

FINAL REPORT

SELF-ASSESSMENT OF FIRE DEPARTMENT OPERATIONS



PORTSMOUTH, NH FIRE DEPARTMENT

APRIL 2015

CONTENTS

EXECUTIVE SUMMARY	2
BACKGROUND	4
SELF-ASSESSMENT ON FIRE DEPARTMENT OPERATIONS	7
DEPARTMENT OVERVIEW	8
COLLECTIVE BARGAINING	8
ORGANIZATIONAL STRUCTURE	9
MISSION AND VISION STATEMENTS	10
DEPARTMENT BUDGET	11
REVENUES	12
COST COMPARISONS FOR PROVIDING FIRE AND EMERGENCY SERVICES	14
DEPLOYMENT AND SHIFT STAFFING	16
HOURS OF DUTY	24
SHIFT REPLACEMENT AND OVERTIME COSTS	25
ADDING ADDITIONAL SHIFT PERSONNEL	30
DISTRIBUTION OF FACILITIES AND APPARATUS	31
DEMAND FOR SERVICES	34
FACTORS IMPACTING DEMAND FOR SERVICES	42
RESPONSE TIME ANALYSIS	46
CUSTOMER SERVICE	49
APPARATUS AND VEHICLES	50
DEPARTMENT FLEET MANAGEMENT COMPARISONS TO BEST PRACTICE	55
SHARED AND COLLABORATIVE SERVICES	57
CALL – VOLUNTEER CONSIDERATIONS	61
STRENGTHS, WEAKNESSES, OPPORTUNITIES	63
APPENDICES	70

EXECUTIVE SUMMARY

The City of Portsmouth Fire Department (PFD) conducted a self-assessment study for the purposes of evaluating and recommending opportunities to guide and inform budget decisions, operations, and strategic planning. The study's principle project manager was Fire Chief Steven E. Achilles. The study team included members of the fire officers' and firefighters' unions, a Portsmouth Fire Commissioner, and department administrative staff. The fire chief engaged members of the 2013 Mayor's Blue Ribbon Committee on the Fire Department and sought their assessment and comments regarding the preliminary findings of the study. Additionally, the study format, process, and data was reviewed by two independent fire professionals; one a fire chief and study consultant, the other an assistant fire chief with a strong administrative and financial background. Consensus standards and contemporary practices were cited and employed to measure current department operations. The format and assessment approach utilized for this study was the applied strategic planning model; specifically an analysis of the strengths, weaknesses, and opportunities of the organization and its' practices. The study was objective and extremely extensive. It considered previous studies and recommendations on department operations and efficiencies, budgets and expenditures, staffing and deployment, facilities and resources, and overall service delivery.

In general, the PFD organizational structure reflects the department's mission, goals, objectives, as well as the size and complexity of the city. The PFD budget is in-line with similar size fire departments and the cost to provide essential emergency and support services to all tax payers is the lowest in comparison to similar NH Fire Departments. The on-duty available staffing and deployment is appropriate under normal circumstances and has been relatively consistent for close to 17 years. However, it falls below national standards for serious incidents and during high volume emergency response requests. Therefore, the PFD should strive to deploy the proper amount of personnel to improve efficient and safe operations based on incident risk, volume, and complexity. This goes hand-in-hand with maintaining the current distribution and number of fixed fire stations.

The deployment of staff, apparatus, and facilities is also driven by a number of factors including demographics, risks and hazards, type and age of buildings, and the type of occupancies. Specifically affecting the city are (a) the number of current and planned commercial and residential developments, (b) the aging population, and (c) the frequency of concurrent call activity. These factors will continue to influence the ability of the PFD to maintain timely and effective responses, as well as stress future staffing and deployment strategies.

Shift replacement and overtime expenditures are under constant scrutiny, but when compared to similar fire departments, the PFD overtime expenditures as a percentage of the operating budget is slightly below the average of similar NH Fire Departments. Also, overtime as a percentage of all hours worked has declined over the last 3 years. Even so the PFD should continue to monitor and manage overtime expenditures. In addition to collective bargaining opportunities to revise working agreements, the PFD may consider adding additional shift employees to offset overtime expenditures. This could be in the form of (a) hiring four firefighters; one assigned to each shift, (b) hiring firefighters to work peak hours only, (c) hiring one officer to work a set day-schedule, or 4) a combination of the aforementioned options. However, this approach would not result in long-term budget savings and some options would require collective bargaining.

The PFD capital and rolling stock programs were also examined and it was determined that the PFD maintains a comprehensive apparatus and vehicle replacement program. With an exception of the fire engines that respond to twice as many runs as the industry standard, the PFD should realign its apparatus replacement schedule to 15 years as primary response and 10 years in reserve status. Another opportunity that the PFD should evaluate is the need to maintain the current number and type of reserve and special response apparatus. This includes the fire boat, utility trailers, the heavy rescue, and the forestry unit.

In a review of shared and collaborative services, the PFD's membership and activities in the area mutual aid district leverages outside funding sources to improve and enhance services that would otherwise have to be borne by the City. The PFD has also proactively sought opportunities to engage area communities to reduce costs and improve services. The PFD should continue these efforts for regional shared and collaborative services.

BACKGROUND

2013 Mayor's Blue Ribbon Committee on the Fire Department

In 2013, a Mayor's Blue Ribbon Committee on the Fire Department was created. The charge of the committee was to choose a consultant to perform an independent study of the Portsmouth Fire Department for the purpose of recommending to the City Council changes to the practices and organizational structure of the Department in order to reduce costs without materially affecting public safety. The following individuals were appointed to the Fire Study Committee: City Councilors Brad Lown and M. Christine Dwyer, Fire Commissioner Paul Wentworth, Fire Chief Steven Achilles, and Portsmouth Residents Eric Gregg, Peter Somssich and Norm Olsen. The Fire Study Committee met from September 2013 to April of 2014. In January 2014 the City Council voted to authorize the City Manager to work with the Fire Chief and the Fire Study Committee to initiate a Request for Qualification (RFQ) for a consultant to review the scope, goals, and objectives of the proposed study. Numerous firms submitted RFQ's and these were reviewed and evaluated by the Fire Study Committee. Subsequently, five firms were selected to submit Request for Proposals (RFP) to complete the study. At the November 17, 2014 City Council meeting, the Fire Study Committee's recommendation on funding and subsequently awarding a contract to a firm was discussed. A motion was made to direct the City Manager to work with the Fire Department to enter contract negotiations with the preferred firm. That motion failed on a 4-5 roll call vote. The result of the vote concluded the charge of the Fire Study Committee and ended the process of an independent study on the fire department. The fire chief and Fire Commission, however, communicated that the department would utilize the year-long work of the Fire Study Committee in developing upcoming operational budgets and strategic plans. On December 8, 2014 City Councilor Dwyer formalized a request for an internal report from the Fire Commission/Fire Department. Her intent was "to make sure the council follows through on the internal report from the Fire Commission and Fire Department and have the information by the end of April 2015 in advance of budget deliberations". A motion was made, seconded, and by unanimous vote, passed.

2012 – 2013 Mayor’s Blue Ribbon Committee on Operational Efficiencies

The Mayor’s Blue Ribbon Committee on Operational Efficiencies was reactivated by Mayor Spear in December 2012. This Committee was reactivated following the work completed by a similar committee that studied the School Department in 2010. The charge of this committee was to determine opportunities for operational efficiencies in all departments of City government and reporting back to the City Council with findings and/or recommendations. There was a particular focus on efficiencies between the Police and Fire Departments. The Committee had its first meeting in January 2013 and met monthly to discuss efficiency and collaborative opportunities between the Police and Fire Departments, as well as other municipal departments. The Committee’s information gathering included research and presentations by the Police, Fire, and Human Resources Departments. Potential efficiencies identified by the Committee related to the operations of the Fire Department were:

- The Fire and Police Departments should actively pursue regionalizing the City’s dispatch operation with surrounding towns.
- The City Council should be supportive of the Fire Department’s efforts to provide ambulance service to other communities thereby potentially increasing revenues.
- The Fire Department should continue to explore providing fire suppression and administrative services to neighboring towns.

2006 Citywide Overtime Audit

In 2006, the Matrix Consulting Group was hired by the City of Portsmouth to conduct a city-wide overtime study. The study analyzed the magnitude, causes, and administrative control of overtime in all city departments except for the School Department. The City-wide Overtime Audit report was released on June 29, 2006 and identified positive areas in the use and control of overtime, as well as recommendations to strengthen the use and control of overtime in Portsmouth. The following are recommendations made specific to the PFD:

- Consider increasing the number of authorized and budgeted firefighters on each shift from 14 to 15. The cost would eliminate approximately the same amount of overtime.
- Exclude all leave as hours worked for the computation of overtime should be implemented.
- Seek contract changes that would enable a firefighter to step up to fire officer's position when there is an officer vacancy on a duty shift.
- Explore ways in which annual leave can be scheduled to alleviate large fluctuations in the number of personnel off on a shift.
- Continue to monitor the number of hours of overtime worked by staff to ensure that staff are not over-worked.

Two additional areas cited were revise guaranteed 4 hour minimum for all emergency call outs and exclude overtime hours that overlap regular shifts. These two recommendations were addressed in collective bargaining agreements effective July 1, 2008 to June 30, 2014. The first was the reduction from a minimum call-back of 4 hours to 2 hours. The second provides that call-back will not be compounded, pyramided, or added to compensation for any purpose. The remaining recommendations have not been implemented by either the Fire Commission, Fire Administration, City Council, or achieved through collective bargaining efforts.

SELF-ASSESSMENT ON FIRE DEPARTMENT OPERATIONS

The intent of this study is to perform an objective self-assessment of the Portsmouth Fire Department (PFD) for the purposes of evaluating and recommending opportunities to guide and inform budget decisions, operations, and strategic planning in the PFD. This study will (a) provide comparisons to relevant communities, (b) identify specific areas for improvement and make recommendations based on benchmarks and best practices as well as suggestions for an implementation strategy, (c) consider short and long range cost implications, and (d) alert the City and Fire Commissioners to innovations that would improve services through efficiency and/or added value.

Desired Outcomes

- Establish a baseline of the PFD's current performance from which to measure the impact of the proposed change and opportunities.
- Provide mechanisms to facilitate change within the PFD to bring about greater efficiency.
- Determine if adequate controls are in place in critical areas.
- Make realistic and practical recommendations for increasing organizational effectiveness and efficiency that are supported by applicable NFPA, state, local and federal standards.

Comparisons, Accepted Principles and Practices

The criteria for selecting relevant communities to compare and contrast the organization, cost of services, and performance of the PFD is based on the following factors: (a) economic and geographic resemblance, (b) provision of 24-hour / 7-day a week career fire protection services, (c) fire-based, paramedic-level, ambulance service, and (d) comparable staffing and deployment levels. Five communities have been identified based on the aforementioned criteria; three are in Rockingham County, one in Strafford County, and one in Merrimack County. They are Concord, Derry, Dover, Londonderry, and Salem.

Guidance for fire and emergency service operational and management best practices is provided by the National Fire Protection Association (NFPA), the Insurance Services Office (ISO), the Commission on Fire Accreditation International (CFAI), and the International City/County Management Association (ICMA). Consensus standards and contemporary practices will be cited and used to measure current and future PFD operations.

DEPARTMENT OVERVIEW

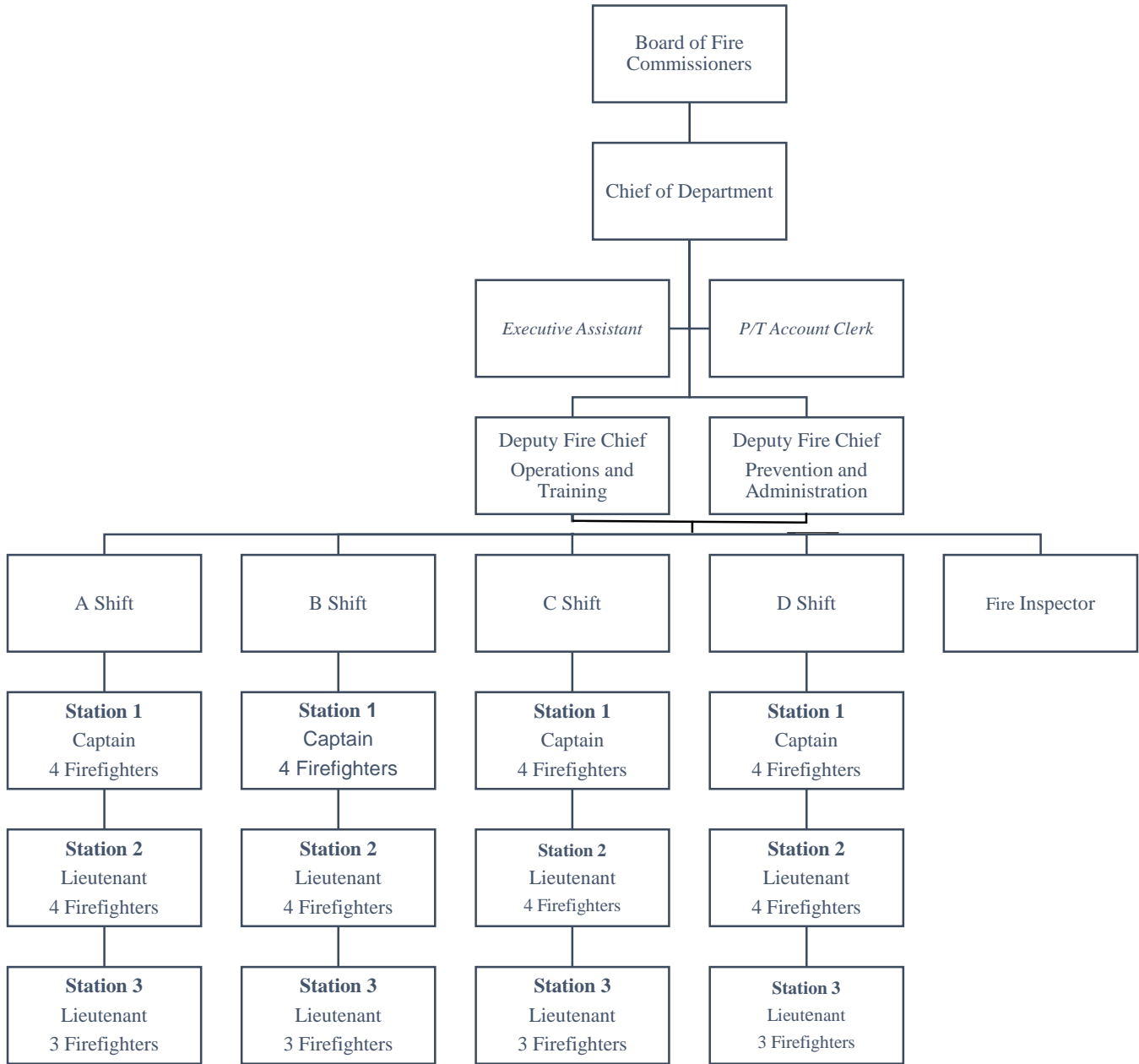
The PFD is a full-time, career fire and emergency services organization that serves a city with a year round population of 21,233 and is situated on the New Hampshire coast 50 miles north of Boston. Heavy tourism and a healthy work force increases the service population of the PFD. The Department is operated by a three-member Board of Fire Commissioners under a Council / Manager form of Government. The Fire Department has 44 firefighters, 12 officers, 1 fire prevention officer, 2 deputy chiefs, 1 chief, and 1 executive assistant and 1 part-time account clerk. Labor contracts governing personnel policies and practices are negotiated with the Board of Fire Commissioners and approved by the Portsmouth City Council.

COLLECTIVE BARGAINING

The firefighters of the PFD are represented by the International Association of Fire Fighters (IAFF) Local 1313 and the fire officers (shift captains, lieutenants, fire inspector) are represented by the IAFF Local 4039. The firefighter's local was established in 1958, whereas the officers formed their union in 2000. As described in the collective bargaining agreements, both unions purpose is to arrange and maintain fair and equitable labor rates and conditions, as well as promote amicable means of adjustment to any and all disputes. The three chief officers and executive assistant are covered under the Portsmouth Professional Management Association (PMA) working agreement. The part-time account clerk follows the agreement between the Portsmouth City Employees Local 1386 (AFSME) and the City.

ORGANIZATIONAL STRUCTURE

Figure 1. Department Organizational Chart



MISSION AND VISION STATEMENTS

In the fall of 2013, shortly after the appointment of Fire Chief Achilles, the department's administration conducted a collaborative process to revise the organization's Mission Statement, develop a department vision, and established a set of operating values. The process included an introduction to these principles and internal stakeholder work sessions that lead to the adoption of the guiding principles for the department.

PFD Mission Statement:

Provide quality emergency, life safety, and prevention services for our citizens, businesses and visitors, with the highest level of valor, integrity, commitment, teamwork, and community involvement.

PFD Vision Statement:

The vision of the Portsmouth Fire Department is to be a recognized leader in the fire service and respected by our citizens for anticipating and responding to their ever changing needs. The department will embrace new technologies and techniques, focusing on training and education to provide the highest level of customer services and satisfaction in a professional and caring manner.

DEPARTMENT BUDGET

Table 1 City Operational Budgets by Department for last 4 years

	FY12	%	FY13	%	FY14	%	FY15	%
Municipal	\$15,427,527	22.5%	\$15,905,044	22.6%	\$16,686,628	22.7%	\$17,010,942.0	22.5%
Police	\$8,589,781	12.5%	\$8,838,885	12.5%	\$9,174,659	12.5%	\$9,343,994.0	12.3%
Fire	\$6,973,895	10.2%	\$7,155,250	10.2%	\$7,531,078	10.3%	\$7,757,108.0	10.2%
School	\$37,206,584	54.2%	\$38,302,260	54.4%	\$39,820,958	54.3%	\$40,975,396.0	54.1%
Total City Operating	\$68,707,692		\$70,451,439		\$73,363,323		\$75,737,440.0	

Source: City of Portsmouth Annual Budget Documents

The above table provides a four year overview of the PFD budget expenditures. The PFD has consistently accounted for 10.2% of the total City’s general fund budget over the last four years. The PFD operating budget has increased an average of 3.3% each year over the same period. The below table illustrates how the PFD budget as a percentage of the general fund budget compares to similar NH fire departments.

Table 2 Percentage of General Fund Comparison Not Including Schools

City / Town	Fire Budget	General Fund Budget	Percentage
Dover	\$7,502,246	\$46,240,686	16.2%
Portsmouth	\$7,759,719	\$34,762,044	22.3%
Concord	\$12,697,323	\$55,005,019	23.1%
Londonderry	\$6,510,218	\$28,157,381	23.1%
Derry	\$10,689,254	\$37,699,677	28.4%
Salem	\$10,174,818	\$33,332,894	30.5%

Source: City / Town FY15 Budget Documents

REVENUES

The Portsmouth Fire Department receives revenues through a number of sources. These include (a) ambulance service billing, (b) fire alarm services, (c) reports, (d) details, (e) Seabrook Station Regional Emergency Radiological Planning, and (f) Overtime Services Rendered / Reimbursements (Tables 3 and 4). A substantial revenue source is realized via the provision of ambulance services and transports. Rates are recommended by the PFD administration after consultation with the department’s billing service agency. The rates are then reviewed by the City Manager and approved annually by the City Council. Unlike the other sources of revenue that offset operational expenses, all ambulance revenue goes into the City’s General Fund account.

Table 3 Ambulance Revenues per Calendar Year

	2010	2011	2012	2013	2014
Payments Received	\$675,552.0	\$731,847.0	\$747,334.2	\$766,623.9	\$841,621.6
Net Commitments	\$857,524.0	\$951,123.0	\$913,172.6	\$1,090,238.5	\$1,203,030.3
Collection Rate	79%	77%	82%	70%	70%

Source: Comstar Billing Services

The City reports the actual ambulance service revenue received for each fiscal year. This is a reconciled amount from net payments received. The amounts reported by the City’s Finance Department are:

- FY11 - \$654,089.00
- FY12 - \$681,475.00
- FY13 - \$682,973.00
- FY14 - \$766,026.00

Table 4 Other Revenues

Customer	Description	FY 11	FY12	FY13	FY14
Reports	Incident Reports	\$430.0	\$340.0	\$210.0	\$475.0
Fire Alarm	Payroll and Supplies	\$3,027.6	\$8,092.9	\$5,756.5	\$15,410.2
Reg. Haz Mat Team	OT Services Rendered	\$32,691.2	\$17,589.7	\$10,445.3	\$26,564.7
NH Fire Standards	OT Services Rendered	\$0.0	\$74,695.5	\$166,884.8	\$5,674.8
Details	OT Services Rendered	\$1,270.9	\$30,263.2	\$27,584.3	\$3,433.5
Seabrook Station	OT Services and Supplies	\$0.0	\$22,337.2	\$5,481.9	\$0.0
Total		\$37,419.7	\$130,981.2	\$216,362.8	\$51,558.2

Source: City of Portsmouth Finance Department

Other revenues that are categorized as *OT Services Rendered* are payroll reimbursements, either through grants or outside payments, for personnel shift or detail coverage. Spikes in FY12 and FY13 NH Fire Standards were related to state-wide safety and preparedness grants and FY12 and FY13. Details were in large part influenced by the fire and ambulance detail staffing for the Boston-Portsmouth Air Shows.

COST COMPARISONS FOR PROVIDING FIRE AND EMERGENCY SERVICES

According to Bruce Kling in his 2013 report on *Fire Departments and Emergency Medical Services in New Hampshire*, there are various statistical measures that can be used to determine the cost effectiveness of a fire department. Most center on the cost per capita which can be a misleading statistic for those communities that get a large influx of visitors or workers. For those communities, cost per call may be a more appropriate statistic (Table 5). Another interesting statistical measure is the cost to protect all property in a town. The cost per \$1,000 (CPT) based on the net appropriations and the cost per \$1,000 (CPT) based on taxable properties can be fairly similar. However, when one includes the tax-exempt properties that a fire department is expected to protect, one gets a more realistic picture of the true cost to protect property in a municipality.

This study employs an approach that considers the equalized value of all properties that require protection, tax rates, and CPT to all tax payers. Table 6 provides a comparison of CPT based on net appropriations (fire budget ÷ net city budget x tax rate) and CPT based on total equalized valuation (fire budget ÷ total equalized valuation ÷ \$1000.0). A limitation to this approach is that it does not consider fire department revenues that may reduce the overall fire budget.

Table 5 Cost per Call Comparisons

City / Town	Fire Budget	2014 Call Volume	Cost per Call
Dover	\$7,502,246	5480	\$1,369
Concord	\$12,697,323	7647	\$1,660
Portsmouth	\$7,759,719	4363	\$1,779
Salem	\$10,174,818	4994	\$2,037
Londonderry	\$6,510,218	3186	\$2,043
Derry	\$10,689,254	4193	\$2,549

Note: The median cost per call is \$1908.00.

Table 6 Cost per thousand all Properties FY15 Comparisons

City / Town	Total Equalized Valuation *	Fire Budget	General Fund Budget	Full Value Tax Rate*	CPT Based on General Fund	CPT / Total Equal Valuation
Portsmouth	\$4,526,473,144	\$7,759,719	\$34,762,044	\$16.11	\$3.60	\$1.71
Londonderry	\$3,093,766,590	\$6,510,218	\$28,157,381	\$23.31	\$5.39	\$2.10
Salem	\$3,936,929,706	\$10,174,818	\$33,332,894	\$20.01	\$6.11	\$2.58
Dover	\$2,612,606,600	\$7,502,246	\$46,240,686	\$24.10	\$3.91	\$2.87
Concord	\$4,047,453,253	\$12,697,323	\$55,005,019	\$24.04	\$5.55	\$3.14
Derry	\$2,688,560,224	\$10,689,254	\$37,699,677	\$27.47	\$7.79	\$3.98

* Total Equalized Valuation Included Utilities and Railroad

Note: General Fund excludes Schools






Source: Equalized Assessed Valuations, NH Department of Revenue Administration

The mean cost per thousand based on net appropriations (General Fund) is \$5.39 and the mean cost per thousand on the total equal valuation is \$2.73. For FY15, the cost for the PFD is 33% lower than the average CPT based on net appropriations and 37% lower than the average CPT on total equalized valuation.

DEPLOYMENT AND SHIFT STAFFING

The department maintains three fire stations staffed 24 hours a day. The department’s “Central Station”, situated in historic downtown, is known as Station 1. This station houses the Administrative and Prevention Offices, Engine and Ambulance Company 1, Engine 6 and Ambulance 3 in reserve, and Command Support Resources. The department’s fire and rescue boat, Fire Boat 1, is located at the NH Port Authority and is staffed by the Station 1 companies. The southern portion of the city is covered by Station 2 which houses Ladder 2, Tower 5, Forestry 1 and Ambulance 2. Station 3 is located on the Pease International Tradeport and houses Engine 3 with an engine and heavy rescue in reserve. The maximum shift staffing is 14; this includes 3 officers and 11 firefighters. Figure 2 provides an overview of the distribution of personnel at maximum staffing.

Figure 2. Distribution of Personnel

Station 1	Station 2	Station 3
 1 Officer 2 Firefighters	 1 Officer 2 Firefighters	 1 Officer 3 Firefighters
 2 Firefighters	 2 Firefighters	

History of Department Staffing

The first permanent PFD firefighters were appointed in 1891. Prior to this, the department staffing consisted solely of call firefighters and officers. By 1900, the department consisted of 99 men: 6 permanent, 93 call that included 1 chief engineer and 4 assistant engineers. The first permanent fire chief was appointed in 1927. Over the next 40 years, the permanent staffing would increase to 21 full-time firefighters while at the same time the numbers of the call force decreased to 30-45 members. Other significant influences to staffing coincided with the opening of both Station 2 in 1966 and Station 3 in 1994. The call force, as a result of dwindling numbers and increased training / certification requirements, was eliminated in 2000. Table 7 provides an overview of permanent staffing changes in the department since 1900.

Table 7 PFD Permanent Staffing Trend Since 1900

Year	Permanent Fire Personnel*	Admin Staff
1900	6	1
1933	17	0
1953	21	0
1966	39	0
1972	46	0
1984	55	1
1998	59	2
2005	59	1
2010	60	1.5
2015	60	1.5

* Includes firefighters, officers, chief officers

Source: PFD records and City of Portsmouth Annual Reports

Apparatus Staffing and Deployment Standards

Staffing of fire apparatus and ambulances can be determined based on a number of variables. Traditional considerations often include the demographics of a community, the demand and numbers of service requests, the nature of risks and hazards in the service area, the type and age of buildings in the community, the type of occupancies (i.e. residential, commercial, industrial), and travel times from existing stations to the coverage area. The National Fire Protection Association (NFPA) has identified the standards to increase the chance for positive outcomes from fire and other emergencies. Staffing of each company shall be led by an officer who shall be considered part of the company. All engine and ladder truck companies should be staffed with a minimum of four on-duty personnel. According to *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* (2009), the fire department’s suppression resources should be deployed to provide for the arrival of an engine or ladder company within 5-minutes (turnout + response time) and/or the initial full alarm assignment within 9-minutes (turnout + response times) to 90% of emergency incidents (NFPA, 2009). The initial full alarm assignment should provide for incident command, water supply, two hose lines, victim search and rescue, ventilation, aerial device operations, and firefighter safety and rescue. Staffing to accomplish these capabilities begins at 15 on-duty personnel and may include up to three additional personnel assigned to

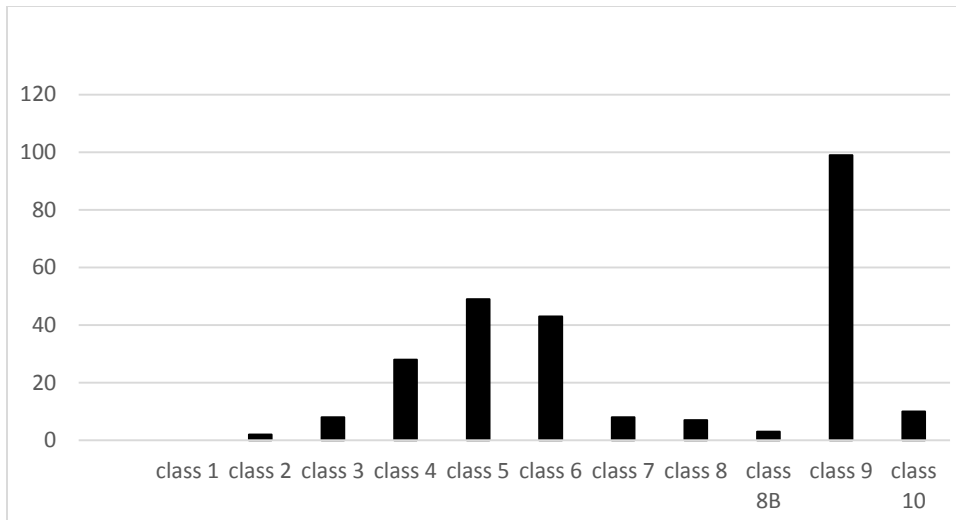
firefighter safety and rescue.

Additional studies and standards that influenced staffing considerations include the National Institute of Standards and Technology (NIST) *Report on Residential Fireground Field Experiments* (2010) and the U.S Occupational Safety and Health Administration (OSHA) Respiratory Standard 29 CFR 1910.134. The NIST study concluded that four-person crews were more effective than two or three-person crews when it came to extinguishing fires in a 2000 square foot house (15% faster than two-person and 6% faster than three person) and rescuing occupants (30% faster than two-person crews and 5% faster than three-person crews). Additionally, four- and five-person crews were able to complete 22 essential firefighting and rescue tasks in a residential property 30% faster than two-person crews and 25% faster than three-person crews.

The OSHA regulation requires firefighters entering dangerous atmospheres do so in teams of two with a minimum of two more firefighters available outside to assist or rescue those inside (2-in / 2-out rule). Therefore, firefighters entering a building with smoke, toxic gases, or fire must do so only after there are a total of four firefighters on scene. An exception to this rule is when a victim is visible from the outside of the hazardous environment and readily accessible to the firefighters. The ratio of firefighters outside the dangerous environment to those inside after the initial entry is not required to be maintained at 2 to 2 (i.e. 6 firefighters inside requires 6 outside). The intent is to insure there is adequate resources, equally equipped, to affect a rescue of the inside crews. This is accomplished by applying the NFPA 1710 standards.

Lastly, a staffing benchmark utilized by fire and emergency service organizations and communities is contained within the Public Protection Classification (PPC) program administered by the Insurance Services Office (ISO). This program provides information about a community's fire-protection services by evaluating the capacity of the local fire department to respond to and fight structure fires. In November 2005, the PFD was surveyed by ISO. Classifications range from 10 to 1 (1 being the highest class). The department, prior to 2005, was a Class 4 and after the survey remained a Class 4. Figure 3 provides the current distribution of communities in New Hampshire by PPC class.

Figure 3 Distribution of PPC in NH



Source: ISO 2015

The PPC program evaluates three major features; fire alarm and communications, fire department, and water supply system. Fifty percent of the scoring is assigned to the Fire Department section which reviews engine and ladder-service companies, equipment carried, responses to fires, training, and available fire fighters. The department received a credit of 27.28 out of 50 (Table 8).

Table 8 PFD 2005 ISO Fire Suppression Rating Schedule

Item	Actual Credit	Max Credit
Engines and Hose	7.41	10.00
Reserve Pumpers	0.71	1.00
Total Pump Capacity	5.00	5.00
Ladder Trucks and Equipment	1.04	5.00
Reserve Ladder Trucks	0.21	1.00
Distribution of 1st Due Apparatus	1.85	4.00
FFs and Officers on-duty	6.83	15.00+
Training	4.23	9.00
Total Credit for Fire Department	27.28	50.00

ISO PPC Comparisons

Table 9 ISO PPC Comparisons

	Class	Year
Concord	2, 8B	2013
Derry	3, 9	2013
Dover	3, 9	2013
Exeter	3, 8B	2013
Portsmouth	4	2006
Salem	3, 9	2014

Source: Fire Chief Telephone Surveys February 2015

Split Classifications: The first number refers to the classification of properties within 5 road miles of a fire station and within 1,000 feet of a creditable water supply. The second number applies to properties within 5 road miles of a fire station but beyond 1,000 feet of a creditable water supply. ISO generally assigns Class 10 to properties beyond 5 road miles.

ISO PPC Effect on Insurance Premiums

According to ISO, the PPC information plays an important part in the decisions insurers make affecting the underwriting and pricing of property insurance. PPC may affect the underwriting and pricing for a variety of personal and commercial insurance coverages, including homeowners, mobile home, fine arts floaters, and commercial property (including business interruption). Assuming all other factors are equal, the price of property insurance in a community with a good PPC is lower than in a community with a poor PPC.

Apparatus Staffing and Deployment Comparisons

Table 10 NFPA and ICMA Staffing Minimums Compared to PFD

	NFPA 1710	ICMA	Portsmouth
Engine	4	3	3
Ladder	4	2.9	3
Ambulance	2	N/A	2

Source: Moulder, E., 2014. ICMA. Police and Fire Personnel, Salaries, and Expenditures for 2013

Table 11 Apparatus Staffing of Comparable NH Fire Departments with a Minimum of 3 Stations

	Concord	Derry	Dover	Londonderry	Portsmouth	Salem	Mean
Engine	3	3	3	3	3	3	3.0
Ladder	3	3	1	3	3	3	2.7
Ambulance	2	2	2	2	2	2	2.0
Min Shift Staffing	19	15	12	9	13	15	13.8

Source: Fire Department Surveys January 2015

Table 12 Total Personnel Staffing Comparison

Position	Concord	Derry	Dover	Londonderry	Portsmouth	Salem
Chief	1	1	1	1	1	1
Asst. / Bureau Chief	2	0	1	0	0	1
Deputy	1	0	1	0	2	1
Fire Marshal	0	1	0	0	0	1
Fire Prevention	1	1	0	1	1	1
EMS Officer	0	1	0	0	0	0
Battalion Chief	4	4	0	4	0	0
Captain	4	0	4	0	4	4
Lieutenant	16	12	8	12	8	12
Firefighters	50	44	36	24	44	44
Total	79	64	51	42	60	65

Source: Fire Department Surveys January 2015

PFD Shift Staffing

The PFD utilizes a four platoon shift staffing model (A, B, C, and D). Based on the department’s apparatus staffing policy and collective bargaining agreements, the following is the total maximum on-duty compliment of firefighters and officers at any one time (Table 13):

Table 13 PFD Maximum Firefighter and Officer Compliment per Shift

<u>Rank</u>	<u>Compliment</u>
Captain	1
Lieutenant	2
Firefighters	11
Total	14

Formula for Calculating Staffing Needs

A number of fire department studies use a recognized formula to assist in determining the adequacy of the total apparatus staffing. The formula can provide a measure of budgetary accuracy in determining the actual number of firefighters and officers required to staff the fire and EMS apparatus, given the minimum staffing levels approved by the municipality. This study is referencing two applications of the formula; Public Safety Solutions, Inc in their *2013 Performance and Management Study of the Portland, Maine Fire Department* and the City of San Francisco Fire Department in their *Methodologies for Determining Staffing Requirements* posted in February of 2014. The formula considers the following: minimum shift staffing, total hours in a year, position assigned work hours in a year, and average time off the floor (i.e. earned time, military leave, administrative leave, etc.).

Using current PFD apparatus minimum staffing levels, that formula is outlined as follows. To staff one shift position on a 24-hour basis for 365 days and allow time off for earned-time, administrative, worker’s compensation, emergency, union, and disability leave and on-the-job injuries, 4.66 employees are required. Work hours per position are based on an average 42-hour work week x 52 weeks (2,184 hours). For calculation purposes, this study uses actual “time off the floor” taken by all shift personnel for FY14 and then divided that total by the total number of shift personnel. Based on actual time taken/required for all leave, the average annual time “off

the floor” for firefighters and officers has been determined to be 302 hours. To determine the number of staff required to cover one position, the total hours in a year (8,760) is divided by the total number of hours available (1,881). The full calculation model for the PFD is illustrated in Table 14.

Based on this approach to calculating firefighter and officer staffing requirements for the current PFD fire station and apparatus deployment model, it appears that 60.53 or 61 firefighters and officers would be needed. This is 4.53 or 5 positions more than approved currently.

Table 14 FY14 Staffing Calculation Based on a 42-hour Work Week

Description	Count
Fire and EMS Staffing	56.00
Total Hours in a Year	8,760.00
Work Hours per FF	2,184.00
Average Time "Off" Floor	302.62
Total Hours Available	1,881.38
Staff to Constantly Cover (1) 24 hr. position	4.66
Staff to Cover 13 person shift	60.53
Staff to Cover 14 person shift	65.19

Off Floor = All approved leave and training
 Total Hours Available = Work Hour per FF - Off Floor

HOURS OF DUTY

The hours of duty for firefighters and officers is a 42-hour (average) workweek that consists of 14, ten (10) hour day shifts and 14, fourteen (14) hour night shifts over an eight (8) week cycle per schedule in effect. The starting times for the shifts are 7:30 a.m. and 5:30 p.m. (Appendix .1). Firefighters and officers are compensated at 1 ½ their hourly rate for hours worked in addition to their 42-hour average workweek. This work schedule was implemented in 1978 when the hours of duty worked by firefighters were reduced from 48 to 42.

Work Schedules

The two predominant work schedules in fire and emergency services are the 10-14 hour schedule and the 24-hour schedule. As noted above, the PFD utilizes the 10-14 hour schedule. There are variations of the 24-hour work schedule that provide the same 42-hour average work week. One option consists of the following: 24 hours on, 24 hours off, 24 hours on, five (5) days off. Another alternative, and one cited by Public Safety Solutions, Inc in their 2013 study of the Portland, ME Fire Department, is the 24-72 hour schedule. It can be described as a four-platoon schedule that also averages 42 hours per week (7 days) during a 28-day cycle; there are seven 24-hour shifts every 28 days totaling 168 hours. This 24-72 schedule is one day on, three days off for 28 days when it repeats, in accordance to the Fair Labor Standards Act (FLSA).

SHIFT REPLACEMENT AND OVERTIME COSTS

It is the policy of the department to grant personnel leave from duty according to department policies and applicable collective bargaining agreements. As provided in PFD Policy 100-17, the categories and descriptions of allowed leave is below:

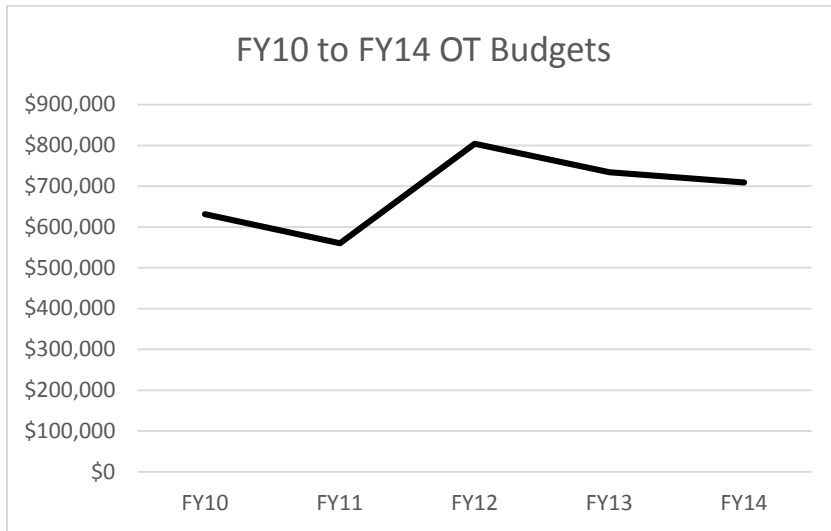
- **Administrative Leave:** The period of time, authorized only by the Chief or covering Chief Officer that requires a member to be excused from his regular duties.
- **Earned Time Leave:** The vacation, sick leave, interim disability, and maternity leave time granted to all members of the department each year in accordance to his/her contract.
- **Disability Bank (Leave):** The period of time used for extended illness, injury, disability related to pregnancy or hospitalization only.
- **Emergency (Funeral) Leave:** The period of time during which a member is excused from active duty by reason of the death of an immediate family member.
- **Workers' Compensation Leave:** The period of time during which a member is excused from duty by reason of being injured while on duty.

Additional leave categories identified in both the firefighters and officers collective bargaining agreements and allowed by the PFD include Union and Military Leave.

The current practice of the PFD is to staff each duty shift at a minimum of 13 firefighters and officers. Overtime is created when either two or more firefighters are on approved leave or one officer is on approved leave. This again is predicated on department policies and collective bargaining agreements (CBA). The shift replacement of the firefighter positions has a buffer with one additional firefighter assigned to each shift, whereas there are no additional officers assigned. Under the firefighters' and officers' CBA the administration of the PFD has the authority to determine the size of the work force and increase or decrease its size. This provides flexibility in determining the number of personnel assigned to each shift. However, as stated in the fire officers' CBA, at

least one captain or lieutenant will be assigned to each station per shift. This provision therefore requires that as long as all three fire stations are operational, there will always be three officers on duty.

Figure 4. Overtime Actual Expenditures FY10 through FY14



Source: PFD Budget Documents

Figure 4 illustrates the actual expenditure of overtime funds over the last 5 years. These actual expenditures often differ from what is budgeted due to a number of factors. The appropriations of the earned-time line has historically been based on best case scenarios vs actual liability. Regarding workers compensation and disability, these accounts can be dramatically affected by unforeseen and lengthy illnesses or injuries. Also, the emergency recall line does not only include funds for the emergency call-back of off-duty personnel, but also funeral, military, union, and administrative leave. Lastly, the training and education expenses are a result of the collective bargaining requirement of the PFD to provide all training necessary for re-certification at the EMT-I or EMT-P level and PFD policies of offering shift coverage for certain professional development and advanced certification courses.

Table 15 Budgeted Overtime Compared to Actual Expenditures

Account	FY11	Actual	FY12	Actual	FY13	Actual	FY14	Actual
Emergency Recall	\$67,000	\$93,825	\$67,000	\$203,751	\$100,000	\$195,445	\$100,000	\$135,061
Earned Time Leave	\$351,076	\$405,839	\$233,868	\$454,508	\$403,000	\$423,820	\$367,780	\$425,841
Disability Leave	\$22,000	\$21,409	\$22,000	\$48,344	\$22,000	\$58,190	\$22,000	\$48,445
Workers Comp	\$15,000	\$3,472	\$15,000	\$11,889	\$10,000	\$11,757	\$10,000	\$21,413
Training/Education	\$20,000	\$35,326	\$20,000	\$85,855	\$40,000	\$44,926	\$40,000	\$55,701

The department monitors the total number of regular hours worked, total number of hours worked at an overtime rate, and the percentage of total hours that were paid at the overtime rate. This measurement and trend for the last three years is illustrated in Table 16.

Table 16 Overtime as Percentage of All Hours Worked

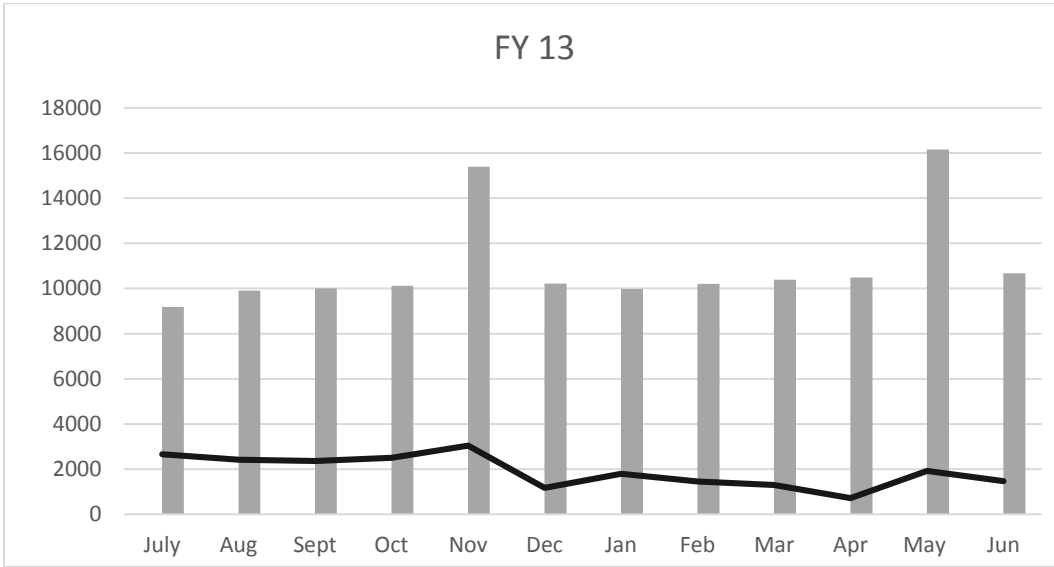
Fiscal Year	Total Hours	OT Hours	%
FY12	149880.35	23973.25	16.0%
FY13	155461.89	22774	14.6%
FY14	155767.94	17688.5	11.4%

Source: City Earnings Analysis Report by Department

Overtime Expenditures by Month

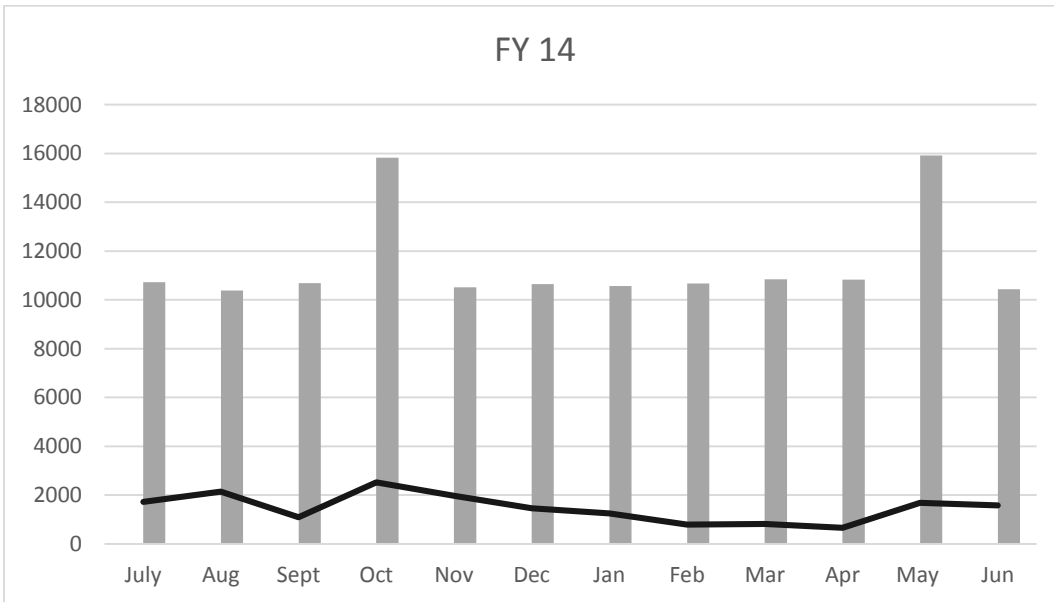
A review of overtime usage trends over the last two fiscal years (Figures 5 and 6) illustrate that the regular hours worked (gray bars) are relatively consistent at approximately 10,000 hours per month except in those months of additional pay weeks. Overtime usage (black line) is higher from May to October / November at 1500 to 2500 hours and lower through December through April (700 to 1300 hours).

Figure 5. FY13 Regular Hours (gray) and Overtime Hours (black) Trends per Month



Source: FY13 Earnings Analysis Report by Department

Figure 6. FY14 Regular Hours (gray) and Overtime Hours (black) Trends per Month



Source: FY14 Earnings Analysis Report by Department

Comparison of Overtime Expenditures

Table 17 OT Budget Comparisons

City / Town	FY15 Fire Budget	Total Overtime Budgeted	OT % of Budget
Concord	\$12,697,323	\$611,036	4.81%
Derry	\$10,689,254	\$754,025	7.05%
Portsmouth	\$7,759,719	\$577,000	7.44%
Dover	\$7,502,246	\$658,000	8.77%
Londonderry	\$6,510,218	\$642,409	9.87%
Salem	\$10,174,818	\$1,080,870	10.62%
Mean	\$9,222,263	\$720,557	8.1%

Source: Fire Department Surveys January 2015

ADDING ADDITIONAL SHIFT PERSONNEL COMPARED TO COVERING VACANCIES WITH OVERTIME

The 2006 Matrix study recommended adding additional personnel as a cost-neutral opportunity to redistribute funds from the overtime lines to the salary lines. Table 18 explores the net costs or savings of adding 4 additional firefighter positions as a method to reduce overtime.

Table 18 Add 4 Firefighter Positions Cost Projections

	Year 0-1	Year 1-2	Year 2-3	Year 3-4	Year 4-5	Year 5 +
<i>Additional Staff Cost</i>						
Firefighter -Paramedic	\$42,908	\$45,268	\$47,761	\$50,383	\$53,154	\$56,079
Clothing	\$600	\$600	\$600	\$600	\$600	\$600
Health	\$28,414	\$29,408	\$30,438	\$31,503	\$32,606	\$33,747
Dental	\$1,331	\$1,331	\$1,331	\$1,331	\$1,331	\$1,331
Retirement	\$12,512	\$13,200	\$13,927	\$14,692	\$15,500	\$16,353
Medicare	\$622	\$656	\$693	\$731	\$771	\$813
LTD	\$207	\$218	\$230	\$243	\$256	\$270
Total Benefits	\$43,479	\$45,196	\$46,988	\$48,856	\$50,807	\$52,844
Total Cost for 1 Firefighter	\$86,387	\$90,464	\$94,749	\$99,239	\$103,961	\$108,923
Total Cost for 4 Firefighters	\$345,548	\$361,855	\$378,995	\$396,958	\$415,844	\$435,693
<i>Overtime Cost</i>						
1 Position per shift x 24 / 365	\$303,129	\$303,129	\$303,129	\$303,129	\$303,129	\$303,129
Retirement	\$88,392	\$88,392	\$88,392	\$88,392	\$88,392	\$88,392
Medicare	\$4,395	\$4,395	\$4,395	\$4,395	\$4,395	\$4,395
Total	\$391,521	\$391,521	\$391,521	\$391,521	\$391,521	\$391,521
Net Savings	\$45,974	\$29,667	\$12,526	-\$5,436	-\$24,323	-\$44,172

FY15 Salaries and benefits

DISTRIBUTION OF FACILITIES AND APPARATUS

Station 1: 170 Court Street. Built in 1919

Station 1 serves as the fire department's Central Fire Station. Built in 1919 in the Downtown District, the facility originally served as the department's main fire station housing all personnel and equipment. The location of the Central Station is consistent with the risks of a business and commercial district surrounded by residential properties of the early 20th Century. The Court Street location is easily accessible to all major routes and bridges. The station houses Engine 1 and Ambulance 1, with an engine and ambulance in reserve.

Station 2: 3010 Lafayette Road. Built in 2010

Situated along the southern portion of Portsmouth's US Route 1, Station 2 was constructed in 2010 and replaced the original Station 2 that was built at the corners of Lafayette Road and Heritage Avenue. Planned to protect the growing residential and retail occupancies of the southern area of the city, the original station was considered to be the "rural" station that housed one (1) engine company. In 2010, a new fire station was constructed at the corners of Lafayette and Ocean Roads. The new station provides additional space for both apparatus and personnel, along with a 50-person training room / emergency operations facility. Currently, Ladder 2 and Tower 5, Ambulance 2, and the Forestry Unit run out of this station.

Station 3: 127 International Drive. Built circa 1950

Formally the structural fire station for the Pease Air Force Base, the city began to staff Station 3 in 1994 after the base closed. The area was speculated to become the industrial and economic engine of the greater seacoast and Portsmouth under the auspices of the Pease Development Authority. Initial equipment resources were to respond within the former military base, to the north and western portions of the city, which included NH Route 16/4, Interstate 95, and the retail district along Woodbury Avenue, Route 33, Panaway Manor (residential), and Schiller Power Station (PSNH). The initial staffing consisted of an engine with one officer and two firefighters. The station was open approximately three years when, in January 1997 due to a failure of the City

and PDA to come to agreeable terms for adequate funding of staffing, the station was closed. The City Council assumed that the City was subsidizing growth and development of the Pease Tradeport and elected not to fund the operation of the station. However, staff for the station was re-assigned to Station 1; primarily to day shifts. Retirements and minimum staffing levels supported this administrative move. After the City and PDA came to an agreement, the station was reopened in August 1998. The station experienced reduced staffing and intermittent closure during 2012. Today the primary response unit in the station is Engine 3 with Engine 4 in reserve.

Response Districts

The city is divided geographically into three primary response districts; 1, 2, and 3. These response districts or zones were initially established based on station locations and anecdotal travel times from those fixed facilities to specific areas within the city. Sometime in the 1990s a special sub-district was defined in District 1. Known as District 4, this district is the older, high occupancy and congested area of downtown. In 2005, a travel time survey was conducted by the PFD as part of a *Standard of Coverage* project. Using posted speed limits (plus or minus 5 mph), actual travel times were documented along primary routes in the city from each fixed fire station facility. The response district boundaries were then revised based on 6 minute travel time routes. The response district boundaries were again revised following the opening of the new Station 2 in 2010. In addition to a new location of a fire station and reassignment of resources, the PFD was experiencing increased call volume in both fire (13.6%) and ambulance (15.1%) over the previous year. Two additional response districts were subsequently added; District 5 located between 1 and 3, and District 6 that focused on the interstate and Spaulding Turnpike (Appendix .3).

Table 19 Response District Primary Response Units

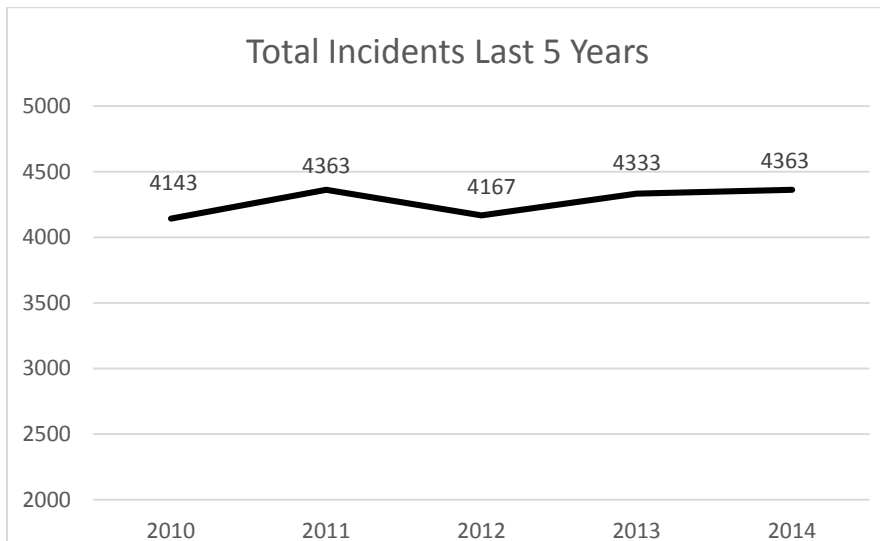
District	Station	Primary Fire Unit (s)	Primary EMS Unit
1	1	Engine 1	Ambulance 1
2	2	Ladder 2	Ambulance 2
3	3	Engine 3	Ambulance 2
4	1	Engine 1	Ambulance 1
5	3	Engine 3	Ambulance 1
6	3	Engines 3 and 1	Ambulance 1

Source: PFD Procedures

DEMAND FOR SERVICES

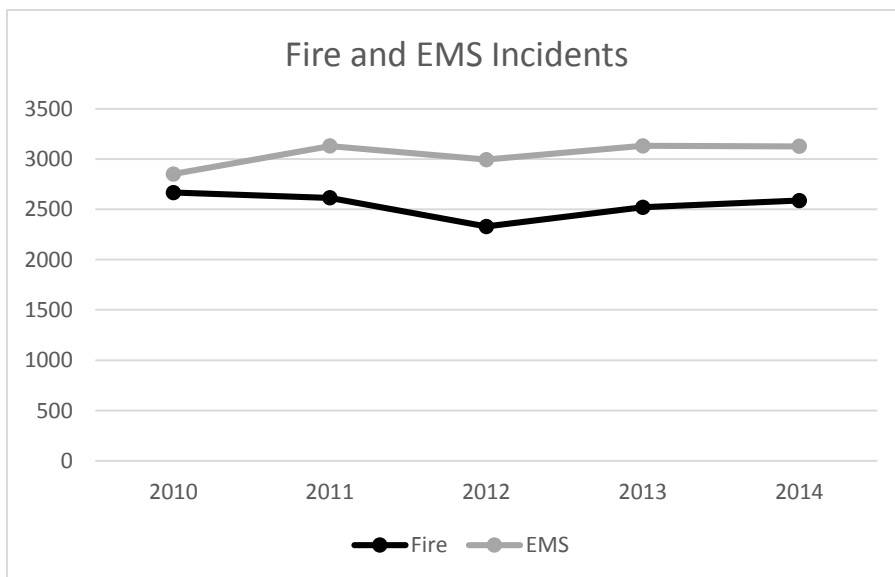
The PFD currently provides fire protection, advanced life support ambulance, fire prevention, hazardous materials response, marine, and special rescue services to the seacoast community of Portsmouth, New Hampshire.

Figure 7. Total Incident Activity for Last 5 Years



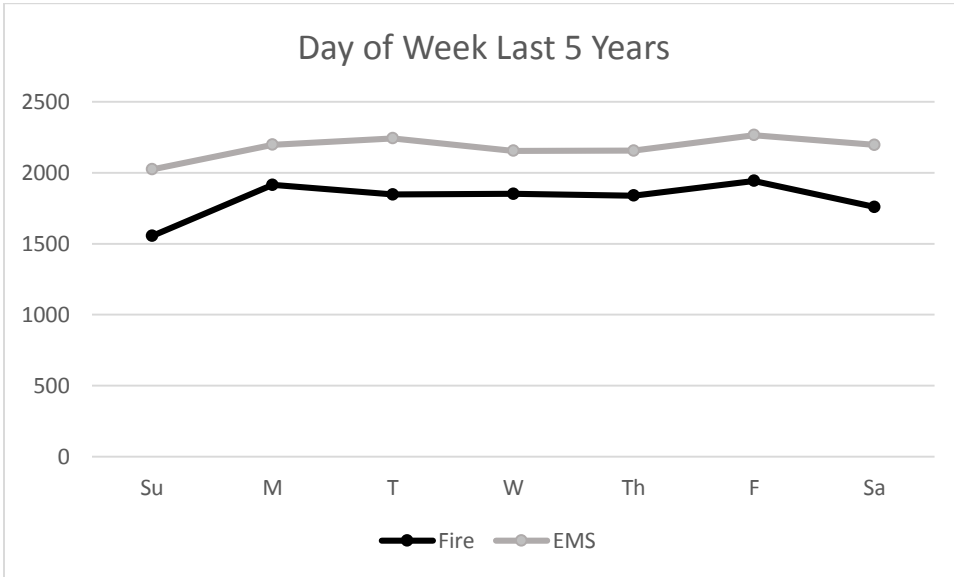
Source: PFD NFIRS and NHTEMSIS Data 2010-2014

Figure 8. Fire and EMS Activity for Last 5 Years



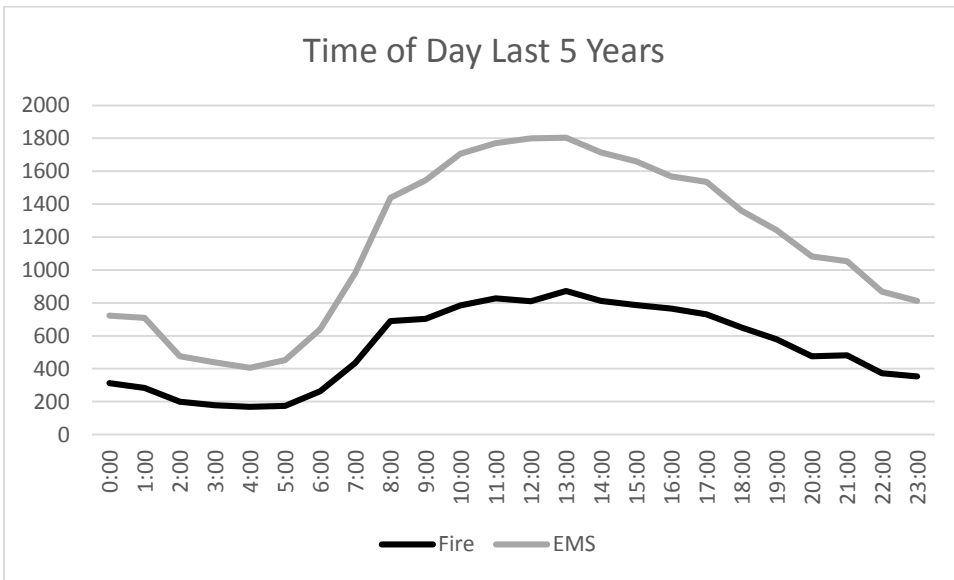
Source: PFD NFIRS and NHTEMSIS Data 2010-2014

Figure 9. Fire and EMS Incidents by Day of Week for Last 5 Years



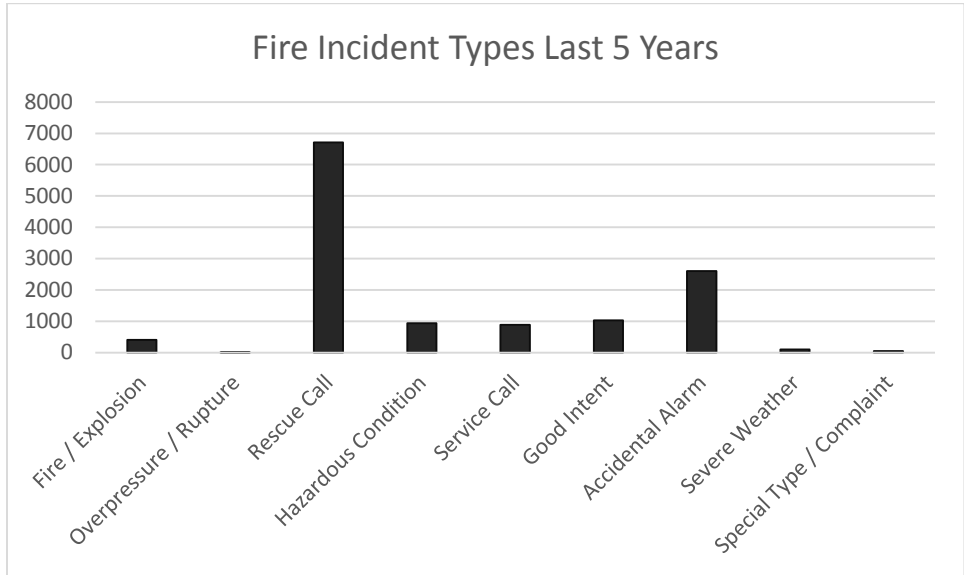
Source: PFD NFIRS and NHTEMSIS Data 2010-2014

Figure 10. Fire and EMS Incidents by Time of Day for Last 5 Years



Source: PFD NFIRS and NHTEMSIS Data 2010-2014

Figure 11. Fire Incidents by Category Last 5 Years



Source: PFD NFIRS and NHTEMSIS Data 2010-2014

Table 20 Fire Responses by Occupancy Type for Last 5 Years

Occupancy Type	Total	%	Yearly Avg.
Assembly	437	3.4%	87.4
Restaurant	426	3.4%	85.2
Passenger Terminal	21	0.2%	4.2
Theater	34	0.3%	6.8
Educational	164	1.3%	32.8
Day Care	14	0.1%	2.8
Health Care	1,477	11.6%	295.4
Detention	31	0.2%	6.2
1 or 2 Family Residential	2,140	16.8%	428
Multi-Family Residential	2,168	17.1%	433.6
Residential Boarding	210	1.7%	42
Hotels	544	4.3%	108.8
Business / Mercantile	1,496	11.8%	299.2
Recreational / Open Land	211	1.7%	42.2
Industrial	421	3.3%	84.2
Street / Highway	2,713	21.3%	542.6
Storage	203	1.6%	40.6
Total	12,710		

Source: PFD NFIRS Data 2011-2014

Demand for Fire Services Based on Area of City

Table 21 Fire Incidents by District Last 5 Years

District	Total	%
District 1	6,977	54.9%
District 2	2,055	16.2%
District 3	3,441	27.1%
Outside City	237	1.9%

Source: PFD NFIRS Data 2011-2014

Demand for All Services Comparison

Table 22 Town/City Demand for Services Comparisons

	Concord	Derry	Dover	Londonderry	Portsmouth	Salem
Total Incidents (2014)	7,647	4,193	5,480	3,186	4,363	4,994
Fire	2,599	1,112	2,384	1,413	1,236	1,382
EMS	5,048	3,081	3,096	1,773	3,127	3,612

Source: Derry Fire Department Comparison Survey. January 2015

The percentage of EMS incidents compared to fire incidents for the PFD is 72% to 28%. This is consistent with both Derry and Salem, but higher than the remaining departments. The average for all six communities is 66% EMS and 34% fire. According to the state Fire Marshal's office, 61% of all calls for service placed to New Hampshire fire departments in 2013 were for medical treatment, up from 60.6 % in 2012 and 57.66 % in 2011 (Feely, April 2015). This is consistent with national trends. According to the NFPA, the percent of EMS calls to fire departments in 1986 was 54% and by 2012 it had risen to 68%.

PFD Ambulance Service

The PFD began providing ambulance service to the city in 1945. Research indicates that the PFD ambulance service is one of the oldest and continuously operating ambulance service in New Hampshire. Today the PFD maintains two staffed and one reserve ambulance. All PFD shift personnel, including the three chief officers, are certified emergency medical providers. As of January 1, 2015, the department consisted of 25 Paramedics, 26 Advanced EMTs, and 9 EMT-Basics.

HeartSafe® Community

The City of Portsmouth is a New Hampshire HeartSafe® Community, which is a State and National level recognition program based on the Chain of Survival. The purpose of the program is to recognize the excellent work being done by EMS programs throughout New Hampshire, and to provide further opportunities to enhance community partnerships, resources and services to improve cardiovascular health, and decrease deaths due to cardiovascular-related events, including sudden cardiac arrest, heart attack and stroke.

Demand for Ambulance Services

Table 23 Top 10 EMS Incident Types for Last 5 Years

Top Ten Incident Types	Occurrences	%
Fall Victim	2,139	14.04
Motor Vehicle Crashes	1,619	10.63
Breathing Problem	1,482	9.73
Other	1,202	7.89
Chest Pain	1,167	7.66
Unconscious / Fainting	875	5.74
Sick Person	779	5.11
Medical Alarm	520	3.41
Seizures	490	3.22
Psychiatric / Behavioral	478	3.14

Source: NHTEMSIS Data 2010-2014

Table 24 EMS Incidents by District for Last 5 Years

District	Total	%
District 1	8,436	70.3%
District 2	1,782	14.9%
District 3	1,774	14.8%
Outside City	780	6.5%

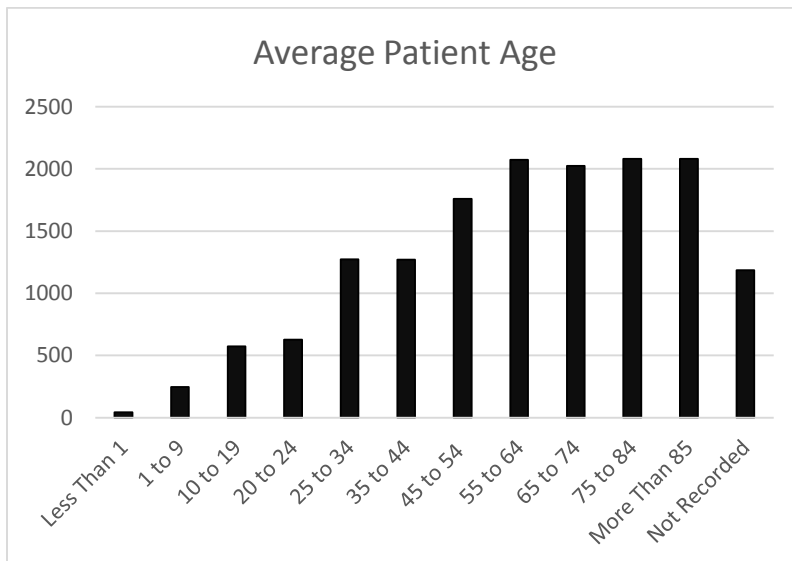
Source: PFD NHTEMSIS Data 2010-2014

Table 25 EMS Responses by Location Type for Last 5 Years

Location Type	Total	%	Yearly Avg.
Home / Residence	7,159	46.98	1432
Street or Highway	2,570	16.87	514
Health Care Facility	2,085	13.68	417
Trade or Service (business, restaurant)	1,865	12.24	373
Public Building (school, office)	466	3.06	93
Residential Institution	403	2.64	81
Other	281	1.84	56
Place of Recreation or Sport	163	1.07	33
Unknown	70	0.46	14
Airport	63	0.14	13
Industrial	53	0.35	11
Lake, River, Ocean	36	0.24	7
Not Applicable	11	0.07	2
Mine or Quarry	3	0.02	1
Not Recorded	1	0.01	0

Source: NHTEMSIS Data 2010-2014

Figure 12 Average Patient Age over the last 5 years



Ambulance Staffing Requirements

New Hampshire Administrative Rule *Saf-C 5900 Emergency Medical Services* (Statutory Authority: RSA 153-A: 20), sets the following staffing requirements for ambulances operating and licensed in New Hampshire:

- The staffing level in each EMS land or water vehicle shall, at minimum, include 2 providers during patient transport, at least one of whom shall attend the patient.
- The 2 providers on board a land or water vehicle shall be licensed at one of the following levels: First Responder, EMT-Basic, EMT-Intermediate, or EMT-Paramedic.

During transport of a patient(s) in a land or water vehicle, the provider who is responsible for the patient care shall be licensed at one of the following levels: EMT-Basic; EMT-Intermediate; or EMT-Paramedic.

NFPA 1710 Staffing and Deployment Standards for EMS

- A fire department first responder with an automated external defibrillator (AED) shall be deployed to provide for the arrival of the AED within a 4-minute travel time to 90 percent of the incidents.
- A fire department providing Advanced Life Support (ALS) shall be deployed to provide for the arrival of an ALS company within an 8-minute travel time to 90 percent of the incidents provided a first responder with AED or BLS unit arrived in 4-minutes or less travel time.
- Personnel deployed to ALS emergency responses shall include a minimum of two members trained at the emergency medical technician–paramedic level and two members trained at the emergency medical technician–basic level arriving on scene within the established travel time.

Additional Requirements

New Hampshire RSA 153-A:11 Licensure of Emergency Medical Care Providers states that except for automated external defibrillation pursuant to RSA 153-A:28-31, a person shall not provide emergency medical services as a paid or volunteer member of a public or private emergency medical services unit in this state, or as a paid or volunteer member of any police or fire department who, as a condition of employment, may be expected to routinely provide emergency medical services in the line of duty, without being licensed by the commissioner. The interpretation of this statute is that although a fire department may not provide ambulance services, employees of the department must be licensed emergency care providers if the department responds to and provides initial emergency care on a regular basis.

FACTORS IMPACTING DEMAND FOR SERVICES

As discussed earlier in this study, the staffing and deployment of apparatus and facilities is driven by a number of factors. They include the demographics of a community, the nature of risks and hazards in the service area, demand for service requests, the type and age of buildings in the community, and the type of occupancies (i.e. residential, commercial, industrial). The following should be considered in the planning of current and future operations of the PFD.

Demographics

In March 2012, the City of Portsmouth's Community Development Department reported on the demographic changes in the city. Particular changes they noted from 2000 to 2010 were:

- Portsmouth's population increased by just over 2% from 20,784 in 2000 to 21,233 in 2010
- From 2000 to 2010, there was a slight decrease in age groups up to 17 years.
- There was also a decrease in the 25 to 44 year age group, but an increase in the 45 to 64 age group.
- The vast majority of population inflow (18.9%) and outflow (18.1%) is among individuals aged 20 to 34 years old.
- In comparison to the state and the county, Portsmouth attracts significantly more college graduates.
- Over the last 10 years, median household income rose from \$45,195 in 2000 to \$60,874 in 2010.

According to the U.S. Census Bureau, the population of Portsmouth in 2010 was 21,223 and estimated at 21,440 in 2013 (a 1% increase). Of that, 27.6% are between the ages of 45 and 64 and 15.9% are over the age of 65 (State of NH, 2009). The incident data of the fire department reveals that this segment of the population is responsible for a majority of our emergency responses. According to the U.S. Fire Administration (USFA), older adults (those over 65 years of age) represent one of the highest fire risk groups in the United States, in large part because they are the fastest growing segment of the U.S. population. In the same 2009 USFA report titled *Fire Risks Series; Fire Risks for the Older Adult*, it is noted that unintentional injuries take the lives of approximately 30,000 elderly each year; 1,200 related to fires and burns.

When compared to the rest of the population, older adults have significantly higher fire death rates. In fact, the fire death rate for people over 60 is 20 % higher than the national average. For those over the age of 75, the rate is twice the national average, and for those over 85, the rate is four times the national average. Conversely, older adults are more apt to sustain fire-related injuries as a result of cooking. Smoking and heating fires are the second and third leading causes of fire-related injuries in this population group.

In addition to the demand for fire services associated with fire-related fatalities and injuries, the elderly are also more likely to utilize emergency ambulance services than other population groups. In a 2000 study titled *Patterns of use of emergency medical transport: A population-based study* that was published in the *American Journal of Emergency Medicine*, the author evaluated how often different population groups use emergency medical services (EMS). He found that the rate of use was highest in those older than 65 with the rate increasing exponentially with each increase in age within this age group.

Economy

The New Hampshire Regional Planning Commission's Project Employment Growth, 2012-2022 predicts that the Rockingham region will enjoy job growth of 14.7 percent, the highest of all the planning regions in New Hampshire (Briand, P. January 13, 2015). A leading job generator in the region is expected to be the Pease Tradeport with another 4,000 jobs expected over the next 10 years. According to PDA Director David Mullen, there is currently 9,000 direct-hire jobs at the Pease Tradeport and about 4.4 million square feet of space has already been developed. It is predicted that another 1 million square feet will be created.

CB Richard Ellis / New England in their NH Market Outlook 2014 predicts the Seacoast/I-95 Office market to continue at its current pace. Vacancy rates will decline as local and out-of-state companies spur growth and expansion. Rental rates will increase modestly, as landlords hold firm on asking rents and reduce concession packages. Any new office developments will be centered in Portsmouth and the Pease Tradeport, as higher rents will continue to justify new construction.

Occupancies and Construction

According to the NFPA, characteristics of properties can have significant impact on outcome and associated response requirements. Each property or structure in a community can be considered a hazard that carries inherent risks based on occupancy type and fire load. Occupancy risk is a sublevel of property risk and is established through an assessment of the relative risk to life and property resulting from a fire inherent in a specific building/structure or in generic occupancy classes (e.g. high rise residential). The *NFPA Fire Protection Handbook* defines hazard levels of occupancies by types. High-Hazard Occupancies include high-rise buildings, hospitals, schools, nursing homes, explosive plants, refineries, public assembly structures, and other high life hazard or large fire potential occupancies. Medium-Hazard Occupancies consist of apartments, offices, mercantile and industrial occupancies that may require extensive use of fire fighting forces. Low-Hazard Occupancies usually include one-, two- or three-family dwellings and scattered small business and industrial.

The City of Portsmouth consists of a wide array of occupancy types and is much like other communities in the region as far as Medium and Low-Hazard Occupancies. However, the number of High-Hazard Occupancies is substantially different in comparison to similar NH communities. For example there are 21 hotels, 3 health care and 3 skilled nursing facilities, five multi-unit senior apartment buildings, 319 restaurants, and 163 place of assemblies (occupancy used for the gathering of 50 persons or more). The city is also home to a number of federal buildings, a fuel storage facility, and a marine terminal. The number and location of each type of occupancy and its associated hazard level must be assessed and consistently monitored in order to properly plan resource deployment. This is not only important for the current inventory of occupancies, but for planned future developments.

Over the last 5 years the city has experienced significant commercial and residential development. A review of data provided by the City's Inspection department reveals close to 40 projects that have added 1.5 million square feet of occupancy over the last five years. Significant projects include 10 multi-story commercial

/ residential properties, 3 multi-story businesses, 2 multi-story residential properties and 1 multi-story hotel. Current and proposed developments number in the double digits and include a 5-story commercial residential property and a 5-story, mixed use hotel, event center, and supermarket (Appendix .4).

Overlapping Demands for Services

An aspect of deployment and performance is the ability to respond to emergency incidents with an effective response force. According to the National Fire Protection Association (2010), a fire department's response capability and capacity is a function of a community's resource allocation; which includes a sizeable, effective, and available firefighting and emergency services force. Call volume alone does not impact the availability of resources. Simultaneous or overlapping incidents have as much effect on in-service availability as does a single incident that requires multiple resources (i.e. structure fire).

Simultaneous responses are defined as two or more incidents that occur within the same time period. The parameters of this time period ranges from the initial incident dispatched time through the initial incident in-service and available time. Any subsequent incident that is dispatched during this time period is considered a simultaneous response. Furthermore, if the initial incident is completed and another incident is dispatched that overlaps the "second" incident, that is classified as a separate simultaneous incident. PFD studies conducted in 2010, 2012, and 2014 found that the frequency of multiple incidents occurring at the same time has risen from 15.6% to over 20%. In 2010 this calculated to 646 incidents, 963 in 2012, and 964 for 2014.

RESPONSE TIME ANALYSIS

According to the Commission on Fire Accreditation International (CFAI), response time and those individual time elements within the overall response time are critical components of an organization's ability to positively impact the outcome of an emergency event. Fire growth is exponentially based upon such things as fuel concentrations and elapsed time to interventions. The elapsed time to effective interventions also have a direct relationship in determining survivability and quality of life during medical or traumatic emergencies.

According to the CFAI, total response time consists of (a) notification and alarm processing, (b) turnout time, and (c) travel time. Notification and alarm processing are the time points which an alarm or request for emergency response is received by an agency and the time interval it takes to retransmit that emergency to the specific agency's resources. Turnout time is the time point at which the responding units are notified to the beginning of travel time. The NFPA 1710 benchmark for staffed fire stations is 60 seconds. Travel time is the actual time of travel from turnout to the arrival on scene and is based on criteria for different risk categories and / or the NFPA 1710 standard benchmark 5 minutes.

Notification and alarm processing are the responsibility of an agency's dispatch center. The PFD is dispatched by the Portsmouth Emergency Communications Center which is located at the Portsmouth Police Department. This is a combined public safety dispatch center under the supervision of the police department. Notification and alarm processing is governed by their staffing, policies, and procedures. The PFD is responsible for turnout and travel times and therefore, total response time reported by the PFD is calculated on the sum of turn-out + travel time only.

In 2004, the PFD began to develop Standard of Cover and performance measures as part of the operational budget process. The program was designed based on the NFPA 1710 standard and the CFAI's *Creating and Evaluating Standards of Response Cover for Fire Departments 4 ed.* and addressed three main areas: (a) existing deployment, (b) service level objectives, and (c) performance and reliability. A standard of cover and performance measure document was produced and served as the template for the department's budget presentation on March

1, 2005. The PFD has since monitored performance and reliability of department resources, as well as measuring and revising service level objectives. The integrated time and performance objective statements address structure fire, wildland fires, special hazards, and emergency medical responses (Appendix 2).

The PFD performed an extensive analysis of all incidents that occurred from January 1, 2009 through December 31, 2013. The source of the information was the PFD dispatch database which is part of the PFD’s electronic record management system. The following table and chart provide insight into turnout and response times of the PFD over a 5 year period.

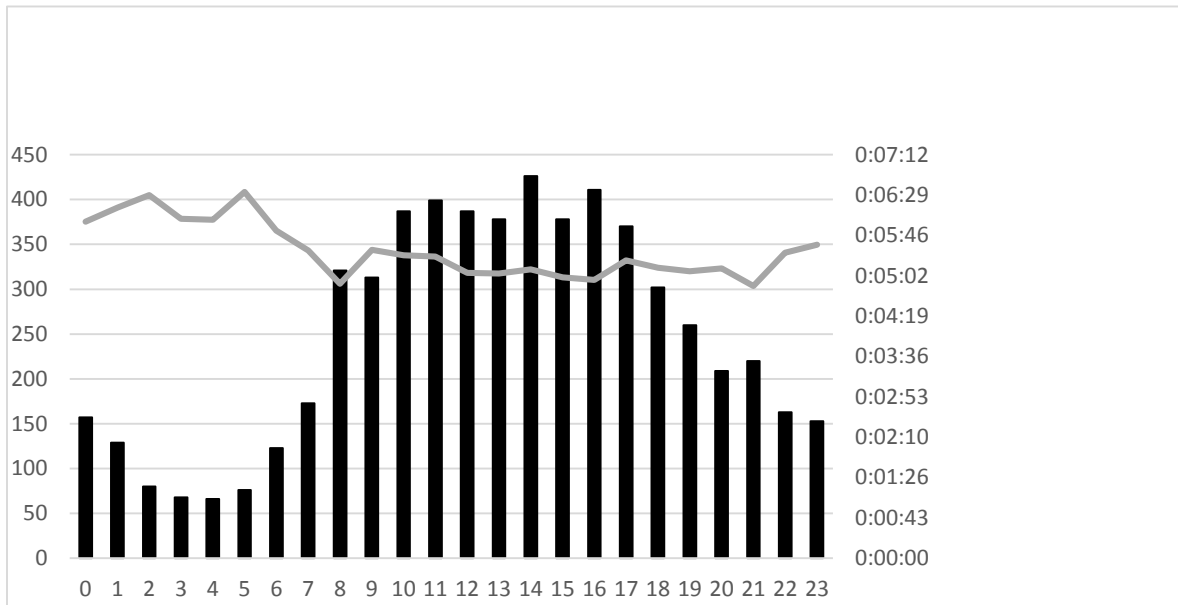
Table 26 Statistics of All Incident Times

	Turnout	Travel	Response
Mean	0:01:32	0:03:55	0:05:34
Median	0:01:46	0:03:25	0:01:34
Max	0:04:05	0:14:00	0:19:54
Min	0:00:01	0:00:01	0:00:01
90 th Percentile	0:02:39	0:07:37	0:09:28

Source: PFD IMC Database 2009 to 2013

As illustrated by the table above, the PFD’s average response time to all incidents is 5 minutes and 34 seconds. The performance benchmark of 90% is 9 minutes and 28 seconds; meaning that 90% of the time, the PFD will arrive in 9 minutes and 28 seconds or less.

Figure 13. Response Time (turn-out + travel) to Priority Incidents by Time of Day



Source: PFD IMC Database 2009 to 2013

The above chart (Figure 13) selected incidents that met “priority” designation. The black bars indicate number of calls per hour and the gray line represents response time trends in minutes. Categories included actual or reported fires, hazardous atmospheres, serious trauma, and serious or potentially serious medical conditions (i.e. chest pain, breathing difficulty, cardiac arrest, and overdose). When these were reviewed, the average response time was 5:18.

Table 31 provides an evaluation of the performance benchmark of 90% for priority incidents only for the years 2010 through 2014.

Table 31 90th Percentile Response Time for Priority Incidents

	2010	2011	2012	2013	2014	Avg.
First EMS Unit D1 and 4	8	8	8	8	8	8
First EMS Unit D2	8	8	9	9	8	8.4
First EMS Unit D3 (5 and 6)	10	10	10	10	10	10
First Fire Unit D1 and 4	7	7	8	8	8	7.6
First Fire Unit D2	7	7	8	6.6	8	7.3
First Fire Unit D3 (5 and 6)	8	8	10	8	9	8.6

CUSTOMER SERVICE

Customer satisfaction surveys can provide valuable insight on how customers view the products offered by a company, as well as what they think about the organization’s customer service operations. The International Customer Management Institute (2001) believes that customer satisfaction surveys allow organizations to view the unfiltered impressions about the service the customer experiences. Online surveys are now the preferred method of obtaining customer feedback because they are the most cost-effective and efficient means of producing data quickly.

Following the formal adoption of Mission and Vision Statements, the PFD developed a 10-question online customer satisfaction survey. The survey is accessible through the PFD web page (www.cityofportsmouth.com/fires) and the link to the survey is also sent out to randomly selected customers of PFD services. To date, there have been 70 respondents to the survey.

Table 32 Customer Satisfaction Survey Results 2013 through 2014

Aspects of Service	Weighted Average Rating	%
Prompt Response	4.61	92.3%
Courteous Personnel	4.64	98.2%
Professional Appearance	4.61	98.2%
Knowledgeable	4.56	98.2%
Demonstrated Concern	4.59	100%
Answered Questions	4.51	92.3%
Problem Solving /Improved Situation	4.64	98.2%
Service Appropriate/Helpful	4.59	98.2%
Overall Satisfaction	4.63	100%

Rating Scale: 5 (Strongly Agree) to 1 (Strongly Disagree)

APPARATUS AND VEHICLES

The Commission on Fire Accreditation International (CFAI) states in their *Fire and Emergency Service Self-Assessment Manual* (2009) that a department's physical resources include fire apparatus and other capital expenditures that make up the property assets of an agency. The CFAI emphasizes the important role these assets play in maintaining an efficient, safe, and effective fire and emergency services department. The CFAI has established benchmark criterion to measure apparatus and vehicles and apparatus maintenance. The following are included performance indicators:

- Apparatus is located to accomplish the stated standards of response coverage and service level objectives.
- Apparatus types are appropriate for the functions served, i.e. operations, staff support services, specialized services and administration.
- There is a replacement schedule for apparatus and other tools and equipment.
- There is a program in place for writing apparatus replacement specifications.
- The apparatus maintenance program has been established.
- Apparatus is maintained in accordance with manufacturer's recommendations, with activity conducted on a regular basis.
- Attention is given to the safety-health-security aspects of equipment.

NFPA Apparatus Descriptions

Aerial Fire Apparatus: A vehicle equipped with an aerial ladder, elevating platform, or water tower that is designed and equipped to support firefighting and rescue operations by positioning personnel, handling materials, providing continuous egress, or discharging water at positions elevated from the ground.

Pumper: Fire apparatus with a permanently mounted fire pump of at least 750 gpm (3000 L/min) capacity, water tank, and hose body whose primary purpose is to combat structural and associated fires.

Quint: Fire apparatus with a permanently mounted fire pump, a water tank, a hose storage area, an aerial ladder or elevating platform with a permanently mounted waterway, and a complement of ground ladders.

Special Services Fire Apparatus: A multipurpose vehicle that primarily provides support services at emergency scenes.

Ambulance: A vehicle used for out of hospital medical care and patient transport, which provides a driver's compartment; a patient compartment to accommodate an emergency medical services provider (EMSP) and one patient located on the primary cot so positioned that the primary patient can be given emergency care during transit; equipment and supplies for emergency care at the scene as well as during transport; safety, comfort, and avoidance of aggravation of the patient's injury or illness; two-way radio communication; and audible and visual traffic warning devices.

Current Apparatus and Rolling Stock

The PFD maintains a current fleet 24 vehicles and trailers. The primary response apparatus and vehicles consist of three pumpers, two quints, three ambulances, one special services (heavy rescue), one forestry unit, and one fire boat. Additional units provide for (a) chief officer and prevention response and travel, (b) equipment and personnel transport, (c) municipal fire alarm repair and maintenance, and (d) storage and transport of technical rescue and hazardous material response equipment. The apparatus and rolling stock replacement schedule utilized by the PFD was adopted in 2002. Ambulances are on a 6 year cycle, staff vehicles 7, support 10, pumpers (engines) and quints (ladder trucks) at 15, trailers at 15, and special services apparatus on a 20 year cycle. Table 28 list the apparatus, vehicles, and trailers of the PFD, as well as the year each is scheduled to be replaced.

Table 28 Apparatus and Rolling Stock of the PFD 2015

Unit	Year	Type	Make	Model	Scheduled Replacement
Engine 4	1987	Pumper	E-One	Hush	2002
Rescue 3	1986	Special	Chevy	C-70	2006
Engine 6	1999	Pumper	E-One	Sentry	2014
HazMat	2000	Trailer	Cargo	Express	2015
CP-1	2001	Trailer	Cargo	Express	2016
Utility 3	2002	Fire Alarm	Ford	F550	2012
Forestry 1	2003	Initial Attack	Ford	F350	2013
Ladder 2	2005	Quint	E-One	Hurricane	2020
Tech. Trailer	2005	Trailer	Cargo	CE820STE	2015
Engine 3	2006	Pumper	E-One	Typhoon	2021
Fireboat 1	2006	Marine	Metal Craft	33'6" Boat	2021
Ambulance 3	2007	Ambulance	Ford	E450	2013
Tower 5	2007	Quint	Ferrara	Inferno	2022
Car 4	2007	Staff	Chevy	Tahoe	2014
Car 3	2007	Staff	Chevy	Tahoe	2014
Utility 4	2008	Support	Ford	Ranger	2018
Ambulance 3	2009	Ambulance	Ford	F450	2015
Engine 1	2011	Pumper	E-One	Typhoon	2026
Car 2	2012	Staff	Chevy	Suburban	2019
Ambulance 1	2013	Ambulance	Ford	E450	2019
Car 1	2014	Staff	Chevy	Tahoe	2021
Utility 1	2014	Support	Chevy	Silverado	2024
Utility 2	2015	Support	Chevy	Silverado	2025

Apparatus and Vehicle Activity

The following tables provide information on the emergency responses made, engine hours, and ambulance mileage of the primary and reserve apparatus of the department over the last 5 years.

Table 29 Apparatus and Vehicle Responses

Unit	Responses	%	Yearly Avg.	Weekly Avg.
Ambulance 1	6195	19.5	1239	24
Ambulance 2	4925	15.5	985	19
Ambulance 3*	1178	3.7	235.6	5
Engine 1	7618	23.9	1523.6	29
Engine 3	5551	17.4	1110.2	21
Engine 4*	335	1.1	67	1
Engine 6*	210	0.7	42	1
Ladder 2	2924	9.2	584.8	11
Tower 5	1631	5.1	326.2	6
Heavy Rescue 3*	13	0	2.6	0
Fire Boat 1	27	0.1	5.4	0
Forestry 1	71	0.2	14.2	0
Other**	1171	3.6	234.2	5

*reserve units and those not generally staffed

**staff, support, and mutual aid units

Source: PFD NFIRS and NHTEMSIS Data 2010-2014

Apparatus Performance: Hours and Mileage

Monitoring apparatus performance is an important factor in effectively managing vehicle replacement strategies, establishing optimal preventive maintenance schedules, and identifying vehicle utilization. Two measures that are commonly utilized are mileage and hours. Hours are intended to monitor engine maintenance scheduling for vehicles used frequently in stationary and/or idle conditions (i.e. fire trucks and ambulances) and can provide a more accurate measurement of overall wear and tear on the vehicle. Miles are typically best for other factors such as chassis, suspension, and driveline components. The industry conversion of hours to equivalent miles is 1 hour = approximately 30 miles. For example, a fire truck that has 3,000 total hours could be considered to have a total of 90,000 miles on it.

Table 30 Apparatus Engine Hours

Unit	Total Hrs.	Month / Year	Approx. Annual Avg.
Engine 1	2,778	Jan-14	926
Engine 3	5,546	Jun-14	693
Engine 4*	3,838	Aug-14	43
Engine 6*	8,293	Oct-14	117
Ladder 2	5,398	Dec-14	600
Tower 5	2,107	Nov-14	301

* reserve units

Table 37 Ambulance Mileage

Unit	Total Mileage	Month / Year	Approx. Annual Avg.
Ambulance 1	80,613	Feb-15	20,153
Ambulance 2	24,852	Mar-15	16,568
Ambulance 3*	91,563	Apr-15	13,080

* reserve since 2013

DEPARTMENT FLEET MANAGEMENT COMPARISONS TO BEST PRACTICES

In 2010, an Emergency Vehicle Maintenance Survey was completed to address the need for timely and accurate maintenance management information. This survey was conducted at the request of the City of Minneapolis by FleetAnswers, a leading provider of benchmarking services and fleet management information. Through a cooperative, first-of-its-kind effort, the partnership conducted an extensive industry-wide survey of municipal fleets, and produced a comprehensive report on this much sought-after information. The FleetAnswers survey covered several vehicle types, including Police Cars (metro and highway/county), Ambulances, SUVs used by police and fire departments and a variety of Fire Trucks. Annual average data for all vehicles types requested in the survey included (a) average age, (b) average miles, and (c) lifecycle (miles, hours, years). Table 31 provides a comparison between the PFD and the FleetAnswers (FA) fire vehicle study results.

Table 31 Fleet Management Comparison

	<i>Ambulances</i>		<i>SUV (Fire)</i>		<i>Pumper</i>		<i>Quint</i>	
	FA	PFD	FA	PFD	FA	PFD	FA	PFD
Average Age	4.50	5.30	5.00	5.00	8.30	16.00	7.70	9.00
Average Miles	75,800	66,000	50,000	50,000	5,677	76,348	*	47,890
Life Cycles (Miles)	165,000	100,000	120,750	100,000	98,500	100,000	107,000	70,000
Life Cycles (Hours)	*		*		*	12,000	*	7,000
Life Cycles (Years)	8.00	6.00	9.00	7.00	15.50	15.00	15.80	15.00

* Insufficient Data

The Fire Apparatus Manufacturer’s Association (FAMA) developed the *Fire Apparatus Duty Cycle White Paper* in 2004 (revised in 2007). The paper is an in-depth analysis of many aspects of apparatus replacement, including the key factors to be considered in a typical apparatus replacement schedule including: (a) type of department, (b) fire department workload, (c) population served, (d) demographics served and, (e) topography of region served. For comparison purposes, this study has selected the data for Urban and Suburban areas (Table

32); Urban Area - served by the fire department is obviously metropolitan and consists of high-density housing, industrial, or retail structures and Suburban Area - served is mainly single family housing, light retail or light industry; could be outskirts of metropolitan areas or smaller communities.

Table 32 FAMA Fire Apparatus Duty Cycles

Urban	Runs per Week	Runs per Year	In Service Years	Reserve Service Years	Total Life Expectancy
Newest Pumper	15	780	15	10	25
Newest Aerial	10	520	18	9	27
Newest Rescue	16	832	13	7	20

Suburban	Runs per Week	Runs per Year	In Service Years	Reserve Service Years	Total Life Expectancy
Newest Pumper	15	780	16	11	27
Newest Aerial	10	520	19	10	29
Newest Rescue	16	832	15	7	22

Source: FAMA Fire Apparatus Duty Cycle White Paper revised 2007

Apparatus and Equipment Maintenance

On-duty shift personnel perform the daily and routine checks and inspections of PFD vehicles, tools, appliances and equipment under the supervision of their respective company officers. Minor maintenance matters that cannot be addressed at the station level are forwarded to the PFD part-time mechanic (who is also a full-time firefighter). The part-time mechanic performs minor repairs, maintenance functions, and regular safety inspections. Some circumstances require the determination of whether or not the matter involves taking the vehicle or equipment to (a) a dealership or fleet maintenance facility, (b) out of service, or (c) whether it is of a minor nature where the vehicle or equipment may remain safely in-service.

Table 33 Apparatus Repairs and Maintenance Expenditures for Last 5 years

	Budget FY 11	Actual	Budget FY12	Actual	Budget FY13	Actual	Budget FY14	Actual	Budget FY15
PT Salaries	\$18,000	\$16,671	\$18,000	\$12,228	\$18,000	\$15,612	\$18,000	\$16,622	\$17,000
Repairs-Equipment	\$5,000	\$3,072	\$5,000	\$6,679	\$5,000	\$10,642	\$10,956	\$14,884	\$15,000
Repairs-Apparatus	\$60,000	\$81,234	\$60,000	\$78,532	\$80,000	\$81,173	\$80,000	\$80,000	\$70,000

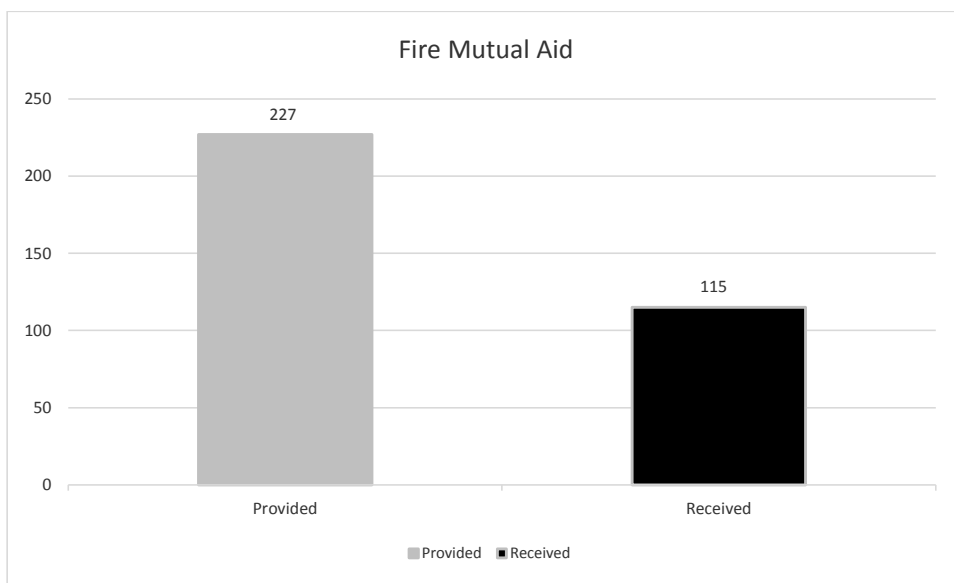
SHARED AND COLLABORATIVE SERVICES

Fire and emergency service organizations can leverage a number of collaborative agreements and efforts in providing cost-effective service delivery to a community. These include mutual aid systems, automatic aid, inter-municipal agreements, contracted services, and group purchasing (GPO). The PFD currently participates and is actively seeking shared and collaborative opportunities.

Mutual Aid

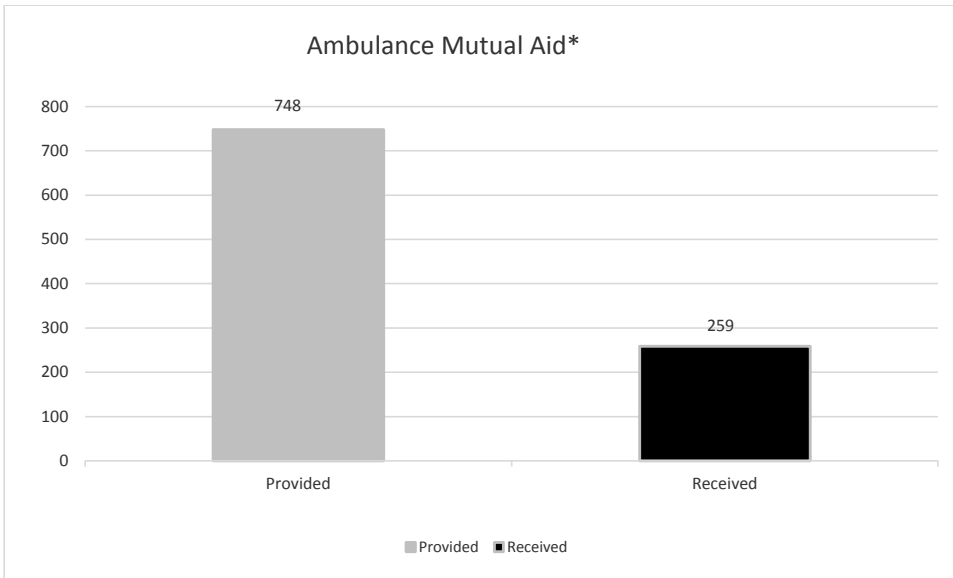
Consistent with New Hampshire RSAs 154:24 (Aid Outside District) the PFD both receives and provides mutual aid response to area communities. The PFD will respond, at no charge, to a request of another fire department with an ambulance or fire unit. The response may be to the scene of an emergency or to provide community coverage from their fire station. This aid is reciprocated by area fire departments to PFD. Data reveals that from 2010 through 2014 the PFD provided approximately twice the amount of fire mutual aid as it received (Figure 14) and close to three times as much ambulance mutual aid (Figure 15).

Figure 14. Fire Mutual Aid



Source: PFD NFIRS and NHTEMSIS Data 2010-2014

Figure 15. Ambulance Mutual Aid



*does not include response to New Castle

Source: PFD NFIRS and NHTEMSIS Data 2010-2014

It is important to note that all provided ambulance mutual aid generates revenue opportunities through billable service fees.

Automatic Aid

Automatic Aid is defined as assistance that is dispatched automatically by a contractual agreement between two fire departments, communities or fire districts whereas mutual aid is assistance that is dispatched, upon request, by the responding fire department (ISO). The only form of automatic aid PFD currently has is with the Town of Greenland, NH in the form of the automatic response of a paramedic staffed ambulance to predetermined, mutually agreed upon reported incident types. This arrangement has been in place since 2011 and provides that any patients transported by the PFD will be billed by the PFD.

Inter-Municipal Agreements

In 2011, the PFD negotiated an ambulance service provider contract with the Town of New Castle. Over the course of the contract, the PFD has responded an ambulance to New Castle 278 times. Revenue generated by this agreement includes an annual fee of \$5,000.00 and an estimated \$9,240.00 in billable ambulance revenue per year.

Mutual Aid District

A Mutual Aid District in New Hampshire may be formed whenever 10 or more municipalities within the state vote to authorize their respective fire departments to render outside aid as provided in RSA 154:24-30. A district fire mutual aid system is a public municipal corporation (RSA 154:30a). The Seacoast Chief Fire Officers Mutual Aid District (SCFOMAD) is such a corporation and is made up of over 40 fire departments primarily located in southeastern New Hampshire, southern Maine, and northeastern Massachusetts. The mission of the organization is to (a) promote an area concept for improved emergency facilities in the fire service, (b) act as a group for discussion of mutual problems and for the development of future improvements for protection of life and property by fire and other hazards, and (c) maintain a current mutual aid agreement between members. SCFOMAD equipment assets include a Mobile Command Unit, 3 Air-trailers, and 2 portable generators / lighting units.

One of the subsidiaries of SCFOMAD is the Seacoast Technical Assistance Response Team (START). START provides all-hazards and all-planning emergency hazardous materials response by combining the resources of the fire service, communities, industry and individuals. This regional concept, as promoted by the SCFOMAD, is progress through cooperation that provides for the protection of life and property while giving top priority to safety and environmental concerns. The team is made up of 40 hazardous material technicians and a Board of Directors from SCFOMAD member fire departments and operates out of two equipment trailers located in Exeter and Portsmouth. These trailers carry a majority of the team's equipment. A portable decontamination shelter is located at the Dover Fire Department. The Team's equipment assets exceed \$250,000. The Team is also

supported by a communications/ research trailer from the PFD.

Membership to SCFOMAD costs the PFD \$200.00 annually and the START assessment, based on population, risk, and equalized valuation, for FY15 is \$8,648.00. The PFD currently has 13 members on the team. Expenditures associated with response, training, and mandatory physical exams of PFD team members are covered by START so long as they are approved by the START Board of Directors. Additionally, the PFD is not responsible for reimbursement to the Team for any and all responses made within the City of Portsmouth.

Opportunities for Shared Services

In 2010, the PFD sought to engage the Town of Newington in a shared services initiative. When former Newington Fire Chief Roy Greenleaf retired, the PFD Fire Chief suggested Newington share a fire chief with Portsmouth and contribute toward the cost, but Newington officials declined. A similar endeavor is currently being explored with the Town of Rye. Again initiated after a retirement, preliminary, official discussions between members of the Rye Board of Selectmen, the Rye Town Administrator, the PFD Commission, and the PFD Fire Chief on shared services have taken place. Unlike the Newington initiative, the Rye Board of Selectmen voted unanimously in January 2015 to meet with Portsmouth fire officials to discuss the possibility of regionalizing some fire services and/or equipment with a goal of reducing costs and increasing services in both communities. Discussion are on-going as of the date of this study.

CALL – VOLUNTEER CONSIDERATIONS

In January 2012, the PFD considered call and volunteer supplemental staffing in a report titled *Exploration of Volunteer, Paid-Call, and Part-time Firefighters Opportunities, Issues, and Impacts*. The terms Volunteer or Paid-Call firefighter at times can be confusing. The Department of Labor (under the Fair Labor Standards Act) defines a volunteer as an individual who works for civic, charitable or humanitarian reasons, without promise, expectation or receipt of compensation. An individual cannot perform the “same type of services” as both an employee and a volunteer. What is more appropriate for today’s fire service is the term Call Firefighter or Paid-Call Firefighter. This category of firefighter receives compensation for his/her participation in response and support to emergency incidents.

Barriers

According to a 1998 National Volunteer Fire Council and U.S. Fire Administration report, *Retention and Recruitment: Problems and Solutions*, 11 factors have contributed to reductions in the number of men and women joining and remaining in the volunteer fire service. These 11 factors included time demands, training requirements, increasing call volume, changes in the “nature of the business” of firefighting, and changes in urban and suburban populations.

Operational Role of a Paid-Call Division

As discussed previously, the PFD on-duty staffing is centered on the timely response of both personnel and resources to requests for services. Understanding that volunteer, or paid-call, emergency responders would not be “on-duty” at one of the three city fire stations, their response and availability would be much like the department’s off-duty full-time employees. Historically, off-duty employees have a response time to their assigned fire station of anywhere between 10 to 20 minutes after notification. In comparison, area call fire departments have stated that their paid-call personnel respond to their assigned stations in 7-10 minutes upon notification during nights and weekends, but longer or not at all during weekday hours. This improved night and weekend time of the area departments is directly related to the requirement that members reside in the town of

their department. Conversely, day time response is poor and can be related to the inability of paid-call firefighters being excused from their primary full-time jobs and that many people do not work in the same town that they live in.

Based on the availability and the anticipated response time of paid-call responders to the fire station, the PFD would use this division not as primary responders, but as support personnel to large or extended incidents or for special details.

Initial and Reoccurring Cost

Volunteer or paid-call members must meet the same minimum training and certification standards of an entry-level department firefighting personnel, as well as actively participate in incident response and on-going proficiency training. They also must be equally equipped and provided a voice / alert pager for response notification. The requisite costs for a volunteer or paid-call firefighter can range from as little as \$4,300.00 per person up to \$6,785.00 (with no previous experience or training).

Reoccurring costs related to each volunteer or paid-call member would be required refresher training costs, Worker's Compensation Insurance, and equipment / uniform maintenance. The cost of approved annual stipend, set amount per incident, or an hourly rate would also have to be factored. This could be anywhere from \$1,000.00 to \$5,000.00 per year per person.

STRENGTHS, WEAKNESSES, AND OPPORTUNITIES

Organizational Structure

- The PFD organizational structure reflects the department's mission, goals, objectives, and complexity.

Mission and Vision Statements

- The PFD mission and vision statements have been recently revised based on a collaborative approach with internal stakeholders.
- The PFD mission and vision statements are published.
- The PFD mission and vision statements should consider the safety and wellness of the employees.

Department Budget

- The PFD budget as a percentage of the City Operating budget has been consistent over the last 4 years.
- The PFD budget as a percentage of the General Fund, excluding schools, is in-line with similar NH Fire Departments. At 22.3% it is 1.6% below the average. Only the Dover Fire Department is less.

Revenues

- Ambulance revenues are substantial and have consistently increased over the last 5 years.
- Ambulance revenues, if added to the PFD budget, would reduce the overall impact of the budget by over 10%.
- Other revenue sources are inconsistent and do not add or detract from the overall budget.
- Reimbursable OT for services rendered have a positive impact on personnel cost by covering salaries and benefits that would otherwise have to be budgeted. The regional hazardous materials team and NH fire standards payroll reimbursements leverage outside funding sources to improve / enhance services.

Revenues

- The PFD should monitor the collection rate for ambulance revenues and seek opportunities to improve rate collection.
- The PFD should compare and benchmark ambulance revenue collection rates to similar NH Fire Departments and its billing company's experience.
- The PFD, working with the City, should evaluate opportunities to utilize ambulance revenues as special revenue or enterprise funds dedicated to fire department capital improvements and rolling stock purchases.
- The PFD, working with the City, should consider charging for inspection services.

Cost for Providing Services

- The PFD cost per call is 7% lower than the average of similar NH Fire Departments.
- The PFD cost per \$1,000.00 based on net appropriations and total equalized valuation, is the lowest of the similar NH Fire Departments.

Deployment and Shift Staffing

- The PFD total permanent staffing has not sustainably increased for the last 17 years.
- The PFD does not meet NFPA 1710 staffing standards for engine, ladder, or total alarm assignment.
- The PFD staffing for apparatus is consistent with the most recent ICMA report.
- The PFD overall department staffing is consistent with similar NH Fire Departments.
- The PFD should strive to deploy the proper amount of personnel to improve efficient and safe operations based on incident risk and complexity.
- The PFD should not reduce the number of available, on-duty firefighters and officers.
- The PFD should request a reassessment of its PPC by the Insurance Services Office.

Hours of Duty

- The PFD work schedule follows acceptable industry practices and is preferred by each collective bargaining unit.
- The PFD work schedule provides the opportunity to manage consecutive hours worked.
- The PFD should monitor the number of consecutive hours worked and set reasonable limits through policy or procedure.
- The PFD should maintain the current work schedule.

Shift Replacement and Overtime Costs

- The PFD grants leave from duty according to department policies and applicable collective bargaining agreements.
- Overtime as a percentage of all hours worked has declined over the last 3 years.
- Predicting shift vacancies due to employee illness / injuries is challenging and has a significant impact on overtime expenditures.
- The PFD absorbs unanticipated overtime expenditures within its overall operating budget; leading to adjustments in other department programs or temporary shift staffing reductions.
- The PFD overtime expenditures, as a percentage of the operating budget, is slightly below the average of similar NH Fire Departments.
- There were no studies, reports, or industry best practices that consistently identified any benchmark related to overtime expenditures as a percentage of an overall budget.
- The PFD should continue to track and monitor overtime expenditures.
- The PFD should consider funding the earned-time overtime account based on actual projected usage and/or probable liability.

Shift Replacement and Overtime Costs

- The PFD should adjust policies, procedures, and/or practices in providing discretionary shift replacement and / or overtime for training or administrative leave in order to properly ensure minimum on-duty shift staffing caused by earned-time, military leave, disability leave, and workers compensation.
- The PFD should consider adopting a wellness-fitness program based on the IAFF/IAFC Joint Labor Management Wellness-Fitness Initiative (WFI) in order to reduce disability and workers compensation leave.

Adding Additional Shift Personnel

- Given the current minimum staffing levels, it would require an additional 4.66 employees to cover shift vacancies to offset overtime expenditures.
- Adding 1 additional firefighter per shift or 4 employees would only result in cost savings for years 1 through 3 and additional expenditures after year 3.
- The PFD, working with both the Officer and Fire Unions, should evaluate alternative work schedules as a means to cover shift vacancies. This could include a shift officer or firefighter assigned to work day shifts.
- The PFD should consider adding additional shift personnel and increase maximum shift staffing in an attempt to be overtime cost neutral only with the appropriate funding to cover the additional salaries and benefits.

Distribution of Facilities and Staff

- PFD fixed facilities are strategically located to provide equal coverage to all areas of the city.
- The PFD, working with the City, should develop a plan for the replacement or significant renovation of both Stations 1 and 3 to ensure they are functional, energy efficient, code compliant, and capable of supporting the operations and equipment of the department.
- The PFD distributes fire apparatus equally, but does not distribute ambulances equally.
- The PFD should consider maintaining an ambulance in each of the three primary response districts.
- The PFD should maintain 3 stations at, or near, their current locations.

Demand for Services

- Demand for services has been relatively stable over the last 4 years.
- Demand for services are relatively consistent throughout the week days.
- Demand for services increase at 7:00 AM and peak between 12:00 PM and 1:00 PM.
- Demand for services represent the occupancies, activities, and demographics of the city.
- Demand for services are higher the closer one is to downtown.
- There is a higher demand for emergency medical services than fire services.

Factors Impacting the Demand for Services

- Demand for services will be impacted by an aging population.
- An increase in health care facilities, older adult communities, and senior housing occupancies will impact service demands.
- Demand for services for the area of the city on or near the Pease Tradeport are likely to increase.
- Demand for services will be impacted by current and projected commercial and residential development.
- The occurrence of simultaneously occurring incidents will continue to impact the ability of the PFD to provide timely and effective response.

Factors Impacting the Demand for Services

- The PFD should continue to actively serve on City committees related to growth and development and the impacts of each on department service delivery.
- The PFD, working with the City, should evaluate opportunities for implementing impact fees to fund or off-set the additional demand for services created by new developments or projects.
- The PFD should not reduce current staffing and deployment standards.
- The PFD should consider adding an additional fire prevention officer to performing place of assembly permits, life safety inspections, and targeted public safety education.

Response Times

- The PFD average response time for all incidents is acceptable.
- The PFD does not meet NFPA response times based on the 90% performance criteria.
- Response times to priority incidents has been relatively consistent over the last 5 years.
- The PFD should continue to monitor response time performance and factors that negatively impact turn-out and travel times.
- The PFD should continue to implement policies, procedures and practices to reduce turn-out and travel times throughout the entire community.

Customer Satisfaction

- The PFD seeks input on services from residents, businesses, and visitors.
- The PFD customer service is rated high.
- The PFD should look to promote and expand access to the survey in order to receive a larger number of responses.

Apparatus and Vehicles

- The PFD has and maintains a comprehensive apparatus and vehicle replacement program.
- Annual and overall individual apparatus and vehicle responses correlates to the role and run order of the units.
- The PFD primary engines annual runs per year is almost twice the industry standard.
- The PFD aerial annual runs per year is consistent with the industry standard.
- The PFD should align its apparatus replacement schedule to current FAMA duty cycles, with consideration to mileage, hours, and run activity benchmarks.
- The PFD should evaluate the need to maintain the current number of reserve and special response apparatus /vehicles.
- The use of a part-time mechanic is cost effective.

Shared and Collaborative Services

- The PFD actively participates in shared and collaborative services.
- The PFD provides more mutual aid than it receives.
- Ambulance mutual aid and automatic aid is a source of revenue.
- The PFD membership and activities in the area mutual aid district leverages outside funding sources to improve / enhance services that would otherwise have to be borne by the City.
- The PFD should continue to explore opportunities for regional shared and collaborative services.

Call – Volunteer Considerations

- A Paid-Call staffing option is not cost-neutral.
- Paid-Call personnel would not improve the on-duty deployment standards established by NFPA 1710.
- Paid-Call personnel could be used to support non-emergency operations.
- The PFD should continue to explore cost-neutral volunteer opportunities within the department.

Appendix .1 PFD Shift Schedule

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 Day Shift : A Night Shift: D	2 Day Shift : A Night Shift: D	3 Day Shift : B Night Shift: A	4 Day Shift : B Night Shift: A	5 Day Shift : C Night Shift: B	6 Day Shift : C Night Shift: B	7 Day Shift : D Night Shift: C
8 Day Shift : D Night Shift: C	9 Day Shift : A Night Shift: D	10 Day Shift : A Night Shift: D	11 Day Shift : B Night Shift: A	12 Day Shift : B Night Shift: A	13 Day Shift : C Night Shift: B	14 Day Shift : C Night Shift: B
15 Day Shift : D Night Shift: C	16 Day Shift : D Night Shift: C	17 Day Shift : A Night Shift: D	18 Day Shift : A Night Shift: D	19 Day Shift : B Night Shift: A	20 Day Shift : B Night Shift: A	21 Day Shift : C Night Shift: B
22 Day Shift : C Night Shift: B	23 Day Shift : D Night Shift: C	24 Day Shift : D Night Shift: C	25 Day Shift : A Night Shift: D	26 Day Shift : A Night Shift: D	27 Day Shift : B Night Shift: A	28 Day Shift : B Night Shift: A
29 Day Shift : C Night Shift: B	30 Day Shift : C Night Shift: B	31 Day Shift : D Night Shift: C	1 Day Shift : D Night Shift: C	2 Day Shift : A Night Shift: D	3 Day Shift : A Night Shift: D	

Appendix .2 Integrated Time and Performance Objective Statements Continued

A. Structure Fire (Maximum and Significant Risk)

Goal

Effective first alarm response force of 14 personnel deployed via two engines, 1 aerial device, two ambulances, plus two chief officers shall respond.

Measure

The first unit shall arrive within 7 minutes total reflex time, for 90% of all requests for emergency services. The completed first alarm units shall arrive within 10 minutes total reflex time, for 90 % of all requests for emergency services. Chief officers shall arrive within 15 minutes total reflex time, for 90% of all requests for emergency services.

Performance Objectives

To stop escalation of a major fire when found. Includes conducting search and rescue, confining fire damage to the area or floor of origin, and limiting extension of smoke and heat damage to area or floor of origin. The tasks of rapid intervention rescue for trapped / lost firefighters, property salvage, and crew rotation with rehabilitation requires at a minimum 14 additional personnel on the fire scene.

B. Structure Fire (Moderate Risk)

Goal

Effective first alarm response force of 14 personnel deployed via two engines, 1 aerial device, two ambulances, plus a minimum of one chief officer shall respond.

Measure

The first unit shall arrive within 7 minutes total reflex time, for 90% of all requests for emergency services. The completed first alarm units shall arrive within 10 minutes total reflex time, for 90 % of all requests for emergency services. The chief officer shall arrive within 15 minutes total reflex time, for 90% of all requests for emergency services.

Performance Objectives

To stop escalation of a minor fire when found. Includes conducting search and rescue, confining fire damage to the area near the room of origin, and limiting extension of smoke and heat damage to the floor of origin. The first arriving unit is capable of starting rescue work or advancing the first line for fire control. Second due units provide additional personnel for tasks already started, plus ventilation, water supply, and firefighter safety support. At a minimum, 8 additional personnel are required on the fire scene.

Appendix .2 Integrated Time and Performance Objective Statements Continued

C. Structure Fire (Low Risk)

Goal

Effective first alarm response force of 14 personnel deployed via two engines, 1 aerial device, two ambulances, plus a minimum of one chief officer shall respond.

Measure

The first unit shall arrive within 7 minutes total reflex time, for 90% of all requests for emergency services. The completed first alarm units shall arrive within 10 minutes total reflex time, for 90 % of all requests for emergency services. The chief officer shall arrive within 20 minutes total reflex time, for 90% of all requests for emergency services.

Performance Objectives

To stop escalation of a minor fire when found. Includes conducting search and rescue, confining fire damage to the area near the room of origin, and limiting extension of smoke and heat damage to the floor of origin. The first arriving unit is capable of starting rescue work or advancing the first line for fire control. Second due units provide additional personnel for tasks already started, plus ventilation, water supply, and firefighter safety support.

D. Wildland Fire (Significant and Moderate Risk Interface Zones)

Goal

Effective first alarm response force of 10 personnel deployed via two engines, one forestry, one ambulance, plus a minimum of one chief officer shall respond.

Measure

The first unit shall arrive within 7 minutes total reflex time, for 90% of all requests for emergency services. The completed first alarm units shall arrive within 10 minutes total reflex time, for 90 % of all requests for emergency services. The chief officer shall arrive within 15 minutes total reflex time, for 90% of all requests for emergency services.

Performance Objectives

To stop the escalation of a major or serious fire when found. Includes controlling the fire to the area of origin on a high fire danger day without spread to adjacent structures or escalating to a size requiring significant additional resources including mutual aid.

Appendix .2 Integrated Time and Performance Objective Statements Continued

E. Special Risk, Hazardous Material Incidents, Technical Rescues

Goal

Effective first alarm response force of 8 personnel deployed via two engines, one ambulance, plus a minimum of one chief officer shall respond.

Measure

The first unit shall arrive within 7 minutes total reflex time, for 90% of all requests for emergency services. The completed first alarm units shall arrive within 10 minutes total reflex time, for 90 % of all requests for emergency services. The chief officer shall arrive within 20 minutes total reflex time, for 90% of all requests for emergency services.

Performance Objectives

To stop the escalation of a serious fire, rescue, or hazardous materials emergency when found. Includes controlling the fire to the area of origin without spread to adjacent structures, rescuing trapped occupants, or containing the spread of a hazardous materials release.

F. Emergency Medical Service -Significant Risk (Mass Casualty)

Goal

Effective first alarm response force of 14 personnel deployed via two engines, 1 aerial device, two ambulances, plus a minimum of one chief officer shall respond

Measure

The first unit shall arrive within 7 minutes total reflex time, for 90% of all requests for emergency services. The completed first alarm units shall arrive within 10 minutes total reflex time, for 90 % of all requests for emergency services. The chief officer shall arrive within 15 minutes total reflex time, for 90% of all requests for emergency services.

Performance Objectives

To stop the escalation of the medical emergency beyond the level of severity found upon arrival. Includes aggressive triage, treatment and transport. Additional significant response resources are required including mutual aid.

Appendix .2 Integrated Time and Performance Objective Statements Continued

G. Emergency Medical Service -Moderate Risk (Critical or Serious Medical or Traumatic Event)

Goal

Effective first alarm response force of 5 personnel deployed via one engines and one ambulance, which includes a minimum of one paramedic certified provider, shall respond.

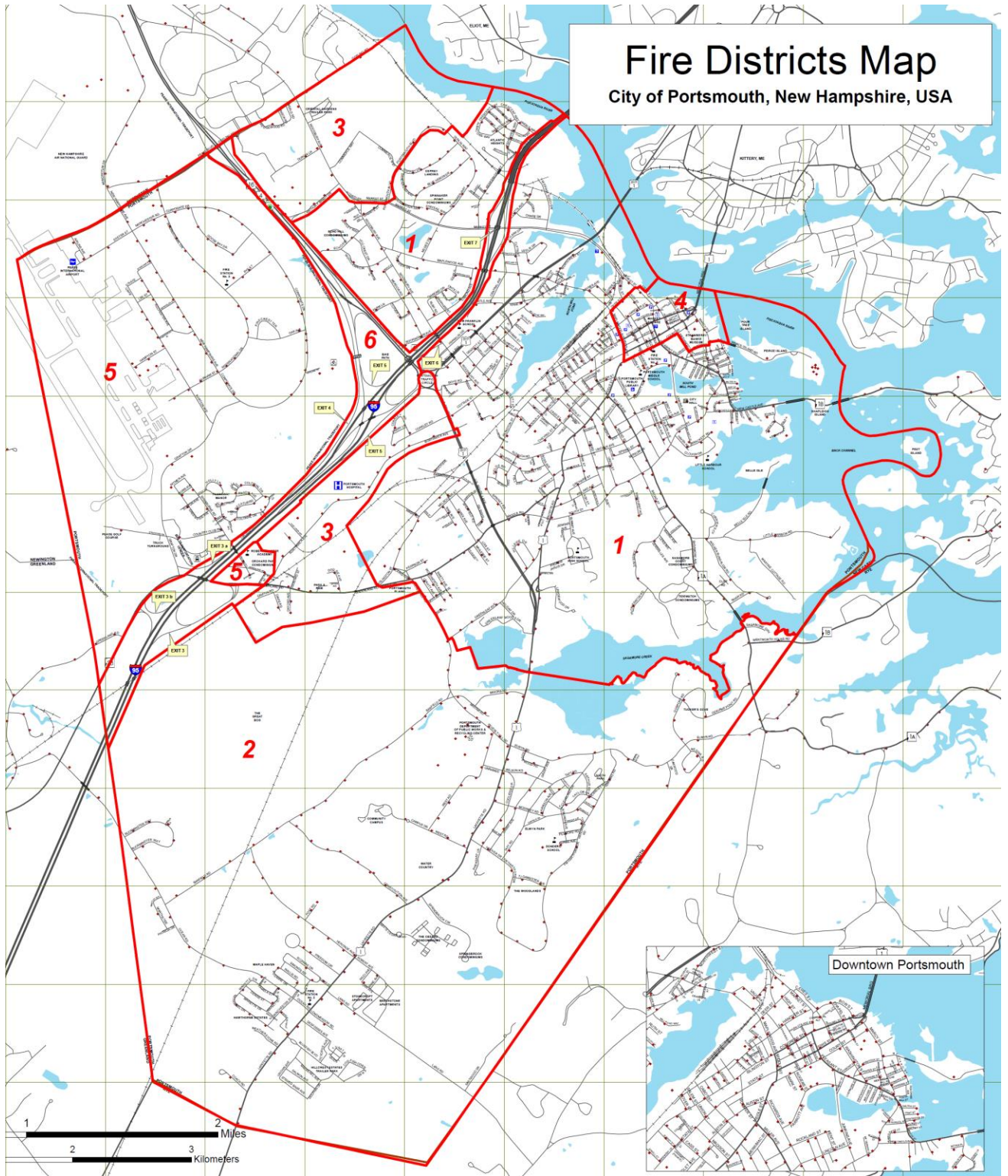
Measure

The first unit shall arrive within 7 minutes total reflex time, for 90% of all requests for emergency services. The completed first alarm units shall arrive within 8 minutes total reflex time, for 90 % of all requests for emergency services.

Performance Objectives

To stop the escalation of the medical emergency beyond the level of severity found upon arrival. Includes patient assessment, basic and advanced life support measures, and / or rescue as necessary for three or fewer patients.

Appendix .3 Fire District Map



Appendix .4 Current and Projected Building Projects in Portsmouth

- Final tenant space fit-ups at Portwalk III. Possible 2 additional restaurants
- 3-story commercial / residential on Maplewood Avenue
- 5-story commercial / residential on Maplewood Avenue
- Harbor Corp. project. 5-story mixed use to include 96 room hotel, 103,000 sq. ft. event center, 14 condominiums, 40,000 sq. ft. supermarket, below grade parking, and 390 space parking garage
- 4-story office building on Commerce Way
- Medical Office Building on Lafayette Road
- 5 building, 14 unit residential development on Islington Street
- Renovation and construction of 2 new buildings at Connie Bean complex
- 4-story mixed use on State Street
- 5-story mixed use on Vaughn Street
- Business occupancy on Corporate Drive