on the outcome of an emergency incident.

In recent discussions with our Insurance Services Office (ISO) representative and based on national standards and our local demographics, the Barnstable Fire District is required to maintain two (2) engines and one (1) aerial ladder to maintain our current public protection classification (PPC) rating. In an effort to reduce operational costs and increase usable space within the current fire station, we began exploring the option of replacing Engine 205 and Ladder 206 with one (1) structural apparatus that would have both pumper and ladder capability. This type of apparatus is called a Quint and has five distinct features as the name



suggests. A Quint is equipped with a pump, water tank, hose, aerial ladder, and ground ladders. Essentially, the vehicle can perform all the functions of a structural fire engine as well as an aerial ladder. After consultation with our ISO representative, this would be a viable solution for the Barnstable Fire District and the transition would not significantly compromise our ISO PPC rating. ISO review and the Districts PPC rating is discussed later in this document.

The benefits of combining an engine and aerial into one vehicle are many, including the initial purchase price. The average current pricing for a stock model fire engine and aerial ladder using a statewide procurement contract is roughly \$650,000.00 for an engine, and \$1,000,000.00 for an aerial ladder. By combining the two (2) vehicles into one (1), the current cost of a stock model quint-style vehicle is roughly \$1,200,000.00. This would result in an initial savings of approximately \$450,000.00 from combining the two (2) vehicles into one (1) vehicle during the initial purchase of the vehicle. Over the life span of the vehicle, the routine maintenance, fuel, testing, and repair costs would essentially be reduced by half by combining two (2) vehicles into one (1). Eliminating one engine from our current fleet would also free up valuable space in our apparatus bays where we are currently very limited.

In 2017, following the retirement of one of our members, we hired Ryan Smith, a call firefighter with twelve (12) years of experience as a Firefighter/EMT with the West Barnstable Fire Department and a certified Emergency Vehicle Technician (EVT) mechanic. Not only is Ryan cross-trained as a Firefighter/EMT, but as an EVT mechanic, he has the ability, resources, and



networking capabilities to perform preventative maintenance and repairs on our emergency apparatus for many things that would have been required to be sent out to private vendors. His ability to perform these functions allows us to have properly maintained apparatus, reduced costs for troubleshooting and mechanical failures, and a reduction in down-time for our vehicles when they are out of service. While some larger repair work must still be sent out to private vendors for service, the ability to have in-house professional oversight of these repairs by a certified EVT mechanic has proven to be an invaluable resource. In addition, Ryan is also able to network with other fire department EVT mechanics in local area fire departments as a shared resource.

The following is a descriptive list of the emergency vehicles that the Barnstable Fire Department currently owns and operates (Photographs courtesy of Massfiretrucks.com and Britt Crosby):

Barnstable Fire Department
Organizational Analysis - 2019
Prepared by Francis M. Pulsifer - Fire Chief



Ambulance 203

2013 Ford F550 – 4 Wheel drive
Lifeline ALS Ambulance
Excellent condition



Ambulance 204

2007 Chevrolet 4500
Lifeline ALS Ambulance
Good condition



Barnstable Fire Department
Organizational Analysis - 2019
Prepared by Francis M. Pulsifer - Fire Chief



Engine 202

2011 EONE Typhoon

Pumper/ JAWS

1500 GPM/ 750 gal. water/ Class A & B Foam

Very good condition



Engine 205

1996 Pierce Quantum

Pumper/ Spare JAWS

1500 GPM/ 750 gal. water/ Foam

Fair condition



Barnstable Fire Department
Organizational Analysis - 2019
Prepared by Francis M. Pulsifer - Fire Chief



Ladder 206

1992 Pierce Arrow/ 105 ft. Smeal
Aerial Ladder with Pre-piped waterway
Refurbished at Pierce Mfg. in 2012
Good condition



Patrol 200

2006 Ford F250 4 Wheel Drive
Service Vehicle
Good condition



Barnstable Fire Department
Organizational Analysis - 2019
Prepared by Francis M. Pulsifer - Fire Chief



Car 212

2008 Ford Explorer XLT
Shift Officers Vehicle
Good condition



Car 210

2018 Chevrolet Tahoe
Deputy Fire Chief's Vehicle
Excellent condition



Barnstable Fire Department
Organizational Analysis - 2019
Prepared by Francis M. Pulsifer - Fire Chief



Car 201

2019 Chevrolet Tahoe
Chief's Vehicle
Excellent condition



Forestry 211

1997 Steward and Stevenson
M 1078 – 6 x 6 High Water Vehicle
Adverse Weather/Natural Disaster Vehicle
Good condition



Barnstable Fire Department
Organizational Analysis - 2019
Prepared by Francis M. Pulsifer - Fire Chief



Marine 219

2003 SAFEBOAT Defender 25 ft.
Refurbished in 2013
Dual Outboard 250 hp Suzuki motors
550 GPM Fire Pump
Very good condition



Marine 218

1983 Boston Whaler 17 ft.
60 hp Mercury motor
Good condition





Recommendations

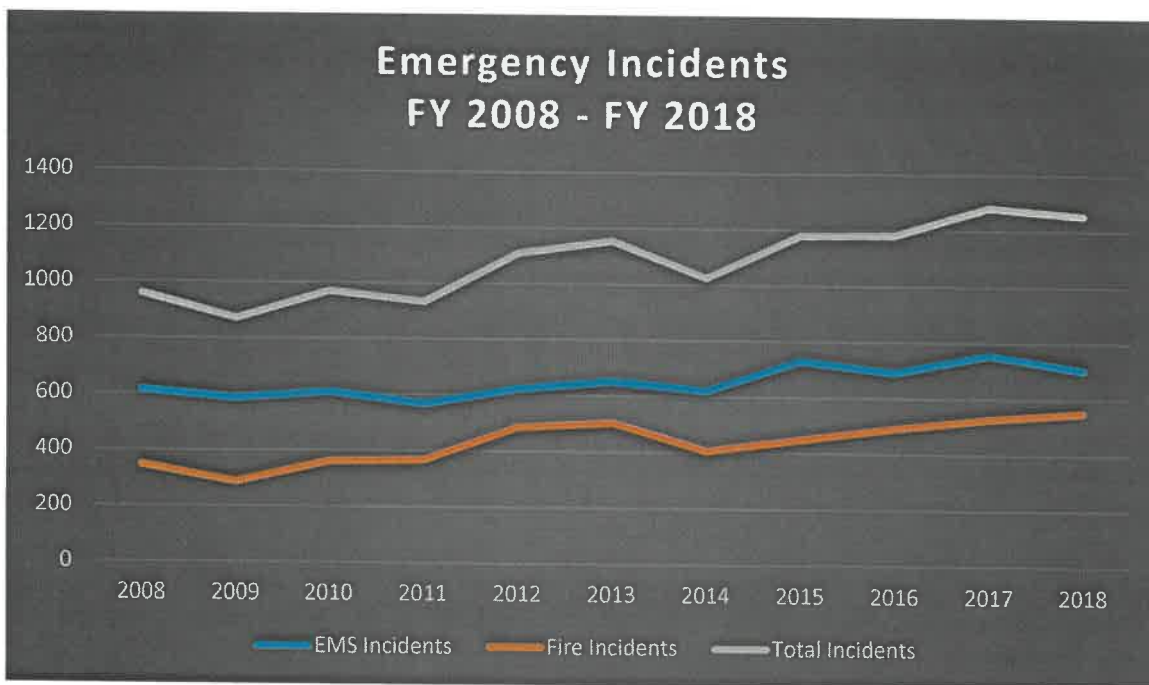
1. The department should continually analyze the infrastructure and needs of the organization and work with the Prudential Committee on prioritizing the maintenance and replacement needs of critical infrastructure.
2. The department should encourage, as well as participate in, the development of regular financial planning meetings with other department heads, the District Treasurer, and Prudential Committee.
3. The department should continue to explore grant opportunities to fund high value capitol items. These grants are highly competitive and can be difficult to obtain, and therefore should not be solely relied upon for capitol replacement.
4. The District should form a fire station needs committee to determine the long-term planning of fixed infrastructure. The District will need to determine whether it will remain with a single-station model, or whether a two-station model will work better.
5. The District should research avenues for securing funding for land purchases. Open space and real estate are becoming limited and at a premium. This problem will only increase as time passes. It would benefit the District to have the ability to readily purchase land and real estate for the future needs of the District, such as for future fixed facilities or well-head protection.



IV. Emergency Incidents and Operations

Overview

Over a ten-year period from 2008 – 2018, the Barnstable Fire Department has experienced a twenty-four percent (24%) increase in total emergency incident volume (*BFD-Chart 4-1*). In the past four years alone, there has been an increase of twenty-two percent (22%) of emergency incidents. In 2012, the Barnstable Fire Department began exceeding 1,000 emergency incidents annually following a two-year fire prevention initiative to encourage the required maintenance of residential and commercial fire protection systems. Over this two-year period, we found that required fire protection systems were not being properly maintained, and that some systems were either not reporting at all or reporting to the wrong fire department. This initiative coupled with new commercial growth has led to an annual increase in run volume.

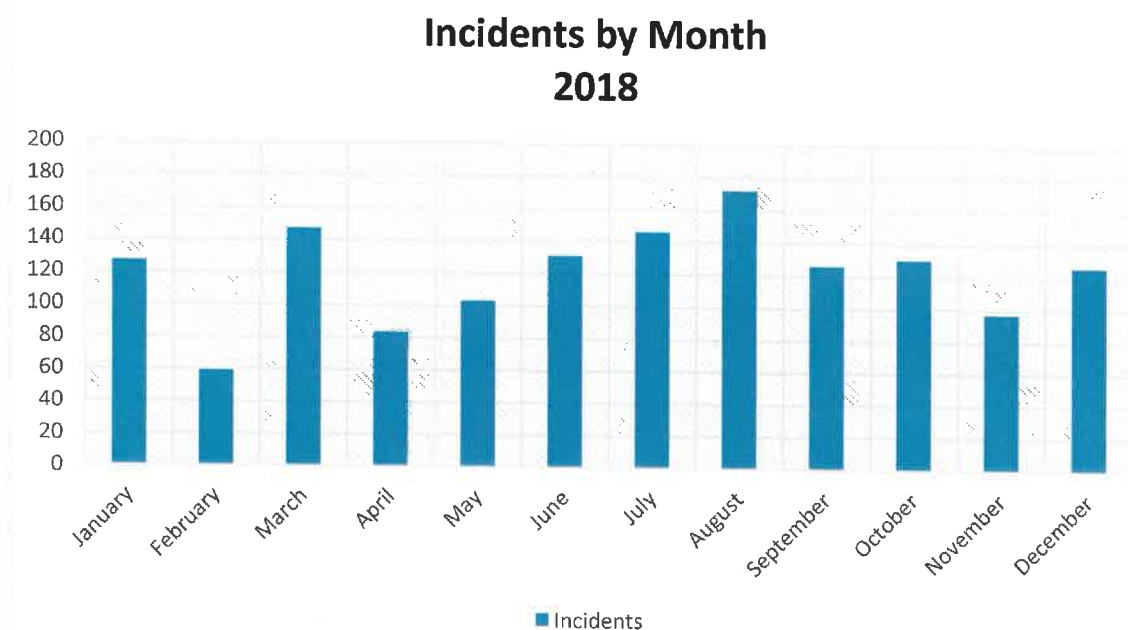


(BFD-Chart 4-1)



In May 2018, the department began primary emergency response to Cape Cod Healthcare- Urgent Care Center. After examining the historical emergency response data for this facility, the Urgent Care Center will consistently result in an additional twenty percent (20%) increase in emergency incidents annually.

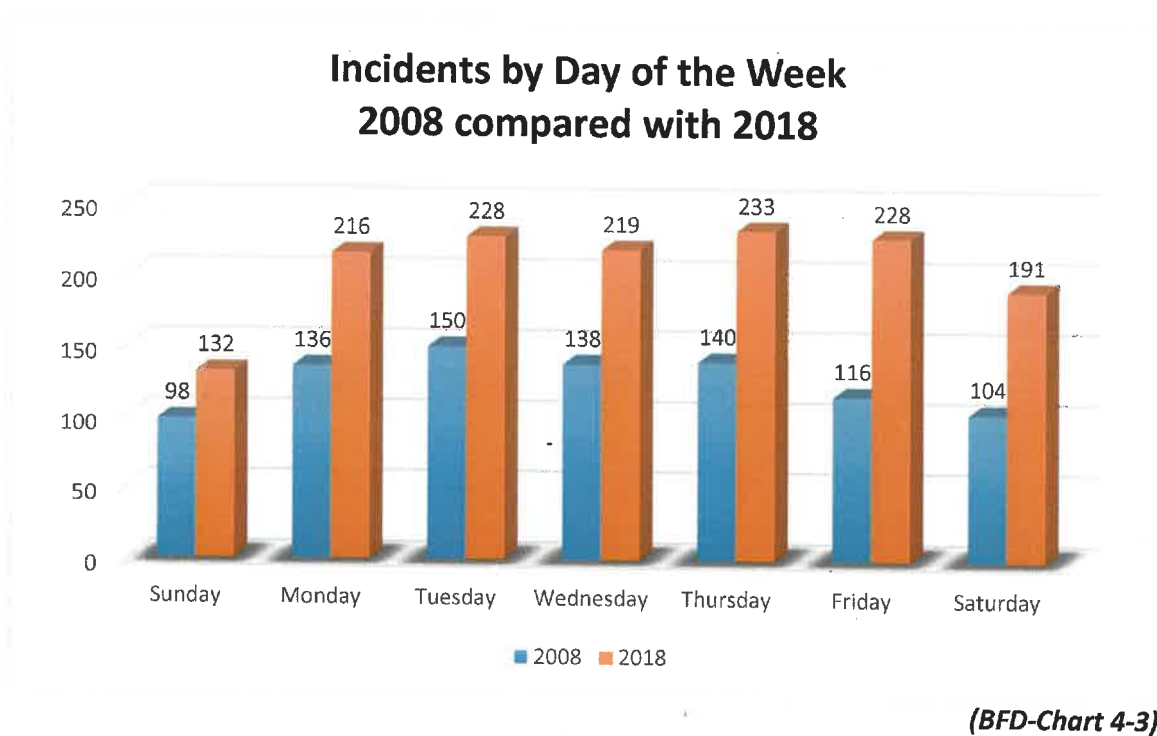
In reviewing Barnstable Fire Department's incidents by month for 2018 (*BFD-Chart 4-2*), it is not surprising that June, July, and August were the busiest consecutive months of the year. It is interesting to note however that the remainder of the year was very eventful. The recent trend that we have seen in the past few years is that although the summer months are the busiest time of year for the fire department, our incident volume is staying fairly consistent year-round.



(BFD-Chart 4-2)



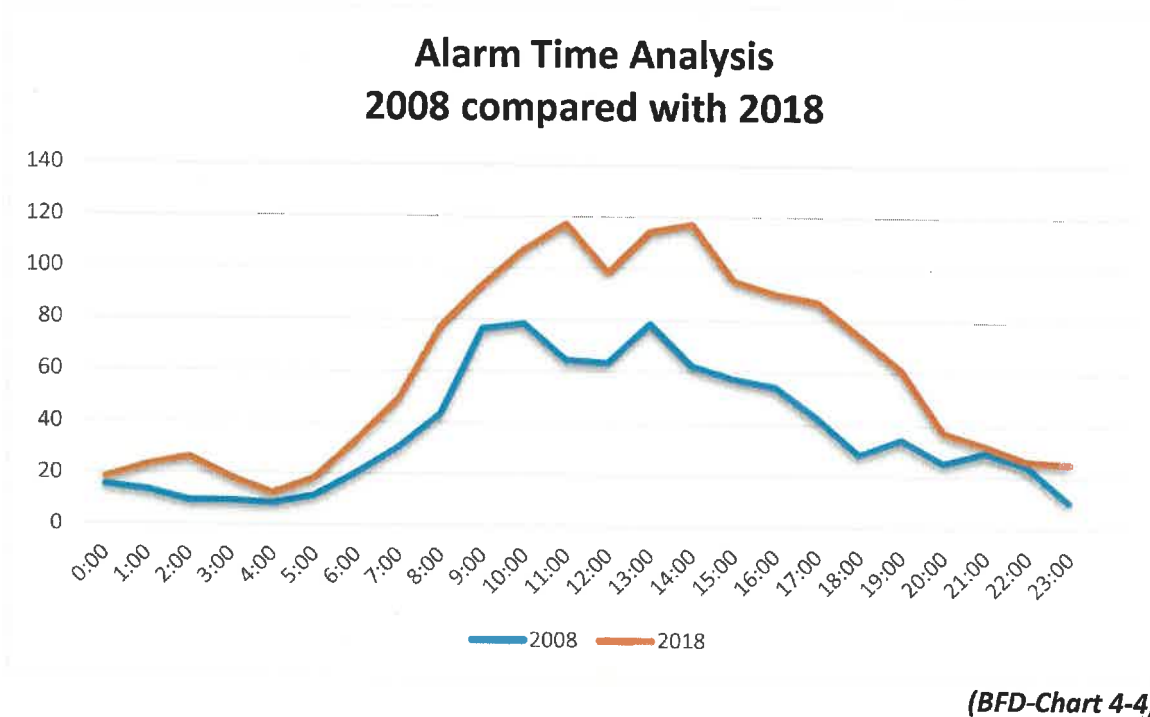
An evaluation of emergency incidents by day of the week (*BFD-Chart 4-3*), comparing a ten-year span from 2008 to 2018, indicates that there is a consistent trend showing that Monday through Friday have historically been the busiest days of the week. It should be noted however, that incidents occurring on Saturdays are increasing nearly to the level of our weekday emergency response.



In addition to reviewing incidents by day of the week, an alarm time analysis was conducted using the same ten-year span from 2008 – 2018 (*BFD Chart 4-4*). In both segments, it was consistently noted that the majority of emergency incidents (73.8 %) occur between the hours of 0800 and 1800 hours. This data is consistent with a busy day-time business population and a



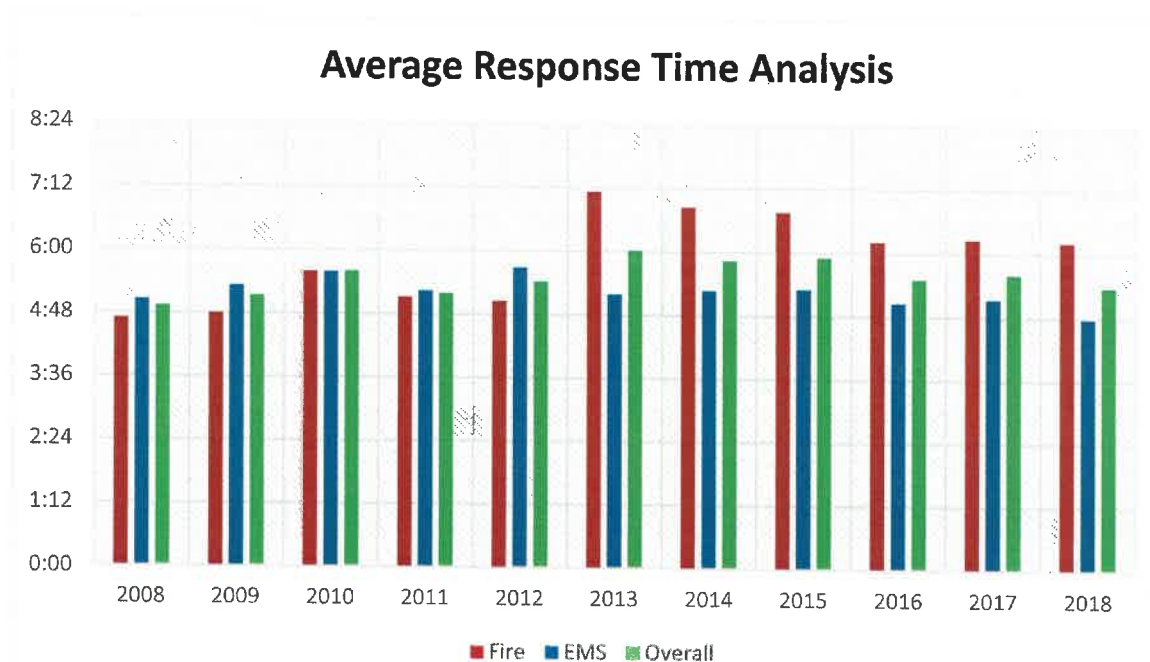
less active residential night-time population. With a residential population increase of nearly 1,800 residents including senior living, it is likely that there will be a shift in a greater number of emergency incidents during the night-time hours than the District has historically encountered.



It is equally important to evaluate our response times to emergencies to ensure that we are meeting our service delivery in a timely manner. Response time is the time from when the incident is dispatched to the time the first apparatus arrives on scene. These response times are continually evaluated to determine if the current fire station location is centralized enough to provide adequate response times to all areas of the District. Response times are also compared with national benchmarks to ensure that our response to emergencies meets



national response guidelines. Many factors can alter response times including increased traffic, remoteness of the emergency, severity of the emergency, etc. As an example, in 2013 the Barnstable Fire Department changed the way we respond to non life-threatening emergencies. Incidents involving station coverage assignments, low priority trouble alarms investigations, and other non life-threatening emergencies are handled with apparatus responding with regular traffic, without warning lights or sirens. This non-emergent response is safer for our personnel and reduces the chance for motor vehicle collisions while responding to the incident. While the apparatus is travelling with normal traffic, our response times are slightly increased which increase our overall average response times. (BFD Chart 4-5) illustrates the Barnstable Fire Department average response times by year.



(BFD-Chart 4-5)



NFPA 1710 Response Time Analysis:

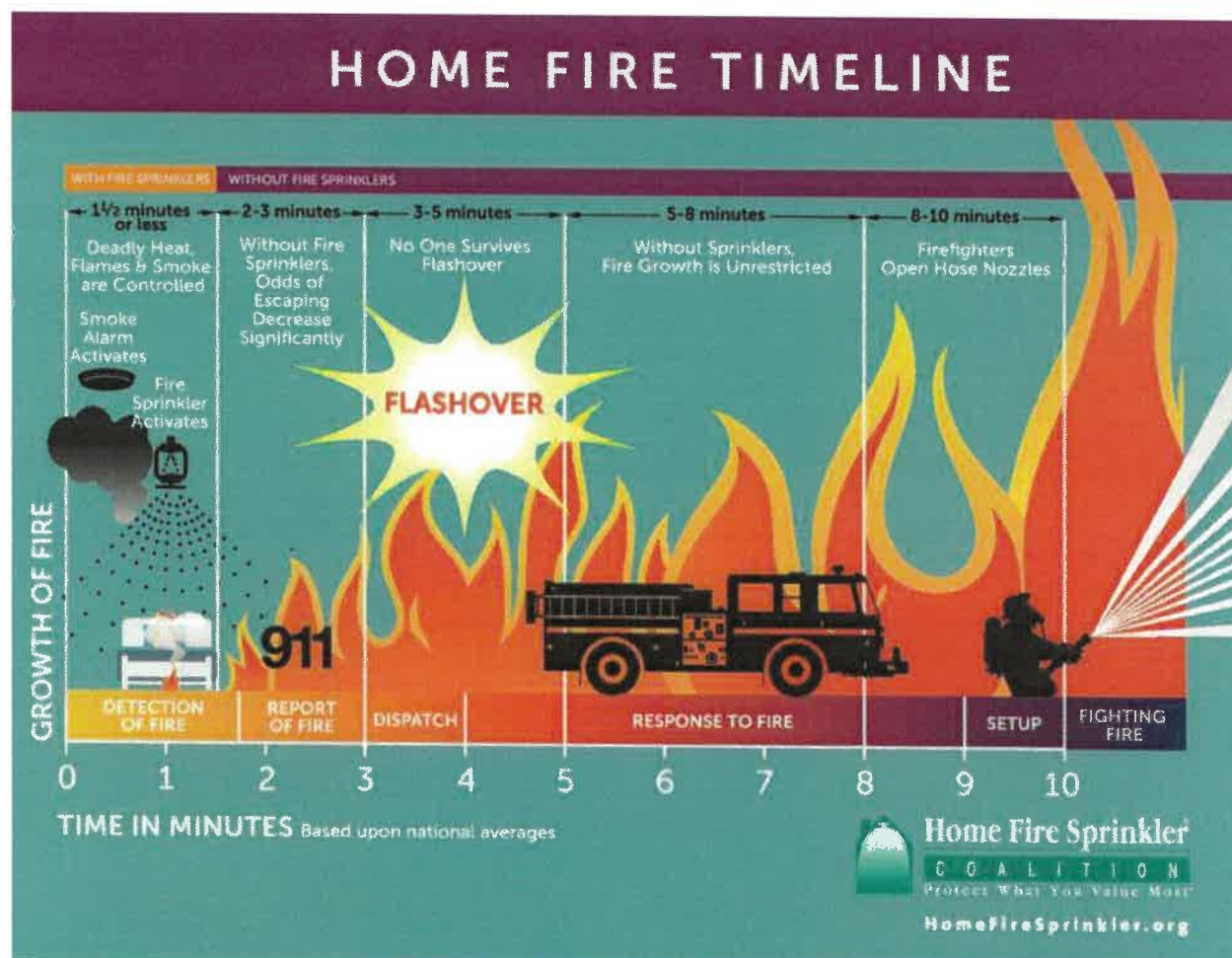
When analyzing performance metrics for emergency response, fire departments will typically refer to two nationally recognized standards; **National Fire Protection Association (NFPA) 1710** – *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* and the **Occupational Safety and Health Administration (OSHA) Respiratory Protection Standard** (29 CFR 1910.134) which refers to the Two-In/Two-Out Rule.

NFPA 1710 is a standard that provides benchmarks for operational performance in terms of required staffing levels and emergency response times. Much of the information contained in this standard is derived from data studied from past fires and timelines of fire progression. Illustrated in *(BFD Chart 4-6)*, is a typical timeline of a residential fire from the point of detection to fire department arrival and extinguishment. An important time segment on this timeline is the “Flashover” stage of the fire, which depending on the fire load and ambient conditions can occur as early as 3 – 5 minutes after the start of a fire. Flashover is the point where all combustibles in a space are heated to their ignition temperature. When flashover occurs temperatures typically exceed 1,000 deg.F which is an un-survivable atmosphere. Even a firefighter in full protective equipment with self-contained breathing apparatus can only survive three seconds in flashover conditions. With this in mind, NFPA 1710 suggests that during a structure fire response, the initial fire engine should have a response time of four (4) minutes or less, and the rest of the first-alarm assignment should have a response time of eight

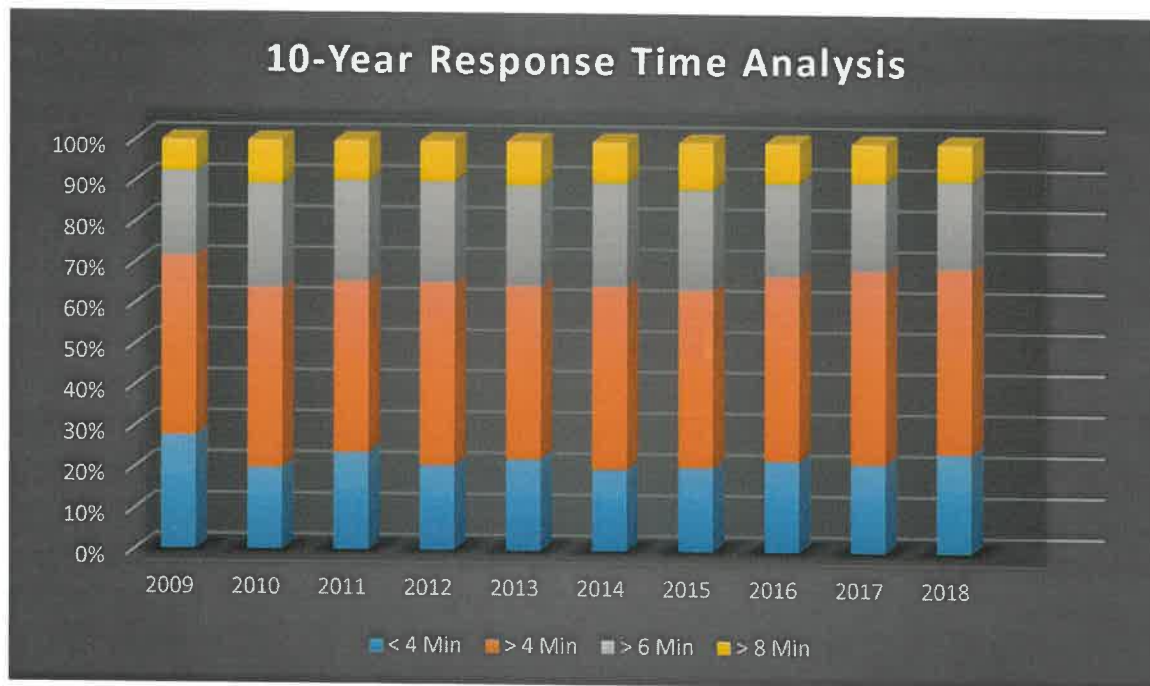


(8) minutes or less. This performance objective should be met at least ninety percent (90%) of the time. (*BFD Chart 4-7*) shows a ten (10) year response time analysis for the Barnstable Fire Department.

NFPA 1710 also suggests that the staffing level for a fire engine performing structural firefighting operations is optimized with four (4) personnel to safely and effectively perform the required tasks during a residential or small commercial structure fire. The OSHA 1910.134 Two-In/Two-Out Rule reinforces the need for four (4) personnel to be on the emergency scene before any structural firefighting operations can occur. Using the Two-In/Two-Out Rule, a minimum of two (2) firefighters in full personal protective equipment (PPE) and self-contained breathing apparatus (SCBA) must be assembled to make entry into a structure fire, while two (2) additional firefighters in full PPE and SCBA are assembled outside the structure as a rescue team prior to any interior firefighting operations. The only time it is acceptable to deviate from this minimum standard, is to perform a visible and viable rescue of a trapped occupant.

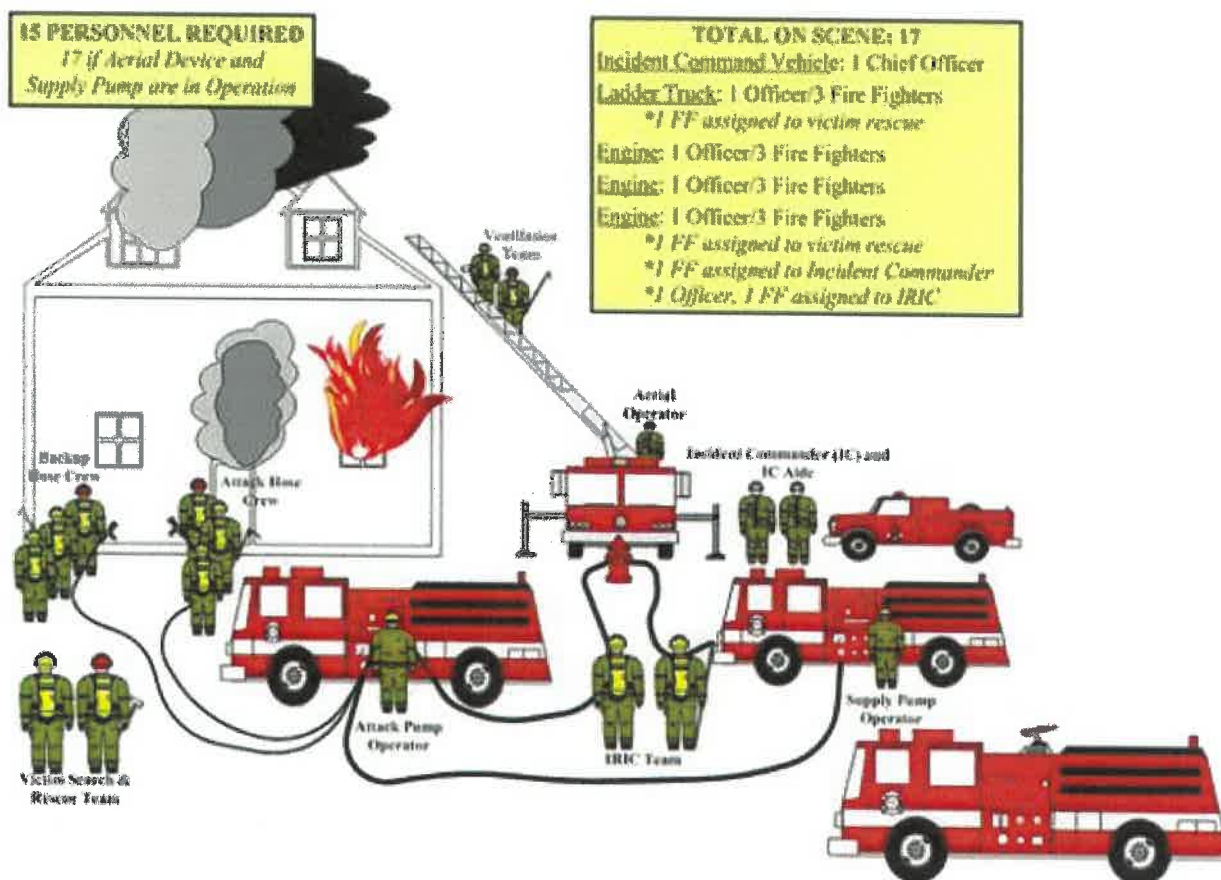


(BFD-Chart 4-6)



(BFD-Chart 4-7)

NFPA 1710 defines the safe and appropriate minimum staffing levels to perform structural firefighting operations given the expected fire conditions. Engine and Ladder companies that perform standard pumping operations, search and rescue, ventilation, and fire attack should be staffed with a minimum of four (4) firefighters including one (1) officer. The following illustration (*BFD-Chart 4-8*) shows what a minimum staffing model would look like under an initial alarm assignment to a structure fire in a 2000 sq/ft typical two-story single-family dwelling. In this scenario, a minimum of seventeen (17) personnel are required for effective fire operations. As the risk increases, so does the need for additional manpower to fight a fire. Complications or rapid fire progression may require additional alarms for additional personnel. In addition, more complex structures such as large commercial buildings or high life hazard buildings would also require additional personnel and resources.



(BFD-Chart 4-8)

The Barnstable Fire Department has an on-duty staffing model of four (4) personnel on duty around the clock. In order to achieve the required staffing levels as depicted above, the Barnstable Fire Department relies on mutual aid and automatic aid from neighboring departments to provide this level of manpower at critical incidents. Our initial response to a reported structure fire will typically meet or exceed staffing requirements as outlined in (BFD-Chart 4-8).

Barnstable Fire Department
Organizational Analysis - 2019
Prepared by Francis M. Pulsifer - Fire Chief



The typical first-alarm assignment for a reported working structure fire in the Barnstable Fire District looks similar to this:

<u>Unit Designation</u>	<u>Number of Personnel</u>	<u>Typical Assignment</u>
Barnstable Chief	1	Incident Command
Barnstable Deputy Chief	1	Interior Division
Barnstable Engine	4	Fire Attack- Search
Barnstable Ladder	2	Ventilation- Search
Barnstable Engine	2	Water Supply
West Barnstable Engine	4	Second Attack Line
West Barnstable Chief	1	Safety/Accountability
Hyannis or Yarmouth Engine	4	Initial RIT
Mutual Aid Ambulance	3	Medical
Total Personnel -----	22	

While this represents a typical first-alarm assignment, every emergency incident is unique. Other mitigating factors will have an impact on the total number of personnel and resources needed as an incident evolves.



Mutual Aid and Automatic Aid:

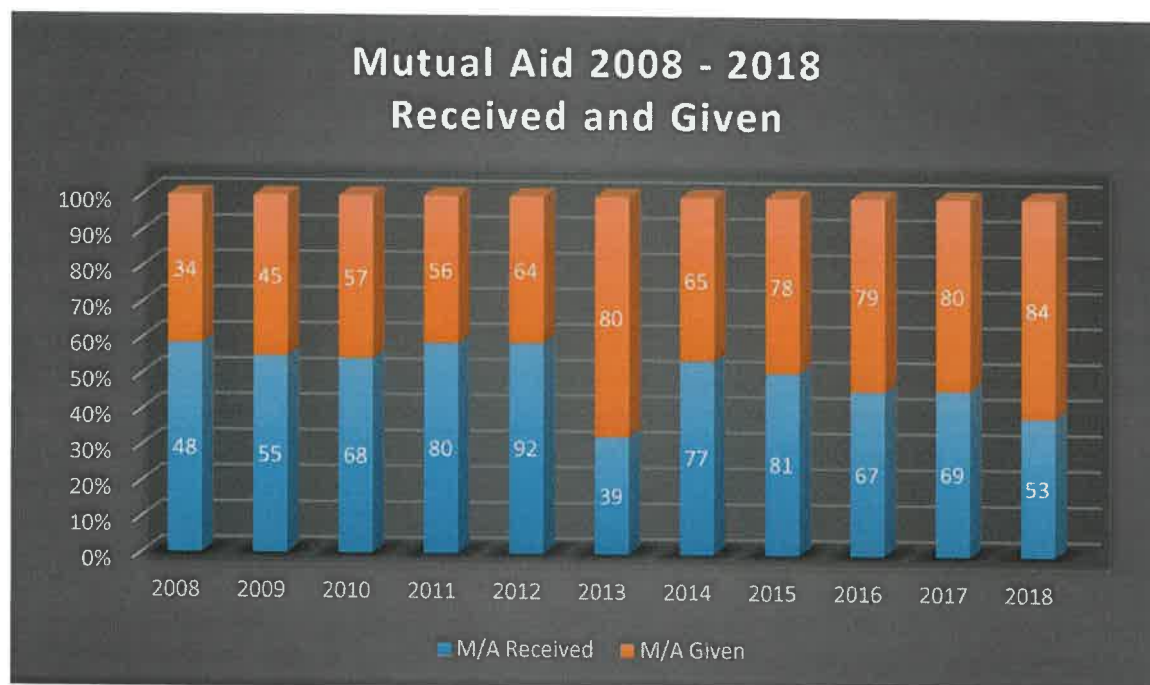
The Barnstable Fire Department participates in a robust mutual and automatic aid system.

Mutual aid resource requests for all of Cape Cod are coordinated through the Barnstable County Sheriff's Office (BCSO). All fire departments on Cape Cod are able to communicate via an 800 Mhz trunked radio system. Each department has their own Fire Alarm frequency that they communicate on for routine radio traffic and incidents. All departments on Cape Cod have the ability to switch to any of the other departments' frequencies, or utilize one of three (3) Operations Channels that may be used during larger scale incidents. The benefit to using the Operations Channels is having a common frequency that all mutual aid companies may communicate on while maintaining the Fire Alarm frequency for a department operating at a large-scale incident.

Mutual aid should be a shared resource between municipalities during large-scale incidents or during periods of unanticipated high-volume incidents that exceed a community's ability to handle multiple incidents. The mutual aid system was not designed to use other municipalities resources in place of, or in the absence of, a municipality funding their own daily resource needs. The goal would be to provide an equal amount of mutual aid to other departments as is requested. In the following chart (*BFD-Chart 4-9*), a ten-year lookback of mutual aid received and mutual aid given is pictured. From 2013 to present, the Barnstable Fire Department has been providing an increasing number of mutual aid to other departments. This is directly



attributable to our department's involvement in providing assistance under the special teams such as the Federal Emergency Management Agency Massachusetts Task Force 1 (FEMA MA-TF1), Massachusetts District 1 HazMat Team, and the Barnstable County Technical Rescue Team (BCTRT). In 2018, we had a dramatic reduction in receiving mutual aid largely due to placing our second ambulance in service. By placing our second ambulance in service, we are now able to handle multiple overlapping EMS calls without the need for a mutual aid ambulance.



(BFD-Chart 4-9)

Insurance Services Office (ISO) Review:

The Insurance Service Office (ISO) is an independent company that was formed in 1971 as an advisory organization for the property/casualty insurance industry to provide statistical and analytical services, to develop insurance programs, and to assist insurance companies in



meeting state regulatory requirements. The ISO routinely conducts an analysis of each community and assigns a Public Protection Classification (PPC) for that community based on the resulting evaluation. The three (3) areas that they evaluate are the fire department fifty percent (50%), communications ten percent (10%), and water supply forty percent (40%). Following the evaluation, ISO will assign a community a PPC number of 1 – 10, with one (1) being the highest rating. The ISO-PPC Program plays an important role in the underwriting process with insurance companies. Many times, insurance companies will use the PPC data to determine insurance premiums for their policyholders. The better PPC rating, the better chance a home or business owner has of improving their insurance premiums.

It used to be typical to have an ISO review completed every ten (10) years. During our most recent evaluation in 2016, our ISO representative stated that we could expect to be reviewed every five to six years instead of every ten years. The Barnstable Fire District was originally assigned a split PPC of 5/10 when the ISO rating system was first implemented in 1971. The “5” being assigned to the main-land part of the Barnstable Fire District and the “10” being assigned to the Sandy Neck portion of Barnstable Fire District. The remoteness and lack of municipal water supply for Sandy Neck create a unique set of challenges for emergency response and is why they have a lower PPC than the rest of Barnstable Village.

In 1998, our ISO rating improved to a 4/10. The improvement was largely due to the addition of full-time staffing at the fire department, reduced response times to emergency incidents,

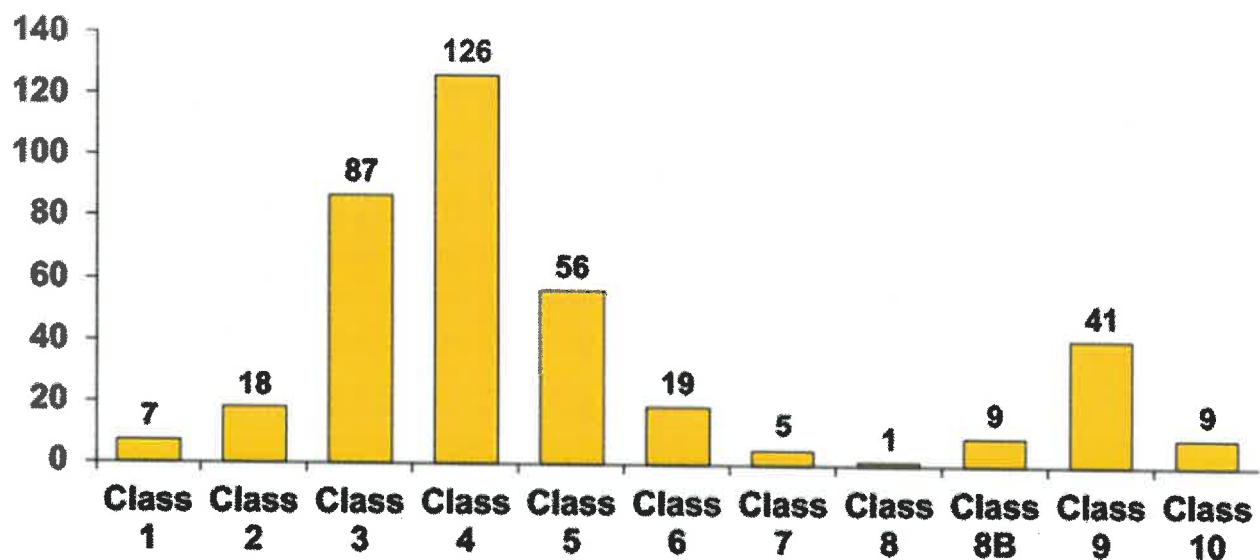


and improvements to the public water supply system. The Barnstable Fire District was able to maintain this 4/10 designation for the next 18 years.

Over the past ten years, the Barnstable Fire Department has made an aggressive push to increase our involvement with community risk reduction programs, increase firefighter training, improve documentation, and further reduce our response times to alarms. In 2016 our efforts paid off and we were assigned a PPC rating of Class 3/10. The Barnstable Fire District is rated in the top 30% of all municipalities in Massachusetts (*BFD-Chart 4-10*), and the top 13% in the United States (*BFD-Chart 4-11*) as it relates to ISO Public Protection Classification ratings.

Current work is already underway to improve our PPC rating during the next evaluation period.

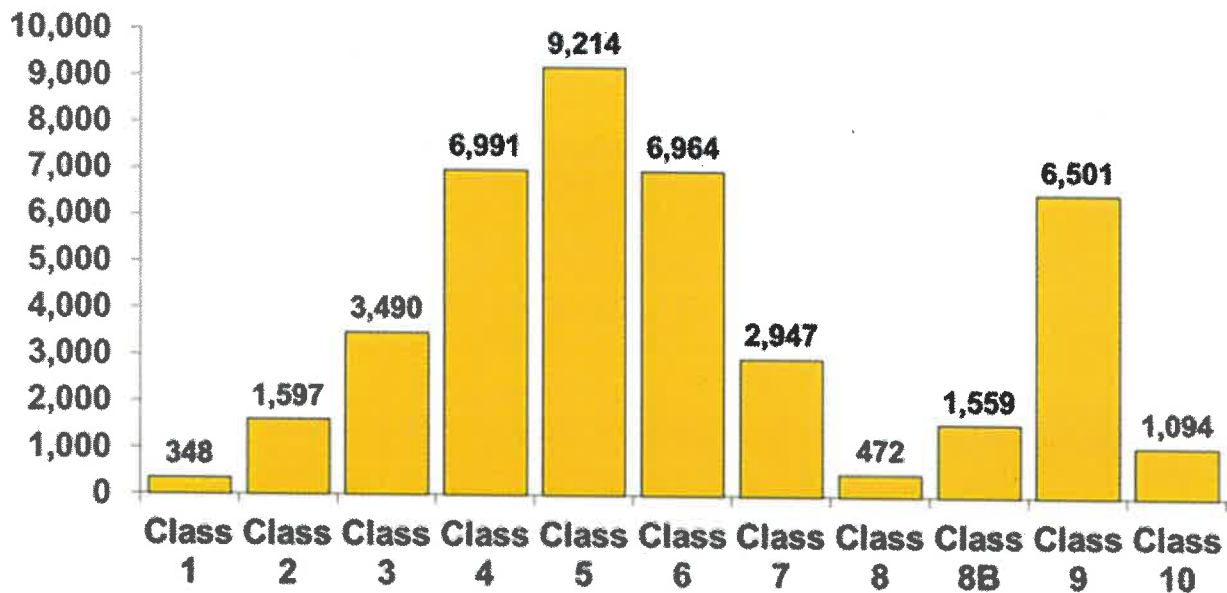
Massachusetts



(*BFD-Chart 4-10*)



Countrywide



(BFD-Chart 4-11)

Recommendations:

1. Response times should be continually evaluated and compared with NFPA 1710 benchmarks, specifically with increased incident volume caused by development in the industrial park.
2. With nearly seventy-five percent (75%) of emergency incidents occurring between 0800-1800 hours, the District should consider the addition of a day-shift firefighter/paramedic position in the fire department. This position would help to manage incidents during



peak times as well as possibly minimize overtime and holdovers to meet staffing requirements.

3. The department should continue to work with surrounding municipalities on mutual and automatic aid agreements to meet staffing compliance during structure fires.
4. The department should continue to look for ways to increase the ISO PPC rating. With some work, the department should be able to achieve a Class 2 rating.

V. Staffing

Overview:

The Barnstable Fire Department currently has a full-time career staff of nineteen (19) personnel. The following is the current structure of the department:

One	(1)	Fire Chief
One	(1)	Deputy Fire Chief
One	(1)	Administrative Assistant
Four	(4)	Captains
Twelve	(12)	Firefighters



The Fire Chief, Deputy Fire Chief, and Administrative Assistant are assigned to work a traditional Monday through Friday day-shift schedule. The Fire Chief and Deputy Fire Chief share on-call responsibilities during nights, weekends, and holidays to ensure twenty-four (24) hour chief officer coverage for the district when needed. The four (4) Captains and twelve (12) firefighters are equally divided into four (4) groups to provide twenty-four (24) hour staffing. The rotating shift personnel work forty-two (42) hours/week over an eight (8) week cycle using a work schedule of 24 hours on duty - 24 hours off duty - 24 hours on duty - 120 hours off duty.

In accordance with the Collective Bargaining Agreement, minimum manning is defined as having three (3) personnel assigned on duty at all times, including a minimum of one (1) person in charge and a minimum of one (1) paramedic. All personnel are cross-trained as Emergency Medical Technicians (EMT), and greater than half of the personnel are trained at the EMT-Paramedic level. The department has historically encouraged and funded members to attend paramedic school and achieve certification as an EMT-Paramedic.

Special areas of responsibility are assigned to certain personnel relative to meeting emergency medical service requirements. The department has one (1) EMS Officer and one (1) Designated Infection Control Officer. These personnel perform these critical functions in addition to their other shift responsibilities and both are compensated according to requirements set forth in the Collective Bargaining Agreement. Neither of these positions is currently assigned rank, which has become problematic when addressing areas of concern with personnel.



The department recently hired a new Firefighter/EMT who is a certified Emergency Vehicle Technician (EVT). This person works a rotating twenty-four (24) hour shift schedule and is assigned additional duties in terms of maintaining and repairing apparatus. By having a certified EVT mechanic on staff, apparatus needing repair is out of service for shorter periods of time, and preventative maintenance is more easily accomplished.

Meeting NFPA 1710:

Full shift manning at the Barnstable Fire Department consists of four (4) personnel assigned to each 24-hour shift rotation. Due to vacancies from paid time off, sick leave, and injured on duty leave, shifts have historically been staffed at the Collective Bargaining Agreement minimum manning strength of three (3) personnel roughly sixty three percent (63%) of the time, and full shift staffing of four (4) personnel only thirty seven percent (37%) of the time.

Referenced earlier, the National Fire Protection Association (NFPA) is a resource, based in Quincy, Massachusetts, that provides written national standards and recommended practices on emergency operations, life safety systems, and fire protection equipment. NFPA standards are used nationwide to provide minimum standards, benchmarks, performance metrics, and safe practices for fire and emergency service operations. In fact, these standards are so widely accepted that they have been used many times in a court of law to determine if minimum standards and practices have been met, typically following an adverse event. While the NFPA



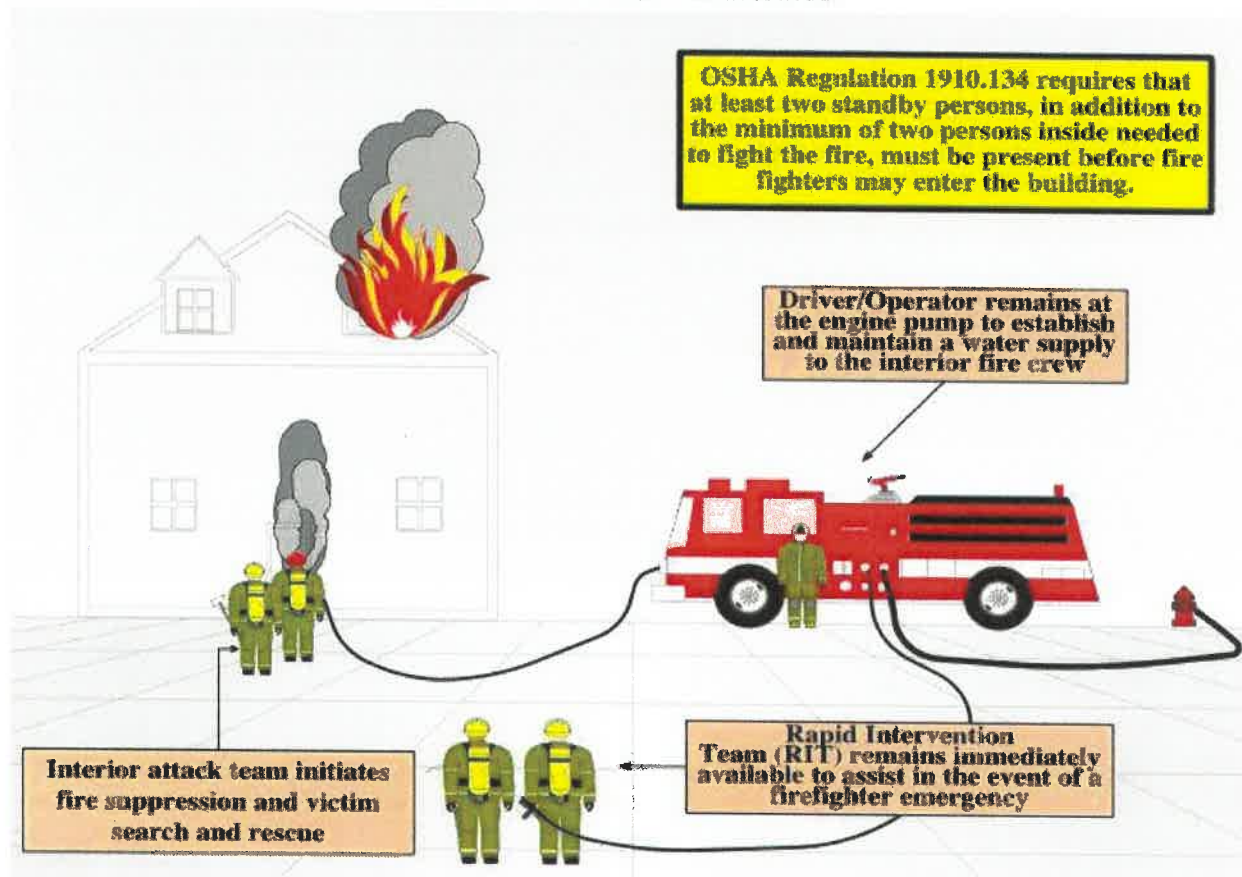
standards are provided as a guideline, communities may be held to the standards during a litigation process.

In 2001, after ten-years of technical debate, the NFPA released the first version of NFPA 1710 which defines the *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. In simplistic terms, the standard calls for Engine and Ladder companies that perform standard pumping operations, search and rescue, ventilation, and fire attack to be staffed with a minimum of four (4) firefighters including one (1) officer. At full shift staffing, the Barnstable Fire Department meets this requirement with the first Engine or Ladder to respond, however if the shift is at the Collective Bargaining Agreement minimum of three (3) personnel, we would not be in compliance with this standard. This was one of the driving factors that led the department to recently alter our staffing model, which will be discussed later in the document.

In addition to the NFPA 1710 standard, the Occupational Safety and Health Administration (OSHA) requires, under OSHA Regulation 1910.134, that during firefighting operations a minimum of two (2) firefighters acting as a safety team must be assembled outside the structure before the minimum of two (2) other firefighters enter the structure for firefighting operations (*BFD-Chart 5-1*). This OSHA regulation is known as the “Two-In/ Two-Out Rule.” This two-person exterior crew remains available in the event there is a firefighter emergency with the interior attack crew. These two (2) standards reinforce the need to maintain a minimum of four (4) person crews on-duty at all times.



OSHA '2 In/2 Out' Illustrated



(BFD-Chart 5-1)

In April 2018, a collaborative effort between management and labor was explored in an attempt to maintain daily shift staffing at four (4) personnel rather than dropping to the contractual three (3) person minimum. This initiative involved back-filling certain paid leave, with exception to sick leave and injured on duty leave, to maintain four-person on duty staffing. In exchange, the Union made concessions on modifying the current call-back system to compensate for the increased overtime. This modified call-back system better regulates



overtime devoted to calling back off-duty personnel when the on-duty crew is committed on an emergency incident and has increased our ability to maintain four-person staffing more often.

A three (3) month trial period was explored with these operational changes for evaluation.

During the three (3) month trial period, the impacts that were realized included safer and efficient fireground operations, increased shift overtime, more efficient call-back overtime, reduction in sick leave use, and increased ability to handle multiple overlapping incidents.

Working with the Union, the decision was made to continue the trial period for another three (3) months for further evaluation. This six (6) month trial period was during the busiest time of year (April – October) relative to incident volume, as well as personnel routinely on vacation and other paid leave. At the end of the six (6) month trial period, management and labor evaluated the impacts again to find consistent results as the prior three (3) months. The department's ability to maintain four-person staffing increased from thirty-seven percent (37%) to eighty-five percent (85%). Although call-back overtime was being managed more efficiently, an average of thirty (30) hours of additional overtime were being allotted each pay-period to maintain better shift staffing. The department's ability to handle multiple incidents improved, and mutual aid requests for assistance were reduced from a ten (10) year historic average of fifty-nine percent (59%) to thirty-nine percent (39%), representing a twenty percent (20%) reduction in mutual aid. Sick leave use was also reduced by more than fifty percent (50%).

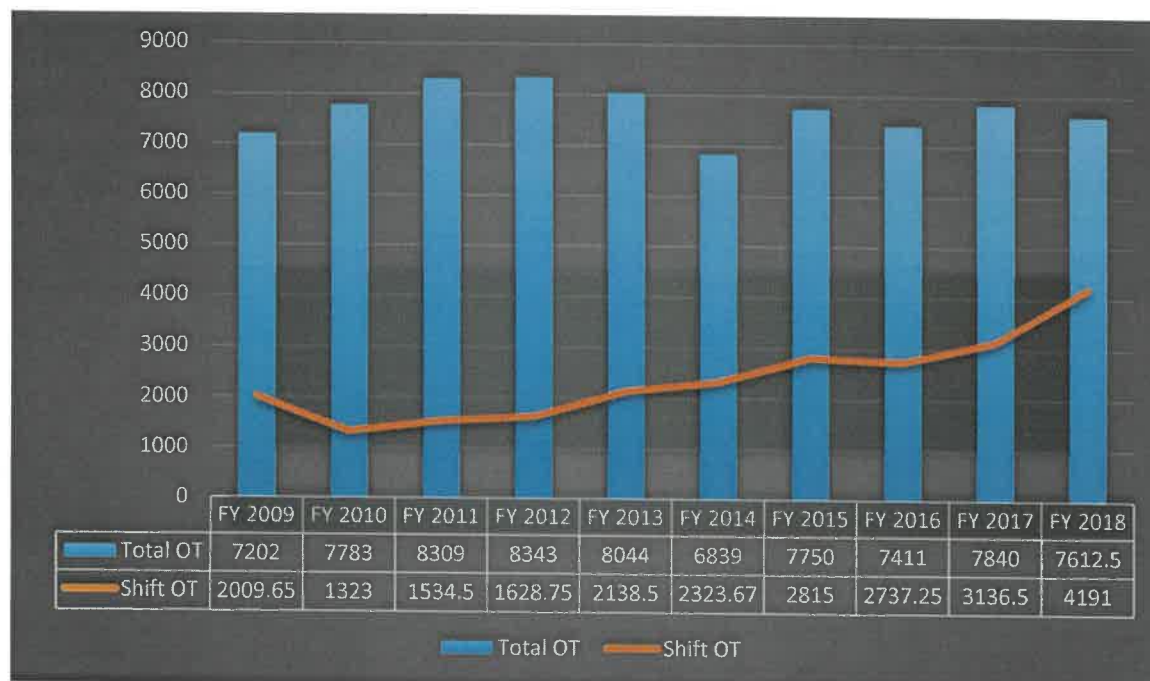
Over the next two (2) months, management and labor discussed final impact bargaining details to permanently implement these changes. The permanent changes were signed and went into effect on January 8, 2019 and represent a collaborative effort by both labor and management



to move forward on a common goal to better the organization and the people we serve to protect.

The graph below (*BFD-Chart 5-2*) illustrates the Distribution of Total Overtime vs. Shift Overtime between 2009 and 2018. This graph indicates an increase of only six percent (6%) in the total number of annual overtime hours from 2009 to 2018. More importantly, the distribution of overtime hours between shift overtime, call-back, and other overtime are nearly split evenly in 2018. This data reinforces the fact that we have been investing greater attention to meet NFPA 1710 staffing levels, as well as managing call-back and other overtime in a more efficient way.

Annual Overtime by Year



(*BFD-Chart 5-2*)



Recommendations:

1. The department should continue to work on maintaining four (4) person staffing around the clock in accordance with NFPA 1710.
2. As commercial build-out increases and annual incident volume grows, the department should look at adding staff using a peak-load staffing model. The addition of a day-shift position would increase manning during peak hours and may have a direct result in reducing overtime while maintaining four (4) person manning.
3. The department should continue to seek out opportunities and apply for Federal SAFER Grant funding to add positions as needed.
4. As the department expands, the EMS Officer position and the DICO position should be combined. Ideally, this position should be assigned to a day-shift schedule to better accommodate training on all groups, as well as facilitate improved accessibility with state, regional, and local partners.
5. The EMS Officer position should be a ranked position. Mitigating EMS related issues with personnel can be problematic at times because the EMS Officer is an equal peer (Firefighter) with many personnel within the department. The authority of the EMS Officer is challenged at times, making it difficult for the EMS Officer to correct issues with peers requiring attention.



VI. Emergency Communications and Dispatch Operations

Overview:

Emergency communications, Fire Alarm Dispatch, and Centralized Medical Emergency Dispatch (CMED) for the Barnstable Fire Department, are conducted through the Barnstable County Sheriff's Office (BCSO) Regional Emergency Communications Center (RECC), located on Joint Base Cape Cod. This regional dispatch center conducts fire-based emergency dispatch for nine (9) communities, coordinates the regional mutual aid dispatch for all of Cape Cod, and provides CMED patches and medical control communications between hospitals and pre-hospital emergency medical service providers.

Public safety agencies on Cape Cod transmit and receive communication on an analog 800 Mhz trunked radio system that is owned by the Massachusetts State Police. This regional radio coverage provides excellent inter-operative radio communication between all fire departments from Bourne to Provincetown. The system also has three (3) tactical operations channels that may be used during events requiring mutual aid from various departments.

The Barnstable Fire Department utilizes a back-up radio frequency on a 33.48 Mhz radio channel. This low-band frequency is used for paging off-duty personnel via Motorola Minitor pagers, and provides a back-up channel in the event that the 800 Mhz trunked system has a significant failure. There are significant issues with maintaining the low-band system including



limited range, inability to communicate with the BCSO dispatch center, and limited availability of paging equipment that is becoming obsolete.

As a secondary system of paging off-duty personnel, the BCSO utilizes their Computer Aided Dispatch (CAD) system and a third-party software to integrate with individual cellular phone carriers to provide text alerts upon dispatch. The system is very reliable and voice streaming is possible, but with a delay of approximately one (1) minute. There is no ability to transmit communication from the member to the dispatch center using this system.

While the current system works well, the Massachusetts State Police are in the process of converting to a Project 25 (P-25) digital 800 Mhz platform in the next five (5) years. The conversion of analog to digital would have rendered much of the current mobile and portable radio equipment in the department obsolete. Replacement of the current radio equipment from analog to digital would cost over \$140,000.00 and would not address the aging back-up system. The department applied for federal grants under the Federal Emergency Management Association- Assistance to Firefighters Grant (FEMA – AFG) program to help facilitate the implementation of transition to the digital platform and to ease the financial burden on the taxpayers with this expense. In August 2019, the Barnstable Fire Department was awarded a federal grant award package totaling \$164,483.00 to fully implement brand new digital P-25 mobile and portable radios for the department. This federal grant award has a federal funded portion, as well as a municipal funded portion, which is calculated based on population in a



community. In this case, the federal portion of the grant is ninety-five percent (95%), and the municipal portion of the grant is five percent (5%). In terms of actual costs, the Federal share (95%) of this grant is \$156,258.85, and the Barnstable Fire Districts share (5%) grant is \$8,224.15.

Dispatching Information Technology:

The BCSO provides emergency dispatch services via Tiburon software. Proactive initiatives have been made by the Barnstable Fire Department in the past seven (7) years to integrate our record management software systems with Tiburon. Integration between these record management systems provides for seamless transfer of critical information and eliminates incorrect data entry due to human error. At the present time, the fire department is integrated with the in-house record management software, *Firehouse Software*, for fire-based reporting and *Image Trend Software* for patient care reporting. The fire department also has two (2) mobile data terminals (MDT's) in the first-line apparatus, that integrates with the Mobile CAD platform. These MDT's rely on imbedded air-cards to provide a live remote connection with the BCSO CAD system. One of the recurring issues that the fire department has encountered is signal drop from the MDT's. This issue causes interruption in the critical data transfer to units responding to an emergency limiting its reliability.



Disaster Preparedness - Preparing for Uninterrupted Communications:

In order to provide for uninterrupted communications during a natural disaster or catastrophic event at the dispatch center, the Barnstable Fire Department has worked the past couple years on a Continuation of Operations Plan (COOP). Although it would be economically unfeasible to provide a completely mirrored back-up of our emergency dispatch operation, we need to be sure that we are able to continue operations and be self-sustaining in the event of an unexpected lapse or catastrophic event with communications.

The communications room at the Barnstable Fire Department has a radio console which has the ability to communicate on our assigned Fire Alarm frequency as well as the Barnstable County mutual aid channel. This console has both 800 Mhz as well as 33.48 Mhz capability. From this console, we can not only communicate with emergency apparatus on the street, but also have paging capability to notify off-duty personnel. Unfortunately, the system at the fire station does not have Computer Aided Dispatch (CAD) capability, but incidents, messages, and assignments are able to be recorded by hand-written logs in the event of complete failure. Although this appears primitive in terms of today's advancements with emergency communications, the communication system is tested daily and well-maintained. As a back-up system, it will work in the event of a catastrophic disaster and serves as a cost-effective solution for the department to maintain our emergency communications.



In addition to the dispatching console, the seven-digit emergency telephone number used by Barnstable and West Barnstable is hard-wired into the station in the communications room. This emergency number is used by central station alarm companies to report fire alarm activations at residential and commercial properties in the district. This number is also used by several facilities to directly report emergencies rather than calling 911. This telephone line has three (3) points of termination: Barnstable County Sheriff's Office, Barnstable Fire Station, and West Barnstable Fire Station. Although the BCSO is the primary answering point for this telephone line, in the event of a catastrophic disaster, the Barnstable and West Barnstable Fire Department's have the ability to provide uninterrupted communications with this emergency telephone line by initiating answering points at each of the fire stations.

All of the data for our emergency incidents is transmitted from the Barnstable County Sheriff's Office to our record management systems via a secured internet connection. In 2017, the Barnstable Fire Department began utilizing the fiber-optic network provided by OpenCape to supply our internet services. This secure internet connection has built in redundancy creating a substantially reliable means of maintaining internet during even the most severe weather events. One of the long-term benefits that we hope to achieve is to have a secured local area network (LAN) connection between the fire station and the water department for inter-department communications and greater resiliency.



Recommendations:

1. The fire department should collaborate with the other fire departments in Barnstable to convert the aging low-band radio system to a UHF system. A UHF system would provide better paging capability for off-duty personnel and provides for a better secondary means of communication. UHF equipment is readily available and is relatively inexpensive once the infrastructure is in place. A combined system could be cost-shared and would meet the needs of all departments during a failure of the 800 Mhz system.
2. Improvements to the Mobile CAD system should be made to eliminate the signal drop from the MDT's. The department should look into moving toward the FirstNet network provided through AT+T and using mobile hot-spots or routers for in-vehicle internet accessibility.
3. A plan should be implemented to utilize the AWARE module in Mobile CAD. This module would provide significant pre-incident plan data that could be accessed by the dispatch center as well as responding units with MDT's. Floor plans and building layouts may also be uploaded to this program in addition to site data.
4. The fire department should continue to utilize the services of BCSO for emergency dispatching. The annual cost for operating expenses and infrastructure for BCSO to provide this service is significantly less than if Barnstable Fire Department were to employ their own dispatchers or share with another agency.



5. The fire department should develop a contingency plan to provide emergency communications if the agreement with BCSO is ever terminated or suspended. A written plan with cost estimates to integrate with another local agency should be evaluated.

VII. Training and Professional Development

Overview:

Training and professional development is very important in the fire service. Not simply entry level training, but continuing education to learn new techniques and further a person's career. In November 2009 when I first came to Barnstable as a new Deputy Chief, there was a drive from both labor and management to increase training in the department. From management, the drive was to incorporate more on-duty, in-service training and to create a career path for firefighters who wanted to advance in their careers. From the labor side, personnel were asking to attend additional training opportunities. They desired less restriction on the number of training hours they could use each year, they wanted to pursue higher educational degrees, and they strived to be a part of the special operations teams in Barnstable County and the Commonwealth of Massachusetts.



The Collective Bargaining Agreement (CBA) has minimal language relative to training outside of mandatory emergency medical service training. The CBA does specify that the department shall hold a minimum of six (6) EMS drills and four (4) Fire drills each year. These drills are not specifically defined in content but are typically between two (2) and four (4) hours long. It has been the responsibility of the Deputy Chief and the EMS Officer to work out a training schedule for the department each year to meet these contractual requirements.

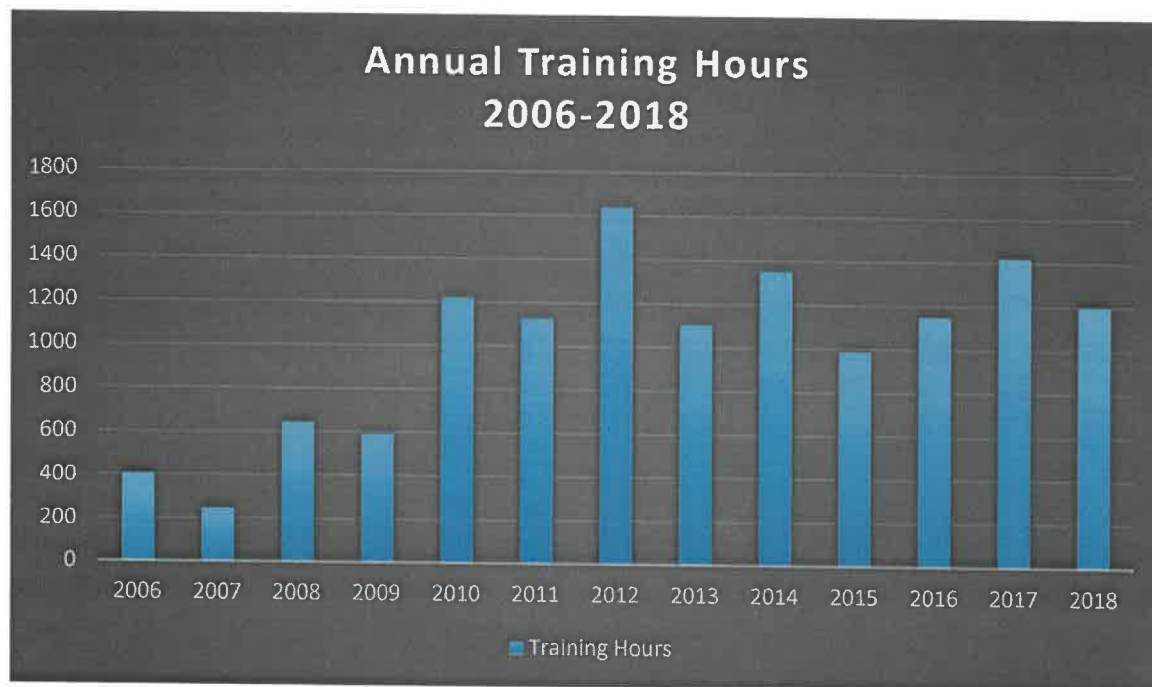
Historically, the department has allotted each member twelve (12) hours of overtime and twelve (12) hours of relief of duty each year to attend outside training. This is not a written policy or a contractual requirement, but more of an equal benchmark for all members. In most cases, if a member used their allotted time for a given fiscal year and they wanted to attend additional training, the member would need to arrange some other means of time off and would not be compensated overtime to attend outside training programs. Leading up to 2009, the department was averaging four hundred seventy-three (473) total hours of training per year. This equates to just over twenty-six (26) hours per person/per year.

Over the past nine (9) years, the department has made attempts to increase training on many levels. The number of on-duty/in-service training programs has increased, and recorded completion has improved among all groups. The annual required training in accordance with the CBA has been managed better, but still requires more structure. The department has encouraged members to attend more outside training for job-specific education as well as



involvement in special operations teams. Within the last six (6) years, the Prudential Committee has made opportunities available for members to obtain Master's level degrees. In the past nine (9) years, our annual training has increased from an average of four hundred seventy-three (473) hours per year to an average of one thousand two hundred forty-four (1,244) hours per year. This equates to more than sixty-nine (69) hours of training per member each year and is more than double the amount of training members were receiving in prior to 2010.

The following chart (*BFD-Chart 7-1*) illustrates the annual number of training hours per year from 2006 through 2018. A significant increase in the number of training hours as well as a demonstrated commitment to sustaining increased training opportunities can be seen from 2010 through 2018.



(BFD-Chart 7-1)

Basic Training:

The basic entry-level training required to be a career firefighter is accomplished through the Department of Fire Services-Recruit Training Program. This is the flagship program for the Massachusetts Firefighting Academy, located in Stow, Massachusetts. The Department of Fire Services has also opened two (2) newer training sites located in Springfield and Bridgewater. The Springfield site currently offers Recruit Training, and the Bridgewater site is planning on offering the Recruit Training Program in the near future. The Recruit Training Program is a fifty-one (51) day program that is held Monday through Friday, eight (8) hours each day. Recruits are provided didactic and practical instruction on basic firefighting skills and are evaluated throughout the program. At the successful conclusion of the program, firefighters have



received instruction on fire behavior, hose handling, laddering, pumps/hydraulics, hazardous materials, and other basic firefighting skills. Graduates of this program receive National and State certification as Firefighter I and II, as well as certification at the Hazardous Materials Operational level. Contractually, all firefighters that are hired in the Barnstable Fire Department are required to successfully complete this program.

Specialized Teams:

Several members of the Barnstable Fire Department actively participate on the technical rescue teams offered by Barnstable County and through the Federal Emergency Management Agency. Prior to 2012, there were no structured technical rescue team resources on Cape Cod. Several county departments had various equipment to perform limited technical rescue activities, but resources were scattered and unorganized. In 2011, the Barnstable Fire Department responded to and successfully mitigated the recovery efforts in a trench collapse. This was a two-day event that brought specialized technical rescue resources to Barnstable for the recovery efforts. This incident reinforced the need for localized technical rescue training and equipment that could be used as a County resource.

In the Spring of 2012, funding was made available through the Southeast Regional Planning and Economic Development District (SRPEDD) to provide equipment and training to Cape Cod fire department members in four (4) different disciplines of technical rescue. The training involved more than eighty-four (84) hours of didactic and practical instruction in the disciplines of Rope



Rescue 1, Rope Rescue 2, Confined Space Rescue, and Trench Rescue. Following the initial technical rescue training, additional programs in structural collapse and dive rescue were also offered. This training, used in conjunction with regional equipment, allows firefighters throughout Barnstable County to provide complete mitigation of these low frequency/high hazard events. These assets are shared resources that are managed through the Barnstable County Fire Chief's Association, and strategically placed throughout Cape Cod. The Barnstable Fire Department currently has five (5) personnel that are actively involved in the Barnstable County Technical Rescue Teams.

In addition to the Barnstable County Technical Rescue Team, the department also has two (2) members, Captain Christopher Beal and Firefighter J. Neil Tuepker that are assigned to the Federal Emergency Management Agency-Massachusetts Task Force-1 (FEMA-MA TF-1) team based out of Beverly Massachusetts. This federally funded and equipped team is trained in specialized rescue and may be deployed anywhere in the United States during a national crisis or emergency. The team is designed to be self-sustaining if necessary and has advanced logistical capability to secure resources while mobilized. These FEMA teams are utilized to supplement local emergency resources that have become depleted due to the size or magnitude of an emergency.

One member of the department is currently a certified Hazardous Materials Technician and assigned to the Massachusetts District 1 Hazardous Materials Response Team. All fire



department members are trained in the identification and response to hazardous materials incidents, however technicians have the ability to provide operational mitigation and advanced air monitoring in the event of complex or large scale hazardous materials incident. Firefighter John Fleming is currently assigned to the state hazardous materials team. Initial technician level training involves one-hundred sixty (160) hours of didactic and practical instruction and team members are required to meet strict annual requirements for ongoing training as well as incident response to maintain their active status on the team.

Officer Development:

In the past ten (10) years, the department has placed an increased emphasis on mid-level officer development. In the ever-changing world of the fire service, it is important that the officers develop successfully with the demands of the job. The department has encouraged the officers to attend leadership training, that is sponsored typically twice annually by the Barnstable County Fire Chiefs Association. These leadership sessions are typically a one-day event with world renowned speakers in the fire service trade. In addition, the department has also supported other educational opportunities for the officers, as well as placement in key roles during multi-jurisdictional exercises. Contractual incentives are in place to encourage enrollment in advanced degree programs through the Master's Degree level. All current officers either have or are taking advantage of this educational benefit. To a lesser degree, there are federally funded officer development programs available that have not been widely



used. The continual development of the officers should remain a top priority within the department.

Hostile Event Preparedness:

With the rising number of active shooter and hostile events taking place in the United States, it is imperative that the fire service be prepared to respond and assist in the mitigation of one of these incidents. The Barnstable Fire Department is located centrally within an area of critical infrastructure. The distance from the fire station to these buildings is short, and the probability for an adverse event is likely. Several minor events and physical threats have taken place in some of the local buildings including the Barnstable County Superior, District, and Probate courts. In addition, Barnstable is the hub of county government, which has also had some minor incidents. With the unknown risk of an incident escalating to major proportions, it is our duty to be prepared for an incident of this type.

In 2012, the department began training members on Defense Tactics for EMS (DT4EMS). The DT4EMS is a sixteen (16) hour program that trains members how to identify and de-escalate hostile situations and if necessary, provide defense tactics to evade personal harm. In 2013, the department began developing standard operating guidelines to identify performance objectives during an emergency response to a hostile event. At the same time, a standard operating guideline was also developed on a fire station lockdown procedure in the event that a hostile event escalated in the proximity of the fire station. In the following year, the



department began training personnel to the Tactical Emergency Casualty Care (TECC) level. The TECC level is a sixteen (16) hour course designed to train firefighters, emergency medical service providers, and law enforcement officers on how to work together to successfully implement a Rescue Task Force (RTF) and provide casualty care and communications in an unstable environment. Following the TECC training, the standard operating guidelines were updated and an active shooter response kit was developed for the department. In 2014 communications began to take place with the Barnstable Police Department on implementation of joint training between fire and police.

In 2015, the Barnstable Fire Department, with guidance from the Barnstable Police Department, purchased seven (7) sets of Level IIIA ballistics protection including helmets, vests, trauma plates, and eye wear. This level of protection is more than suitable for a RTF response under law enforcement protection. In 2016, the Barnstable Fire Department hosted a TECC program which included all members of the Barnstable Fire Department, as well as select members of the Barnstable Police Department, and select members from area fire departments. The program was a huge success in multi-discipline and multi-jurisdictional training.

At the time of writing this operational analysis, all but one of the members of the Barnstable Fire Department have been trained to the TECC level. Additionally, a total of fourteen (14) sets of level IIIA ballistics protection have been purchased and are in service. An active shooter bag



and multiple expanded hemorrhage kits have been developed, and the department has participated in multiple joint exercises with the Barnstable Police Department, area fire departments, and the Massachusetts Trial Courts on active shooter response. Since the purchase of the first sets of ballistics protection in 2015, the department has had to deploy the equipment on three (3) separate hostile incidents, including the unfortunate response to the incident that took the life of Yarmouth Police Sargent Sean Gannon.

Recommendations:

1. The Deputy Chief and the EMS Officer should work together and develop a structured in-service annual training program that focuses on required annual training components that must be achieved by all members.
2. The department should continue to fund the involvement of members in the special operations teams. This is a statewide and regional benefit that promotes a more well-rounded firefighter for everyday applications locally.
3. The department should continue to promote mid-level officer development and encourage attendance at the National Fire Academy.
4. The department should involve members that are achieving higher levels of education in research and development programs in the department. These programs may be broken down into manageable tasks that may be used to meet the departments future goals and objectives.



5. The department should continue to seek out training that is federally funded or funded through other grant opportunities in order to maximize training costs.
6. The department should continue to train personnel to the TECC level and actively participate in multi-jurisdictional exercises with the police department.
7. The department should consider advanced training at the Active Attack Integrated Response (AAIR) or Active Threat Integrated Response Course (ATIRC) level. These are federally funded programs that incorporate Fire, Police, EMS, and Dispatch to perform coordinated mitigation exercises for an active shooter event.

VIII. Community Risk Reduction (CRR) Programs

Overview:

The Barnstable Fire Department offers a wide array of programs to our residents and businesses in an effort to reduce the risk of fires and injuries in our community. What was traditionally known as “Fire Prevention and Public Education” programs, has transformed into an even broader approach commonly known as Community Risk Reduction. This revised program encompasses not only the reduction of fires and fire related injuries through public education programs, but further provides a fire inspection and code enforcement component that help ensure that our community is meeting national safety initiatives and fire safety legislation. The public education component has expanded over the course of the past ten (10) years to include much more than traditional fire safety information. Many people likely



remember historical programs on dialing 9-1-1, Stop-Drop-Roll, and designing Exit Drills In The Home (EDITH). While we continue to use these traditional programs today, our outreach programs have expanded to an all-hazards approach focusing on all different age groups.

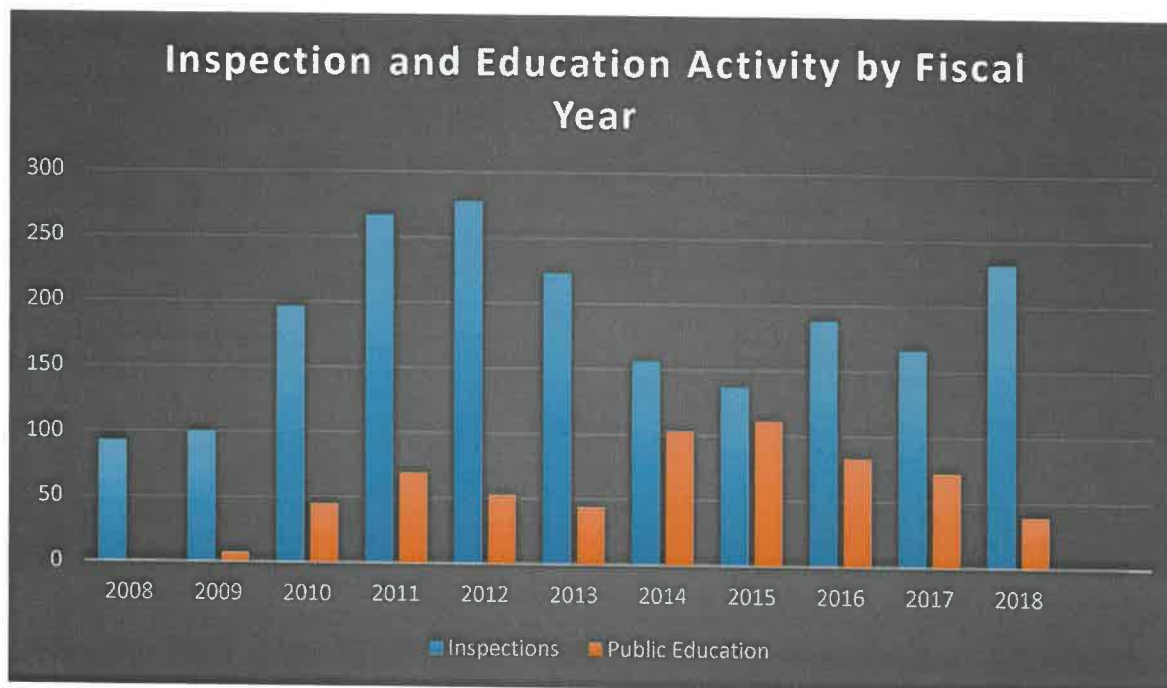
Inspections and Code Enforcement:

The Barnstable Fire Department is active in providing required life safety inspections in the community. On-site visits are an opportunity for fire department officials to familiarize themselves with building layouts and business operations so they are better prepared in the event an emergency occurs. During these site visits, fire department officials will speak with the building representatives and educate them on ways to increase the safety of occupants within their buildings. Many of the fire safety regulations that are in place today are the result of major historical fires of devastating proportion that have claimed the lives of many innocent people. In fact, one of the historical fires that generated vast changes relative to fire safety legislation and advanced burn treatment, happened right here in Massachusetts. In 1942 a nightclub named Coconut Grove located in Boston Massachusetts suffered a devastating fire that claimed the lives of four hundred ninety-two (492) people and injured many more. Several key findings during the investigation of the fire led to aggressive changes in the fire safety codes. Investigators focused on not only the cause of the fire, but what contributed to the rapid fire progression and large loss of life. Some of their findings included violations of occupancy load within the building, flammable decorations and interior treatments, poorly identified and limited exits, inward swinging exit doors and lack of panic hardware, among



other code violations. Additionally, with so many people from this fire suffering from severe burns in local hospitals, doctors at Massachusetts General Hospital made great advancements in burn treatment, including the use of penicillin. These forward-thinking physicians introduced the drug to combat the infections that burn survivors would encounter following skin graft treatments. This was a huge advancement in the medical world at the time and led to the survival of many victims with burn injuries. Today, this historical fire remains the largest loss of life in a nightclub fire in the United States.

The Deputy Fire Chief is in charge of managing the inspections and plan review within the District. The type of inspections can range from annual business inspections, new construction, flammable/combustible storage, marine fueling, fire protection systems, smoke/CO inspections, and various other life safety inspections. Although Barnstable is a small community, there is a significant amount of properties that require annual inspections for various permitting and licensing reasons. Additionally, there has been quite a bit of recent commercial construction that requires inspections throughout the building process. The following chart (BFD-Chart 8-1) illustrates the number of inspections and public education activities the department performs each year. As you will see, the department has made an aggressive push since 2010 to increase our community risk reduction programs.



(BFD Chart 8-1)

Public Education:

The fire department also provides a wide range of public education outreach to our residents and businesses. The public education programs are managed through one of the fire department Captains, but all firefighters participate in public outreach. For many years, our programs focused primarily on fire safety for children in the school system. In 2010, the department expanded our outreach programs to include the local businesses and the general public, using a multi-hazard approach. The department has been successful in obtaining grant funding to allow for the expansion of public education services in the community, and in conjunction, partnering with other local organizations to broaden the outreach of our services.



Our programs have been developed to focus on prevention at all age groups and many programs incorporate a hands-on component. Some of the programs that the department offers are:

1. Fire Safety in the Schools
2. Fire Extinguisher Training
3. CPR/AED Training
4. Child Passenger Safety/ Car Seat Installations
5. Stop the Bleed
6. ALICE
7. Home Forever Program
8. SAFE and Senior SAFE Program

Recommendations:

1. The department needs to implement a company-level inspection program that can be coupled with pre-incident planning for general business inspections.
2. The department should expand the use of the FH Inspector for Ipad to facilitate the efficiency of inspections.
3. The department should continue to provide new and innovative public outreach programs.
4. The department should continue to apply for grant funding to offset municipal impacts to providing public education services.



5. The department should consider developing a training outline and a mentoring program for line officers on implementing a comprehensive inspection program.
6. Emphasis should be placed on sending department members to Public Fire and Life Safety Education (PFALSE) training.

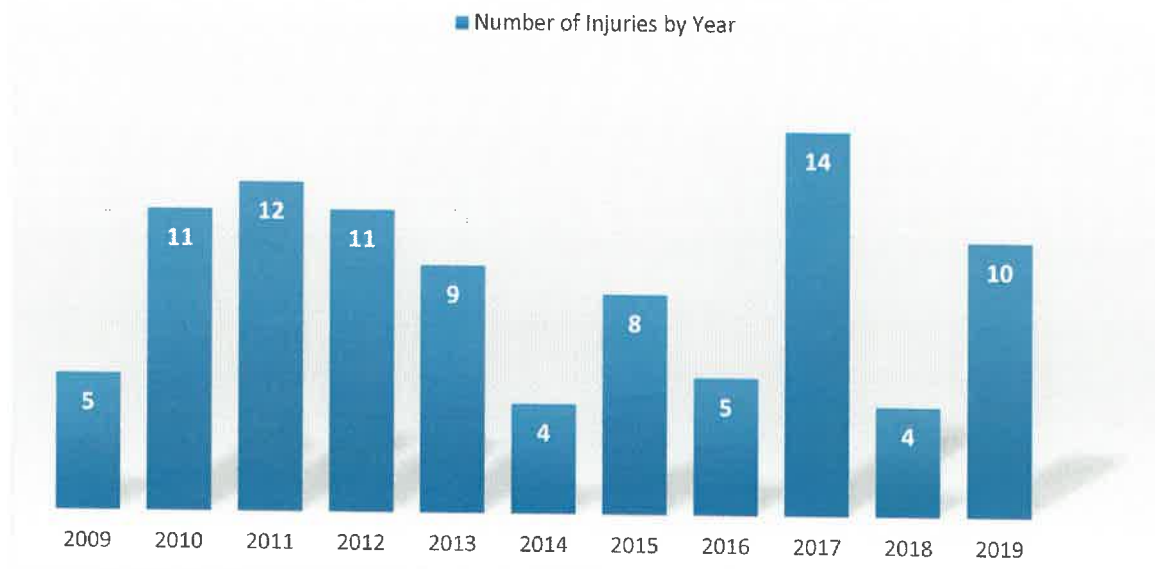
IX. Accident and Sickness Review

Overview:

The common dangers of firefighting coupled with the urgency of emergency incidents, create an inherent atmosphere that is prone to injuries. The day-to-day operations of firefighters has been proven to put a great deal of physical stress on the body, both muscular as well as cardiovascular. In addition, the toxic atmospheres that firefighters routinely encounter have been proven to have an increased effect on critical diseases from long-term exposures to smoke, gasses, and carcinogens from fires, as well as certain acute blood-borne pathogen exposures. Although the fire service has increased the level of safety practices and procedures throughout the years, injuries and illnesses remain common in this line of work. Many risk managers would agree that "Predictable is Preventable." In order to work on the prevention of future injuries, we must first examine what the department has encountered for past injuries and identify any significant trends.



Injuries by Year



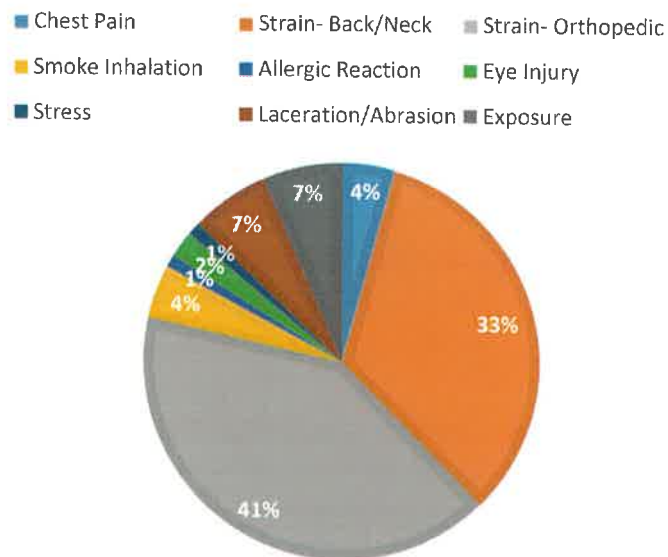
(BFD-Chart 9-1)

In reviewing the reported injuries from September 2008 through September 2019, the department encountered a total of ninety-three (93) reported injuries (*BFD-Chart 9-1*). Of those injuries, seventy (70) injuries were sustained during emergency incidents, ten (10) injuries were sustained during training exercises, and thirteen (13) injuries were sustained during other non-incident/non-training activities. Of the ninety-three (93) reported injuries, forty-six percent (46%) of these injuries resulted in a medical claim. The total cost of all medical claims during this time period was \$ 136,480.00. This cost represents only the medically related expenses associated with an injury. The department in many cases incurred additional costs associated with lost time (filling vacancies to cover minimum manning requirements) as well as fitness for duty and functional capacity examination costs.



It is not only important to look at the total number of injuries, but equally important is the type of injuries sustained. If we can identify the injury types, or certain trends, we stand a better chance of identifying the root cause for injuries for preventative purposes. The following chart (*BFD-Chart 9-2*) illustrates the injuries by type from September 2008 through September 2019.

INJURY BY TYPE



(BFD-Chart 9-2)

As illustrated in the chart above, an overwhelming percentage (74%) of injuries are sustained due to strains. The type of strains noted on the injury reports indicated that forty-one percent (41%) occurred as orthopedic strains, while thirty-three percent (33%) occurred as a result of back and neck strains.



Recommendations:

1. The department should continue to evaluate the frequency and type of injuries that are being reported to identify the need to alter practices or increase safety.
2. The department should implement a formal fitness and wellness program that incorporates physical fitness as well as nutritional wellness.
3. Department members should consider using all available members at an incident scene when lifting or moving people or heavy objects.

X. Information Technology Infrastructure

Overview:

Information technology is a critical component to any public safety organization. From daily communications to documenting emergency incidents, the electronic transfer of information is a necessary part of our infrastructure. Much of the information that the Barnstable Fire Department handles must not only be backed up for record retention purposes, but in many cases contains confidential records that must have very limited access. Over the past ten (10) years the department has made significant progress in updating the information technology infrastructure to meet current operational standards and industry best practices.



In 2009, the fire department had one (1) main server in the fire station that was the gateway to seven (7) work-stations in the fire department. Each work-station had an individual Microsoft Office license that was purchased whenever a desktop computer was purchased. In addition, each work-station had access to Firehouse Software, a SQL record management system that had been in use for over twenty (20) years. Firehouse Software is used to track all emergency incidents, daily logs, inspections/permits and training, as well as inventory in the department. Relative to Emergency Medical Services, patient care reporting was being accomplished through a different software program called Image Trend. All information, data points, and transmission of incident reports for both software programs was being done manually.

Data on the server was backed up once each week using removable hardware which was stored off-site in a secure location. The foundation of the information technology was built by one of the fire department Captains and worked well for many years. As the system aged and data storage became even more critical to the fire departments operation, technological advancements to the infrastructure were becoming imminent. Manually entering data for emergency incidents and physically removing back-up devices had the potential for human error. Microsoft Office licenses were starting to become outdated and versions differed between computers sometimes causing incompatibility issues with sending and receiving data from outside sources. In addition, a Captain focusing increased time on computer maintenance was simply not practical in today's constantly evolving IT world. In the past ten (10) years, the department has developed an ongoing computer replacement program. This not only allows



the department to manage the replacement of the terminals, but also ensures that we are in compliance with all necessary updates and statutory networking compliance regulations. In 2012, the department began implementing methods of transmitting data from the Computer Aided Dispatch (CAD) software used by our dispatchers, directly into our Record Management Software (RMS) such as Firehouse Software and Image Trend. This data transfer is designed to take place automatically using web-based applications, and pre-fills certain critical data fields in our incident reports. The benefits of having the CAD system integrate with the RMS programs is to facilitate faster turn-around times at the hospital, more efficient completion of emergency incident reports, and to eliminate human error when entering critical data into reports.

In 2013 through 2015, the department began implementing Mobile Data Terminals (MDT's) in some of the apparatus. This application called Mobile CAD provides incident information and street mapping to be sent from the dispatch center directly to the responding units in the field. This is made possible using wireless air-cards imbedded in select laptops. When an incident is created, it will populate on the computer monitor in the vehicle to provide information about the incident, along with a street map with demographic information. This is especially helpful when finding difficult addresses, during limited visibility situations, or when identifying nearest cross-streets. Another benefit of the Mobile CAD system is the ability for responders to see where the closest fire hydrants are during a fire related emergency. An ongoing project currently being developed, is adding data to this program that will provide both the dispatcher and the emergency responders with specific building data and pre-incident planning that can be



used during an incident response. Examples of this data are the locations of sprinkler connections and other critical utilities, as well as floor plans and maps.

In 2017, the department transitioned from a fee-for-service based IT support, to a managed IT support program. This was an important step in the departments' advancement in the rapidly changing IT world. The fire service is a 24-hour operation and as stated previously, information technology is critical to the operation. Any downtime in the IT system creates significant problems and impacts efficiency. Through a solicitation of bids, the department was able to secure a local vendor that provides exceptional service and IT support for the fire department. This service is available to the department 24/7/365 and incorporates a full-service management of the IT system. An added benefit with a managed IT solution is the ability for technicians to connect in remotely to the system to repair issues. This not only corrects issues faster but is a more cost-effective solution to ensure continuous and uninterrupted service.

In 2017, the department replaced the main server at the fire station, which had reached the end of its service life and was out of warranty. Included in the replacement of the server, was the complete migration of historical data as well as automatic cloud-based storage of data. This accomplished two important goals; to free up storage space on the server creating greater efficiency, and to eliminate any human error and data loss when backing up data. This cloud-based backup is an added level of security, occurs automatically many times throughout each day, and data recovery if needed is much faster.



In 2017, the department also transitioned to the Microsoft 365 Office platform. This platform is a web-based application that uses the most up-to-date Microsoft Office programs including Microsoft Outlook, which is currently used for electronic mail. Using this web-based application, the department is also able to manage and store this data remotely to meet obligations with remote data backup. Since transitioning to Microsoft 365, the department has had no issues with security, data transmission, or the ability to access data. In fact, Microsoft 365 can be accessed from any computer that has access to the internet, making remote access even more user-friendly when personnel are away from the station.

In researching alternative internet accessibility, the department began looking at the possibility of connecting to a local fiber-optic network being developed for municipal government. In 2018, the department integrated a fiber-optic network connection within the fire station that provides for a secure internet connection. The fiber-optic network has built in redundancy and is much faster and more reliable than traditional cable or telephone networks. The system has secondary power and increased speeds for upload and download of information. Since transitioning to this system, the department has been impacted with several significant storms and we have never lost the fiber-optic network connection in the building.

The department has historically had operating and maintenance problems with the Firehouse Software RMS. The department had been using the legacy software for over twenty (20) years. The software is very powerful and has many options for tracking critical information, however



the SQL format is not very user friendly. With two decades of data in the system, the department wanted to try to make the system work more efficiently. In 2019, the department transitioned from the legacy server-based platform to an internet-based platform. During the transition, all the historical data from the legacy version of Firehouse Software was able to be migrated over to the web-based version preventing any data loss. In addition, the application has automatic back up capability, as well as encrypted data transmission for additional security purposes. Moving this software off the local server has increased local usable space, and the Firehouse Software program has run much more efficiently since the transition.

Recommendations

1. The department should continue to research ways to improve information technology within the organization.
2. The department should consider transitioning to the FirstNet network. This network is being built out as a result of the communication failures during 9/11. Once built out, this network will have the ability to provide superior communications to public safety agencies, especially during large-scale disasters.
3. In-vehicle modems or hot-spots should be explored as an option to improve connectivity in the field. These options typically allow multiple devices the ability to connect to the internet over a secure, password protected connection.
4. The department should continue to implement Mobile Data Terminals in vehicles when possible.



5. The department should begin using the AWARE program in the Mobile CAD software to enter pre-incident planning data. This should be assigned through the shift officers when they conduct pre-planning of buildings in the District.
6. The department should work to implement FH Inspector, which is a Firehouse Software application. This application has the ability to fully integrate with the departments existing hardware/software and would help facilitate a company-level inspection program.
7. The District should research the possibility of connecting the fire department, water department, and the District Treasurer to the fiber-optic network using a local access network (LAN) line. This internal connection would allow for the future expansion and connectivity between all departments District-wide.



Current Fire Department Members

December 2019

Administration

Fire Chief	Francis M. Pulsifer
Deputy Fire Chief	Richard Pfautz
Administrative Assistant	Karen Hickey

Group 1

Captain/Paramedic	Christopher Beal
Firefighter/EMT	John Fleming
Firefighter/Paramedic	Nicholas Black
Firefighter/EMT	Frederico Nogueira

Group 2

Captain/Paramedic	Kevin Brailey
Firefighter/Paramedic	J. Neil Tuepker
Firefighter/EMT	Ryan Jones
Firefighter/Paramedic	Keith Stranger

Group 3

Captain/Paramedic	Robert Cecil
Firefighter/Paramedic	James Giannelli
Firefighter/EMT	Adam Penni
Firefighter/EMT/Mechanic	Ryan Smith

Group 4

Captain/Paramedic	Brian Tyson
Firefighter/EMT	Edward Poirier
Firefighter/EMT	Brian Cabral
Firefighter/Paramedic	Matthew Goodwin



Acknowledgements:

I would like to take this opportunity to thank the officers, firefighters, and administrative staff both past and present of the Barnstable Fire Department for their continued dedication, commitment, and exceptional service to the community. Their passion for the job, desire to be operationally ready, and ability to provide the highest level of customer service for our residents, business owners, and visitors is nothing short of outstanding. I appreciate all my personnel for their willingness to embrace new, innovative, and sometimes complex challenges that better the emergency services we deliver within our community. These people have made it possible to successfully pace and moderate consistent change within the organization. In addition, I would like to thank the members of the Prudential Committee for allowing me the opportunity to lead this organization. The guidance and support that the Board has provided me has allowed me to advance our department dramatically over the past decade. Finally, I would like to express my sincerest gratitude toward the residents and business owners of the Barnstable Fire District. Barnstable Village is a quaint, unique, and highly desirable community. Our community has provided the fire department with the opportunity to continually be mission ready and well trained with the tools and equipment that we need to successfully accomplish our job. I am proud to have had the opportunity to serve as your Deputy Fire Chief from 2009 – 2012, and as your Fire Chief from 2012 - present. I look forward to continuing to serve the Barnstable Village community and meet the new challenges that await us moving into the next decade.

Respectfully submitted,

Francis M. Pulsifer
Fire Chief