

# A PERFORMANCE REVIEW & AUDIT FIRE AND RESCUE CITY OF PAWTUCKET, RHODE ISLAND



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Mayor Donald R. Grebien  
City of Pawtucket  
137 Roosevelt Avenue  
Pawtucket, Rhode Island 02860

Dear Mayor Grebien:

I am pleased to submit with this letter our Report on the Fire & Rescue Performance Review and Audit for the City of Pawtucket, Rhode Island.

The Audit Team would like to acknowledge the excellent cooperation that we received from City officials and the members of the Pawtucket Fire Department. If you have any questions relative to this Performance Review and Audit, please contact my office.

Sincerely,



Leslie D. Adams  
President

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## **EXECUTIVE SUMMARY**

### **THE CITY OF PAWTUCKET**

Pawtucket was founded in 1671 and is a city in Providence County, in the Providence-New Bedford metro area. It is centrally-located in the northwestern corner of the State of Rhode Island. The City has the distinction of being the fourth largest city in the state.

The City of Pawtucket is just northeast of the state capital city of Providence and home to many industries, most notably Hasbro Toys. Located along the state border with Massachusetts, the city encompasses less than 9 square miles of mostly urban and industrial development scattered in different areas of the city. A major interstate (I-95) and several state highways traverse through the city, along with several major rail routes. The Seekonk River also splits the city and flows into the Narraganset Bay on the south side of the city.

The City is bordered by the following:

- North Providence to the west;
- Providence to the southwest;
- East Providence to the southeast;
- Seekonk, Massachusetts, to the east;
- Attleboro, Massachusetts, to the northeast;
- Central Falls to the north; and,
- Lincoln to the northwest.

As of the 2000 Census, in the City there were:

- 72,958 persons
- 30,047 households
- 18,508 families

Today, according to its website, the City includes:

- Major residential areas with 30,000 housing units
- An employment center with 300 industries
- 1,000 commercial and service establishments

### **City Government**

In 1954, a home rule charter went into effect that provides a strong mayoral and unicameral City Council form of government, which provides a clear organizational format.

### **THE PAWTUCKET FIRE DEPARTMENT**

The Pawtucket Fire Department (PFD) provides fire, rescue, and emergency medical services to the City. It is headed by the Fire Chief and Assistant Chief.

The official Pawtucket Fire Department Statement of Policy included in the Rules and Regulations of the Fire Department is as follows:

#### **Statement of Policy**

“The Pawtucket Fire Department shall be responsible for the protection of all life and property within the City from fire and shall enforce all laws, ordinances and regulations relating to Fire Prevention and the Rhode Island Fire Safety Code. It shall further be responsible for the organization and maintenance of the Rescue Division now in operation for as long as deemed appropriate by the City of Pawtucket.”

The emergency and other services provided by the PFD include the following:

- Fire suppression
- Emergency medical services (rescue)
- Communications and dispatch of fire units
- Hazardous materials response
- Automobile accident extrication

## **PFD ORGANIZATION**

As outlined in the Pawtucket Fire Department Rules and Regulations the Bureaus of the Division (PFD) are:

- Fire Fighting
- Rescue
- Fire Prevention
- Training
- Fire Alarm and Communications

To attain the delivery of optimum fire and emergency medical service, it is essential that local government recognize and accept that responsibility and fulfill that obligation to provide appropriate guidance and direction in order to:

- Oversee the formation process of the organization of fire and EMS services;
- Ensure that the fire/EMS organization reflects the public interest;
- Protect the service from undesirable external interference;
- Determine basic policies for providing services; and,
- Legally define the duties and responsibilities of service providers.

## **Organizational Issues**

During the Audit Team's interviews and discussions, a number of reasons were cited to justify the need to upgrade the organization of the Pawtucket Fire Department, including:

- Outdated organization chart, which does not reflect the actual day-to-day reporting relationships
- Increasing cost to the City for funding the PFD
- Significant number of fire house facilities needing renovation, major repairs, and/or replacement
- Substantial amount of fire station furniture and equipment is aging and in need of replacement
- Functions not provided with adequate oversight
- Unclear day-to-day program reporting relationships
- Potential excessive number of fire stations

- Apparent desire on the part of a number of fire department members to implement upgraded EMS delivery services

The organization options and recommendations include:

1. Updating the PFD organization chart;
2. Updating and re-issuing comprehensive state-of-the-art Rules and Regulations;
3. Enhancing the utilization of the Assistant Chief to include responsibility for specific functional areas;
4. Assigning important functional tasks to the battalion chiefs and staffs of the fire stations;
5. Providing a second full-time civilian administrative staff member to the PFD;
6. Removing the fire assistant chief position from the union to create a “management team” within the PFD; and,
7. Removing the battalion chief positions from the union to create a “management team” within the PFD.

## **STAFFING**

The PFD is administered and operated with the following 127 uniformed staff members:

- 1 - Fire Chief
- 1 - Assistant fire chief
- 4 - Battalion chiefs
- 10 - Captains
- 31 - Lieutenants
- 80 - Firefighters

The staff of the PFD includes one administrative support person.

## **Expenditure of Overtime Funds**

The Audit Team was apprised of the fact that a substantial amount of overtime is being expended each pay period by the Fire Department primarily for apparatus staffing

requirements. Reportedly, the overtime expenditure is estimated at \$2,500,000 in the coming fiscal year. A substantial portion of this overtime is likely due to staffing above the budgeted funding levels.

For the future, with a complete determination of time “off the floor,” including vacation, sick, training, on the job injuries, and details, for example, the City and the PFD may determine what its budgetary firefighter and officer position requirements are from year to year. This would also assist in assuring that the budgeted overtime requirements are appropriately funded for the PFD.

The staffing options and recommendations include:

1. Adopting the suggested staffing formula for the determination of current and future PFD staffing requirements;
2. Conducting a complete determination of time “off the floor,” and using this data to accurately determine budgetary firefighter and officer position requirements;
3. Considering apparatus staffing options at National Fire Protection Association (NFPA) 1710 levels, four person engines and ladders, as PFD organizational changes are made and/or fiscal opportunities are available; and,
4. Considering implementing the 24X48 firefighter work schedule.

## **DEPLOYMENT**

The Pawtucket Fire Department (PFD) has six fire stations with one engine at each station, truck apparatus at two stations, and two rescue ambulance units. The duty battalion chief operates from Station 2 (adjacent to City Hall), where the fire administrative offices are located. Reserve apparatus is stored in available space in four of the six fire stations.

Today, the PFD operates from six fire stations, as follows:

1. Fire Station 1, located at 394 West Avenue
2. Fire Station 2, located at 155 Roosevelt Avenue
3. Fire Station 3, located at 2 Columbus Avenue
4. Fire Station 4, located at 375 Cottage Street

5. Fire Station 5, located at 301 Smithfield Avenue
6. Fire Station 6, located at 385 Newport Avenue

The deployment options and recommendations include:

1. Implementing automatic “closest available” mutual aid with all surrounding municipal fire departments to provide improved safety of firefighters and customers;
2. Considering the implementation of the shared services delivery option referred to as the Western Regional Station Scenario for reduced cost of operations; and,
3. Implementing a four-fire station option (including the Western Regional Station Scenario) for improved cost effectiveness and apparatus staffing by closing Fire Station 3 or Fire Station 6.

## **APPARATUS**

There are four basic types of fire rescue apparatus:

1. Pumpers deliver water from an internal tank, pressurized system, or static source (river, canal or pond) to the fire scene;
2. Aerial devices are vehicles with long extension ladders or platforms;
3. Specialized rescue trucks with equipment for extricating individuals from vehicles, underground entrapment, high locations, entanglement in machinery, and difficult transportation accidents; and,
4. EMS transport units (rescues or ambulances) with basic and/or advanced life support supplies and equipment.

The current primary fire rescue apparatus included in the fleet of the PFD.

**SUMMARY BY APPARATUS TYPE**

<b>TYPE</b>	<b>NUMBER</b>
Engines	8
Ladder Trucks	3
Rescues	4
Special Operations	1
<b>Total</b>	<b>16</b>

Source: PFD.  
Note: Includes two reserve engines, a reserve ladder truck and two reserve rescue units.

Options for the configuration of the PFD apparatus fleet are outlined, including reducing the number of engines in the fleet with the implementation of four- or five-station options, cross staffing an engine and special operations unit, and periodic re-justification of the support vehicle fleet.

An apparatus replacement schedule to provide for long-term scheduling of fire and rescue apparatus replacement was reviewed and suggested for consideration.

The vehicular apparatus options and recommendations include:

1. Continuing to maintain two strategically located ladder trucks;
2. Maintaining three strategically located rescue units, municipal or private;
3. Maintaining a reserve unit for each primary apparatus type (engine, ladder truck, and rescue);
4. Considering cross staffing an engine and the special operations unit;
5. Reducing the PFD apparatus fleet by up to three engines and four rescue units, if the four- or five-station and rescue privatization options are adopted; and,
6. Adopting and implementing a scheduled multi-year apparatus replacement capital equipment program based on adopted criteria as fiscal opportunities develop.

**EMERGENCY MEDICAL SERVICES — RESCUE**

The history of EMS delivery by the Pawtucket Fire Department (PFD) dates back to the 1950s. Many of the more senior PFD personnel interviewed by the Audit Team reported the importance of EMS in the PFD, and there were very few negative comments received about the PFD being involved in full-service EMS delivery. The PFD provides pre-hospital emergency medical service utilizing two (2) ambulance transport units referred to as “rescue” units.

In reviewing response time data for “medical emergencies” only, the Audit Team found the following:

**AVERAGE ARRIVAL TIME OF RESCUE UNITS  
TO MEDICAL EMERGENCIES**

	CY2011	CY2010	CY2009
Rescue 1	5.80 minutes	5.44 minutes	5.37 minutes
Rescue 2	5.13 minutes	4.89 minutes	5.00 minutes

In 2011, PFD’s Rescue 1 and Rescue 2 responded to 9,881 incidents for which they provided 7,359 patient transports to local hospitals. In addition, there were another 842 incidents in the City of Pawtucket in 2011 that required the dispatch of rescue units from surrounding jurisdictions in order to transport patients to the hospital. That means that roughly a little more than 10% of all patients needing emergency transport to a hospital in the City of Pawtucket in CY2011 had to await the arrival of a rescue unit from another jurisdiction. That also means that the potential revenue that would have been generated by PFD rescues on those transports was lost to mutual aid jurisdictions.

There are several hospitals serving the Pawtucket regional area with Memorial Hospital of Rhode Island being the primary transport facility simply because it is located within the City. Most patients transported by PFD units are taken to Memorial Hospital.

An approach taken to the delivery of EMS in many municipalities involves the provision of such services by one or more qualified private ambulance companies. With the private ambulance service approach, EMS services are delivered by a privately owned company for a fee, on a for-profit basis. Typically, a local government would most likely enter into

a written agreement with the private ambulance company identifying the level of services provided and cost of said services.

The emergency medical services options and recommendations include:

1. Partnering with Memorial Hospital in implementing a citizen CPR program;
2. Implementing a public access Automatic External Defibrillator (AED) awareness program;
3. Implementing Emergency Medical Dispatch (EMD) medical dispatch pre-arrival instruction to appropriate 911 callers;
4. Assigning the duties and responsibilities of overseeing the department's delivery of EMS to a chief;
5. Implementing a program that places a third rescue unit in service on a part-time basis during peak demand periods as an alternative to full-time third rescue staffing;
6. Implementing electronic patient care reporting as used by many other EMS response agencies throughout the State;
7. Implementing a written, EMS quality assurance program in compliance with RIDOH's Rules and Regulations Relating to Emergency Medical Services, Section 12—Standards for Ambulances and Ambulance Services; and,
8. Considering utilizing a private ambulance company to provide pre-hospital emergency medical service.

## **TRAINING**

Training in the fire service over the past decade has undergone a revolutionary process because of the changing environment in which it exists. There have been many changes in technology that have resulted in significant improvements in equipment for emergency responder use. The fire, rescue, and emergency medical situations that emergency responders encounter are often more complex in the post-9/11 era; emergency responders in all public safety agencies must now prepare for more large-scale, catastrophic types of incidents, in addition to the traditional fire and rescue incidents.

Based on interviews and documentation there appears to be considerable inconsistencies in training and certification within the Pawtucket Fire Department (PFD). The Audit Team considers these inconsistencies very concerning because, as stated previously, the training function is one of its most critical internal functions of a fire department.

Training impacts nearly every aspect of emergency response operations. Without well-planned and executed training programs, an emergency response organization will most likely struggle to be successful in its endeavors, which may in return impact the safety of its customers and service providers. The items presented in this Report reflect issues of concern.

The training options and recommendations include:

1. Establishing a Training Committee to address the immediate and short-range training needs;
2. Implementing minimum training and certification requirements for PFD officers;
3. Developing a plan by which to deliver any training courses needed for the existing officers;
4. Establishing a continuing education program for PFD officers;
5. Developing and implementing a Probationary Fire Fighter Program;
6. Conducting a complete review of National Incident Management System (NIMS) course completion for the PFD;
7. Developing and implementing a company drill program;
8. Developing and implementing an emergency vehicle driver training program and policy that is NFPA 1002 compliant; and,
9. Constructing a multi-story drill tower that also has some enclosed space for hose line evolutions and a smoke maze.

## **OPERATIONS**

Decisions made at the emergency scene may be irreversible and the consequences of error can be disastrous. Errors can lead to further property loss, as well as injury or death to civilians and firefighters. Successful fire operations require thorough pre-incident

planning; knowledge of the nature and location of buildings; interior contents; and built-in systems.

Every fire department should have a set of rules and regulations that outline performance expectations for its members, the standard operating procedures for the department, and disciplinary actions that can be taken against personnel not following the regulations. The Audit Team found a serious need for an up-to-date, comprehensive policies and procedure manual within the PFD.

Pre-fire planning and building fire inspections performed by firefighters and officers can improve firefighting service. The increased knowledge by firefighting personnel of the buildings and other occupancies in their service area can be very beneficial. Additionally, these activities can result in more productive use of staff time and improve public relations.

The operations options and recommendations include:

1. Developing and implementing fire and life safety programs that target the population groups most likely to suffer from the occurrence of a fire in their home;
2. Working to restrict access to abandoned and vacant properties within the City, specifically the vacant mills and factories;
3. Ensuring that pre-fire plans and pre-fire planning activities are completed for each of the vacant mill and factory properties;
4. Assigning one of the platoon Battalion Chiefs to oversee the Special Operations program as a collateral duty; and,
5. Establishing a policies and procedures committee to provide consistency and coordination of the policy and procedure development process.

## **SAFETY**

The health and safety of firefighters and EMS personnel should be a major concern of those delivering the services, those receiving the services, and those helping to pay for the services.

Individuals working in public safety, particularly firefighting and EMS personnel, perform one of the most physically demanding and mentally stressful occupations in the nation. Quite often, fire and emergency medical personnel are subjected to environments that require rapid, physical, and mental responses with a minimum of preparation.

The Pawtucket Fire Department lacks a comprehensive safety and health program and falls short in many areas of compliance with NFPA 1500. Many professionals in the fire service say that safety is an attitude that must be believed in, that must be communicated, and most importantly, must be enacted. Much work is needed in order for the PFD to attain that position.

The safety options and recommendations include:

1. Developing a written risk management plan for the PFD;
2. Developing a comprehensive written safety and health policy and implementing an organized and effective safety and health program;
3. Developing and implementing an injury reporting and investigation program;
4. Developing and implementing a PFD vehicle collision reporting and investigation program;
5. Appointing a PFD Health and Safety Officer with full authority to act on health and safety matters;
6. Creating a joint labor/management Occupational Health and Safety Committee;
7. Completing a thorough overhaul of the PFD's training program to include the implementation of certification-based training and the development and implementation of a thorough and effective in-service training program;
8. Implementing an Insurance Services Office (ISO) and NFPA-compliant annual pump testing;
9. Developing and implementing a formal, driver training and certification program;
10. Developing and implementing clear and consistent incident management policies and procedures;
11. Requiring all fire officers, at a minimum, to be certified to the Fire Officer I level (NFPA 1021), Incident Scene Safety Officer, and ICS 200 level (NIMS);

12. Requiring all chief officers, at a minimum, to be certified to the ICS 300 and 400 levels (NIMS);
13. Developing and implementing a comprehensive structure fire response procedure that meets NFPA 1500 and addresses the use of an initial 2-out team, the transition to a RIT operation, and a process by which a MAYDAY situation is managed;
14. Developing and implementing a comprehensive incident personnel accountability system that also integrates the use of mutual aid companies;
15. Developing and implementing a post-incident analysis policy and procedure;
16. Installing smoke and carbon monoxide detectors in all fire stations; and,
17. Developing and implementing a fire department infection control program.

## **COMMUNICATIONS**

The fire alarm dispatchers who provide fire and EMS dispatch for the Pawtucket Fire Department are uniformed firefighters employed by the City of Pawtucket.

According to the PFD Organization Chart, the Fire Alarm dispatch function comes under the auspices of the Assistant Fire Chief and the Fire Chief. However, in discussions with various Fire Alarm and other PFD officers, the function was variously stated to be the responsibility of the Training Officer, the Assistant Fire Chief, and the fire prevention captain. There seemed to be a general lack of understanding as to the chain-of-command for the firefighters working in Fire Alarm.

During the course of this project, the Audit Team perceived that there is a desire on the part of a number of area municipalities to consolidate their public safety dispatch centers.

The administrative and overhead costs to operate multiple centers are a sizeable sum. Effectiveness and efficiency improvements, such as shorter call and alarm processing times, can be realized through consolidation to a regional approach. Additionally, the costs of operating multiple full-time facilities, providing security, and maintaining a number of emergency standby generators could be avoided by co-locating 9-1-1 equipment and personnel.

The Audit Team would offer as an alternative that a regionalization of the Public Service Answering Points (PSAPs) would be a more effective and efficient arrangement if the fire and police department were jointly dispatched.

The emergency communications and dispatch options and recommendations include:

1. Ceasing the policy of assigning new hire firefighters to Fire Alarm;
2. Clarifying the chain of command as to who is in charge of Fire Alarm;
3. Taking action to implement “closest unit available” automatic mutual aid dispatching of fire and EMS units;
4. Initiating an effort to have area municipalities participate in a comprehensive study and proceed to implement a regional public safety dispatch center involving as many other area municipalities as possible, potentially including North Providence, Central Falls, East Providence, Lincoln, Cumberland, Johnston, Smithfield, North Smithfield and Woonsocket ; and,
5. Considering civilianizing the PFD Fire Alarm with full-time professionally-trained emergency dispatchers with a qualified civilian dispatch director, in the event a regional approach is not implemented.

## **FIRE PREVENTION**

Chapter 210 of the Code of the City of Pawtucket establishes the Fire Prevention Section of the PFD. Several sections relative to establishment, composition, and duties regulate the Section.

The PFD Fire Prevention Section works to prevent fire and ensure the safety of the residents and business owners/operators through the enforcement of the City Fire Prevention Code and applicable Rhode Island laws.

The Pawtucket Fire Department administers the applicable fire and life safety codes and carries out its related responsibilities within the City of Pawtucket through its Fire Prevention Section. The Section is headed by the Chief Fire Inspector who reports to the Chief of the PFD, as stated in City Code.

The Section is responsible for the following fire prevention-related functions:

- Building inspections
- Building plans review
- Public fire education
- Fire and arson investigations

These are typical responsibilities of a city fire department's fire prevention functions. The Fiscal Year 2012 PFD approved budget includes five (5) uniformed fire officer positions for the Fire Prevention Sections, including:

- Captain (1)
- Lieutenant (3 )
- Firefighter (1)

The administrative/clerical and records support functions for the Section are provided by the single civilian staff person who provides this type of support for all elements of the Fire Department.

The fire prevention options and recommendations include:

1. Taking action to enhance the fire building inspections program by implementing a comprehensive three-tier building inspections program (self-inspection, firefighter/officer inspection, and Fire Prevention Bureau) with complete documentation/records maintained;
2. Developing the means for firefighters and officers to enter site information data into a computer program for subsequent access on the network by dispatch and others;
3. Reallocating two firefighters/inspectors to the Fire Prevention Bureau's inspection staff to implement comprehensive commercial and industrial building inspections;
4. Enhancing the fire and life safety programs by involvement of former firefighters, on a part-time or full-time basis, with appropriate training/certifications to deliver fire and life safety programs; and,
5. Considering various potential approaches to the provision of City fire prevention functions involving civilianization or regional and/or shared services with neighboring municipalities, including potentially, North Providence, Central Falls and East Providence.

## **CONSOLIDATION - REGIONALIZATION**

Consolidation and regionalization initiatives and successes are a national trend in the provision of public safety services. The Audit Team has extensive knowledge and experience with the consolidation and regionalization options and related benefits available to cities and towns for consolidation and regionalization of various functions, including fire and emergency medical services. It is for that reason that a full chapter of this Report is dedicated to this subject for consideration by City of Pawtucket officials, services providers, and taxpayers.

There are a many benefits that may be attained through fire, emergency medical, and dispatch services consolidation and regionalization, including:

1. Increased efficiency;
2. Improved effectiveness;
3. Seamless delivery of services;
4. Elimination of overlaps in positions;
5. Elimination of duplicate equipment;
6. Reduced response time for units dispatched;
7. Increased opportunity for staff specialization;
8. Upgrading recruit training programs;
9. Opportunity for increased promotional selectivity;
10. Increased promotional opportunity for personnel;
11. Potential revised perspective/outlook of personnel;
12. Enhanced or expanded services;
13. Improved safety of customers and services providers;
14. Reduced costs;
15. Improved incident command coverage;
16. Improved allocation and utilization of staffing;
17. Cost avoidance;
18. Coordination of planning;
19. Standardization of services and programs;
20. Improved and more effective training;
21. Potential improve ISO rating; and,
22. Impact on future state and federal grant funding.

This Report outlines a number of fire, emergency medical, and dispatch options available to the City for consideration.

The consolidation-regionalization options and recommendations include:

1. Implementing an appropriate form of fire protection services delivery consolidation with participating surrounding municipalities, including potentially North Providence, Central Falls and East Providence;
2. Implementing an appropriate form of emergency medical services delivery consolidation with participating surrounding municipalities, including potentially North Providence, Central Falls and East Providence; and,
3. Proceeding to develop a plan and implement an appropriate form of emergency dispatch services delivery consolidation or regionalization with participating surrounding municipalities, potentially including, potentially including North Providence, Central Falls, East Providence, Lincoln, Cumberland, Johnston, Smithfield, North Smithfield and Woonsocket .

### **COMPARATIVE FIRE COSTS PER CAPITA**

In a comparison of national data for average fire costs among cities within different population ranges, the International City/County Management Association (ICMA) publishes police and fire data in the ICMA Year Book. According to the (ICMA) *Municipal Year Book, 2012*, the average per capita costs in 2011 for fire services were as follows:

<b><u>City Classification</u></b>	<b><u>Per Capita Costs</u></b>
44 cities of all sizes in New England:	\$196.01
49 cities with a population range of 50,000 to 99,999:	\$184.91
113 cities with a population range of 25,000 to 49,999:	\$173.81
 <b>City of Pawtucket Data:</b>	
For FY 2012: (72,000 ÷ \$20,483,843)	\$284.50

According to the ICMA, its data include retirement, hospitalization, and “other” costs. Officials are encouraged to exercise caution in interpreting the comparative data and are encouraged to verify published data before making any decisions on the data. **Caution is required in the interpretation of any comparative data.**

### **COMPARATIVE STAFFING – U.S. CITIES**

The ICMA also publishes staffing data by population range and number of cities reporting in each population range calculated on per 1,000 basis. **Caution is required in the interpretation of these data.**

<b><u>City Classification</u></b>	<b><u>Uniformed/Sworn</u></b>
71 cities in New England	1.77
8 cities with a population range of 500,000 to 1 million:	1.52
10 cities with a population range of 250,000 to 499,999:	1.54
46 cities with a population range of 100,000 to 249,999:	1.48
108 cities with a population range of 50,000 to 99,999:	1.61
244 cities with a population range of 25000 to 49,999:	1.70
<b>Pawtucket Data (127 uniformed /72):</b>	<b>1.76</b>

### **POTENTIAL BENEFITS**

In upgrading the personnel, operations, management and administration of a fire department, it is not possible to delineate all the positive outcomes. Improving the quality of life in a community and saving lives do not necessarily involve quantitative analysis.

A number of the anticipated returns on investment for the operations and management recommendations in this Audit include:

1. Improved management of the Pawtucket Fire Department by upgrading the senior uniformed staffing;
2. Increased pride in the organization;
3. Reduced loss of time on the job through comprehensive firefighter safety programs;

4. Enhanced management of human resources;
5. Improved cost effective service through automatic mutual aid;
6. Improved firefighter effectiveness through upgraded training;
7. Increased awareness, planning for major fire incidents, and improved effective use of firefighters through implementation of pre-fire planning by firefighters and officers in the fire stations;
8. Improved morale;
9. Improved accountability;
10. Reduced dispatch processing time;
11. More effective use of key senior staff members; and,
12. Enhanced status of the City being served by an accredited fire agency.

## **FISCAL IMPACTS**

The non-personnel related fiscal impacts will depend on which, if any, recommendations are implemented by the City of Pawtucket. The primary areas related to costs and savings (cost avoidance) include:

1. Reducing the number of fire station facilities utilized and maintained by the PFD;
2. Upgrading the PFD fire station facilities;
3. Reducing the fire apparatus fleet;
4. Reducing the number of emergency communications centers utilized and maintained;
5. Cost avoidance related to maintaining/replacing the systems and subsystems for one dispatch rather than two;
6. Providing the facility upgrades related to combining the dispatch centers;
7. Implementing an appropriate form of regionalization of EMS services;
8. Implementing an appropriate form of fire protection regionalization of services;
9. Implementing a state-of-the-art fire department records management system;
10. Implementing EMS training program upgrades; and,

11. Implementing fire training program upgrades to National/State certification requirements.

Once the City decides on a specific course, internal finance personnel should be consulted to assess the fiscal impacts of any changes.

### **TIMELINE FOR DECISIONS AND ACTIONS**

This comprehensive assessment of the Pawtucket Fire Department should be considered as a strategic planning tool for the future. Additional issues may need consideration in the future; the plan should be used as a flexible guide for decisions relative to the organization, management, and provision of fire/EMS services by the Pawtucket Fire Department.

### **UPDATING THE PLAN**

The City of Pawtucket is encouraged to update this assessment plan each year with internal staff. The update should include progress, obstacles, fiscal impacts, workload analysis, and anticipated outcomes.

## **CHAPTER ONE INTRODUCTION**

This Chapter provides a brief overview and profile of the City of Pawtucket, Rhode Island, surrounding municipalities, and Providence County.

This Chapter also summarizes the methodology for conducting this Fire & Rescue Performance Review and Audit.

### **THE CITY OF PAWTUCKET**

Pawtucket was founded in 1671 and is a city of nine (9) square miles in Providence County, in the Providence-New Bedford metro area. It is centrally-located in the northwestern corner of the State of Rhode Island. The City has the distinction of being the fourth largest city in the state.

The City was a major contributor of cotton textiles during the American Industrial Revolution. The Slater Mill, which was built in 1793 by Samuel Slater on the Black River, falls in the downtown area of Pawtucket. This mill was the first fully mechanized cotton-spinning mill in America and is known for developing a commercially successful production process not reliant on horse-drawn processes. In the early days, a variety of machines and iron working shops developed, in addition to the textile industry.

The City is bordered by the following:

- North Providence to the west;
- Providence to the southwest;
- East Providence to the southeast;
- Seekonk, Massachusetts to the east;
- Attleboro, Massachusetts, to the north east;
- Central Falls to the north; and,
- Lincoln to the northwest.

As of the Census of 2000, in the City there were:

- 72,958 persons
- 30,047 households
- 18,508 families

Today, according to its website, the City includes:

- Major residential areas with 30,000 housing units
- An employment center with 300 industries
- 1,000 commercial and service establishments

### **City Government**

In 1954, a home rule charter went into effect that provides a strong mayoral and unicameral City Council form of government, which provides a clear organizational format.

### **FIRE SERVICES**

The Pawtucket Fire Department provides fire, rescue, and emergency medical services to the City. It is headed by the Fire Chief and Assistant Chief.

The official Pawtucket Fire Department Statement of Policy included in the Rules and Regulations of the Fire Department is as follows:

#### **Statement of Policy**

“The Pawtucket Fire Department shall be responsible for the protection of all life and property within the City from fire and shall enforce all laws, ordinances and regulations relating to Fire Prevention and the Rhode Island Fire Safety Code. It shall further be responsible for the organization and maintenance of the Rescue Division now in operation for as long as deemed appropriate by the City of Pawtucket.”

As outlined in the Pawtucket Fire Department Rules and Regulations the Bureaus of the Division (PFD) are:

- Fire Fighting
- Rescue
- Fire Prevention
- Training
- Fire Alarm and Communications

The emergency and other services provided by the PFD include the following:

- Fire suppression
- Emergency medical services (rescue)
- Communications and dispatch of fire units
- Hazardous materials response
- Auto extrication

Other services reportedly provided by the PFD include;

- Fire code enforcement
- Fire investigations
- Incident fire reports
- Plan review for new construction
- Fire safety inspections of commercial buildings
- Fire safety programs for citizens, businesses and schools
- Fire station tours
- Smoke detector give-a-way program
- CPR training
- Fire extinguisher training

Today, the PFD operates from six fire stations, as follows:

1. Fire Station 1, located at 394 West Avenue
2. Fire Station 2, located at 155 Roosevelt Avenue
3. Fire Station 3, located at 2 Columbus Avenue
4. Fire Station 4, located at 375 Cottage Street
5. Fire Station 5, located at 301 Smithfield Avenue
6. Fire Station 6, located at 385 Newport Avenue

The current primary fire rescue apparatus included in the fleet of the PFD are illustrated in Figure 1.1.

**Figure 1.1**  
**SUMMARY BY APPARATUS TYPE**

<b>TYPE</b>	<b>NUMBER</b>
Engines	8
Ladder Trucks	3
Rescues	4
Special Operations	1
<b>Total</b>	<b>16</b>

Source: PFD.

Note: Includes two reserve engines, a reserve ladder truck and two reserve rescue units.

The PFD vehicular apparatus fleet also includes cars and SUVs.

The PFD is administered and operated with the following 127 uniformed staff members:

- 1 - Fire Chief
- 1 - Assistant fire chief
- 4 - Battalion chiefs
- 10 - Captains
- 31 - Lieutenants
- 80 - Firefighters

The staff of the PFD includes one administrative support person.

### **COMPARATIVE FIRE COSTS PER CAPITA**

In a comparison of national data for average fire costs among cities within different population ranges, the International City/County Management Association (ICMA) publishes police and fire data in the ICMA Year Book. According to the (ICMA) **Municipal Year Book, 2012**, the average per capita costs in 2011 for fire services were as follows:

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According to the ICMA, its data include retirement, hospitalization, and ‘other’ costs. Officials are encouraged to exercise caution in interpreting the comparative data and are encouraged to verify published data before making any decisions on the data. **Caution is required in the interpretation of any comparative data.**

**COMPARATIVE STAFFING – U.S. CITIES**

The ICMA also publishes staffing data by population range and number of cities reporting in each population range calculated on per 1,000 basis. **Caution is required in the interpretation of these data.**

<u>City Classification</u>	<u>Uniformed/Sworn</u>
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244 cities with a population range of 25000 to 49,999:	1.70
<b>Pawtucket Data (127 uniformed /72):</b>	<b>1.76</b>

## **AUDIT METHODOLOGY**

In conducting this Audit for the City of Pawtucket the Audit Team utilized a proven and consistent approach to conduct and complete fire department analysis. This methodology incorporates eight (8) distinct but interrelated phases: data collection; interviews with key individuals; on-site observation; analysis of data; comparative analysis (which included the computerized fire station location analysis); alternatives and recommendations; submission of a written Audit; and an oral briefing.

In addition, the following Audit guides were considered.

### **Fire Department Accreditation**

The framework for this analysis incorporated the model developed by the Accreditation Committee of the International Association of Fire Chiefs (IAFC) [now the Commission on Fire Accreditation International (CFAI)].

The Commission on Accreditation of Law Enforcement Agencies (CALEA) had previously developed a police department accreditation process for use by police departments. The Commission on Fire Accreditation International developed a similar analysis model for fire department use on a voluntary basis. Inclusion of this model as a framework for this Pawtucket Audit will assure that the “latest thinking” is considered in this Audit.

There are ten major analysis categories included in this CFAI accreditation model. The analysis categories included in this CFAI accreditation model are as follows:

1. Governance and Administration
2. Assessment and Planning
3. Goals and Objectives
4. Financial Resources
5. Programs
6. Physical Resources
7. Human Resource
8. Training and Competency
9. Essential Resources
10. External Systems Relations

Within each of these categories, there are specific criteria and considerations weighed by the Audit Team in conducting this Pawtucket analysis.

The applicable performance indicators associated with these categories and criteria were considered and addressed where appropriate in this Audit.

The CFAI's manual, entitled "Creating and Evaluating Standards of Response Coverage for Fire Departments," provides guidance and direction on the conduct of fire rescue station, apparatus, staffing, and related risk assessment studies. The Audit Team utilized the latest (4th Edition) of this CFAI guide in the performance of this Fire Rescue Station Apparatus and Staffing Audit for the City of Pawtucket.

### **Standards and Accepted Practices**

The Audit Team also utilized published fire protection standards and information on accepted principles and practices for the operations and management of fire services as background and guidelines for the conduct of this Pawtucket Audit.

Some of the key organizations with standards and publications that were utilized as part of this Audit are the following:

- National Fire Protection Association (NFPA)
- ISO Commercial Risk Services, Inc. (ISO)
- International Association of Fire Chiefs (IAFC)
- American Heart Association (AHA)
- American Medical Association (AMA)

The National Fire Protection Association follows a nationally recognized process for the establishment of many standards that are applicable to fire protection operations and administration. In many jurisdictions, some of the NFPA standards have been adopted and fully implemented while in others NFPA standards are utilized as general guidelines for pursuing further improvement in safety and services.

The following list includes some of the key NFPA standards utilized by the Audit Team to conduct this Audit for Pawtucket.

<b><u>Name of Standard</u></b>	<b><u>NFPA Number</u></b>
Standard for Fire Fighter Professional Qualifications	1001
Standard for Fire Officer Professional Qualifications	1021
Developing Fire Protection Services for the Public	1201
Fire Department Occupational Safety and Health Program	1500
Standard for the Organization and Deployment of Fire Ops.	1710

These and other written standards and nationally recognized documents, such as the *NFPA Fire Protection Handbook*, were utilized by the Audit Team as reference materials.

## **CHAPTER TWO**

# **ORGANIZATION AND ADMINISTRATION**

This Chapter includes a review of general aspects of the organization of the Pawtucket Fire Department (PFD), including history, legal authority, mission, and the current structure of PFD. Options and recommendations suggested by the Audit Team are included.

### **OVERVIEW**

Organizing fire and emergency services within a community to provide the most efficient and cost effective delivery of quality service is one of the most important functions of local government. Historically, many fire/EMS services have been developed and organized on the basis of local neighborhood need and initiative and, in many instances, volunteer fire departments were formed initially. However, as communities have become increasingly urban, calls for service have increased resulting in the need for increased coordination and direction of fire and rescue services and resources through paid services.

A key fire and EMS organizational principle relates to the basic responsibility for public safety within the community. It is widely accepted that the provision of fire and EMS service is considered to be a local government responsibility in most areas of North America. Local government is broadly interpreted to include municipalities, such as cities, towns, villages, and townships.

To attain the delivery of optimum fire and emergency medical service, it is essential that local government recognize and accept that responsibility and fulfill that obligation to provide appropriate guidance and direction in order to:

- Oversee the formation process of the organization of fire and EMS services;
- Ensure that the fire/EMS organization reflects the public interest;
- Protect the service from undesirable external interference;
- Determine basic policies for providing services; and,
- Legally define the duties and responsibilities of service providers.

Identification of this authority and responsibility is addressed in Section 3-1 of NFPA 1201, Developing Fire Protection Services for the Public, as follows:

“The government agency responsible for establishment and operation of the fire department shall adopt a formal statement (bylaw, statute) of purpose and policies for the fire department that includes the type and levels of services that are to be provided, the area to be served, and the delegation of authority to the fire chief and other officers to manage and operate the fire department.”

## **ACCEPTED PRINCIPLES AND PRACTICES—ORGANIZATION**

Both the National Fire Protection Association (NFPA) standards and Commission on Fire Accreditation International (CFAI) criteria provide guidance to municipalities and fire departments relating to organization structure.

### **NFPA 1201 - Standard for Developing Fire Protection Services**

NFPA 1201 provisions relate further to the organization structure of fire departments providing guidance to this Performance Review and Audit as follows:

#### **“Chapter 5: Organizational Structure of the Fire Department**

5-1 Purpose. The fire department shall have an organizational structure that facilitates efficient and effective management of its resources to carry out its mandate.

5-2 Management/Fire Chief.

5-2.1 The manager of the fire department shall be the fire chief. The fire chief shall be governed in the development of regulations and orders by the provisions of all applicable laws or ordinances and shall maintain a file of such documents.

5-2.2 The fire chief shall be appointed on the basis of merit and ability.

5-2.3 The fire chief shall communicate closely with the local government chief executive and governing body.

5-2.4 The governing body shall establish only the primary policies of the fire department and shall not act as an administrative agency or direct day-to-day management of the department.”

### **CFAI Governance and Administration Criteria**

The CFAI accreditation criteria related to fire department organization governance and administration that is relevant to this Performance Review and Audit is as follows:

The governing Board and/or agency manager has been legally established to provide general policies to guide the agency, approved programs and services, and appropriated financial resources.

1. The agency has been legally established.
2. The governing body having jurisdiction over the fire service organization or agency periodically reviews and approves programs and ensures compliance with basic agency policies.
3. The governing body approves the administrative structure that carries out the agency’s mission.

There is an established administrative structure and environment for achievement of the agency’s mission, purpose, goals, strategies and objectives.

1. There exists an administrative structure which reflects the agency’s mission, goals, objectives, size and complexity.
2. Allocation of resources reflects the agency’s mission, goals and objectives.
3. The agency administration demonstrates compliance with legal requirements of local, state, and federal governments.
4. Personnel functions, roles and responsibilities are defined in writing and a current organization chart exists.

The Audit Team considered these criteria as the organization of the PFD was reviewed as part of this Performance Review and Audit.

The remainder of this Chapter addresses current legal authority to operate fire and emergency medical services in the City of Pawtucket, current organization and appropriate conclusions and recommendations.

## **LEGAL AUTHORITY**

This section of the Performance Review and Audit outlines the legal authority under which the Pawtucket Fire Department is organized and operates.

The following sections address legal references in the Code of the City of Pawtucket to the organization of the fire protection services in the City.

### **Code of the City of Pawtucket**

The following sections outline provisions of the Code of the City of Pawtucket that relate to the organization of the Pawtucket Fire Department.

*“Sec. 4-702. Fire division.*

*The fire division shall consist of the fire chief, who may serve as an assistant deputy fire marshal, and subordinate officers and employees, of such grades as prescribed by Article VII of this Charter. The fire division shall be responsible for the protection of life and property within the city from fire and for the enforcement of all laws, ordinances and regulations relating to fire prevention and fire safety. The fire chief shall be in direct command of the fire division. Under the general supervision of the director of public safety, and subject to applicable state law and to agreements entered into pursuant thereto, the fire chief shall make rules and regulations in conformity with the ordinances of the city, concerning the operation of the division and conduct of all officers and employees thereof; shall assign all members of the division to their respective posts, shifts, details and duties; and shall be responsible for the efficiency, discipline and good conduct of the division and for the care and custody of all property used by the division. Upon application of any individual firm, corporation or association showing the necessity therefor, the chief may assign one or more special firemen to be paid by the applicant to the premises of the applicant. Special firemen shall wear when on duty in full sight a badge in the form prescribed by the chief, and shall have the powers and duties of*

*firemen of the city and shall be subject to the rules and regulations of the division.  
Such assignments shall be revocable by the chief at any time.*

## **ORGANIZATION STRUCTURE**

The following sections outline the current organization structure of the Pawtucket Fire Department.

### **Ranks and Position Titles**

The following sections describe the relative uniformed and civilian workforce rank and position titles, as included in the Fiscal Year 2012 Budget.

#### **Uniformed Workforce**

The primary operations rank structure of the Pawtucket Fire Department includes the following positions:

- Fire chief
- Fire assistant chief
- Fire battalion chief
- Fire captain
- Rescue captain
- Fire lieutenant
- Rescue lieutenant
- Fire Fighter
- Dispatchers

#### **Civilian Staff**

At the time this Performance Review and Audit was conducted there was one civilian administrative support staff member assigned to the PFD. The Audit Team was advised that a second civilian office staff member had been assigned, however, reportedly due to fiscal constraints, that civilian member was reassigned to another City department.

The civilian staff performs essential non-operational administrative functions for the Fire Department, including:

- All payroll functions
- Coding Imc CAD system
- Administering clothing and cleaning allowance
- Injury records and reporting
- Maintaining all personnel files
- Coordination of station repair matters
- Purchasing functions
- Correspondence relating to fire prevention and administration
- Answering telephone calls
- Providing administrative support and assistance to the PFD administration and all other organizational elements of the PFD
- Training personnel related to office equipment and systems
- Researching, cataloging, and processing all paperwork related to administrative functions

### **Current Organization Structure**

The official organization chart of the Fire Department illustrates five primary functional components of the Fire Department referred to as Bureaus, which are under the direction of senior staff members who appear to report directly to the Fire Chief. These functional areas include:

1. Fire fighting
2. Rescue
3. Fire Prevention
4. Training
5. Fire Alarm and Communications

The Audit Team noted that the current official PFD organization chart was not up-to-date as to the current structure listed in the copy of the Rules and Regulations, revised September 2010. Typically, such organizational charts are included as part of an official fire department policy regarding the organization of the department.

## **ORGANIZATIONAL OBSERVATIONS**

This section includes a number of the Audit Team's general observations regarding the organization and operations of the Pawtucket Fire Department from departmental and organizational perspectives. These observations are based on a review of the organization charts, various PFD documents, general orders, policies and procedures, job descriptions, personnel interviews, and consideration of national trends and principles and practices observed by the Audit Team.

The Pawtucket Fire Department is governed by provisions of the Code of the City of Pawtucket, as well as the limited number of established policies and procedures outlined in the Rules and Regulations provided to the Audit Team.

The PFD is an all-paid fire department with all commissioned firefighting and one full-time civilian support person employed by the City of Pawtucket. The basic chain of command in the Department is similar to that used in other paid fire departments with one fire chief, an assistant fire chief, four shifts each with a battalion chief and a complement of captains, lieutenants, and firefighters assigned to the 6 fire houses and fire communications.

The organization of the Pawtucket Fire Department includes a Fire Commission which is responsible for the appointment and control of personnel, supervision of Fire Department property, and preparation of the department budget. Further, the PFD organization includes a Board of Chiefs which, according to City Code, makes "...such rules and regulations for the government, discipline and good order of the department and for the extinguishment of fires as they may deem expedient..."

There are two union labor contracts between the City and the IAFF Local and the City and civilian employees.

The Pawtucket Fire Department focuses its operational efforts primarily in its own response area and periodically receives or provides mutual aid services with surrounding fire and EMS departments.

## **ORGANIZATIONAL ALTERNATIVES**

The following sections discuss the possible need for change and some organizational alternatives that could be considered by Pawtucket officials.

### **Input from Officials and Firefighters**

During the interview and survey process the Audit Team elicited comments from stakeholders, City officials, and Fire Department officials and firefighters in the fire stations and other work locations (dispatch, training center, etc.) on the subject of the organization and administration of the fire protection service in the City of Pawtucket.

These individuals were asked their opinions on major problem areas and ways to improve the organization of the Pawtucket fire service. Their input was considered by the Audit Team in developing the conclusions and recommendations in this Chapter.

### **Organizational Issues**

During the Audit Team's interviews and discussions, a number of reasons were cited as justifying the need to upgrade the organization of the Pawtucket Fire Department, including:

- Outdated organization chart that does not reflect the actual day-to-day reporting relationships
- Increasing cost to the City for funding the PFD
- Significant number of fire house facilities needing renovation, major repairs and/or replacement
- Substantial amount of fire station furniture and equipment is aging and in need of replacement
- Functions not provided with adequate oversight
- Unclear day-to-day program reporting relationships
- Potential excessive number of fire stations
- Apparent desire on the part of a number of fire department members to implement upgraded EMS delivery services

The recommendations are based on what appears to be a longstanding systemic issue and include:

1. Remove the position of Fire Assistant Chief from the IAFF union; Develop a contract of three to five years for the position of Fire Chief; this contract should have specific performance objectives and expectations delineated, including roles and responsibilities
2. Conduct an evaluation of a Fire Chief periodically (e.g., semi-annually); the evaluation should be most appropriately done by the Mayor

### **Organization of Fire Prevention**

As discussed in the Fire Prevention and Education Chapter (Chapter Eleven), later in this Report, the typical Fire Prevention Bureau within a fire department incorporates a number of functions, including building inspections, plans review, investigations (arson/bomb), and public education.

### **Administrative Support**

The Pawtucket Fire Department, which includes more than 127 employees, operates from seven facilities (including the training and emergency management building), and was budgeted more than \$19 million for FY2012, has only one full-time civilian administrative support person—the Office Supervisor.

The Audit Team has never seen a fire department the size of Pawtucket's with such a limited number of civilian administrative and support personnel.

The result of this apparent inadequacy is uniformed personnel are required to perform functions that they are not trained or intended to perform, and chiefs, captains, and other senior uniformed staff must do personnel, budget, automation, contracting, records management, and other related work that would be done by more appropriate civilian staff. Either the uniformed staff performs this work or it does not get done.

## **Fire Alarm**

The Communications and Dispatch (Fire Alarm) Chapter (Chapter Ten) of this Performance Review and Audit provides a number of suggestions that the City should consider. The suggestions include combining Fire Dispatch with other emergency dispatch centers in the immediate regional area to establish a state-of-the-art regional public safety dispatch center potentially serving up to nine (9) municipalities in the vicinity of the City.

## **Organization Element Terminology**

The Audit Team noted apparent confusion and inconsistency on the part of PFD firefighters and officers in the terminology used to describe and define organizational elements within the Fire Department. Some referred to the same element with different terms, such as bureau and division. This is evidenced in the current organization chart that, although the PFD is referred to as a “division” in City Code, the four shifts of firefighting forces are referred to as the “fire division.”. The proper terminology should be implemented in daily usage by the PFD, as well as on the organization chart.

## **Battalion Chief Assignments**

The Audit Team noted during the interview phase of the project and in assessing the various PFD program areas that the firefighting battalion chiefs apparently are solely responsible for the management and oversight of the personnel on their respective shifts and incident operations occurring on their on-duty shift. In the experience of the Audit Team members, this is an unusual approach to the assignment of responsibilities within fire departments. Typically, chief officers, as senior level managers within the organization, are assigned one or more co-lateral duties and responsibilities.

Examples of the types of duties and responsibilities that chief officers may be assigned to coordinate/oversee, depending on the size of the fire department and the nature of the community served, include:

1. Hazardous materials coordination;
2. Aspects of safety programs;
3. Apparatus specification development;

4. New procedure development;
5. Policy development;
6. New equipment testing;
7. Automation programs;
8. Researching operational improvements; and,
9. Fire Alarm liaison

These types of responsibilities may be assigned in relation to their respective shift or on a department-wide basis. The fire departments observed by the Audit Team, that seem to be better organized and managed, assign these types of co-lateral duty assignments to chief officers who work as a team with the fire chief and other senior chiefs to manage the fire department. As part of the management of the fire department chief officers should expect to be involved and assigned such responsibilities, as needed.

### **Station Assignment of Functions**

The Audit Team also observed that the management of well-organized and managed fire departments also utilizes a comprehensive approach to the accomplishment and distribution of essential fire/EMS tasks within the organization. In many fire departments, the staffs of appropriate fire stations are assigned one or more tasks that are essential to the day-to-day delivery of fire and EMS service.

The types of tasks that may be so assigned include:

1. Repairing, issuing and tracking all fire hose;
2. Refilling and tracking EMS oxygen bottles;
3. Managing the foam inventory;
4. Maintaining boats;
5. Replacing EMS oxygen regulators, demand valves, bottle valves, and air powered suction units;
6. Laundering and coordinating the repair of protective clothing;
7. Repairing small hand tools;
8. Filling medical supply orders for all stations;
9. Sewing replacement backboard straps;
10. Managing hazmat supplies, and maintaining hazmat equipment;

11. Testing and maintaining all PFD ground ladders in cooperation with the apparatus maintenance staff
12. Maintaining technical rescue equipment;
13. Conducting all pump tests on apparatus; and,
14. Self contained breathing apparatus (SCBA) and PASS device (an important SCBA safety feature) maintenance, testing, repair and fit tests.

Note: These examples may or may not apply in the PFD.

This is a proven cost-effective and well-managed means of accomplishing essential fire/EMS service delivery tasks. Station firefighters and officers may take these responsibilities seriously and take action to accomplish and improve the handling of their assigned functions. And, it is a very good use of station staff. In many fire department studied, the labor unions seem to support this approach to task assignments.

### **Facility Maintenance and Furnishings**

In general, the PFD fire house facilities are in fair to very poor condition and need to be given priority for funding and oversight of facility maintenance and renovation. The Audit Team was advised that the responsibility for maintenance and renovation of the PFD facilities is not assigned amongst organizational elements. The central placement of this important function in the organization of the PFD could facilitate improved facilities maintenance. This function could be staffed with an appropriately qualified staff member.

### **Cross-Functional Teams—Committees**

Nationally, as business and service organizations have worked to “flatten” and break down the functional organizational silos, the more progressive organizations and managers have found the use of cross-functional teams to be a very useful and productive tool. These organizations have found that the development, nurturing, and use of cross-functional teams may be a powerful organizational vehicle that brings together diverse talents to solve organizational issue/s and/or or problems.

The idea of using cross-functional teams is a recent and highly effective idea to streamline operations and define effective solutions to problems. The cross-functional team is simply a group of people who come from and often represent different parts of the organization and who are committed to a common purpose.

## **FIRE DEPARTMENT ACCREDITATION**

Over a ten-year period, a committee of the International Association of Fire Chiefs, in cooperation with the International City Management Association, developed an analysis model for self assessment of fire departments and services. That fire department self assessment process is now under the auspices of the Commission on Fire Accreditation International. The Audit Team employed portions of this model as a framework for this City of Pawtucket Performance Review and Audit to provide established criteria for review and the reader with information on the latest trends in the fire service.

In years past, standards available to the fire service have been the product of collaborative efforts involving organizations such as the National Fire Protection Association (NFPA). There have been other systems of standards and measurements for the fire and emergency services available, however, they were created to serve interests relating to the fire service, but not specific to the fire service. A good example of this type of process is the Insurance Services Office (ISO) grading schedule.

In 1988, the International City/County Management Association (ICMA) and the International Association of Fire Chiefs (IAFC) executive boards signed a memorandum of understanding that committed both organizations to the development of a voluntary national fire service accreditation system. Over a period of the intervening years, the framework for a fire department accreditation model was developed, beta test fire department accreditations were conducted and an accreditation model was finalized and implemented under the management of the Commission on Fire Accreditation International.

According to the CFAI website there are currently 98 accredited fire departments in the United States.

The accreditation analysis categories included in the model are as follows:

1. Governance and Administration;
2. Performance Review and Audit and Planning;
3. Goals and Objectives;
4. Financial Resources;
5. Programs;
6. Physical Resources;
7. Human Resources;
8. Training and Competency;
9. Essential Resources; and,
10. External Systems Relations.

The Audit Team is considering appropriate aspects of this CFAI accreditation model for this Performance Review and Audit, and two members of the Team have been involved with the CFAI since its inception and are peer fire department assessors. Additionally, the preparation made by the Pawtucket Fire Department for this Performance Review and Audit and the data and information collected is very similar to that necessary for the Fire Department to pursue accreditation.

As stated in the CFAI accreditation manual, the City and the PFD could accrue a number of important benefits from becoming an accredited fire agency, including:

1. Further promotion of excellence in the Fire Department;
2. Quality improvement through self Performance Review and Audit;
3. Provision of assurance to peers and the public that the Fire Department has defined missions and objectives and strives to go beyond them;
4. Identification of strengths and weaknesses within the PFD;
5. Provision of detailed evaluation of the PFD and its services;
6. Establishes a method or system for addressing deficiencies and building on the strong points;
7. Growth for the Fire Department and its personnel;
8. Establishment of a forum for the communication of management and leadership philosophies;

9. National recognition for the PFD by peers and the public;
10. Creation of a mechanism for developing concurrent documents, such as strategic and business plans and a “desktop manual” of everything the PFD is involved in; and,
11. Further development of pride in the organization, from PFD members, community leaders and citizens.

The Audit Team considers the Pawtucket Fire Department to exhibit a number of the characteristics of an excellent fire department. It appears that the City, the Fire Department, and stakeholders could benefit in many ways from the Pawtucket Fire Department becoming an internationally accredited fire agency with the CFAI.

## **SUMMARY**

Organizing fire and EMS services within a community so as to provide the most efficient and cost effective delivery of quality service is one of the most important functions of local government. Historically, many fire services have been developed and organized on the basis of local neighborhood need and initiative and, in many instances, volunteer fire and EMS companies were formed—as was the case with the initial organization of the Pawtucket Fire Department.

Pawtucket’s Fire Department is at a “crossroads” in its history and development. With the continual increase in emergency calls and changes in the PFD that may have been driven in the past by the economic and fiscal conditions of the City and community, the City and the Fire Department have the opportunity to refocus resources and efforts toward the saving of lives and enhancing the Fire Department services.

## **RECOMMENDATIONS**

- 2-1 The Fire Chief should consider placing a high priority on updating the organization chart and the Rules and Regulations of the PFD.
- 2-2 The Fire Chief should consider enhancing the utilization of the Assistant Chief to include responsibility for specific functional areas

- 2-3 The Fire Chief is encouraged to establish the progressive approach to the assignment of important daily tasks to the battalion chiefs and staffs of the fire stations.
- 2-4 The Fire Chief is encouraged to make full use of committees and cross-functional teams in the planning and implementation of appropriate PFD programs and tasks.
- 2-5 The City should consider providing an additional civilian administrative staff member to the Fire Department.
- 2-6 The City and the Fire Department are encouraged to pursue accrediting the PFD utilizing the Commission on Fire Accreditation model.
- 2-7 The City should pursue removal of the fire assistant chief position from the union for the creation of a true “management team” within the Fire Department.
- 2-8 The City should pursue removal of the battalion chief positions from the union for the creation of a true “management team” within the Fire Department.

## **CHAPTER THREE**

# **FIRE AND EMS APPARATUS STAFFING**

This Chapter provides a review of fire and EMS staffing practices generally in fire and emergency medical services; current Pawtucket Fire Department staffing and exploration of minimum and maximum/desired staffing of PFD apparatus options; and related suggestions for the City and Fire Department to consider. The reader should note that the Pawtucket Fire Department refers to EMS transport units as “rescue” units.

### **APPARATUS STAFFING GENERALLY**

This Section reviews apparatus staffing generally as it relates to the staffing levels of fire and EMS apparatus—engines, ladders, heavy rescue units, and ambulance/rescue patient transport units that support the treatment and transport of patients. The Audit Team has developed an overview of fire services staffing based on practical experience and fire and EMS assistance in the United States.

The major cost of a fire rescue department is salaries and wages for the personnel, firefighters, and officers. For that reason, staffing levels become a crucial budget consideration, as well as service level issue, in municipalities and their fire departments. Depending on which of the various fire rescue service models is utilized, staffing has been justified by experts to include from three individuals per piece of apparatus to as many as six. The variables in this decision process involve:

1. The demographics of the community;
2. The numbers of fire and EMS calls to which the units respond;
3. The location of the fire stations and their distance of travel and response time for back-up;
4. The type and age of buildings in the community, as well as the building occupancies—residential, commercial and industrial--- which exists within the community; and,
5. The nature of the fire rescue protection and related risks in the service area.

From the perspective of operations, the Audit Team believes the minimum staffing of any fire unit (engine, squad, and truck) should be at least three individuals. Specialty or multifunctional units, such as quints (combination pumper/truck units), may require increased staffing to be safe and fully operational.

For water flows of 150 gallons per minute or less, it takes two individuals to maneuver the hose line and one operator at the pumper. For water flows higher than this amount, at least three firefighters are needed to maneuver the hose line into the correct position and hold the hose line in place during suppression activities.

Raising ladders for rescue requires two to three firefighters, depending upon the length of the ladder. Ground ladders longer than 35 feet, such as those carried on an aerial truck, require as many as four firefighters to raise the ladder in place. If a rescue is to be made, these ground ladders must be removed from their storage on the unit, carried to the correct location, and raised in place. Without sufficient personnel, this activity can be delayed, resulting in the potential for injury or death to civilians and firefighters.

The key objective is maintaining sufficient personnel on each piece of apparatus to use it effectively and safely.

Studies and staffing trials have shown that the performance of critical firefighting tasks can be performed in a safer and quicker manner with an increased number of firefighters and officers. One such study, conducted in Milwaukee, was done to determine the relative times required to lay and advance a hose line to the fourth floor using three-, four-, five-, and six-member engine companies. That study showed, for example, that it may take 34 percent more time for three firefighters to accomplish the work than it does four firefighters, and it may take 82 percent more time for two firefighters to complete the tasks.

The successful completion of critical tasks during emergency fire and EMS operations has a direct impact on the overall success of incident mitigation (e.g., fire suppression and patient medical care) and upon the level and quality of service delivery to the public. Fire and EMS tasks must be completed in a timely and safe manner.

For reasons of economics, there are few fire rescue departments in the United States that operate with the optimum apparatus staffing (e.g., 5 or 6 firefighting staff members on

engines and ladders). The actual number of firefighters and officers available to staff the fire rescue department apparatus will ultimately be a municipal policy decision and reflected in the fire department's budget allotment for personnel. The fundamental policy decision must determine how many firefighters and officers are to be on duty for each fire and EMS company (engines, ladders, heavy rescue squads, and rescues) every day.

### **Firefighter Utilization**

One might assume that if there are three personnel on an engine or truck, all three of those personnel are available for interior fire attack when they arrive on the scene of a working fire. That perception is not accurate since, most often, the unit driver must remain with the unit to operate the pump, the aerial ladder, or set up equipment to support firefighting operations.

In a real situation, using engine operations as an example, the following are the functions initially performed by a crew of three:

#### **Driver/Operator**

- Sets and operates the pump
- Develops water supply
- Provides equipment to part of building
- Relays radio communications
- Guides apparatus placement for incoming units

#### **Officer**

- Provides initial incident command
- Sizes up the incident
- Performs circle check of building
- Directs crew of one in interior attack
- Is part of two person interior fire attack crew
- Handles radio communications for crew
- Provides interior command as necessary

### **Third Person**

- Lays out supply line
- Pulls and advances hand lines
- Begins interior fire attack with officer as crew of two

This example presumes that there are no immediate incident complexities such as medical or rescue emergencies. A similar example could be outlined for the staffing of a ladder truck.

The purpose of this discussion is to point out the justification of staffing engines and ladder trucks with three personnel as the absolute minimum. Personnel on units staffed by one or two personnel cannot function as independent crews on the scene of emergencies. Personnel responding on units staffed by one or two personnel must join up with other personnel from other units, after arriving on the scene, to develop crews for a fire attack.

Unit staffing of one or two firefighters may seriously hinder successful fire attack operations, in addition to creating significant safety risks for firefighters and increased liability exposure for the fire department and the City.

For these reasons, the Audit Team suggests that the City and PFD deploy no less than a total of three firefighters to ensure proper unit staffing of engines and ladders.

Staffing levels should be carefully monitored, with optional firefighter and officer absences (vacation leave, etc.) being controlled in order to maintain minimum staffing levels and assure that an excessive number of personnel are not authorized leave at the same time. This staffing data is invaluable in assessing the level of service.

### **Rescue Staffing**

The minimum staffing of rescue units providing pre-hospital basic or advanced life support services is generally accepted by municipalities and their fire departments to be two qualified personnel. A number of metropolitan fire/EMS services staff their busier units with a minimum of three personnel due to call loads or the generally serious nature of EMS calls being handled. However, rescue units cannot function with less than personnel.

## **DESIRED APPARATUS STAFFING**

The standard on Fire Department Deployment and Operations is NFPA 1710, which is discussed in the Fire Services Risks and Deployment Chapter later in this Report in relation to response times. It is an industry guideline that serves as a benchmark for the fire department organization and deployment of services.

NFPA 1710 addresses fire, EMS, special, wildland, airport, and marine operations. These various operational areas are addressed with benchmark requirements based on a fire involving a 2,000-square-foot detached single-family occupancy. Fire departments are expected, under the approach taken by 1710, to deploy additional resources according to occupancies and hazards in their jurisdictions.

This NFPA standard, which includes provisions relating to apparatus staffing, has been adopted and implemented, in whole or in part, in a number of cities, counties, and towns. It has also been utilized in many fire departments as a guide for goal planning documents and policies and procedures, due largely to economic impact considerations.

Staffing of fire apparatus is a key component of NFPA 1710. In developing the staffing component of the standard, the NFPA Technical Committee reviewed numerous studies, evaluations, and stakeholder reports containing empirical data on departmental response and mitigation of fire. These studies clearly documented that for safe, effective, and efficient fire suppression, each responding company needs a minimum number of firefighters and officers.

NFPA 1710 specifies the following minimum staffing levels by type of company and function:

1. Engine Companies—Fire companies whose primary functions are to pump and deliver water and perform basic firefighting at fires, including search and rescue, are known as engine companies to be staffed with a minimum of four on-duty personnel.

In jurisdictions with tactical hazards, high-hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors are to be staffed with a minimum of five or six on-duty members.

2. Ladder Truck Companies—Fire companies whose primary functions are to perform the variety of services associated with truck work (such as forcible entry, ventilation, search and rescue, aerial operations for water delivery and rescue, utility control, illumination, overhaul and salvage work) are known as ladder or truck companies. Ladder truck companies are to be staffed with a minimum of four on-duty personnel.

In jurisdictions with tactical hazards, high hazard occupancies, high incident frequencies, geographic restrictions, or other pertinent factors shall be staffed with a minimum of five or six on-duty members.

3. Other Companies (heavy technical rescue squads, etc.)—Other types of companies equipped with specialized apparatus and equipment shall be provided to assist engine and ladder companies (and provide other services, e.g. heavy rescue) deemed necessary as part of standard practice. These units shall be staffed with a minimum number of on-duty personnel required by the tactical hazards, high incident frequencies, geographic restrictions, or other pertinent factors.
4. Quint Apparatus Companies - Fire companies that deploy with quint apparatus, designed to operate either as an engine company or a ladder company shall be staffed with a minimum of four on-duty personnel. If the company is expected to perform multiple roles simultaneously, additional staffing, above the level of four, shall be provided to ensure that those operations can be performed safely, effectively and efficiently.
5. EMS Units (rescues) - On-duty EMS units shall be staffed with the minimum numbers of personnel necessary for emergency medical care relative to the level of EMS delivery provided by the fire department. EMS staffing requirements shall be based on the minimum levels needed to provide patient care and member safety.
6. Advanced Life Support (ALS) - Personnel deployed to ALS emergency responses shall include a minimum of two members trained to the emergency medical technician-paramedic level and two members trained to the emergency medical technician-basic level arriving on the scene within the established response time. These staffing patterns ensure efficient and effective on-scene operations as

evidenced and supported by the American Heart Association and the National Institutes of Health.

Based on these standards and guidelines, the apparent current and future projected nature of Pawtucket's fire and emergency medical risks, tactical hazards, hazard of occupancies, incident frequencies and geographic restrictions the Audit Team suggests the following as a possible maximum/desired primary fire rescue per unit apparatus staffing level for the Pawtucket Fire Department.

- 4 Engines—including one paramedic;
- 4 Engine/tankers co-located at a fire station with another major unit (ladder, heavy rescue squad or rescue)—including one paramedic;
- 4 Ladder trucks;
- 5 Quints operating as both engine and ladder;
- 4 Heavy rescue squad providing technical rescue services;
- 3 Rescue units providing emergency medical transport services with at least two certified paramedics; and,
- 1 Shift command units.

All other fire rescue apparatus (i.e., brush, light, and air units and boats) would be staffed on a cross-staffed basis by on-duty personnel assigned to primary units.

### **PFD SHIFT STAFFING**

This Section reviews current Pawtucket Fire Department shift staffing.

#### **Current Total Shift Operations Staffing**

The Audit Team was advised that the current complement of personnel in the Fire Department allocated to shift apparatus staffing is 125. Figure 3.1 outlines total staffing by rank.

**Figure 3.1**

**TOTAL FIREFIGHTER/OFFICER COMPLEMENT**

<b>RANK</b>	<b>COMPLEMENT</b>
<b>BATTALION</b>	4
<b>CAPTAINS</b>	10
<b>LIEUTENANTS</b>	31
<b>FIREFIGHTERS</b>	80
<b>TOTAL</b>	125

Source: PFD budgeted for Fiscal Year 2012.

**CALCULATING STAFFING NEEDS**

The Audit Team typically utilizes a nationally recognized formula to assist in its determination of the adequacy of the total apparatus staffing of fire departments assessed. That formula can provide a measure of accuracy in determining the actual number of firefighters and officers required to staff the fire apparatus, given the minimum staffing levels approved by the municipality.

**Forty-Two Hour Work Week—Current Hours**

Using current Pawtucket apparatus minimum staffing levels, that formula is outlined as follows. To staff one position on a 24-hour basis and allow time off for training, vacations and sick leave and on-the-job injuries requires 5.2\* employees. The Audit Team was advised that the average annual time off for firefighters and officers has been 500 hours, including time off for on the job injuries. Based on this average number of hours off, the number of personnel required could be calculated as follows for the PFD:

\*The 5.2 number is calculated as follows:

Total hours in a year:	8,760
Firefighters work 42 hours x 52 weeks	2,184
Minus average time off “floor”	- 500
<b>TOTAL HOURS AVAILABLE</b>	<b>1,684</b>



Number of Employees       $\frac{8,760}{1,996} = 4.4$  staff to cover one 24-hour constant  
staffed position.

Based on this approach to calculating firefighter and officer staffing requirements for the current fire station and apparatus deployment model it appears that 127.6 firefighters and officers are needed.

### **Current Four-Station Model - 48-Hour Work Week**

The following calculations illustrate the application of this calculated formula to determining employment needs.

6 pumpers × 3 staff × 4.4	=	79.2 staff
2 ladder truck × 3 staff × 4.4	=	26.4 staff
2 rescue units × 2 staff × 4.4	=	17.6 staff
1 battalion chief × 4.4	=	<u>4.4</u> staff
<b>TOTAL</b>	=	<b>127.6 staff</b>

It should be noted that the currently approved budget for staffing of the current fire stations and apparatus includes 125 firefighter and officer positions, including battalion chiefs, captains, lieutenants and firefighters.

Further, the implementation of a 48-hour per week 24-hour shift would involve three platoons rather than four. Therefore, there would be a reduction in the number of officers needed.

### **Expenditure of Overtime Funds**

The Audit Team was apprised of the fact that a substantial amount of overtime is being expended each pay period by the Fire Department primarily for apparatus staffing requirements. Reportedly, the overtime expenditure is estimated at \$2,500,000 in the coming fiscal year. A substantial portion of this overtime is likely due to staffing above the budgeted funding levels.

For the future, with a complete determination of time “off the floor,” including vacation, sick, training, on the job injuries, and details, for example, the City and the PFD may determine what its budgetary firefighter and officer position requirements are from year to year. This would also assist in assuring that the budgeted overtime requirements are appropriately funded for the PFD.

## **SUMMARY**

Decisions made regarding the staffing of fire and EMS apparatus have a direct impact on the level of fire and EMS service delivered to the community. These decisions also have an impact on the relative safety of firefighters as they perform the many dangerous tasks associated with extinguishing fires and dealing with medical and other emergencies, such as hazardous materials incidents, that fire/EMS departments are expected to handle.

Additionally, decisions regarding staffing of fire and EMS apparatus have significant fiscal implications since the major cost of a career fire department is salaries and wages for the personnel. For that reason, staffing levels become a crucial budget, as well as service level issue, in municipalities and their fire departments.

A number of optional staffing approaches in apparatus staffing are presented for future consideration by Pawtucket. Further, a formula for determining future position needs, based on approved apparatus and station staffing, is outlined. The objective is to provide options for the safe and cost effective delivery of quality fire and EMS services to the residents and business owners/operators in Pawtucket.

## **RECOMMENDATIONS**

- 3-1 The City should consider adopting the suggested staffing formula for the determination of current and future staffing requirements for the approved budget.
- 3-2 The City and PFD should consider conducting a complete determination of time “off the floor,” including vacation, sick, training, on the job injuries, and details, for example, and use this data to accurately determine what its budgetary firefighter and officer position requirements are from year to year.

- 3-3 The City should consider using the proposed staffing calculations formula for implementing any revisions in the approved budget related to the four or five - station models.
- 3-4 The City is encouraged to dual encumber firefighter/officer positions while awaiting final retirement actions in order to avoid related overtime.
- 3-5 The City should consider apparatus staffing options at NFPA 1710 levels, four person engines and ladders, as PFD organizational changes are made and/or fiscal opportunities are available.
- 3-6 The City should consider implementing the 24X48 firefighter work schedule.

## **CHAPTER FOUR FIRE SERVICES RISKS AND DEPLOYMENT**

### **SERVICE AREA DESCRIPTION**

The City of Pawtucket is just northeast of the state capital city of Providence and home to many industries, most notably Hasbro Toys. Located along the state border with Massachusetts, the city encompasses less than 10 square miles of mostly urban and industrial development scattered in different areas of the city. A major interstate (I-95) and several state highways traverse through the city, along with several major rail routes. The Seekonk River also splits the city and flows into the Narraganset Bay on the south side of the city. Street crossings of these barriers can be limiting.

The Pawtucket Fire Department (PFD) has six fire stations with one engine at each station, truck apparatus at two stations, and two rescue ambulance units. The duty battalion chief operates from Station 2 (adjacent to City Hall), where the fire administrative offices are located. Reserve apparatus is stored in available space in four of the six fire stations. Figure 4.1 illustrates the station locations within the city limits.

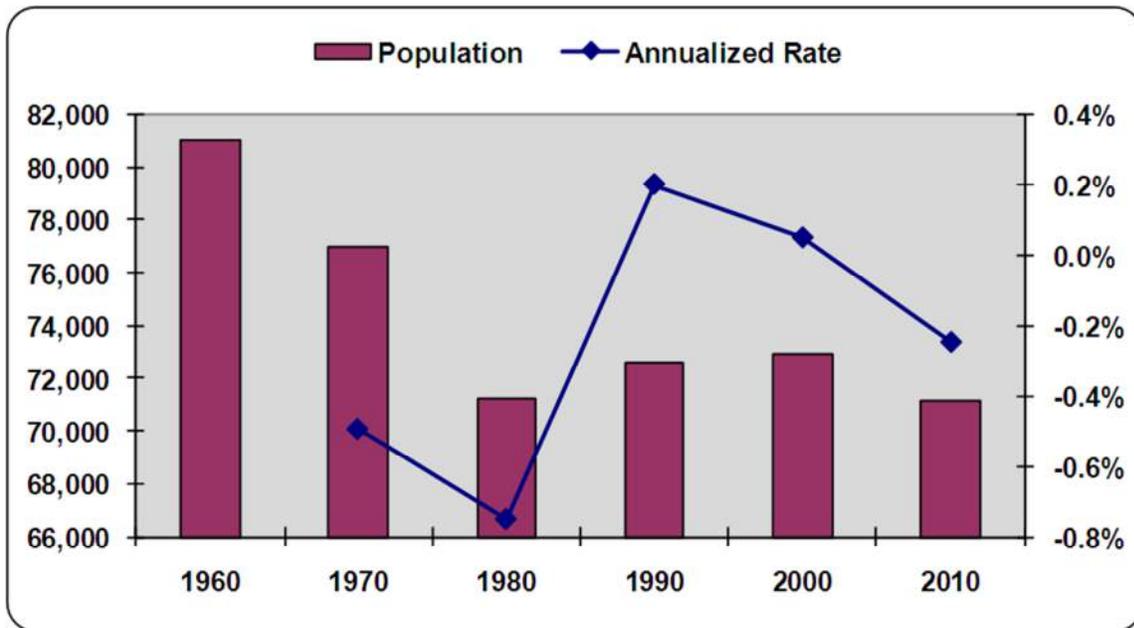
### **Population and Housing**

In 2010, Pawtucket had a total population of 71,148, according to the U.S. Census Bureau. This is an estimated .2% decrease since the last decennial census in 2000 when the population of the city was 72,958. The population of Pawtucket has not significantly increased for several decades, as can be seen in Figure 4.2.

Figure 4.2 represents residential population and does not account for the variation during the daytime hours for commuters, shoppers, and out-of-area employees. The residential population is also not evenly distributed. It is well understood that demand for emergency services correlates with areas of higher population. Figure 4.3 shows the concentration of residential population by census block group areas.

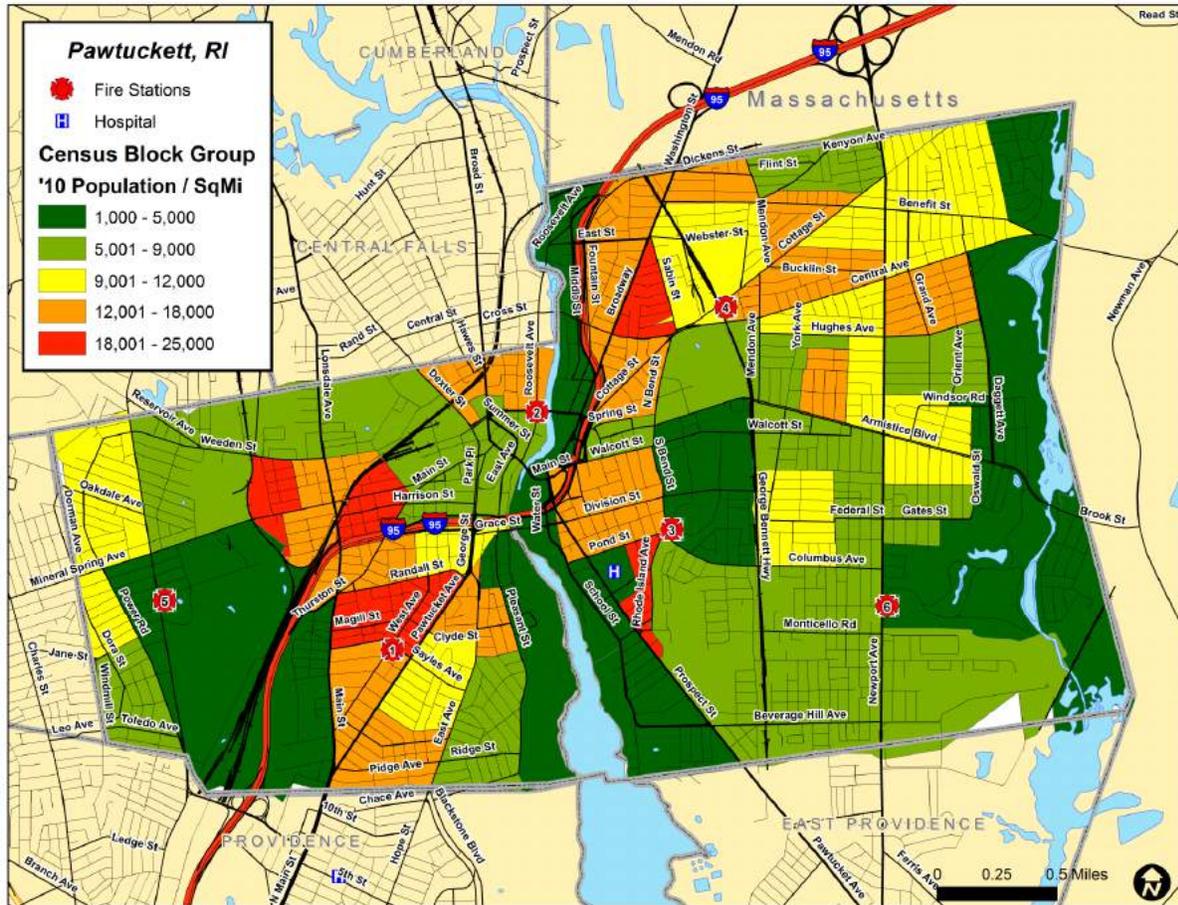


**Figure 4.2**  
**PAWTUCKET POPULATION GROWTH**

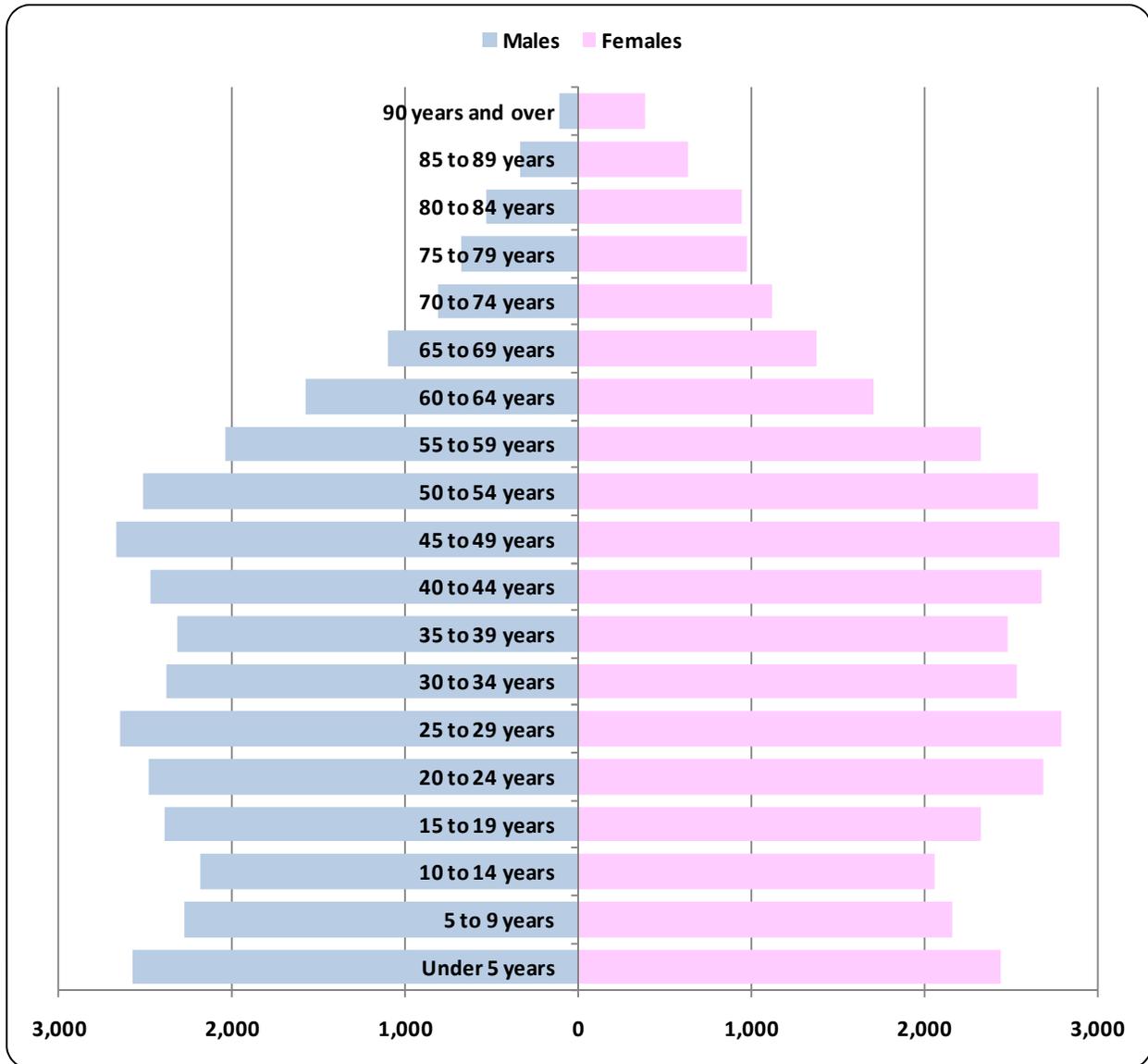


It can be seen from Figure 4.3 that the city is very urban with the higher concentrations of population near Stations 1, 3, and 4. Although general population levels play a role in the geographic distribution of demand for fire services, it is important to examine the composition of the population. For example, the elderly and the pediatric populations are more prone to serious medical emergencies and are more prone to succumb to smoke and fire due to their behavioral tendencies during a fire. Children often hide making an interior search by firefighters more difficult, while mobility issues limit the ability of the elderly to escape. The Figure 4.4 illustrates the levels of population by age group in Pawtucket.

**Figure 4.3**  
**POPULATION PER SQUARE MILE**



**Figure 4.4**  
**POPULATION BY AGE GROUP**



Nineteen percent of Pawtucket’s population is less than 15 years old, with 7% less than 5 years old. As discussed previously, fire fatalities often include children who hide during a fire emergency. Fire prevention activities targeted at school- aged groups is encouraged.

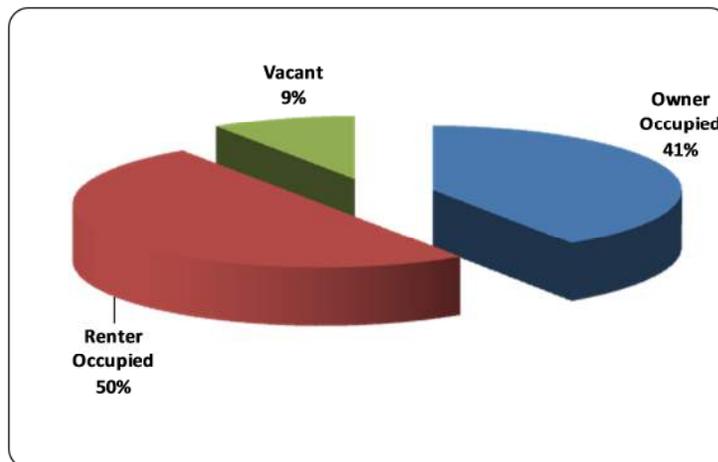
Comparing the demographic changes from 2000 to 2010, all age groups have declined in Pawtucket (see Figure 4.5), except the 45 to 64 age group, which has grown significantly. Although 13% of the city’s population is over the age of 65, it should be noted that within the next ten years the bulk of the “baby boomer” population (those born between 1946 and 1964) are poised to enter the ranks of “senior citizens” (generally those above the age of 65). It is expected that demand for medical emergency services will rise significantly, and the threat of fatal fire deaths may also increase based upon the age progression of the population, as well as expected mortality rates that are anticipated to be reduced with medical advances.

**Figure 4.5**  
**AGE GROUP GROWTH**

Demographic Change- 2000 to 2010								
	Total Pop	Age <5	5 to 24	25 to 44	45 to 54	55 to 64	65 to 74	75 and up
<b>2010</b>	71,148	5,012	18,578	20,306	10,613	7,647	4,416	4,576
<b>2000</b>	72,958	5,376	19,851	22,838	8,737	5,786	5,232	5,596
<b>change</b>	-2%	-7%	-6%	-11%	21%	32%	-16%	-18%

In the Figure 4.6, housing is examined by occupancy types. It should be noted that a lower than average national and statewide rate of owner-occupied properties exists. This is important because areas of higher vacant and rental properties are typically reflective of lower economic means that correlate with higher demand for emergency services.

**Figure 4.6**  
**HOUSING BY OCCUPANCY**



It is important to point out that an economic downturn has prevailed across the country at the time of this report beginning in late 2008. Although the period of negative economic growth was declared at an end in June 2010, very slow growth has persisted and housing foreclosures continue to be above pre-recession levels. A comparison of the two decennial census housing occupancy figures reveals that the rate of change in ownership may have just started to be reflected in the 2010 U.S. Census figures when compared to the year 2000 (see Figure 4.7)

**Figure 4.7**  
**COMPARISON OF HOUSING OCCUPANCY**

<b>Housing Information- 2000 to 2010</b>				
	<b>Housing Units</b>	<b>Owner Occupied</b>	<b>Renter Occupied</b>	<b>Vacant</b>
<b>2010</b>	32,055	13,020	16,002	3,033
<b>2000</b>	31,819	13,331	16,716	1,772
<b>change</b>	1%	-2%	-4%	71%

The sharp rise in vacant units over the decade point to a strong economic downturn in the area and pose special hazards for the fire service. Vacant properties are a serious concern for emergency services, especially for the opportunity for arson and for structural collapse when it is neglected. As noted previously, vacant properties in Pawtucket had increased by almost 71%. If job losses continue or are replaced by lesser wages, foreclosures may continue contributing to the amount of vacant properties.

## **SERVICE DELIVERY RESOURCE DISTRIBUTION**

The first decision in determining a fire station location for fire-related services is the maximum total response time that would be acceptable. One of the key factors is the time from ignition to flashover (simultaneous ignition of all combustibles), at which time the spread of the fire will increase dramatically. The Audit Team's experience, supported by various studies, has shown that the time from ignition to flashover in a structural fire will vary from six to nine minutes. In order to arrive on the scene within this time frame, the following time factors need to be considered:

1. Ignition-to-detection/to communication notification;
2. Communications notification to fire company dispatch;
3. Fire company dispatch until apparatus is en route;
4. Travel time to the scene; and,
5. Initiate rendering of service, e.g., placing hose lines in service.

A description of these five factors follows.

### **1. Ignition-to-Detection/to Communication Notification**

There have been great strides in reducing the ignition-to-detection phase of fires. Inexpensive smoke detectors, heat detectors, monitored alarm systems, and sprinkler systems have been installed in residential, commercial, and industrial buildings.

This time factor can be reduced if the automatic suppression and detection notifies the occupants and the communications center simultaneously. This time factor can be significantly controlled by changing the local codes to require detection devices in all residential, commercial and industrial buildings, with automatic notifications in those facilities with large life or property loss potential.

### **2. Communications Notification to Fire Company Dispatch**

A dispatch center's internal processing time of a call for assistance is dependent upon the call load, the level of expertise of the communications operators, and the type of communications equipment. A processing time of less than 60 seconds is ideal and should be the goal of fire departments.

3. Fire Company Dispatch Until Apparatus is En route (Turnout Time)

Once notification is received in a fire station, personnel must stop their activities, note the location and nature of the call, board the apparatus, don any protective clothing, open the doors, start the apparatus, and exit the fire station. These factors are fairly stable and only small amounts of time can be saved by automating the door opening process with the fire station alert and placing the information regarding the nature and location of the call on computer terminals in the vehicle.

4. Travel Time to the Scene

Travel to the scene generally requires the most time. It is dependent upon:

- Fire station location;
- Weather factors;
- Road conditions;
- Traffic conditions; and,
- Training of personnel.

Response time can also be lessened as a result of installation of traffic control preemption devices.

5. Initiate Rendering of Service, e.g., Placing Hose Lines in Service (Set-up Time)

Upon arrival at the scene, water supply must be established; self contained breathing apparatus donned, and attack hose lines stretched to the location of the fire. The effectiveness of the company's operation on the fire ground is dependent upon, among other things, the level of training and the physical condition of the personnel and the number of personnel arriving at the scene. Firefighting personnel then enter the structure, approach the fire, and initiate fire suppression activities, while at the same time conducting search and rescue activities as necessary. The amount of time required for set-up can vary significantly from one incident to another.

## **Time Segment Responsibility**

The responsibility for the various components of response time in the City of Pawtucket and other communities is shared between the dispatch function and the fire and EMS service providers—the fire department dispatch center and the fire and EMS field personnel. The components shared by each of these agencies are as follows:

### **Communications Center Responsibility**

1. Event occurs and continues until detected by human, electronic or mechanical means.
2. Emergency communications center receives notification of event.
3. Call taker qualifies the call. Must determine type of incident, extent of event, location of event, and other pertinent information.
4. Call taker enters data and reviews. Transfers incident to dispatcher.
5. Information reviewed, response sequence reviewed and dispatch made.
6. Dispatch information received in the fire and EMS station.

### **Fire and EMS Agency Responsibility**

1. Turnout time: Personnel move to fire unit, get on unit and advise the communications center the unit is responding.
2. Travel time.
3. On-scene time.
4. Termination of action.

These responsibilities are outlined to emphasize that the PFD operations and dispatch center staff should consider their responsibilities for the various components of response time and take action to make improvements. This analysis can aid in reducing processing time and potential errors.

## **Response Area Criteria**

### **NFPA Mileage-Based Criteria**

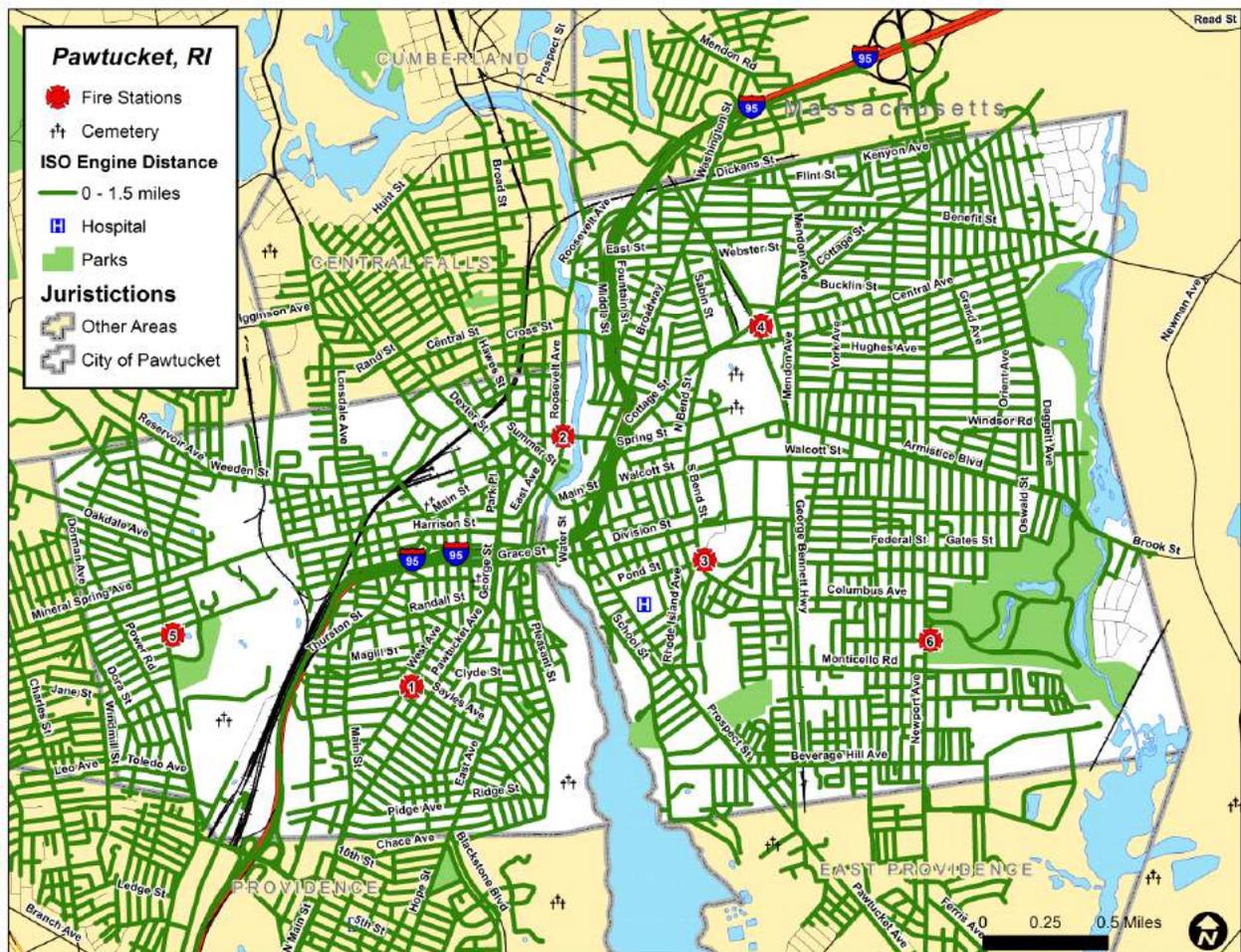
The establishment of response times for a specific community depends upon the geography, demographics, and distribution of commercial, industrial, and residential property.

The National Fire Protection Association (NFPA) has established criteria that states that a pumper should be located within:

- Two miles of residential property;
- One and one-half miles of commercial areas; and,
- One mile of major industrial development that would require a flow of water of 5,000 gallons per minute or more.

These are very conservative estimates. The problem with using mileage alone is that weather and road conditions are not taken into account. Figure 4.8 shows the 1.5 mile distance of pumper (engine) company from the stations.

**Figure 4.8**  
**ENGINE 1.5 MILE DISTANCE MAP**



Because all stations currently house an engine (pumper), the entire city is within reach of an engine in less than 1.5 miles. The extreme northeast and southeast corners are residential in nature and well within the two-mile distance.

### **ISO Criteria**

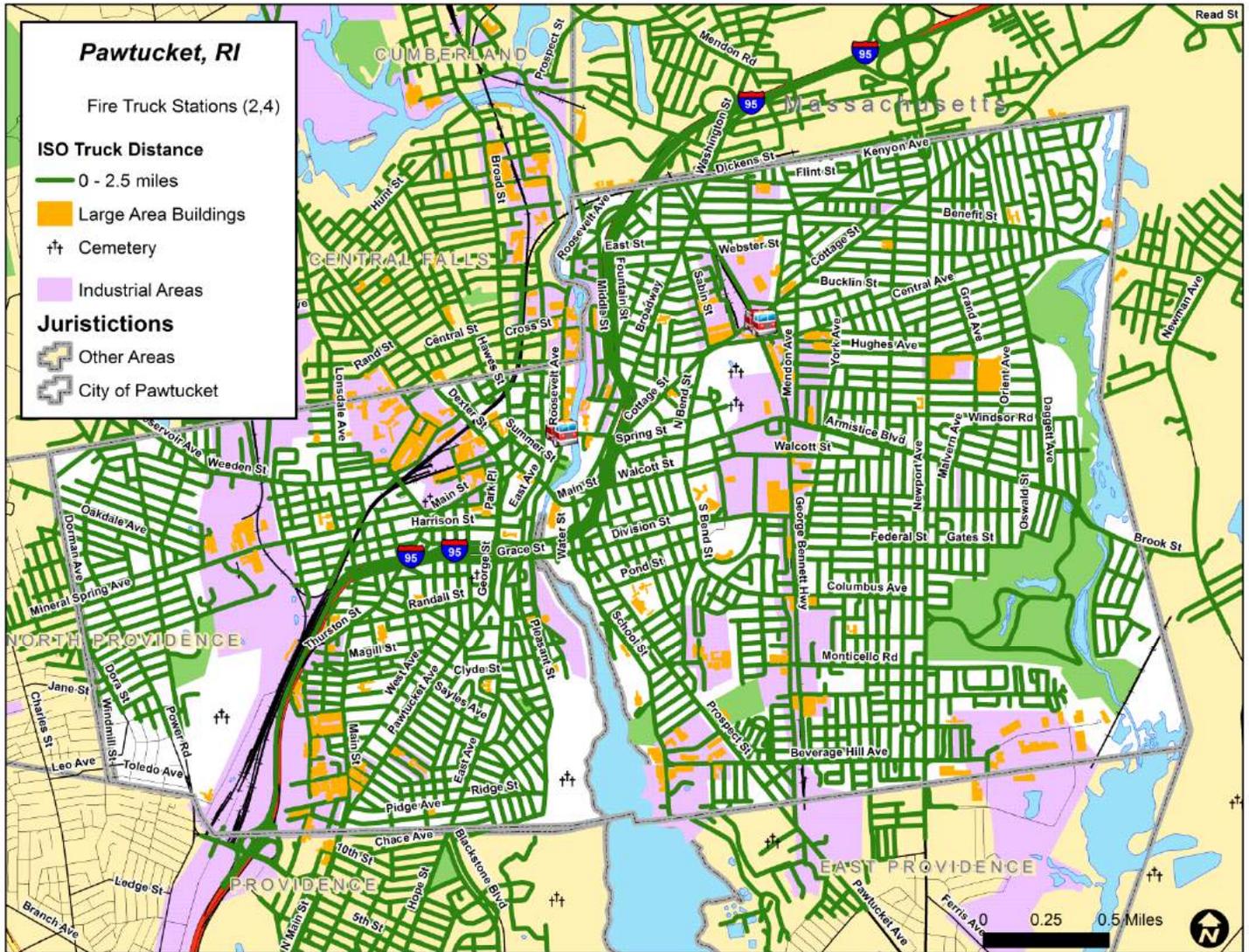
The Fire Suppression Rating Schedule used by the Insurance Services Office (ISO) in its evaluation of municipal fire suppression capabilities includes fire station location analysis with objective mileage-based criteria. Item 560 in the *Fire Suppression Grading Schedule*, Edition 6-80, reads as follows:

“The built-upon area of the city should have a first-due engine company within 1.5 miles and a ladder-service company within 2.5 miles.”

The ISO considers the optimum physical location of engine companies and ladder companies essential to earning maximum credits under the Fire Department Item in the Schedule. Obviously, engine companies and ladder companies are placed in fire stations. So it is the location of the fire station that becomes important to the evaluation process used by the ISO.

Figure 4.9 illustrates the 2.5 mile distance from a ladder truck company from Station 2 and 4 relative to the city’s industrial areas. The city has numerous aged mill factories, which are either still in use, been converted to condominiums, house commercial enterprises, or are vacant. Large industrial swathes of property, including rail yards, are plotted throughout the city.

**Figure 4.9**  
**ISO LADDER TRUCK DISTANCE COVERAGE**



**Risk Category Criteria**

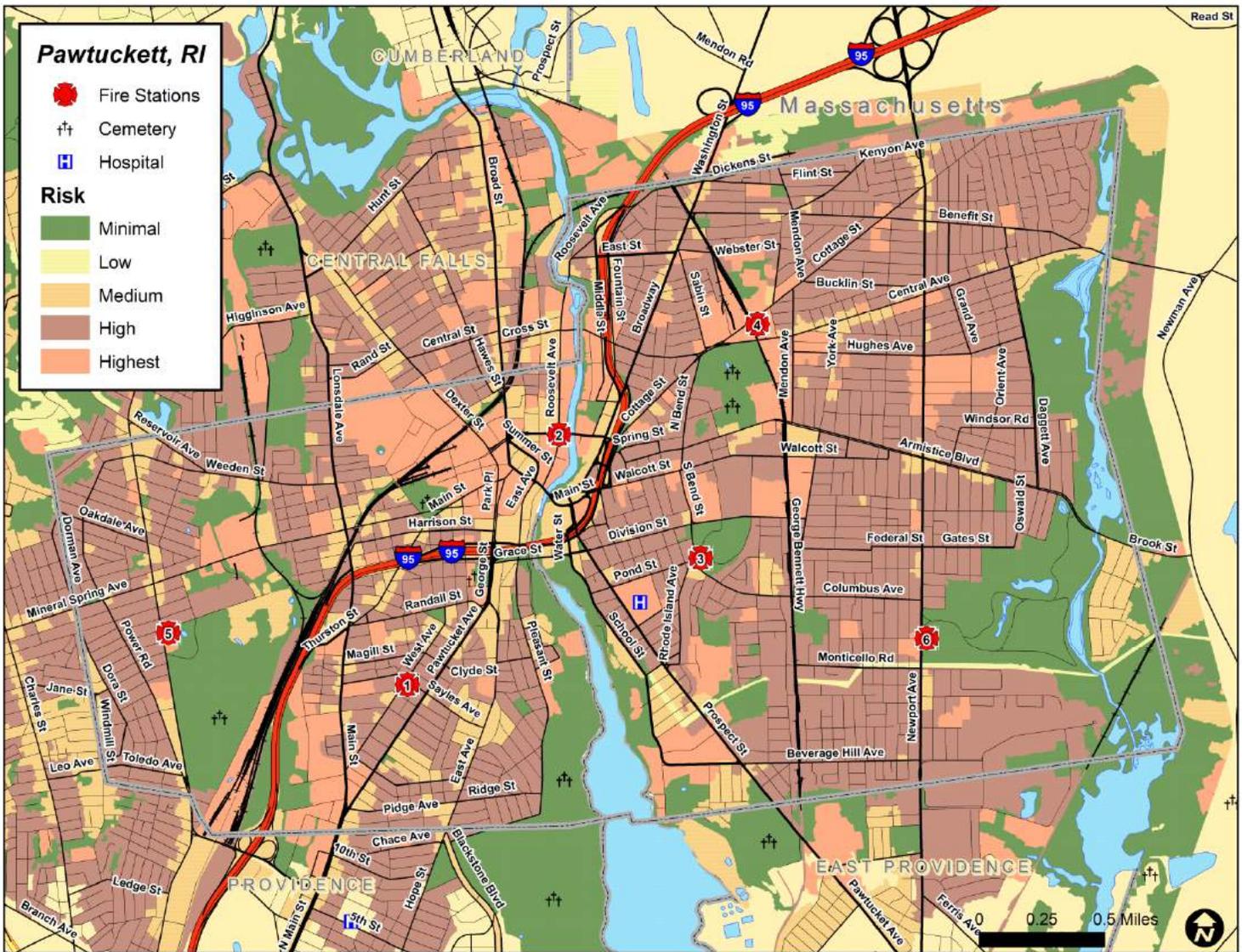
Another way of approaching this issue is to define levels of property risk and assign a response-time requirement to each risk, rather than using mileage response. These risks can be defined as follows:

1. *Highest*—Refineries, large industry, hospitals, school dormitories, lumber yards, and propane storage facilities without built-in suppression or detection systems;
2. *High*—High-rise hotels and residential buildings, large shopping centers, and industrial complexes;
3. *Medium*—Commercial and industrial facilities with sprinkler systems, small shopping centers, and high-density, low-rise residential buildings;
4. *Low*—Single-family dwellings with a separation of at least 100 feet between buildings; and,
5. *Minimum*—Wide separation of single family dwellings and farm land.

In the International City Management Association's (ICMA) study *Fire Station Location Analysis: A Comprehensive Approach*, the following data on the response time requirements of some cities were provided in an article by Susan B. Benton and Neal B. Carpenter entitled, “A Computerized Approach to Fire Station Location.”

<b>Risk Category</b>					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>City</b>	<b>Minutes</b>				
San Antonio, TX	2.5	3.0	3.5	4.0	6.0
Salt Lake City, UT	2.5	3.0	3.5	4.0	6.0
Lynchburg, VA	3.0	4.0	5.0	6.0	7.0
Memphis, TN	2.3	2.7	3.3	4.3	5.8
Davenport, IA	3.0	3.5	4.0	4.5	5.0

**Figure 4.10**  
**PAWTUCKET RISK MAP**



## **Time-Based Criteria**

The response time of fire and EMS apparatus to the scene of an emergency incident is an essential determining factor as to the magnitude of the fire or medical emergency that the fire department must handle upon arrival on the scene of the incident. The theory is the shorter the response time, the smaller the fire that must be extinguished and the better opportunity for paramedics to save critical patients.

Time-related criteria for determining and evaluating fire station locations can be divided into two types of incidents: fire and emergency medical service related incidents.

### **Fire-Related Time Considerations**

One of the key factors to consider in assessing response times to fires is the time from ignition to flashover. The instantaneous eruption into flames generates a tremendous amount of heat, smoke, and pressure with enough force pushing beyond the room of origin through doors and windows. The combustion process then speeds up because there is an even greater amount of heat to move to unburned objects.

The time from ignition until water is applied to a fire should be no longer than the six to nine minutes it takes for flashover to occur with a free-burning fire. Again, flashover is defined as the instant burning of an explosive mixture of heated air, smoke, and gases that flashes through openings around the fire area, such as doors and windows. This does not include a smoldering fire, which can burn for hours before breaking out into the free-burning stage.

Flashover is a critical stage of fire growth for two reasons. First, no living thing in the room of origin will survive, so the chance of saving lives drops dramatically. Second, flashover causes a quantum jump in the rate of combustion, and a significantly greater amount of water is needed to cool the burning material below its ignition temperature. More firefighters are needed for fire attack and there exists the likelihood of reduced fire safety.

Figure 4.11 is a summary of the significance of flashover in the process of fighting fire.

**Figure 4.11**

SIGNIFICANCE OF FLASHOVER	
Pre-Flashover	Post-Flashover
Limited to One Room	May Spread Beyond One Room
Requires Smaller Attack Lines	Requires Larger, More Attack Lines
Search & Rescue Is Easier	Compounds Search & Rescue
Initial Assignment Can Handle	Requires Additional Companies

Source: *Creating and Evaluating Standards of Response Coverage for Fire Departments*, 3<sup>rd</sup> Edition - Summer 2001, CFAI

For these reasons, it is critical that fire suppression forces reach a fire structure and initiate effective suppression efforts prior to flashover.

Measurements of many of the response parameters outlined are not possible because data is not collected or readily available for automated analysis by the PFD. Decisions must be based on average response time based on travel time calculations. **Travel time must be kept short enough to ensure that the total average time does not exceed the six-to-nine-minute flashover requirement.**

### **EMS-Based Response Time Goal**

Time is one of the most important factors relating to patient outcomes in emergency medical situations. Rapid delivery of EMS is essential in the acute situation of cardiorespiratory arrest; a measurable factor is the time from heart stoppage and cessation of breathing (clinical death) to when irreversible brain damage begins (biological death). Although the time varies with patients and conditions, the generally recognized intervention time to prevent biological death is four to six minutes. Time is also critical in heart attacks, stroke, and major trauma where time interval recommendations for emergency crews have been established by the American Heart and Stroke Association and by trauma surgeons.

## **NFPA 1710 Standard**

There are a number of applicable NFPA standards and practices that include response time considerations, which are important to labor and fire officials nationwide. NFPA 1710 (Standard for the Organization and Deployment of Fire Operations) response time-related provisions are described in the following sections.

NFPA 1710 is an industry standard that serves as a benchmark for the fire department organization and deployment of services offered by firefighters. It is the standard for paid/career fire departments that describes the requirements for delivery of services, response capabilities, incident management, and strategy.

This Standard includes the following benchmarks related to call receipt and processing time, turnout time, and response (travel) time:

- Turnout time of eighty seconds on fire suppression calls and sixty seconds for EMS calls;
- The fire department's fire suppression resources deployed to provide for the arrival of an engine company within a four-minute travel time and/or the initial full alarm assignment within an eight-minute response time to 90 percent of the incidents;
- The fire department's EMS basic life support (BLS) resources with automatic defibrillator equipment deployed to provide for the arrival of a BLS unit (EMS first responder or transport unit) within a four-minute travel time; and,
- The fire department's EMS resources providing advanced life support (ALS) service deployed to provide for the arrival of an ALS company within an eight-minute travel time to 90 percent of the incidents.

It should be noted that the various standards and criteria discussed in previous sections placed a high priority on both the effective delivery of fire and EMS service in the protection of life and property. Moreover, the safety of the firefighters and officers delivering the services and safety for the customer and stakeholder were important considerations to the development of these standards and criteria, and to their application by the Audit Team for Pawtucket.

### **NPFD Response Time Goal**

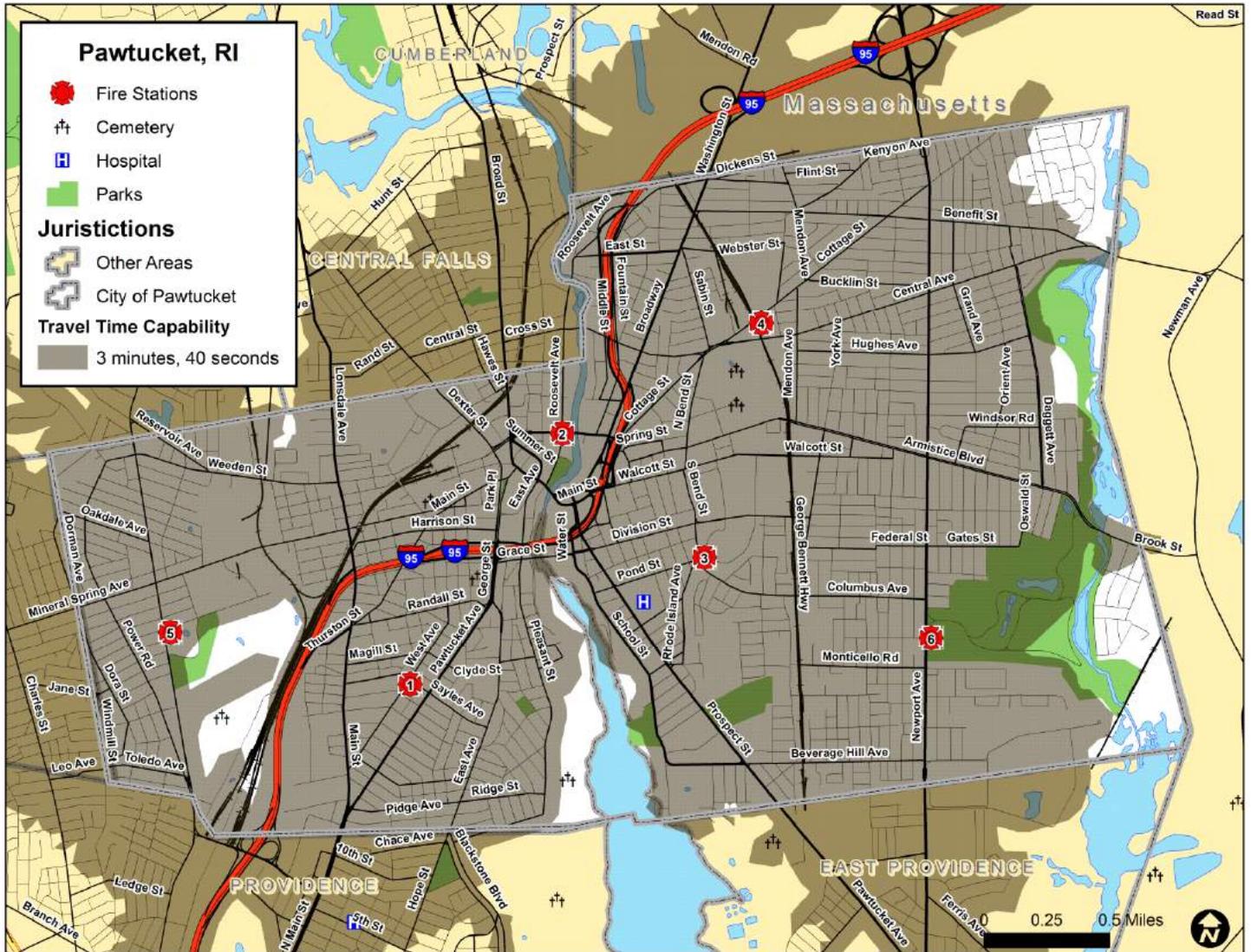
Given the fact that actual fractal response time data is not currently available to the Audit Team, and based on the response time criteria and standards outlined, **the Audit Team utilized the average projected response time goal of five minutes.** It should be noted that for purposes of this evaluation “response time” is considered to include both turnout time for initial response of the apparatus and the projected time for apparatus to travel to the scene. The Audit Team recommends that **Pawtucket adopt the NFPA 1710 guidelines** pending the availability of actual comprehensive fractal response time data from its emergency dispatch center.

Once comprehensive fractal apparatus response time data is available, the Audit Team recommends it be reviewed with adjustments implemented to meet the goal for the five-minute response time/turnout time goals outlined in NFPA 1710.

### **SERVICE DELIVERY DISTRIBUTION**

Another factor that influences response time is the time it takes to travel to incidents. The geographic extent of a fire apparatus that can be reached within a certain travel time exists from each station regardless of staffing patterns. Figure 4.12 illustrates the travel time capability of emergency apparatus when it leaves each firehouse. Adjustments to speed capability of the streets were made to account for negotiating turns and intersections. This travel time can be affected negatively by traffic, construction, weather, design, connectivity, and speed limit, to name a few. In addition, each station’s apparatus was delayed departure based upon the recommended eighty second turnout time for fire apparatus.

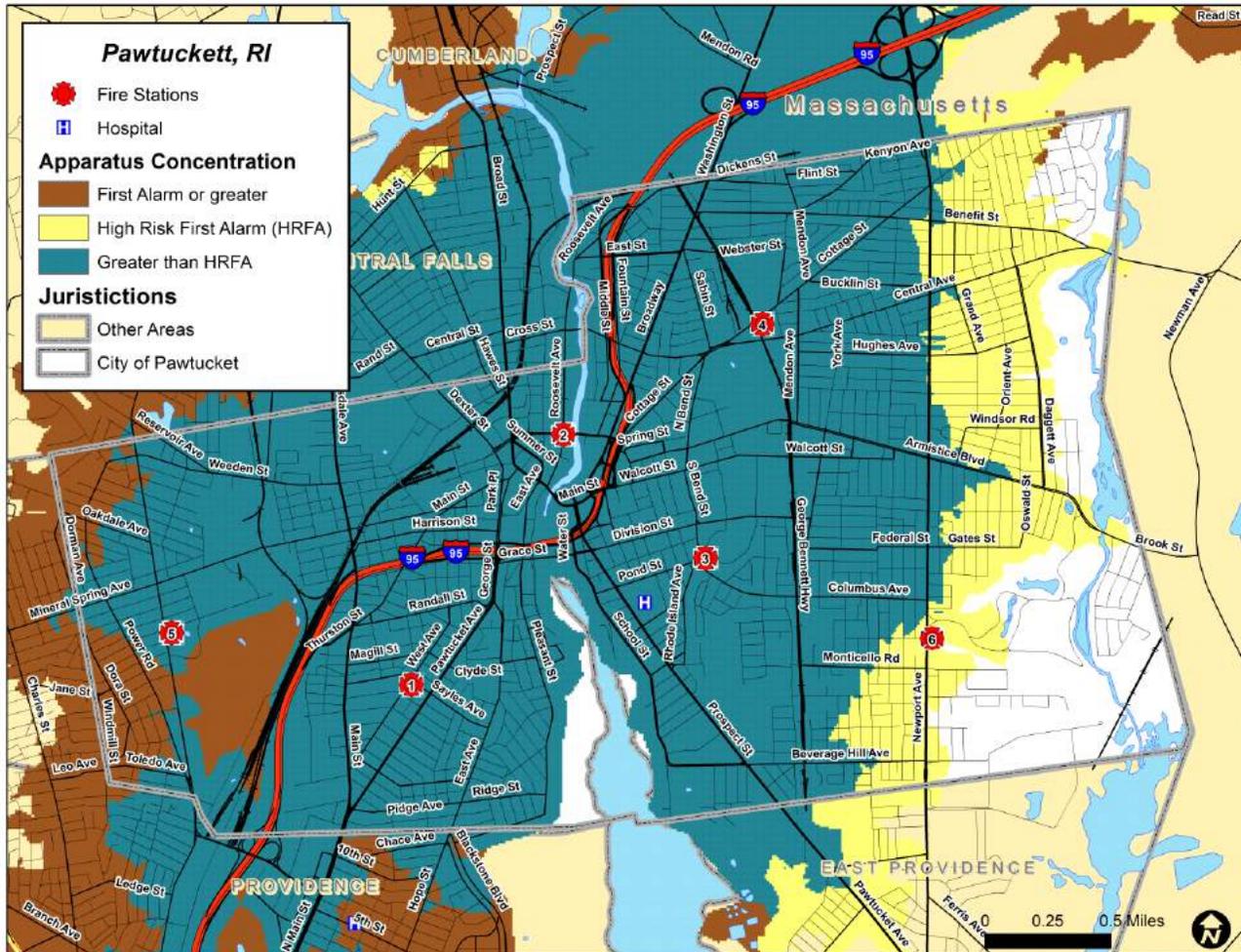
**Figure 4.12**  
**RESPONSE AREA CAPABILITY**



The first arrival apparatus from the closest station provides the city with blanketed coverage except for extreme northeast and southeast residential areas. Available ambulance coverage from either Station 1 or Station 4 in eight minutes of travel also provides the city with adequate coverage. Fortunately for Pawtucket, a hospital exists near the geographic center of town, many times a rescue ambulance may be responding from there and the travel time capability for the city is unhindered. Coverage by all types of apparatus currently is hindered only by the volume of demand and, in the case of rescue units, the transportation out of the area to hospitals or multi-casualty incidents.

While overlaps of coverage between stations exist, this is important if demand creates a situation where the next neighboring station's apparatus needs to respond into another's primary area. It is also important when examining the geographic extent of travel time to assemble a first-alarm concentration of apparatus and firefighters. For Pawtucket's 3-man crews, a first-alarm assignment dispatches three engines, a ladder truck, and the duty battalion chief. For a high risk structure (such as a multi-storied building, elderly housing, or a school), the fire department sends four engines, two ladder trucks, a rescue ambulance, and the duty battalion chief. Figure 4.13 shows where varying levels of apparatus concentration can reach based upon an eight minute travel time.

**Figure 4.13**  
**APPARATUS CONCENTRATION COVERAGE**



**MUTUAL AID**

This section reviews fire department mutual aid and its use by the Pawtucket Fire Department.

“Mutual aid” as discussed in this section refers to the response of fire and EMS apparatus across jurisdictional or municipal boundaries. The effective use of mutual aid apparatus response has become a successful means for the level of fire protection service in participating jurisdictions to be improved without increased financial commitments. During a time when many municipalities are continuing to deal with severe fiscal

constraints, the implementation of mutual aid (particularly automatic mutual aid) has become an accepted national trend.

The *NFPA Fire Protection Handbook* states the following regarding the implementation of mutual aid:

“Every fire department today should have mutual-aid or automatic-aid contracts with adjoining departments. These reciprocal agreements provide communities with the ability to share their personnel and equipment to provide sufficient resources to handle major emergencies in a timely and cost-effective manner.”

### **The Concept**

Mutual aid is the means by which one fire department or group of fire departments assist another either upon request, on an incident-by-incident basis, or on an automatic basis from the point of initial dispatch. It is virtually impossible for any local government to staff and equip its fire services to handle every potential major incident. This is especially true for small municipalities. The cost would be prohibitive and is entirely unrealistic, especially considering fiscal constraints facing local jurisdictions today. As a result, it is very common for fire departments to implement mutual aid agreements with the surrounding jurisdictions in order for personnel and equipment to be jointly dispatched on certain types of major incidents.

There are two types of mutual aid response approaches. One type of mutual aid is referred to as “special request” mutual aid and involves a request being made either by the incident commander or the dispatch center. The second type of mutual aid is “automatic” closest unit available dispatched mutual aid that involves a request for mutual aid being made by the dispatch center under established protocols.

### **Benefits of Automatic Mutual Aid**

Improved fire protection service to the public can be attained in the following ways through the use of automatic mutual aid on incidents where mutual aid companies are closer:

- More timely arrival of apparatus on the scene of incidents;

- Improved firefighter safety as a result of the reduced time necessary for mutual aid units to arrive on the scene to provided needed assistance;
- Decreased response times resulting in improved delivery of fire and EMS services; and,
- Improved firefighter safety.

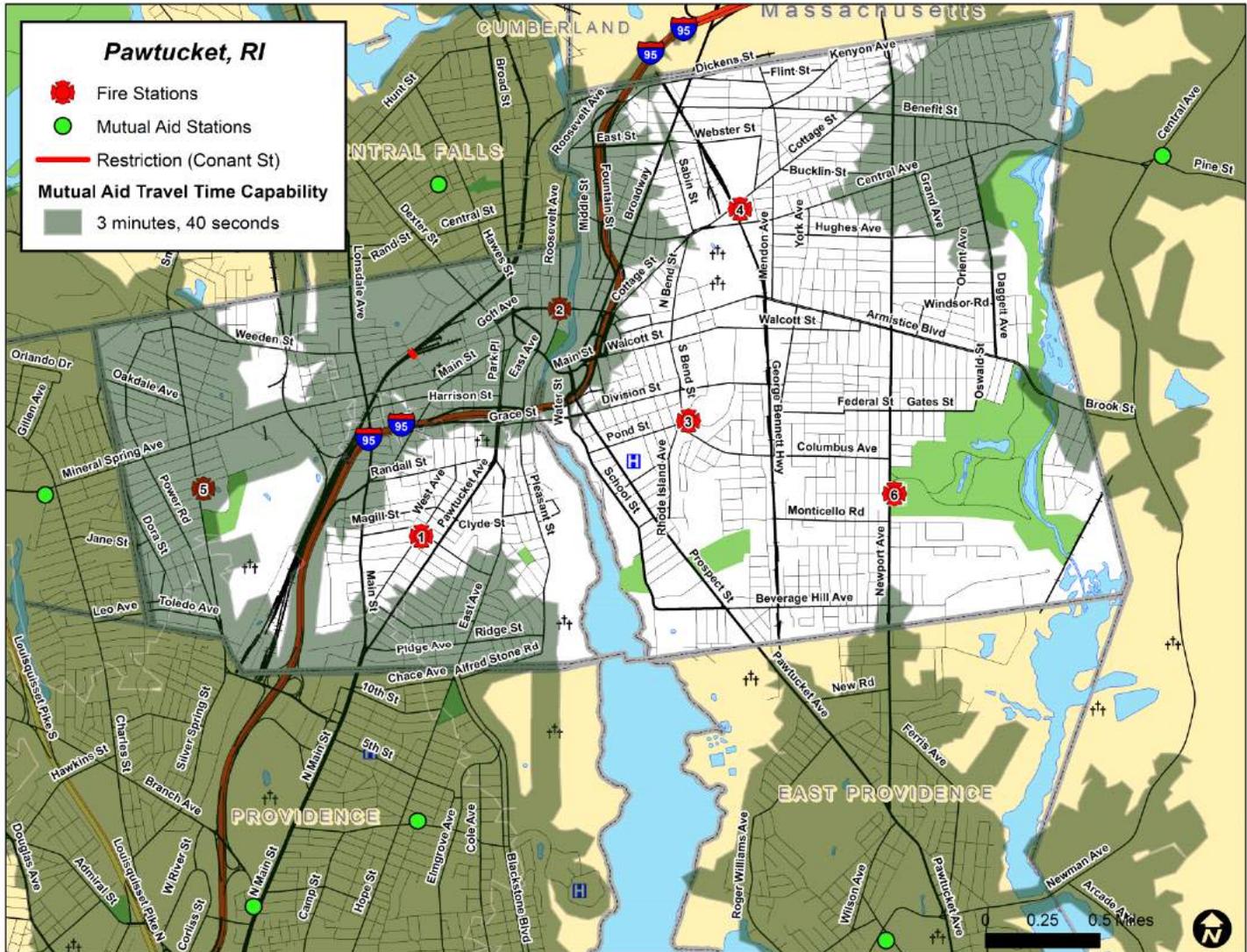
### **Use of Mutual Aid**

City of Pawtucket has a number of mutual aid procedures with surrounding municipalities/counties. However, there is very limited use of inter-jurisdictional mutual aid by the Pawtucket Fire Department. Automatic mutual aid is not utilized. The type of mutual aid used by PFD and surrounding fire rescue agencies is “special request” mutual aid, in that the officer in charge of the incident must request units from another fire rescue agency through the dispatch center, who then makes arrangements to fill the request.

The PFD is also part of the Rhode Island State-wide Mutual Aid Response System, a mutual aid response system established by the Rhode Island Association of Fire Chiefs to coordinate mutual response on a large-scale major incident or multiple incident basis through four Regional Control Centers. This State-wide mutual aid response system is a form of “special request” mutual aid.

To improve fire protection service in the future through reduced response times, the City of Pawtucket should consider taking steps to facilitate automatic closest unit dispatched mutual aid response with the fire departments in neighboring jurisdictions and municipalities. Figure 4.14 illustrates the projected response areas of relevant mutual aid fire stations immediately adjacent to the City of Pawtucket.

**Figure 4.14**  
**MUTUAL AID RESPONSE TRAVEL CAPABILITY**



Of note is the projected response area of the North Providence fire station #4 near the western border of Pawtucket and the Central Falls Fire Station relative to Pawtucket Fire Station 2. These fire stations are very close to a substantial portion of Pawtucket and could arrive on-scene in that area to work in a team effort with city fire units, thus potentially providing a measurable improvement in fire services and customer and firefighter safety. Further, there would be no additional cost to the city, if an engine from

a neighboring municipality fire station were dispatched on the initial assignment under an appropriate automatic closest dispatched mutual aid protocol.

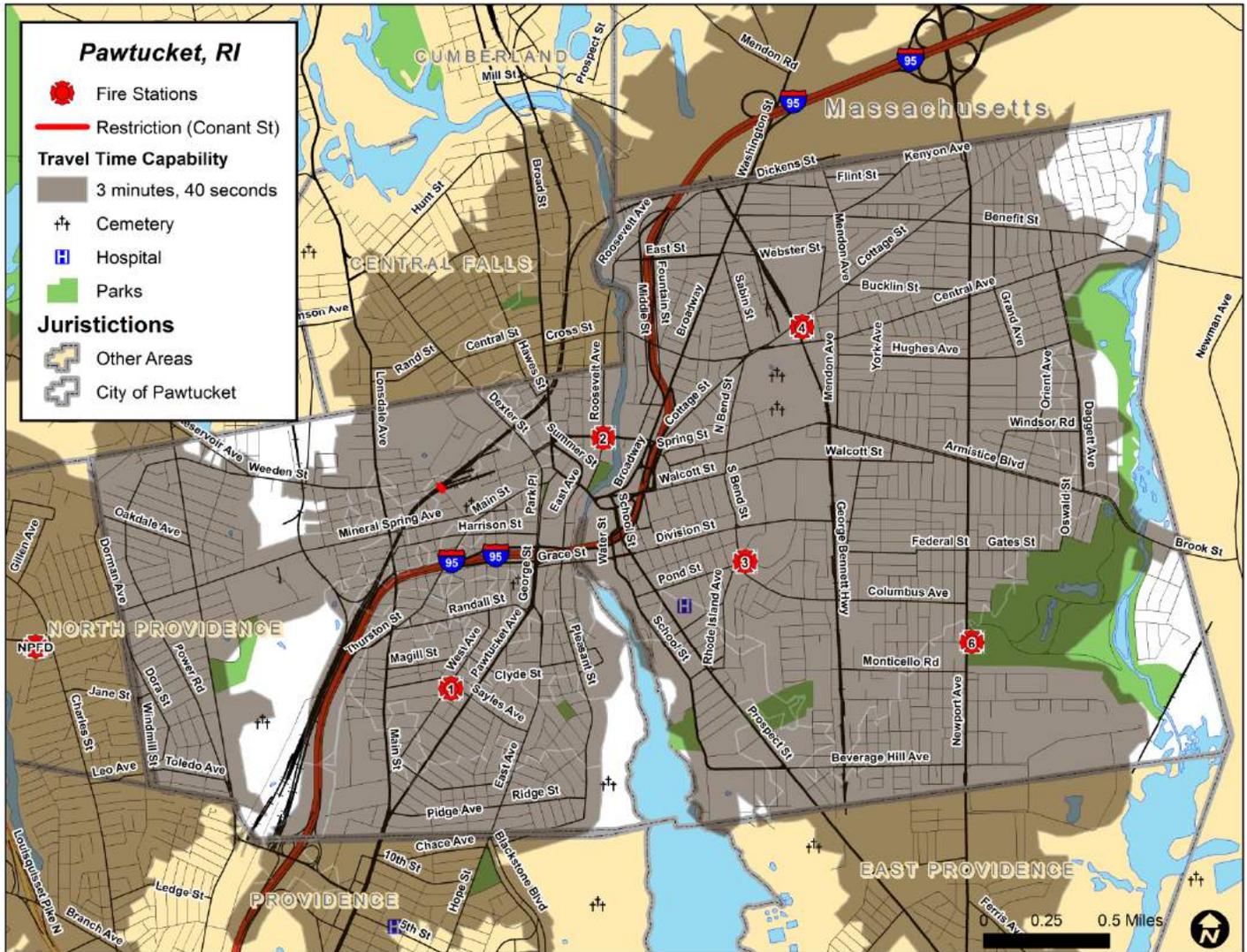
Ultimately the full benefit in terms of reduced response times cannot be attained unless “automatic” mutual aid is implemented. Therefore, consideration should be given to **implementing "automatic" closest unit dispatched mutual aid with all adjacent fire departments.**

### **SCENARIO A: USE OF WEST SIDE REGIONAL STATION**

Due to the proximity of Pawtucket Fire Station 5 and North Providence Fire Station (NPFDD) 4, this scenario examines the first response coverage if the resources of these two stations were combined into one station. PFD Station 5 is a two-bay station without drive-through capability located next to an elementary school. Aside from its operational engine apparatus, it houses a reserve rescue, a hazmat unit and a multi-casualty trailer. NPFDD Station 4 is a more recently constructed three-bay, drive-through facility located along a major arterial route of Mineral Springs Road. It houses operational engine, squad and a rescue unit.

Should NPFDD Station 4 operate from PFD Station 5, space becomes available to house the NPFDD units, as well as relocating the reserve PFD resources into other stations, none of which have space. More viable, due to the overall size of the station, would be for PFD Engine 5 to operate from NPFDD Station 4. Alternatively, a singular engine company and other apparatus, including reserve resources could operate with both NPFDD & PFD firefighters covering both jurisdictional areas. Space for reserve units will need to be evaluated for capability at NPFDD Station 4 as it would be superfluous to operate PFD Station 5 as a storage facility. Issues such as maintenance, heat and air conditioning cost, and security continue or worsen in an unmanned facility. Figure 4.15 illustrates the coverage in Pawtucket utilizing NPFDD Station 4 as a regional operational base.

**Figure 4.15**  
**WESTERN REGIONAL STATION SCENARIO**



The advantages of this scenario (reduced departmental operating costs and regional cooperation) are not without some shortcomings. The area north of Reservoir Avenue is just slightly outside the modeled first response area and the industrial area off of Concord Avenue has a reduced area of reach by a fire apparatus within the first response area when compared to apparatus responding from PFD Station 5.

## **FOUR-FIRE STATION MODEL**

Another option that could be considered by the City would be a four-fire station model, including the implementation of the Western Regional Station option. As illustrated in Figures 4.8 and 4.12 four fire stations could provide good coverage to all areas with the NFPA 1710 and ISO guidelines. Further, a four-fire station option was suggested as “the most attractive option” by a review of the Pawtucket Fire Department conducted in 1992 by another consulting firm. That study stated that “this plan is considered attractive because it reduces the number of fire stations from six to four, with corresponding reduction in building maintenance and operations costs, with very minor impact on response times.” Further, in the opinion of the Audit Team, substantial improvement in safety and services delivery could be attained if the staffing of a number of the remaining engines and ladder trucks were increased to meet NFPA 1710 guidelines of four person staffing.

## **RECOMMENDATIONS**

- 4-1 The City should implement a vacant property tracking and monitoring data base and concentrate efforts to reduce the number of vacant properties and manage the vacant property issue to reduce blight and the problems involving such properties.
- 4-2 The City should consider implementing automatic “closest available” mutual aid with all surrounding municipal fire departments to provide improved safety of firefighters and customer services delivery through reduced travel time of apparatus to the scene of emergencies.
- 4-3 The City should consider implementing the shared services delivery option referred to as the Western Regional Station Scenario for reduced cost of operations.
- 4-4 The City could also consider implementing a four-fire station option (including the Western Regional Station Scenario) for improved cost effectiveness and apparatus staffing by closing either Fire Station 3 or Fire Station 6.
- 4-5 The City should consider the opportunity to improve fire company staffing to four-persons on an appropriate number of engine and ladder companies in the event automatic mutual aid and four-fire station model is determined to be appropriate.

## **CHAPTER FIVE FIRE & EMS APPARATUS**

This Chapter includes a general overview of fire and EMS (rescue) apparatus; NFPA standards and general maintenance requirements; PFD apparatus maintenance programs; the current inventory of vehicular fire and EMS apparatus; and suggestions to consider for the future.

### **CFAI APPARATUS AND VEHICLES**

The Study Team considered criteria from the Commission on Fire Accreditation International (CFAI) in their evaluation of the current and future apparatus needs assessed as part of this Study.

The CFAI accreditation criteria related to fire department apparatus are as follows:

1. Apparatus resources are designed and purchased to be adequate to meet the agency's goals and objectives.
  - a. Apparatus is located to accomplish the stated standards of response coverage and service level objectives.
  - b. Apparatus types are appropriate for the functions served, i.e. operations, staff support services, specialized services, and administration.
  - c. There is a replacement schedule for apparatus and other tools and equipment.
  - d. There is a program in place for writing apparatus replacement specifications.
2. The inspection, testing, preventative maintenance, replacement schedule, and emergency repair of all apparatus are well established and meet the needs for service and reliability of emergency apparatus.
  - a. The apparatus maintenance program has been established. Apparatus is maintained in accordance with manufacturer's recommendations and maintenance is conducted on a regular basis. Attention is given to the safety-health-security aspects of equipment operation and maintenance.

- b. The maintenance and repair facility is provided with sufficient space and equipped with appropriate tools.
- c. A system is in place to ensure the inspection, testing, fueling, preventative maintenance, and emergency repair for all fire apparatus and equipment.
- d. There is an adequate number of trained and certified maintenance personnel available to meet the objectives of the established program.
- e. There are standard procedures and methods in place for the apparatus maintenance program.
- f. There is adequate supervision to manage the program.
- g. There is a management information system in place that supports the apparatus maintenance program and provides for analysis of the program.

## **GENERAL APPARATUS DESCRIPTION**

Because the lay reader may not be familiar with the differences in fire equipment, a brief review is provided.

### **Types of Fire Apparatus**

There are four basic types of fire rescue apparatus:

1. Pumpers deliver water from an internal tank, pressurized system, or static source (river, canal or pond) to the fire scene;
2. Aerial devices are vehicles with long extension ladders or platforms;
3. Specialized rescue trucks with equipment for extricating individuals from vehicles, underground entrapment, high locations, entanglement in machinery, and difficult transportation accidents; and,
4. EMS transport units (rescues or ambulances) with basic and/or advanced life support supplies and equipment.

In addition, a single vehicle can include a number of these functions. For example, a pumper and ladder truck can be on a single chassis—referred to as a “quint” or a rescue

squad and a ladder or pumper truck can be designed as the same vehicle. Further, a pumper or ladder truck, properly equipped with specialized vehicle extrication and rescue equipment, may provide both a firefighting and extrication/rescue service—referred to as a rescue-engine or rescue-truck. **Combination units of these types are often utilized to attain the maximum service delivery capability with a limited number of available staff and funding constraints.**

### **Pumpers/Engines**

In order to deliver water to the fire scene, a pumper has to connect to a water source and function to develop pressure into the hose lines. The amount of water that a pumper delivers is measured in gallons per minute (gpm). The smallest size pumper currently made is 500 gpm, while the largest standard pumper is 2,000 gpm.

Pumpers also carry various size hoses and nozzles to get the water to the scene and apply it to the fire. In addition, the amount of water flowing determines the number of personnel required to stretch the hose line. Large flow devices, known as master stream nozzles, require a large number of personnel to set up and a few individuals to monitor the flow.

### **Ladder Trucks**

Aerial devices carry an elevating ladder or basket which, depending on its design, extends between 75 and 200 feet. A ladder truck has an extension ladder fixed to the chassis, while a platform has a basket that can extend from ground level to its maximum height. Several manufacturers make combination platform and ladder trucks.

In addition to the fixed-extension device, ladder trucks carry fixed and extension ladders in varying lengths (12, 14, 20, 24, 28, 35, 40, and 50 feet). Other responsibilities of personnel assigned to this type of apparatus might require that entry, ventilation, and salvage equipment also be carried.

## **Heavy Rescue Vehicles**

As indicated, the emergency service becomes involved with the rescue of individuals in very difficult situations. These rescues can involve heights, below-grade problems, entanglements in machinery, entrapment in vehicles, and exposure to chemicals. Each of these problems requires that specialized equipment be carried. The type of apparatus and equipment will vary with the specific needs of a municipality.

## **Rescue / Ambulance Vehicles**

Pre-hospital emergency medical services and transport are provided by three basic types of ambulance units, as follows:

1. Class I: Pickup truck or small truck chassis ambulance with modular patient care “box;”
2. Class II: Van chassis based ambulance; and,
3. Class III: Van chassis ambulance with modular patient care “box.”

Ambulances are generally designed to transport one patient on a wheeled-litter in a patient care area. This area includes built-in compartments to store essential basic and/or advanced life support supplies and equipment.

The type of apparatus and equipment will vary according to the specific needs of a municipality.

## **Functions of Primary Fire Apparatus**

It is important for the reader to understand the functions of the various types of fire apparatus. The personnel on each different type of vehicular apparatus must perform different functions on an emergency fire incident in order for the incident to be handled in a timely, safe, efficient and successful manner. For this reason, the functions typically performed by each type of fire apparatus are discussed in this section.

It should be understood that, in the absence of the normal type of apparatus (pumper, ladder, squad, and rescue, etc.), each unit may perform other essential functions to

accomplish the overall objectives for mitigating the incident at hand. However, incidents are mitigated in a more timely, safe, efficient, and successful manner when the appropriate number/type of apparatus and personnel are dispatched to emergency incidents.

### **Pumpers/Engines**

The pumper apparatus has essentially one function—the delivery of water to the fire. Despite many technological advances in the fire rescue field, fire departments still extinguish nearly all fires with water. Therefore, the function of the pumper apparatus and the staff on each pumper is to carry, deliver, and put water on the fire. Pumpers assume the tasks of taking water from available sources and applying it to the fire.

Pumpers have pumps, carry hose, and nozzles of various types and sizes and other related equipment.

### **Ladder Trucks**

Even in the early days of American firefighting, the personnel assigned to apply water to the fire were separated from those needed to perform the various other duties required on the fireground. Other primary units, designated “hook and ladder” companies, were assigned the remaining firefighting jobs. Today, the other primary firefighting units are referred to as ladder companies or truck companies.

No matter the name, the duties are mostly the same in all fire departments. Ladder truck companies perform all of the functions necessary to extinguish a fire in support of the pumpers. In summary, the job of the ladder truck is to perform rescue, overhaul, ventilation, entry, and reconnaissance.

Ladder truck duties can be itemized as follows:

- Opening locked doors to permit entry for search, rescue ventilation, and application of water;
- Opening windows, skylights, doors, and other coverings to allow the escape of smoke, heat, and fire gasses;

- Cutting holes in the roof of the fire building to speed the escape of heat, smoke, and fire gasses;
- Using smoke ejectors to aid in the ventilation described in items 2 and 3 above;
- Searching for persons overcome by smoke or otherwise in need of assistance;
- Removing persons in danger to safety;
- Searching for extension of the fire;
- Opening partitions, ceiling, and other concealed spaces, to allow engine companies to put water on the fire;
- Raising ladders when needed to accomplish all of the above items and to allow engine companies to take hose lines to upper floors;
- Overhauling, i.e. opening ceiling, walls, floors, and examining burned furniture, stock, and other contents of the premises to make certain the fire is completely extinguished, and restoring the occupancy to a condition as reasonably close to its pre-fire status as circumstances allow; and,
- Performing salvage duties to minimize loss by removing furniture and goods from a building on fire, or threatened by fire.

These are essential tasks that are critical to the extinguishment of fires and must be performed frequently, while at same time water is being used by the pumper crew to suppress the fire.

## **NATIONAL FIRE PROTECTION ASSOCIATION**

The National Fire Protection Association (NFPA) Standard 1901 specifies the design, equipping, and testing of fire apparatus. The ISO Grading Schedule references this standard and requires the apparatus and equipment in a fire department be tested yearly and proper records of the tests be maintained.

NFPA 1901 requires that pumpers be tested from draft (pond, tank, lake) and meet the levels of performance detailed in Figure 5.1.

**Figure 5.1**  
**PUMPER TESTING REQUIREMENTS — NFPA 1901**

<b>PUMP FLOW (GPM)</b>	<b>DURATION OF FLOW (minutes)</b>	<b>NET PUMP PRESSURE (PSI)</b>
100% of Capacity	20	150
70% of Capacity	10	200
50% of Capacity	10	250
100% of Capacity	5	165

Another required test is the dry prime measurement. This procedure requires that all valves and drains be closed, the primer operated until a reading of 22 inches of mercury is obtained on the master intake gauge, and the motor shut down. At the end of 10 minutes, this gauge must still read at least 12 inches of mercury.

The calculations for net pump pressure necessary for conducting the tests, the test layout, the test equipment, and the test procedure can be found in a number of fire service text books, including *Fire Service Pump Operators Handbook* by the late Chief Warren E. Isman.

## **VEHICLE AND EQUIPMENT MAINTENANCE**

### **Maintenance Requirements**

Both the ISO Grading Schedule and NFPA Standard 1901 require that a complete maintenance and preventive maintenance program be in place. Items that need to be included in this plan are:

#### **Pump**

- Clearance rings
- Packing
- Primer oil reservoir
- Primer rotary vane or gear clearance
- Impeller balance
- Impeller waterway clearance

- Valve gaskets and controls
- Transfer valve changeover equipment
- Gauges for accuracy, needle deflection, and fluid levels
- Relief valve equipment
- Clean intake screens

### **Chassis**

- Braking system
- Air brake adjustment and air reservoir system
- Tire pressure
- Springs
- Lubrication points
- Steering linkages
- Attachment points
- Clutch linkages
- Gear boxes and pump transfer case

### **Engine**

- Engine oil and filter
- Transmission oil
- Coolant condition
- Coolant fluid level
- Auxiliary cooling equipment
- Leaks from any lines
- Radiator and cooling system
- Engine oil
- Transmission oil
- Belts
- Joints, flanges, and hose condition
- Electrical system
- Battery fluid level
- Battery connection
- Alternator

### **Cab**

- Switches and gauges

- Warning devices
- Safety equipment
- Horns
- Windshield wipers and washers
- Parking brake
- Inside lights
- Outside lights, including high beams
- Back-up lights and audible warning device
- Rust or worn parts on the cab or cabinetry

### **Ladders on Trucks**

- Hydraulic level in the system
- Leaks in the hydraulic system
- Condition of the hydraulic lines
- Operation of the controlling valves
- Extension, elevation, rotation
- Ladder locks
- Hydraulic closure systems
- Manual override systems
- Cracks in ladder and base
- Remote starter device
- Pressure gauges

Maintenance work covering these items that must be performed on typical fire and EMS apparatus is illustrated in order for the reader to have an understanding of the complexity and extensive maintenance requirements of this type of specialty vehicular apparatus. Most general city fleet maintenance staffs are not trained or experienced to handle this type of work.

### **CURRENT APPARATUS INVENTORY**

The following figures provide details regarding the current inventory of primary PFD fire and EMS vehicular apparatus.

Figure 5.2 is a detailed listing of the Pawtucket fire and rescue units.

**Figure 5.2**  
**PFD VEHICLAR APPARATUS FLEET**

VEH NO.	POSITION	NAME	REG.	YR.	MAKE	MODEL	VINNO.	COLOR	Take home	Veh.#
CAR 1	FIRE CHIEF	W.SISSON	17	2006	FORD	EXPLORER	1FMEU7384SU607750	BLACK	4DOOR	B07750
CAR2	ASST.CHIEF		1100	2001	FORD	TAURUS	1FAFP3S2S1G221987	BLACK	4DOOR	221987
CAR20	BATTALION CHIEF	BC 1-2-3-4	1182	2004	FORD	EXPEDITION	1FMPUTSL14LA8051S	RED	4X4	A80516
CAR3	C/FIRE PREV.	S. PARENT		2007	FORD	SEL	1FAHP27137G14S85S	Green	4DOOR	145856
CAR31	LT. FIRE PREV.	J. DOLAN		2007	FORD	SEL	1FAHP271S7G14S857	Green	4DOOR	145857
CAR32	LT. FIRE PREV.	S. GALUSKA	35	2004	FORD	CROWN VIC	2FAFP1V984X109644	RED	4DOOR	109644
CAR33	LT. FIRE PREV.	P. DOOLEY	1188	2003	FORD	TAURUS	1FAFP3U23G187194	BLACK	4DOOR	187194
CAR34	F.PREV. SUV	FIRE PREV.	SC		FORD	EXPLORER	1FMDU34E4VJC80SSB	RED	2DOOR	C87149
CAR4	LT. TRAINING		12S2	2003	FORD	CROWN VIC	2FAFP74VV43X197070	SILVER	4DOOR	197070
CARS	FIRE ALARM SUPT.				FORD	CROWN VIC	2FALP71W0SX1S0233	RED	4DOOR	160233
CARS	FF FIRE PREV.	D. LANGEVIN		2005	FORD	TAURUS	1FAFP3U3S1AT59247	BLACK	4DOOR	159247
CAR7	HAZMAT	W. CULLINAN	117	2003	FORD	EXPLORER	1FMZU73WBSUB883700	BLACK	4DOOR	B83700
CARS	ASST. TRAINING	E. SHOTTEK		2005	FORD	PICK-UP	1F1NF21S2SEC87149	RED	4X4	C80658
CAR9	MECHANIC	J. COCCIA	2909		FORD	TAURUS	1FALP5744S220806	RED	WAGON	220806
CART0	MARINE 1 TENDER	STATION 3		2002	FORD	EXPLORER	1FMZU72E22UAS37S2	RED	4X4	A63752
SPARE	LT. FIRE PREV.		104S	2005	FORD	TAURUS	1FAFP3SUSSAT59248	BLACK	4DOOR	159248
ENGINE 1	STATION 1		89		E-ONE	HURRICANE	4ENBAAA89R10037S2	RED	12SO	003782
ENGINE2	STATION 2		2988	2000	FERRARA	INFERNO	1F933422SVZ14002S	RED	12SO	140025
ENGINE 3		RESERVE			MAXIM	F1S	1M9CA0208KM300025	RED	1SOO	300025
ENGINE 3	STATION 3			2009	E-ONE	TYPHOON	4EN 849100S1S7	RED	1SOO	1005157
ENGINE4	STATION4		S97		E-ONE	PROTITLT	4EN 87PT1002881	RED	12SO	002881
ENGINES	STATIONS		1184	2004	E-ONE	CLYCLONE	4ENSAAA884T008847	RED	12SO	008847
ENGINES	STATIONS		177	2007	EONE	TYPHOON	4EN 80710029SO	RED	12SO	102950
ENGINE 7		RESERVE			BECK	34645308	11VSB9SGSNA000023	RED	12SO	000023
LADDER 1	STATION2		1411	2005	EONE	CYCLONE II	4EN3AAA87S1000SSS	RED	95'PLATFORM	po0566
LADDER2	STATION 4		870	1995	E-ONE	HURRICANE	4ENDABABSS1004971	RED	AERIAL LADDER	004971
LADDER3	STATION4		334		E-ONE	HURRICANE	46JDBBBA1M1003SS2	RED	AERIAL LADDER	003652
RESCUE 1	STATION 1			2009	FORD	F4SO	1FDXE45P39DA0201S	RED	RESCUE	102016
RESCUE2	STATION 4			2009	FORD	F4SO	1FDXE45P9DA02017	RED	RESCUE	102017
RESCUE 1	STATION4	RESERVE		2003	FORD	F4SO	1FDXE45F53HB01359	RED/WH	RESCUE	B01369
RESCUE2	STATION4	RESERVE	82	2003	FORD	F36S	1FDWF3SP23EC58781	RED/WH	RESCUE	C58781
SPEC.OP	STATIONS	SPECIALOPS	484	2005	EONE		4EN 89S1000109	RED	HVYRES	000109
TRAILER	STATIONS	MCITRAILER		2003	HAUL		1SHPB142S3HT112843	BLUE	TRAILER	112843
TRAILER	STATION4	SMOKE TRAILER	2377		SURREY	SMOKE TR.	0905SM019US2901S9	WHITE	TRAILER	290169
TRAILER	STATION2	MARINE 2	2878	1993	STARR	B800-14	1WEBA141SW100379S	SILVER	TRAILER	003796
TRAILER	STATION4	HAZMAT	11SS	2005	Blackrock	BOOOhd	2SWUS11A2SS027983		TRAILER	027983
TRAILER	STATION 3	MARINETRAILE		2007	TIDE		5LFGV17177P002981		TRAILER	002981
MARINE 1	STATION 3		SS813	2005	BOS.WHL		WCG00247FS0S	GREY	17' RESCUE BOAT	47F606
MARINE2	STATION 2				QK.SILVR	INFLAT.BOAT	USA793741S97	WHITE	10' RESCUE BOAT	741697

The following table provides specific summary information regarding the current inventory of primary PFD fire and EMS vehicular apparatus (see Figure 5.3).

**Figure 5.3**  
**SUMMARY BY PRIMARY APPARATUS TYPE**

<b>TYPE</b>	<b>NUMBER</b>
Engines	8*
Ladder Truck	3
Special Operations	1
Rescues	4*
<b>Total</b>	<b>16*</b>

Note: \* Includes reserve units.

The in-service primary fire and EMS units are housed at the PFD fire stations as follows:

<u>Fire Station</u>	<u>Address - Apparatus</u>
1	394 West Avenue Engine 1, Rescue 1
2	155 Roosevelt Avenue Engine 2, Ladder 1 & Battalion Chief
3	2 Columbus Avenue Engine 3
4	375 Cottage Street Engine 4, Ladder 2 & Rescue 2
5	301 Smithfield Avenue Engine 5
6	385 Newport Avenue Engine 6

Figure 5.4 illustrates the PFD engine apparatus fleet.

**Figure 5.4**  
**ENGINE APPARATUS**

**Pawtucket  
Fire Department**



Engine 1



Engine 2



Engine 3



Engine 4



Engine 5



Engine 6



**APPARATUS CONFIGURATION OPTIONS**

**Justification for Apparatus**

This Section reviews the justification for the apparatus in the PFD fleet. In considering future changes to the fleet, some of the following factors were considered:

- Fire rescue risks handled by the PFD
- Fire station location recommendations adopted
- High cost of purchasing fire rescue apparatus
- Cost of maintaining fire and rescue apparatus

- Fire station space requirements for apparatus
- Organization of the fire department

The Audit Team noted that the need for the current apparatus in the Pawtucket Fire Department relates to the historical development of the fire and rescue service in Pawtucket and the built-out nature of the City.

### **Engine/Pumpers**

The Fire and EMS Stations chapter of this Study report included the suggestion that the City consider implementing a four-station or five-station option for the delivery of fire and EMS services in Pawtucket. If the City chooses to implement a four-station or five-station option, the number of engines in the PFD emergency apparatus fleet could be reduced by three engines. With such a reduction there could be four in-service and one reserve engine in the PFD apparatus fleet.

### **Ladder Truck/s**

The PFD currently operates two in-service ladder trucks that operate with unit staffing at Fire Station 2 located at 155 Roosevelt Avenue and Fire Station 4 located at 375 Cottage Avenue.

The ISO standard for ladder company response areas is that “the built-upon area of the City should continue to have two first-due ladder-service company within 2.5 miles.” Figure 4.9 (Chapter Four) visually illustrates the ISO standard compared to the PFD ladder truck with a 2.5 mile response area circle around the ladder truck at Fire Station 1.

### **Cars, Vans, and Pickup Trucks**

Cars, vans, and pickup trucks provided to support PFD staff in the provision of its various services should be based on need and justification provided by the Fire Chief and his staff to the City. Periodically, the City should require that the cars, vans, and pickup trucks in the PFD vehicle fleet be re-justified to insure the appropriateness of these types of units in the fleet.

## **PROPOSED APPARATUS INVENTORY**

Other chapters of this Audit contain options for increased efficiency in the Pawtucket Fire Department. Specifically, the reduction in the number of engine and rescue companies and phasing-out the Fire Alarm through implementation of the regional dispatch option. If the City of Pawtucket chooses to implement part or all of these options, there will be a potential reduction in the PFD's need for vehicular apparatus.

With the implementation of options for efficiency and considering the current number of apparatus, the Audit Team is suggesting that the City and Fire Department consider a reduction in apparatus from 16 to 9 (see Figure 5.5).

**Figure 5.5**  
**PROPOSED APPARATUS FLEET**

<b>TYPE</b>	<b>CURRENT</b>	<b>PROPOSED</b>
<b>Engines</b>	8	5
<b>Ladders / Towers</b>	3	3
<b>Rescues</b>	4	0
<b>Special Operations Unit</b>	1	1
<b>Total</b>	16	9

Note: Apparatus needs considering implementation of various options, four fire stations and rescue outsourcing.

This proposal envisions the following:

- Retaining in the fleet only that apparatus which can reasonably be staffed with available personnel along with an appropriate number of reserve units
- Reserve pumper and ladder fleet based on projected 1/4 of front-line fleet
- Two front-line and one reserve ladder/tower units to serve the City
- Four front-line and one reserve pumper/engine units
- Implementation of automatic “closest available” mutual aid
- Any further changes in the car, station wagon, pickup, truck, and van vehicles will

be justified on a “needs” basis to the Chief and the City as part of normal budget processes

**This proposed apparatus inventory is considered conservative given the hazard levels, number of structures, and population of Pawtucket and NFPA 1710 and ISO guidelines.**

This proposal would reduce the tax-funded apparatus in the fleet from 16 to 9. These changes should be made as soon as practical through attrition and in conjunction with implementation of staffing and fire station and apparatus location choices.

It appears to the Study Team that the reduction in the overall Pawtucket fire and rescue apparatus fleet outlined above can be made while either maintaining or, in some areas, increasing the level of fire services to the public, considering the potential implementation of four-person staffing of apparatus. This seems to also be possible as a result of implementing the automatic mutual aid with surrounding fire departments.

### **Potential Cost Savings**

The potential savings or cost avoidance to the City from the reduction in the fire and rescue apparatus fleet is from:

1. Elimination of replacement costs
2. Reduction in the annual cost of apparatus maintenance
3. Reduction in the annual cost of operating apparatus, e.g. fuel, etc.

Figure 5.6 outlines potential life cycle (20 years) savings/cost avoidance for the units proposed for reduction.

**Figure 5.6**  
**PROJECTED LIFE CYCLE COST SAVINGS**  
**FROM REDUCING THE APPARATUS FLEET**

<b>TYPE</b>	<b>NUMBER</b>	<b>REPLACE SAVINGS* (20 year)</b>	<b>MAINT. &amp; OPERATION SAVINGS***</b>
Engine/Pumper	3	\$ 1,100,000	\$ 360,000
Rescue Units	4	400,000	288,000
<b>TOTAL</b>	<b>7</b>	<b>\$ 1,500,000</b>	<b>\$ 648,000</b>

\*Estimate based on replacement cost of \$475,000 per pumper and \$50,000 for rescue units on a 10-year life cycle.

\*\*Estimate based on estimated annual maintenance and operating costs of \$6,000 for pumpers and \$3,600 for rescue units.

**As estimated in Table 5.6, the cost savings or cost avoidance in taxes to Pawtucket residents and businesses could be as much as \$2,148,000 over a 20-year life cycle for three engines and 10-year life cycle for 4 rescue units proposed for reduction.**

**SCHEDULED APPARATUS REPLACEMENT**

The criteria and approach taken in the planning for apparatus rehabilitation and replacement vary among fire departments.

PFD officials indicated that the department does not have an apparatus replacement request process. According to officials, the replacement request process for these units is built into the City budget process when funding is available.

To maintain the apparatus fleet in good condition and assure reliability, many municipalities and fire departments **nationally** have adopted apparatus replacement plans for unit replacement.

One such apparatus replacement schedule is as follows:

Automobiles                      Replacement on an 8-year service life cycle.

Boats                                      Replacement or major rehabilitation on a 20-year service life.

Brush units	Replacement on a 15-year service life cycle.
Command Units	Replacement on a 5-year service life cycle.
Heavy Rescues	Replacement on a 15-year service life cycle with rehabilitation occurring in year 10.
Ladder Trucks	Replacement on a 20-year service life cycle with rehabilitation occurring in year 10.
Mini-Pumpers	Replacement on a 20-year service life cycle.
Pumpers	Replacement of first-line units on a 10-year service life cycle with rehabilitation during years 8-10 prior to placement in secondary status during year 11.
Rescues	Replacement on 5-year service life cycle.
Tankers	Replacement on a 20-year service life cycle.
Utility Vehicles	Replacement on an 8-year service life cycle.

Based on this type of replacement criteria, fire departments should be in a better position to plan for these important purchases.

Criteria for fire and EMS apparatus, similar to that outlined above, should be adopted and an apparatus replacement schedule based on that criteria should be developed, approved, and implemented by the City and PFD in order to maintain an up-to-date apparatus fleet and provide the basis for related financial planning and expenditures.

## **SUMMARY**

The vehicular apparatus fleet of the PFD includes the types of fire rescue units typically operated by fire departments in the delivery of emergency fire and EMS services—pumpers, ladder trucks, rescue units, and other support vehicles including pickups, vans, SUVs, and cars.

The current PFD vehicular fire and EMS apparatus fleet is comprised of 16 primary vehicles including 8 engines, 3 ladder trucks, a special operations unit, and 4 rescue patient transport units.

Options for the configuration of the PFD apparatus fleet are outlined, including reducing the number of engines in the fleet with the implementation of four- or five-station options, cross staffing an engine and special operations unit, and periodic re-justification of the support vehicle fleet.

An apparatus replacement schedule to provide for long-term scheduling of fire and rescue apparatus replacement was reviewed and suggested for consideration.

## **RECOMMENDATIONS**

- 5-1 The City and PFD should consider continuing to maintain two strategically located ladder trucks.
- 5-2 The City should consider maintaining three strategically located rescue units, municipal or private.
- 5-3 The City is encouraged to maintain a reserve unit for each primary apparatus type (engine, ladder truck, and rescue).
- 5-4 The City is encouraged to consider cross staffing an engine and the special operations unit.
- 5-5 The City should consider reducing the PFD engine fleet by up to three engines, if the four- or five-station option is adopted.
- 5-6 The City and PFD are encouraged to conduct a focused assessment of utility vehicle needs—car, pickup, trucks, and vans.
- 5-7 The City and PFD are encouraged to implement a scheduled apparatus replacement capital equipment multi-year program based on adopted criteria.

## **CHAPTER SIX**

# **EMERGENCY MEDICAL SERVICES**

This chapter includes sections on the history of Emergency Medical Services (EMS) in the United States, the delivery of EMS in the State of Rhode Island, and the delivery of EMS in the City of Pawtucket.

### **OVERVIEW**

The delivery of quality emergency medical care is one of the most basic services that a local government must ensure is available to its citizens. The actual delivery of such service is just one component of an EMS system. An EMS system consists of those organizations, resources, and individuals from whom some action is required in order to ensure a timely and medically appropriate response to medical emergencies. The basic goal of an EMS system is to get the patient to a definitive care facility in a timely manner so that no further harm occurs to the patient. Although an EMS system does not stop when the patient arrives at the hospital door, the delivery of pre-hospital care and patient transport are the most complex components of a community's EMS system. Traditionally, there are 13 recognized essential elements of the pre-hospital component of an EMS system.

1. Prevention and early recognition;
2. Bystander action and system access;
3. Call taking and dispatching function;
4. Telephone protocols and pre-arrival instructions;
5. First responder dispatch;
6. Ambulance dispatch;
7. First responder services;
8. Ambulance services—basic and advanced life support;
9. Direct on-line medical control;
10. Transport;
11. Receiving facility interface;
12. Off-line medical control; and,
13. Record keeping and evaluation.

Emergency medical care can be delivered through a variety of methods, which include: contracting the service through a private ambulance company; delegating the service to a volunteer agency in the community; providing direct service through government employees; or any combination of the above.

As EMS in the United States has evolved, so have the different models or profiles of organizational structures for the delivery of the service. In the early 1980s, the United States Fire Administration published *Fire Service/EMS, A Program Management Guide*. This publication identified 28 different profiles for the delivery of EMS. Twenty-six of the profiles included participation of the fire department in some aspect of the pre-hospital EMS system. Each profile has its own particular strengths and weaknesses. The profiles, identified thirty years ago, still accurately portray fire service based EMS today. The original profiles identified in the *Management Guide* are built around five primary variables:

1. Dual-role vs. cross-trained vs. “civilian” providers;
2. Career only vs. career & volunteer vs. volunteer only organizations;
3. First responder vs. EMT vs. paramedic certifications;
4. Transporting units vs. non-transporting units; and,
5. Engine or truck company first response vs. no engine or truck company first response.

These variables can be combined into 52 different ways of EMS delivery; it is most likely that every variable has been tried and is probably in service today somewhere in the United States. The variables also can be pieced together as necessary to meet the needs and resources of a particular community. Many jurisdictions have started out with one profile and changed to another as their EMS systems have grown and resources shifted.

The combination of these variables can be classified into one of four main categories of pre-hospital emergency medical service delivery:

1. *Third-Party Service*. EMS services are delivered by a separate public safety agency that usually holds equal status with other agencies in the community, such as the fire department and police department. Career, volunteer, or a combination of career and volunteer personnel may provide these third-party services.

2. *Hospital-based Service.* EMS services are delivered from a medical facility, normally a local or regional hospital. Personnel delivering the services are usually hospital or health care system employees and the services are commonly supported by hospital funding.
3. *Private Service.* EMS services are delivered by a privately owned company for a fee, on a for-profit basis. A local government would most likely enter into a written agreement with the private ambulance company identifying the level of services provided and cost of said services.
4. *Fire Department-based Service.* EMS services are delivered by fire department personnel (career, volunteer, or combination). Fire department personnel are trained as EMS care providers and are equipped to provide care and transport for sick and injured patients.

## **HISTORY OF EMS IN THE FIRE SERVICE**

There is a long history of fire service involvement in the delivery of EMS services in the United States. As early as 1928, a few fire departments began providing first aid services to citizens suffering from heart attack symptoms or having trouble breathing. These services were provided with equipment that the firefighters carried to treat other firefighters who would be overcome with smoke at fire incidents. Later in the 1930s, fire departments began developing special vehicles that they used to provide assistance to citizens in their communities who became ill or injured. These specialized units included vehicles used for heavy rescue and extrication operations.

During the 1940s and 1950s, many fire departments continued to provide ambulance service, consisting primarily of basic first aid and transport operations. As new techniques were developed for the care of the ill or injured outside of the hospital setting, fire departments in major cities such as Baltimore, Seattle, Los Angeles, Milwaukee, and Columbus were the first to implement the techniques.

In 1966, the National Traffic and Motor Vehicle Safety Act was passed authorizing the U.S. Department of Transportation to set EMS guidelines and establish the National Highway Traffic Safety Administration, which was charged with improving emergency

medical services. As pre-hospital care started to become more sophisticated with the introduction of national standards for training of Emergency Medical Technicians (EMT) and Paramedics, fire department involvement in EMS grew throughout the United States.

In 2004, it was estimated that more than 60 percent of all fire departments in the United States were involved in providing some level of emergency medical service. Those fire departments that provided EMS services to their community found that at least 50 percent (and up to as high as 80 percent) of their total emergency incidents handled each year were EMS related.

For a fire department to deliver quality EMS service, local government officials, fire department leadership, and EMS care providers must all embrace the importance of the service and must all understand the demands that a quality EMS program places on departmental resources.

Most recently, the International Association of Fire Fighters (IAFF), one of the largest unions of the AFL-CIO, has taken a pro-active position on fire-based EMS delivery. To quote Harold A. Schaitberger, General President of the IAFF, “Fire department based EMS systems are—and will continue to be—the frontline responders for medical emergencies in the pre-hospital environment and the safety net for all citizens without access to primary care.” In fact, in some U.S. communities, the delivery of EMS services is being returned to the local fire department after struggling with various models of private sector involvement.

Many leaders in the fire service at the national level believe that the fire departments that have been involved in the direct delivery of EMS services have also been the fire departments that have remained the most stable through the difficult up-and-down economic times of the last 25 years. The fire service has truly taken on an “all-hazards” approach to its response capabilities in recent years and those fire departments that only respond to the report of fire are the fire departments that will continue to have their future in jeopardy.

A well-staffed, well-trained, and well-equipped fire engine can mean so much more to a community than just a fire response vehicle. If that vehicle is staffed with trained and equipped medical providers, it becomes the neighborhood first-aid unit that helps people with cut hands, broken bones, asthma attacks, and life threatening emergencies. Going on

an EMS run should not be an inconvenience to a fire department; it should be an opportunity to aid and interact with the citizens that the department serves.

## **THE MODERN EMS AGENCY**

The progressive EMS delivery agency is really a complex agency that has many customers—one of which is the patient receiving the care. EMS customers also include the patient’s family, the citizens of the community, local medical professionals, the local hospital emergency room staff, trauma and specialty referral centers, local nursing and long-term care facilities, health care insurance providers, health care educators, 911 call takers and dispatchers, and of course, the EMS providers themselves.

Modern EMS delivery is actually an aggressive EMS delivery that begins before the 911 call is initiated. Public health care awareness and injury prevention education are often delivered by local or regional hospital resources, as well as the EMS provider agency in hopes that the 911 call can be prevented, or at least made early in the event. In communities where public health care education has been prioritized as an important part of the EMS system, the result is quite often improved patient survivability and outcome. As a community’s population changes in age and cultural composition, the need for public health care education grows increasingly more important.

When the 911 call is made, the progressive EMS agency will answer with an Emergency Medical Dispatch (EMD) trained call taker who will also provide pre-arrival instructions to the calling party so that basic lifesaving interventions can be started prior to the arrival of trained EMS providers. That progressive agency will have in place a tiered-type of response system that gets both basic and advanced life support services to the patient within nationally accepted response time criteria. Ultimately, the patient will be properly diagnosed, treated, and transported to a medical facility capable of providing definitive care.

## **THE IDEAL CHAIN OF SURVIVAL EVENTS**

In the “ideal” EMS system, a patient with a life threatening medical emergency, such as a heart attack, should first encounter a family member or bystander who is CPR trained and who also recognizes the signs and symptoms of the medical emergency. The bystander or

family member would activate the local EMS system through a 911 call and would initiate basic first aid and CPR care.

If needed, the EMD trained 911 call taker would provide nationally recognized pre-arrival care instructions via telephone while emergency responders were being dispatched. These pre-arrival instructions would continue until the arrival of the trained emergency responders. If this emergency was occurring in a public venue, such as a shopping mall or health club, an Automatic External Defibrillator (AED) would be immediately available for use along with an AED-trained staff member or security person.

The first emergency response personnel to arrive on the scene would be trained at least to the EMT-B (Basic) level and equipped with a first-aid bag, oxygen delivery equipment, and an AED. Within a few minutes, a trained paramedic (or two) would arrive with advanced life support equipment capable of providing cardiac monitoring, intravenous medication therapy, and advanced airway management techniques. Using standing medical protocols, the patient would receive a 12-lead electrocardiogram, life saving medications, and other cardiac therapies in order to diagnose and treat the medical emergency.

The patient would be stabilized, loaded into a transport unit and begin a short trip to a definitive care facility capable of handling cardiac emergencies. While en route to the care facility, the paramedics would consult via radio or telephone with emergency care physicians to obtain orders for further pre-hospital interventions. The patient would arrive at the care facility having received appropriate advanced life support care (ALS) within the delivery time criteria established by the American Heart Association.

Patient care would be transferred to the emergency room staff and an accurate and clearly written transfer report would be provided. The transfer would be seamless and timely and the care providers would ready their equipment for the next response with minimal delay.

Back at their station, the care providers would finalize any reports and file them using a computer-based data collection system. The data would be used for billing, State reporting, departmental analysis of service delivery, and EMS system master planning—in addition to simply documenting the incident.

Finally, a Quality Assurance staff member would review the care provider's written report for accuracy and protocol compliance and then send a customer service survey to the patient within 30 days of the incident.

As stated previously, how all these system components arrive in the time required is really a complex process that varies from community to community throughout the United States. When multiple agencies are required to provide the system components listed above, inter-agency cooperation and coordination are paramount to successful patient outcome. Should one component fail, then the system fails to provide the best care.

### **EMS IN RHODE ISLAND**

The Rhode Island Department of Health (RIDOH) is the statutory public health agency of Rhode Island. The health care delivery system of Rhode Island is planned, improved, and supervised by RIDOH with assistance from other health agencies throughout the State.

Currently, EMS systems in Rhode Island are regulated by the Rules and Regulations Relating to Emergency Medical Services (R23-4.1-EMS) under sections 23-4.1-4 and 23-4.1-10(b) of the General Laws of Rhode Island.

The RIDOH agency overseeing the delivery of EMS throughout the State is the Division of Emergency Medical Services (DEMS). DEMS' mission is to plan for and oversee licensing of emergency medical services in the state. DEMS works in conjunction with the Ambulance Service Advisory Board to develop and administer the comprehensive statewide plan for EMS; establish minimum standards for licensing providers, vehicles and their equipment, provider training, and communications; and collect and analyze ambulance response data.

RIDOH regulations affect several areas of EMS system operations: licensing of ambulance and emergency first responder services; establishing training and certification requirements for each level of emergency care provider; and inspecting vehicles and equipment to ensure that they meet inventory and operational requirements.

There are three basic levels of EMS providers recognized in Rhode Island with each level facilitating a hierarchy of emergency care.

1. *EMT-Basic (EMT-B)*. The functions of an EMT-B include providing basic emergency medical care for patients at emergency scenes or during ambulance transport. EMT-Bs undergo a fairly rigorous initial training program that includes both classroom and clinical work. Once licensed, EMT-Bs must maintain their certification through a combination of refresher training and continuing education requirements. At the scene of emergencies, EMT-Bs are versatile care providers who can perform basic lifesaving functions such as AED use, CPR, basic airway management, bleeding control and bandaging, and the administration of certain controlled substances on a limited, life threatening only basis. In addition, the EMT-B is trained in fracture management, childbirth procedures, poisoning and overdose management, and other basic medical care procedures. The EMT-B is probably the most recognized level of EMS training throughout the United States. EMT-Bs are often considered the workhorse of most any EMS service—public or private.
2. *Emergency Medical Technician-Cardiac (EMT-C)*. The functions of an EMT-C include the functions of an EMT-B plus cardiac monitoring, manual defibrillation, intravenous therapy, endotracheal intubation, and additional pre-hospital care medications. Quite often, the EMT-C is used to supplement the more advanced trained EMT-Paramedic by providing a caregiver who can initiate intravenous therapy and advanced airway management techniques as well as assist with various ALS skills.
3. *Emergency Medical Technician-Paramedic (EMT-P)*. The functions of the EMT-P include the functions of the EMT-C and the provision of advanced life support techniques related to the treatment of cardiac and respiratory emergencies, major trauma, and other life threatening events. The EMT-P operates under the direct and indirect medical control of a licensed emergency care physician to provide such life saving interventions as controlled substance administration, electrocardiogram, cardiac pace making, etc. In Rhode Island, all EMT-Ps are Nationally Registered EMT-Ps (NREMT-P). Next to the quick deployment and actions of an AED-equipped EMT-B, the EMT-P is the EMS care provider most likely to make a significant difference in the outcome of a critical patient in the pre-hospital

setting. In many locations across the United States, the generally accepted standard of care in the EMS industry is to deliver two, EMT-Ps to the scene of every life threatening medical or trauma-related emergency.

Any agency delivering EMS services in Rhode Island must understand the organization of the RIDOH system. It is impossible to provide services without knowing the roles and responsibilities of all the agencies and players involved, and it is equally important that provider agencies be active participants in local, regional and State councils and committees.

### **EMS IN PAWTUCKET**

The history of EMS delivery by the Pawtucket Fire Department (PFD) dates back to the 1950s. Many of the more senior PFD personnel interviewed by the Audit Team reported the importance of EMS in the PFD, and there were very few negative comments received about the PFD being involved in full-service EMS delivery. In fact, in speaking with PFD personnel, the Audit Team found a strong belief by many that the department should not abandon the ambulance service and, in fact, the department should expand the service by increasing the number of ambulance (rescue) units operated.

### **Public Education and Early Recognition**

The first important link in the American Heart Association's (AHA) Chain of Survival is the early recognition of a medical emergency. Public health education efforts in recent years have tried to focus the public's attention to the warning signs and symptoms of heart attack, cardiac arrest, stroke, and foreign body airway obstruction. In some communities, public health care education is a joint effort involving several health care agencies and often includes the EMS system.

It appears that the PFD does not participate in any type of organized public health care education, and there does not appear to be an organized effort in the community to address the AHA Chain of Survival principles. It was unclear to the Audit Team what agencies in the Pawtucket community offer layperson CPR. Although an internet search did locate a number of small, private firms offering CPR and first-aid training for corporate clients.

The Audit Team believes that as a full-service EMS agency, the PFD should be actively involved in citizen public education training; not only is it a great way to raise the level of cardiovascular emergency awareness in the community, but it is also a positive means by which to be involved in the community. The PFD in conjunction with Memorial Hospital of Rhode Island should consider implementing an EMS public education initiative focused around the AHA Chain of Survival program. Given Pawtucket's diverse population in terms of age and ethnicity, the program should be multilingual and focus on generation appropriate topics.

### **EMS System Access**

The second critical link in the Chain of Survival is easy access to 911 and activation of the EMS system. All of Rhode Island has 911 as the dedicated emergency telephone number for police, fire, and emergency medical assistance; therefore, 911 is accessible to Pawtucket residents. There appear to be no major issues with 911 access in Pawtucket other than some language barrier issues, which is common in cities with such an ethnically diverse population. Most residents have access to 911 using either the traditional hard-wire or cellular telephone systems.

### **Bystander Action**

The third critical link in the Chain of Survival is the delivery of bystander CPR. In order for bystander CPR to be effective, there has to be a bystander present who is trained to administer CPR. As already discussed, in many communities where the fire department delivers EMS, the fire department is also involved in providing citizen CPR training. This training is often done in partnership with local health care facilities or civic organizations. Historically, in communities where CPR has been marketed, delivered, and accepted by the public, the survival rate of cardiac arrests has improved.

The PFD does not participate in public CPR education. While the Audit Team learned of a few, limited avenues for obtaining public CPR training courses, there does not appear to be an organized approach to address citizen CPR instruction. The PFD should consider partnering with Memorial Hospital in implementing a citizen CPR program by offering CPR instruction on a regularly scheduled basis throughout the community. The program should be multilingual and should be in partnership with other local health care

organizations. The program might even be able to be funded entirely through a public/private partnership.

Another link in the Chain of Survival is the early access to cardiac defibrillation for the correction of lethal heart dysrhythmias. Originally, defibrillation was thought best in the hands of trained paramedics. As technology improved over the last decade, we now find the use of public access automatic external defibrillators (AEDs).

It is becoming more and more common to find access to AEDs on airplanes, at health clubs, and in shopping malls. In fact, New York City passed an ordinance requiring the installation of public access AEDs in all city-owned structures; that ordinance is remarkable considering the number of city-owned properties in New York City, and it shows one city's strong commitment to improving the Chain of Survival.

The new AEDs are very simple to use and are practically failsafe in terms of accidental misuse. The Audit Team received limited information concerning the use of public access AEDs within the City of Pawtucket, and there appears to be few, if any, currently in use in the community. Apparently, there is no organized initiative to implement such a program.

RIDOH operates the Rhode Island HeartSafe Community Program, which is a collaborative effort between the Heart Disease and Stroke Prevention Program, and the American Heart Association, Providence Affiliate. The initiative is based on the principle that lives can be saved by being prepared with prevention, early access to care, early CPR, early defibrillation, and early advanced care. The goals of the program are to increase the number of community members trained in CPR; increase the number of first responders equipped with AEDs; and ensure appropriate pre-arrival instructions are provided by telecommunicators and optimize the pre-hospital care system. Most recently, East Providence achieved the HeartSafe Community status.

The PFD, along with Memorial Hospital and the City of Pawtucket, should consider implementing a public access AED awareness program that is designed to increase the number of public access AEDs throughout the community. The three agencies should also work to have the City of Pawtucket become a RIDOH HeartSafe Community.

## **911 Call-Taking and Dispatch**

The PFD does not participate in any type of regional 911-dispatch center; the department operates its own independent center out of Station 2 (Headquarters). (See the Communications and Dispatch Chapter of this study for more information and recommendations concerning dispatch operations.)

When an emergency incident occurs in Pawtucket, the patient or bystander can obtain help by calling 911. The 911 call is answered by a call-taker at the State's communications center in North Scituate and forwarded to the PFD dispatch center at Station 2. The call-taking center in North Scituate is operated by the Rhode Island State Police. However, there is little to no interaction involved with the calling party other than to transfer the call to the PFD.

The call takers and dispatchers at the PFD communication center do not use any type of recognized or approved EMS call-taking information gathering system. The standard in EMS 911 call taking today is the use of the Medical Dispatch Priority Card System to gather incident and patient information. This guide card-based Emergency Medical Dispatch (EMD) program is a nationally recognized program that guides the 911 call taker through a flow chart of appropriate questions so that the appropriate dispatch of resources can be made. In addition, the EMD program also provides the 911 call taker with pre-arrival emergency care instructions that can be relayed to the 911 caller in an effort to help provide immediate care prior to the arrival of trained providers.

The Audit Team found two areas of concern related to the PFD and the EMS call taking and dispatch functions in Pawtucket. The first and most important concern involves the lack of trained dispatchers handling the 911 EMS calls. Currently, each PFD work platoon (or battalion as PFD calls it) has two members assigned to the dispatcher role at Station 2 during any given tour of duty. Unfortunately, the personnel assigned to the call taking and dispatching function are most often the newest, least experienced members of the platoon and department. Coupled with limited telecommunicator training and no telecommunicator certification, the Audit Team finds the PFD's EMS call-taking and dispatching a recipe for disaster. Fortunately, all PFD EMS units are staffed with two EMT-Cs or higher and an engine company is dispatched on most EMS calls. Otherwise, there could be severe, negative outcomes for improperly handled call-taking and processing.

The second area of concern is also related to the training of the call-takers and dispatchers. The Audit Team found no evidence of the PFD dispatch center being capable of providing pre-arrival instructions as used in an EMD system. Throughout the United States there have been numerous incidences of lives being saved by the pre-arrival instructions provided by the call-taker during a 911 emergency call. This capability does not presently exist at the PFD dispatch center.

The Audit Team, therefore, recommends that all PFD 911 call-takers and dispatchers immediately be trained and certified in EMD.

### **EMS Provider Response and Patient Transport**

All PFD EMS responders are cross-trained as firefighters. Currently, the department has sixteen EMT-Bs, eighty-eight EMT-Cs, six EMT-Ps, and twenty CPR/AED trained members. The department operates two EMS transport units (called “rescues”) out of two fire stations. Rescue 1 operates out of Station 1 on West Avenue and Rescue 2 operates out of Station 4 on Cottage Street. In 2011, the two rescue units ran a combined total of more than 9800 calls, which is a high call volume for just two transport units in a city of 71,000 residents.

In terms of an EMS organizational focus within the PFD, there really is none. The PFD organization chart reflects no one in charge of EMS. Yet, the delivery of full-service EMS is a major component in the total workload of the department, and the service is a revenue generator for the City. In looking at other communities across the country, the Audit Team normally finds an officer (quite often a chief officer) in charge of a fire department’s EMS delivery program. However, that is not the case in the PFD. Instead, there is a firefighter/paramedic who has been detailed at times from his normal platoon to handle the role of EMS Director/Coordinator. Fortunately, the firefighter/paramedic assigned to this role is highly qualified to handle the position requirements, and the Audit Team found the work done thus far to be very important to the improved quality of EMS service provided by the PFD.

The Audit Team recommends that the PFD assign the duties and responsibilities of overseeing the department’s delivery of EMS to a chief officer—the most probable choice being the department’s Assistant Chief. The administrative and logistical

workload associated with operating a fee-based, full-service EMS system is great and the responsibility of managing that system needs to rest with a high-ranking officer. This does not mean, however, that the use of support staff should cease.

With every engine company capable of providing at least an EMT-B level of care, PFD's first responder service (non-transport capable) provides a higher level of service than many traditional fire department first responder services. The PFD is commended for their efforts in having their first responder units deliver this level of EMS service.

The Pawtucket Fire Department's rescue units deliver ALS care by staffing each unit with at least two EMT-C certified members at all times. As noted earlier, the two rescue units operate out of Stations 1 and 4. Also, two reserve transport units that are not staffed are used to replace the front-line rescue units when the front-line units are out for maintenance and repair. (See Chapter 5: Apparatus for more information on the status and condition of the rescue unit fleet.)

The Audit Team learned that occasionally a reserve rescue unit is placed in-service for special events or standbys. However, the Audit Team received no data by which to verify the report.

In Pawtucket, when a high-priority 911 call is received (such as an unconscious person), the nearest engine company and rescue unit are dispatched. Upon arrival of the engine company, EMT-B care will be initiated following standing medical protocols. The initial patient care crew will transfer care to the ALS-equipped rescue unit crew upon their arrival, and then both crews will provide a combined effort in patient care.

With basic life saving care already in place, the ALS providers arriving on the rescue unit can initiate advanced life support services, such as cardiac monitoring, advanced airway management techniques, and intravenous medication administration in accordance with their standing protocols or through consultation with medical control. At some point in the event, the patient is loaded into the rescue unit and transported to a hospital facility.

One of the critical elements associated with any EMS delivery system is response time. Response time is usually defined as the time period existing from the point of dispatch until the point of arrival on the scene. Basic American Heart Association guidelines suggest that CPR be initiated within 4-minutes of the cardiac arrest occurring and that

advanced life support care should be available within 12-minutes of the arrest. From this, one can see the importance of early recognition and bystander CPR training.

Using the response time data provided by the PFD, the Audit Team was able to examine the average arrival time of a rescue unit on an emergency scene from the time of dispatch. Ideally, the use of fractile response time data is preferred, but for the Audit Team’s discussion of rescue unit response time, the data format provided to the Audit Team will suffice.

In reviewing response time data for “medical emergencies” only, the Audit Team found the following:

**Figure 6.1**  
**AVERAGE ARRIVAL TIME OF RESCUE UNITS**  
**TO MEDICAL EMERGENCIES\***

	CY2011	CY2010	CY2009
Rescue 1	5.80 minutes	5.44 minutes	5.37 minutes
Rescue 2	5.13 minutes	4.89 minutes	5.00 minutes

\* Medical emergencies was chosen because the Audit Team believes that it is this call type whereby minutes can make a huge difference in the outcome of a cardiovascular or respiratory emergency. There were several other call types such as vehicle collisions and building fires, but the Team felt the medical emergency call type provides a good starting point for examining the speed in which ALS resources reach the emergency scene.

The Audit Team cautions the reader that the data presented above does not “tell the whole story,” but it does show that PFD rescue units have been arriving at the scenes of medical emergencies in less than 6.00 minutes on a consistent basis over the last three calendar years. What the data does not show is the response of mutual aid rescue units into the City of Pawtucket when both of the PFD’s rescue units are already committed to an emergency incident.

In CY2011, PFD’s Rescue 1 and Rescue 2 responded to 9,881 incidents from which they did 7,359 patient transports to local hospitals. In addition, there were another 842 incidents in the City of Pawtucket in CY2011 that required the dispatch of rescue units from surrounding jurisdictions in order to transport patients to the hospital. That means

that roughly a little more than 10% of all patients needing emergency transport to a hospital in the City of Pawtucket in CY2011 had to await the arrival of a rescue unit from another jurisdiction. That also means that the potential revenue that would have been generated by PFD rescues on those transports was lost to mutual aid jurisdictions.

Related to response time is the call load volume for EMS transport units. Obviously, if a PFD rescue is transporting a patient to a hospital, it is not available to respond on another call until after the crew has transferred the patient to hospital emergency department staff, restocked the unit, and completed transfer paperwork.

As call load volume increases without an increase in transport service capacity, then the time taken to get a transport unit to the scene will also increase because of the need for mutual aid rescue unit response. Basically, when PFD's Rescue 1 and Rescue 2 are not available for response, then the 6:00-minute arrival time mark discussed above will be exceeded.

Another way of looking at it is that if you are the first or second citizen placing the 911 call for a medical emergency, then you will most likely receive a rescue unit at your doorstep in less than 6:00 minutes. But, if you are that third citizen placing the 911 call, it is very unlikely that a rescue unit will arrive in any timely fashion or meet any nationally recognized response time standard. Fortunately, however, as the third 911 caller, you will at least receive a PFD engine company capable of initiating basic life support care.

Therefore, an important aspect of EMS delivery is to examine the need for additional transport units so that response times can be kept within established guidelines and units do not become overworked, which can lead to fatigue, poor quality of patient care, and EMS employee burnout.

One method for examining call volume and transport is the concept called Unit Hour Utilization (UHU). UHU is a calculation that estimates the amount of time a unit is occupied on emergency calls as a percentage of the total amount of hours a unit is staffed and available for response. In other words, UHU measures the percentage of "on-duty" time consumed by emergency incident activities.

A high UHU means lower availability for calls. Poor availability will negatively impact response times by requiring another unit to respond from a farther away location. It is

important to note that UHU simply measures the percent of a unit's time in service that is spent running calls. There is other time that is not accounted for, which includes time for training, vehicle and equipment maintenance, and other preparedness-related activities. The bottom line is that when units are not engaged in an emergency response, it does not mean that the crew is not working.

While there is consensus in the EMS field on the importance of UHU rates and how to measure them, the interpretation of how indicative UHU rates are of overall system efficiency is still debated. Many private ambulance service providers believe that a UHU between 35 and 45 percent for EMS is good for economic efficiency. However, many of those private units are engaged in non-emergency or "routine" patient transfers between medical facilities and response times may not be as critical as a 911 call.

In the field of 911 EMS delivery, even a 40 percent UHU means that a unit will not be available for the next call 40 percent of the time. Many communities choose to aim for a UHU in the 15 to 25 percent range to improve or maintain good response times. In order to effectively deploy emergency response resources, units must be able to respond to emergency incidents most of the time.

PFD's UHU rate using 2009-2011 dispatch data provided to the Audit Team is shown in Figure 6.2.

**Figure 6.2**  
**PFD RESCUE UHU RATE SUMMARY\***

	CY2011	CY2010	CY2009
Total Incidents Rescue 1 & 2 Combined	9,881	10,045	9,627
Total Hours Spent on Incidents (Arrival to Clear)	3659 hours	3559 hours	3358 hours
Total UHU Rate	0.418 or 41.8%	0.406 or 40.6%	0.38.3 or 38.3%

\*For this report/table UHU = Total Hours Spent on Incidents/8,760 hours (8,760 hours is the total staffed hours in one calendar year).

In previous work with other fire department based EMS delivery agencies, the Audit Team has recommended a UHU rate of 30 percent as the threshold point at which an organization increase its EMS response and transport services. Clearly, the two, PFD rescue units currently exceed that 30 percent threshold by a significant amount.

The issue of implementing a third full-time rescue unit was mentioned numerous times to the Audit Team during the course of its site visits and interviews. Based upon the UHU findings presented above, the Audit Team is able to make some basic recommendations.

First, the two PFD rescue units currently fall above the often recognized 30 percent UHU threshold for additional transport service. The Audit Team recommends the staffing and implementation of a third PFD rescue unit as soon as possible. The call volume certainly exists to warrant the third rescue unit and, while response times for the existing PFD are acceptable when the units are available, the response times are not acceptable for instances when the PFD units are not available and mutual aid rescue units must be used.

Obviously, cost is an issue with staffing and implementing a third rescue unit. The Audit Team wishes to note that much of the infrastructure already exists (there are two reserve rescue units available currently). The other important item is the loss of EMS transport billing funds when mutual aid units transport patients that a third PFD rescue unit would have transported. While collecting the missed revenue will not make implementing a third rescue unit “cost neutral,” those revenues certainly would help offset the cost of operation.

The Audit Team also recommends that the PFD adopt a UHU rate of 30 percent as its threshold for rescue unit use analysis in order to monitor and improve the future delivery of EMS throughout the City.

While the Audit Team recommends the implementation of a third rescue unit, there is another possibility that should be examined—staffing a third rescue unit to meet peak demand service. Peak demand service can be defined as those time periods where PFD EMS is overwhelmed by back-to-back EMS calls.

The response and incident data made available to the Audit Team was insufficient in terms of being able to make reliable statements about PFD EMS’ peak service demand periods, so only a basic recommendation can be made. As a precursor to the full-time

implementation of the third PFD rescue unit, perhaps the third rescue unit is staffed on a regular part-time basis during certain hours of each day where EMS call volume is highest.

While this practice would be a change in how units are presently staffed, it would allow for a third transport unit to be placed in service at peak times while keeping staffing costs to a minimum. For example, a review of incident data might show that the peak demand period for EMS is between 8:00 am and 8:00 pm each day of the week. The PFD would then staff the third rescue unit during those time periods only, using personnel assigned to a four, 12-hr tour of duty rotation. In other words, the personnel working on the third rescue unit would work four 8:00 am to 8:00 pm shifts and then be off four complete days.

The Audit Team recommends that the PFD closely track EMS call volume in an effort to identify peak demand for service periods and then consider implementing a program that places a third rescue unit in service on a part-time basis during those peak demand periods.

### **Hospital Interface & Medical Control**

There are several hospitals serving the Pawtucket regional area with Memorial Hospital of Rhode Island being the primary transport facility simply because it is located within the City. Most patients transported by PFD units are taken to Memorial Hospital.

In terms of trauma centers, Memorial Hospital is also a Level II trauma center with the nearest Level I trauma center being Rhode Island Hospital located in Providence. The regional burn center is also located at Rhode Island Hospital in Providence. The closest pediatric referral center is Hasbro Children's Hospital in Providence. In terms of cardiovascular centers, there are several providers: Miriam Hospital in Providence handles STEMI patients; Memorial Hospital, Miriam Hospital, and Rhode Island Hospital are stroke center centers; and, Memorial Hospital operates a diagnostic catheterization lab. Figure 6.3 shows the number of transports to area hospitals for calendar years 2009-2011.

**Figure 6.3**  
**PAWTUCKET FIRE DEPARTMENT –**  
**TRANSPORT DESTINATIONS**

	CY2011	CY2010	CY2009
Memorial Hospital	5569	6006	5474
Miriam Hospital	1157	837	1026
Rhode Island Hospital	312	195	242
Roger Williams Hospital	19	26	18
Veterans Hospital	40	55	32
Women & Infants Hospital	68	43	49
Hasbro Children’s Hospital	155	155	124
Other Hospitals	39	30	52

The Audit Team is aware of no issues or concerns involving PFD’s interactions with the local hospitals or trauma centers.

In Rhode Island, like most states, EMS systems are required to have a medical director. The work of the EMS providers at the emergency scene falls under the auspices of the system’s Medical Director. The role of Medical Director is an important role in any Rhode Island EMS system: it is a position of authority that should not be taken lightly. All EMS providers in a jurisdiction basically operate and perform their duties under the license of the Medical Director, thus the Medical Director must be carefully selected to ensure that the person chosen is engaged at all levels of EMS in the jurisdiction. Some jurisdictions have assistant or deputy medical directors to help provide oversight and direction to the EMS system.

The current Medical Director for PFD EMS is an emergency department physician at Memorial Hospital where he currently also serves as the Interim Director of that department. The current Medical Director performs his duties and responsibilities without compensation from the PFD and without a written contract. In addition, the Medical

Director operates without any additional liability insurance in relation to his work in the Medical Director position. The Audit Team commends the Medical Director for his volunteer service—his work without pay certainly shows a commitment to the community from both him and his employer.

While the Audit Team can appreciate the Medical Director's gratis work, the Audit Team is concerned over the lack of a written agreement and the lack of liability insurance—neither represent good business practice in today's emergency medical care field. The Audit Team recommends that the City of Pawtucket and the Medical Director enter into a written agreement concerning the roles and responsibilities of the Medical Director position and that the agreement be completed using State guidelines for the role of the local Medical Director.

There are increased insurance coverage needs related to a physician serving as Medical Director for a pre-hospital EMS system. By agreeing to assume the Medical Director responsibilities for a jurisdiction, a physician is assuming responsibilities that are consistent with, but substantially different from those the doctor is involved with in his or her regular medical practice, either private or involving a hospital. The Medical Director's professional liability coverage should be clearly stated in a contract for services. Liability issues include not only medical negligence, but also operational issues. Good Samaritan Laws do not usually provide adequate protection, even if a Medical Director is not compensated.

Generally, there are two types of insurance needed by an EMS Medical Director. The first is malpractice insurance. The Medical Director should obtain a certificate of insurance or binder from his/her malpractice carrier specifically identifying coverage for EMS activities. The second type is directors and officers' professional liability insurance, which covers operational issues.

There are insurance packages available that are offered by insurance companies specifically focused on the unique insurance coverage needs of physicians performing Medical Director functions for an EMS system. Typically, the coverage needed includes the following:

- Professional Liability coverage for services performed or advice given in the medical director capacity;

- Bodily injury coverage or personal injury arising out of direct patient care while acting as medical director;
- Coverage for employment liability practices such as wrongful termination, discrimination, sexual harassment and retaliatory treatment, while acting as medical director;
- Defense coverage for civil suits brought against the medical director for sexual misconduct, while acting as medical director;
- Defense coverage for proceedings brought against the medical director by a state or other regulatory or disciplinary official or agency to investigate charges alleging professional misconduct in performing the medical director functions; and,
- Coverage for personal injury, including false arrest, malicious prosecution, libel or slander, while acting as medical director.

Given that the Audit Team found no evidence of existing liability insurance relating to the role of Medical Director, the Team recommends that the City of Pawtucket require Medical Director liability insurance and that the coverage and minimum limits be clearly listed in the medical direct Medical Director's contract for service. The cost of this insurance should be considered as part of the fee and expense compensation package provided by the City of Pawtucket in the contract, since it is in the best interest of the City, the PFD, and the Medical Director that they be protected for third-party claims, including defense costs.

### **Billing and Records**

Much of the EMS service delivered in the State of Rhode Island is delivered using a fee system that attempts to recover service delivery costs via the patient's health care insurance provider. When a patient is transported to the hospital by a PFD rescue unit, the patient's health care insurance provider is billed for ambulance service. The PFD uses The Dawson Group (a third-party billing service) located in Cranston, Rhode Island, to handle all billing operations. Money collected from the third-party billing service is forwarded to the City of Pawtucket and deposited in the City's general account.

The current billing process uses a fee schedule that covers a number of EMS service components related to patient care and transport to the hospital. Items included in the

schedule include: BLS supplies, IV supplies, oxygen, ground mileage, ALS care, etc. At the end of each patient transport and transfer to emergency room staff, a list of services provided is compiled by the rescue unit crew for submittal later on the incident report.

No data was presented to the Audit Team concerning the percentage of successful fee collections. Such information is important when reviewing the EMS billing process because it is part of the evaluation process for the third-party billing firm and for the EMS delivery agency. The success of EMS billing really starts with good documentation from the service providers and continues with strong administrative support work to collect the information for submittal to the billing firm. Weak administrative support most often results in a lower percentage of successful fee collection.

According to data provided by the PFD, EMS billing (Rescue Billing) derived \$1,184,603 in FY2011, \$709,243 in FY2010, and \$857,966 in FY2009. Clearly, FY2011's revenue collections reflect the best results of the three fiscal year periods. What is not known is what could have been done better to improve the amount collected. The only item that is known for sure is that several hundred patients were transported by mutual aid rescue units during each of those fiscal year periods resulting in a zero percent collection rate for the City of Pawtucket on those transports.

Because EMS billing is a very important function to the health of PFD's EMS system, the Audit Team recommends that the PFD work very closely with The Dawson Group to analyze the entire billing process and collection percentage rate.

Accurate record keeping is a very important part of any EMS delivery system. In Rhode Island, the standard record keeping form for EMS incident reporting is the Rhode Island EMS Ambulance Run Report (run report). The PFD uses this report as its documentation instrument for rescue unit calls.

When a PFD rescue unit transports a patient to a local hospital, the provider in charge of the unit will complete a run report and leave a copy with the emergency department staff for inclusion in the patient's treatment record. Upon return to the fire station, the remaining copies of the run report are stored for collection by the battalion chief when he makes his station visits.

Once the battalion chief collects the run reports from the two fire stations, the reports are delivered to PFD headquarters where clerical personnel further handle them. A part-time administrative clerk enters the run report information into a data base, copies various forms needed for the third-party billing company, files the PFD copy of the run report, and prepares the remaining copies for submission to the State.

There is no electronic filing of any run report other than when the clerk enters some information from the reports into a local database. All reports are paper-based and must be hand-carried and filed. Any data required from the reports has to be hand-entered in a computer or hand-tabulated for analysis. While this process is important to the billing process, it is very time consuming and labor intensive.

In 2011, there were 7,359 transports made by PFD rescue units—that is quite a workload for a part-time administrative position. The Audit Team recommends that the PFD consider the implementation of electronic patient care reporting as used by many other EMS response agencies throughout the State. The move to electronic reporting would most likely prove more efficient in patient reporting and the billing process.

One item of concern to the Audit Team is the manner by which run reports are collected at the station level for deposit at headquarters. The current process of using the on-duty battalion chief to collect the run reports probably does not comply with the Health Insurance Portability and Accountability Act (HIPAA) regulations regarding the privacy of the information on the report, because the run reports are not secured at the station level prior to the pick up process. Therefore, the Audit Team recommends that the PFD immediately develop and implement a HIPAA-compliant process whereby the completed run reports can be securely stored at the station and then be securely transported to headquarters for processing.

### **Funding of EMS in Pawtucket**

As previously discussed, like many EMS service delivery programs in Rhode Island, PFD's EMS service is a fee-based service delivered by the PFD. A third-party billing service is responsible for billing a patient's health care insurance provider and for disbursing those collections to the City of Pawtucket—after the billing agency deducts their fee for service. Of course, none of the EMS fees collected are returned directly to

the PFD. The assumption is that if \$1 million is collected then that \$1 million is used to fund \$1 million of the PFD's budget; that simply is not the case.

The Audit Team learned that \$42,000 is the amount allotted in the FY2013 PFD budget for EMS operations. These funds are used to repair and maintain EMS equipment and to restock EMS supplies on the PFD's rescue units and fire apparatus. There appears to be a woeful underfunding of EMS equipment maintenance and supplies.

While many disposable EMS supplies can be restocked at the local hospitals, with just two transport units taking over 7,000 people to the hospital each year, equipment maintenance and specialty supplies needs will most likely quickly consume all available funding dollars. As noted previously in this chapter, PFD EMS delivery is a revenue generating operation and its operation should be fully supported and funded to maximize its efficiency and effectiveness.

The Audit Team recommends that the PFD complete a comprehensive cost analysis of EMS supply, equipment, and maintenance funding needs so that proper operational funds can be allotted to the delivery of EMS in the City of Pawtucket.

## **PAWTUCKET EMS ISSUES**

There are a few issues that were brought to the attention of the Audit Team concerning the delivery of EMS services in Pawtucket. The following sections review those matters.

### **Written Policies and Procedures**

There are very few written PFD policies or procedures governing the delivery of EMS by the Department. This lack of written policies and procedures violates RIDOH's Rules and Regulations Relating to Emergency Medical Services, Section 12—Standards for Ambulances and Ambulance Services. There are eighteen different policy areas identified in Section 12 of the State regulations and the Audit Team found PFD in compliance with few of them. Therefore, the Audit Team recommends that the PFD immediately develop and implement written policy and procedures for the delivery of EMS as required by the RIDOH regulations.

## **Mobile Data Computers**

The Audit Team learned that the rescue units are equipped with mobile data computers (MDCs), but that no information is sent to those MDCs when a call is dispatched. This seems to be a poor use of resources. MDCs have proven to be very valuable in many different fire and EMS applications and to have them on the busiest units in the Department and not use them effectively is a waste. Therefore, the Audit Team recommends that the PFD evaluate the need for and use of MDCs on the PFD rescue units and make the necessary changes to effectively use the MDCs in incident dispatch and response operations.

## **Equipment Needs**

Transporting 7,000-plus patients a year using just two transport units takes a toll on vehicles, equipment, and supplies. The Audit Team learned of several equipment needs where it seemed that the motto in recent time has been, “do whatever is needed to get by.” The Audit Team notes once again that the PFD EMS system is a revenue generating system and that the revenue should be able to be used to offset the equipment and supply costs of providing this critical public safety service.

The Audit Team found several problem areas in terms of EMS supplies and equipment: AEDs, CPAP supplies, cardiac monitors, and stretcher maintenance to list a few. The present complement of AEDs is just enough to equip the engine and ladder companies. There are no spare AEDs and no training AED, which means that when an AED goes out of service for repair or maintenance then there is one less AED available for emergency response service. And, without an AED training unit, every time there is a CPR/AED recertification class, an AED from an engine or ladder company is needed just to support the class—again, reducing the availability for emergency response. The Audit Team also learned that the PFD has no pediatric AED capability.

One of the most recent advances in EMS delivery in the PFD is the use of CPAP therapy on critically ill or injured patients. Continuous positive airway pressure (CPAP) is an important tool in managing patients who have airway difficulties or who are intubated. The Audit Team learned that as of January 2012, after just three months of use, an estimated 40 patients have received CPAP therapy by PFD ALS providers with the

majority of the patients having a much more positive outcome than had no CPAP been used.

The problem created by the CPAP program is that restocking the CPAP supplies at the hospital can be difficult because of the differences in the devices used between the pre-hospital and hospital settings. The result is the need for CPAP supplies to be purchased by the PFD, which, of course, consumes more of the limited EMS supplies and equipment budget.

Another important piece of medical equipment carried on the rescue units is the cardiac monitor. This device is critical in the care of patients having cardiac emergencies. The device is used to perform patient EKGs, defibrillate patients whose heart rhythms are lethal, and provide external pace making to patients whose hearts are not beating sufficiently. The cardiac monitor is by far the most important piece of medical equipment carried on an EMS unit for the care of critically ill cardiac patients.

Presently, the PFD uses Physio Control's LifePak 10 and LifePak 12 cardiac monitors. The LifePak 10 is one of the oldest cardiac monitors still in use today. Technology has changed greatly over the last 15 years and most progressive EMS systems have moved far past the LifePak 10. The problem with the LifePak 10 is that the unit is basically too old to repair. The Audit Team learned that there is no replacement plan for PFD's cardiac monitors and, therefore, the ALS providers must sometimes work with outdated technology in their care of critically ill cardiac patients.

The Audit Team recommends that the PFD evaluate all EMS equipment and supply needs and adjust the funding allocated for the purchase of new equipment, supplies, and maintenance plans. At a minimum, this evaluation should include a replacement plan for the cardiac monitors, the acquisition of spare AEDs, and a purchase plan for EMS supplies not easily restocked at hospital facilities.

### **Pain Medications**

The Audit Team found that the PFD rescue units do not carry pain medications, such as morphine or valium—two narcotic medications used in EMS to manage pain and cardiac emergencies. The Audit Team could not determine a clear answer as to why pain

medications are not carried on the PFD rescue units. Although the Audit Team suspects that it might be related to the medications being a more strictly controlled substance under federal regulations than the other medications carried.

It was made very clear to the Audit Team that the PFD's ALS providers assigned to the rescue units feel that pain management is an important part of ALS service delivery and the Audit Team agrees. The Audit Team finds it unusual for an ALS EMS system not to carry the most common pain medications. The Audit Team recommends that the PFD implement the use of pain medications as part of its EMS delivery in accordance with the RIDOH DEMS Pre-hospital Care Protocols & Standing Orders, Pain and Sedation Management Protocol.

### **EMT-P Officers**

The PFD uses rescue lieutenants and rescue captains as the officers/supervisors on its two rescue units. It was unclear to the Audit Team what roles the officers play in the delivery of the service other than basic supervisory roles. It also appears that there are no assigned duties and responsibilities assigned to the rescue officers other than basic supervisory ones.

Many career fire departments that operate a full-service ALS EMS system do not use officer ranks on their transport units. While there most always is a "paramedic in charge" of patient care and the unit, the officer rank is generally assigned to a supervisor who often supervises multiple ALS transport units in a geographic region.

The Audit Team also learned that none of the rescue unit officers are certified to the EMT-P level, they are all EMT-Cs. While not a significant issue, it does make for a strange arrangement when the driver of the rescue unit is an EMT-P, yet the supervisor is an EMT-C. This arrangement results in questions such as, "Who is in charge of patient care?" and "Who is the supervisor?"

The Audit Team recommends that the PFD examine its assignment and use of lieutenants and captains on the rescue units and, if the decision is to retain the rank structure, then the Audit Team recommends that all rescue unit officers be certified to the EMT-P level and

be assigned specific collateral duties (EMS supply ordering, scheduling and tracking equipment maintenance, etc.) related to the delivery of EMS by the Department.

### **Rotation of Personnel**

Another issue raised was the assignment of personnel to the rescue units. Although all PFD employees are cross-trained as firefighters, new personnel are assigned to the rescue units after moving out of the dispatch center. The concern raised by several of personnel interviewed was that the new firefighters can “lose touch” with their firefighting skills by being assigned to the dispatch center and then a rescue unit before ever making it to a fire engine or ladder truck.

The Audit Team tends to agree with this concern, especially when PFD personnel are hired as cross-trained firefighters/EMT-Bs. Though assignment to a particular unit is not uncommon in large fire departments, smaller fire departments generally do not have the luxury of a large personnel complement and must rely on more cross-training of personnel.

It is a practice in many dual service fire departments to rotate their cross-trained firefighters on a frequent basis—some as often as each shift. The Audit Team recommends that the PFD re-evaluate its rescue unit assignment procedure and consider a reduction in the length of the tours that personnel are assigned to the units. This will be especially important as the Department’s call volume continues to increase. The Audit Team believes that at a maximum, rotation should occur at least monthly and that the administration should consider a trial period of rotation each shift.

### **Quality Assurance**

Finally, another important part of an EMS delivery program is the presence of a quality assurance and customer service program. A quality assurance (QA) program helps ensure that proper documentation has been completed and that patient care was provided in accordance with medical protocols and procedures. The Audit Team knows of no written QA policy for the PFD EMS.

The Audit Team was informed that QA is handled in the PFD by the director/coordinator pulling random run reports and checking for report completion, continuity of care, response times, and proper definitive care transport choice. If a problem is found, then the matter is taken to the Fire Chief. The Audit Team also learned that the Medical Director reviews the run reports using similar QA evaluation criteria.

The Audit Team encourages the PFD to develop and implement a written EMS quality assurance program in compliance with RIDOH's Rules and Regulations Relating to Emergency Medical Services, Section 12—Standards for Ambulances and Ambulance Services.

In addition, the Audit Team recommends that the PFD develop and administer a customer service survey that gathers information from customers of the service. For example, customer surveys would be sent out to patients who have received PFD EMS service within the last 30 days. The mailing could be on a random basis and the form made easy to complete and return (postage already provided). The returned surveys would be a good way to gather data about the customers' perceptions of the EMS service and the data could be used in the future expansion of the Department's EMS programs.

Along the lines of quality assurance, the Audit Team found that the PFD passed the 2011 Annual Ambulance Inspection Program, which is conducted by RIDOH's DEMS. The Audit Team commends the PFD for meeting the State ambulance service licensing and inspection requirements.

### **OPTIONAL APPROACH TO EMS DELIVERY**

As outlined in the initial description of pre-hospital EMS earlier in this chapter, an approach taken to the delivery of EMS in many municipalities involves the provision of such services by one or more qualified private ambulance companies. With the private ambulance service approach EMS services are delivered by a privately owned company for a fee, on a for-profit basis. Typically, a local government would most likely enter into a written agreement with the private ambulance company identifying the level of services provided and cost of said services.

The implementation of this optional approach to EMS delivery would require the development of a comprehensive request for proposals that would serve as the basis for receiving proposals from qualified firms and subsequently a City-service provider contract for service provision that would address the following, at a minimum:

- Level of EMS to be provided, including performance standards to be met
- Provision of medical control
- Nature of accreditation to be maintained by the services provider
- Written policies and procedures to be maintained
- Professional appearance of services provider staffing
- Number of ambulance units to be maintained in services by hour of day
- Minimum level of qualifications of services provider staff
- Level of maintenance of providers vehicular apparatus
- Location of vehicular apparatus to be provided
- Services billing methodology and collection efforts

Further, the successful EMS provider should be required to provide the following:

- Immediate stand-by coverage as requested by the PFD
- Stand-by services at training and exercises
- Stand-by services at City sports events
- In-City transport services for the coroner
- Participate in appropriate state-wide mutual aid responses

As a point of information, non-municipal EMS providers are relied upon to provide high quality pre-hospital EMS in many regions of the United States, reportedly including a majority of such services in Massachusetts. Further, the Audit Team has assessed a number of major municipality emergency services serviced by non-municipal EMS providers, including Hartford, CT, Springfield, MA, Tacoma, WA, and the Phoenix, AZ, region. In summary, with proper selection and contractual requirements in place National experience involving private ambulance services provision working in teamwork with municipal fire services for first responder services is a proven EMS delivery model that could be considered by the City of Pawtucket.

## **SUMMARY**

With over 100 certified EMT-Bs or higher, two ALS equipped transport units, and AED-equipped engine and ladder companies, PFD's full-service EMS system provides a much higher level of service than many traditional fire department first responder services. The PFD must be commended for their efforts to provide said service.

The Pawtucket Fire Department provides ALS emergency response and transport service using two rescue units operating out of separate fire stations (Stations 1 and 4). Both rescue units experience a very high call volume to the point whereby approximately 40 percent of the time the units are not available for emergency response, which often results in the use of mutual aid rescue units from surrounding jurisdictions. A third rescue unit is needed to reduce the call load on the two existing units and to improve response times to EMS incidents within the City.

In Pawtucket, the delivery of EMS service by the Fire Department seems to operate on a "shoe-string" budget and just barely meeting the demands of the system users. The providers delivering the service are commended for their efforts. The Audit Team learned of no serious service complaints from the public, and this certainly is a reflection of the care provided by the men and women riding the rescue units and delivering first responder services while transporting over 7,000 patients each year to the hospital.

There are however, some serious needs within the PFD EMS system besides the addition of a third transport unit. Unfortunately, funding is tied to most of those needs. The most important needs are equipment and supplies—from fundamental basic needs to keeping an EMS system functioning at a proper level. The City and the PFD are urged to review the revenue generated by the current service, consider the additional revenue possibilities of a third transport unit, and then develop and implement a plan by which to sufficiently fund the operating expenses of those units.

## **RECOMMENDATIONS**

- 6-1 The PFD in conjunction with Memorial Hospital of Rhode Island should consider implementing an EMS public education initiative focused around the American

- Heart Association Chain of Survival program. The program should be multi-lingual based and focused on generation appropriate topics.
- 6-2 The PFD should consider partnering with Memorial Hospital in implementing a citizen CPR program by offering CPR instruction on a regularly scheduled basis throughout the community. The program should be multilingual and should be in partnership with other local health care organizations.
  - 6-3 The PFD, along with Memorial Hospital and the City of Pawtucket, should consider implementing a public access AED awareness program that is designed to increase the number of public access AEDs throughout the community. The three agencies should also work to have the City of Pawtucket become a RIDOH HeartSafe Community.
  - 6-4 The PFD 911 call-takers and dispatchers should immediately be trained and certified in EMD.
  - 6-5 The PFD should assign the duties and responsibilities of overseeing the department's delivery of EMS to a chief, while still using support staff to carry out critical functions.
  - 6-6 The PFD should staff and implement a third PFD rescue unit as soon as possible.
  - 6-7 The PFD should adopt a Unit Hour Utilization rate of 30 percent as its threshold for rescue unit use analysis in order to monitor and improve the future delivery of EMS throughout the City.
  - 6-8 The PFD should closely track EMS call volume in an effort to identify peak demand for service periods, and then consider implementing a program that places a third rescue unit in service on a part-time basis during those peak demand periods as an alternative to full-time third rescue staffing.
  - 6-9 The City of Pawtucket and the Medical Director should enter into a written agreement concerning the roles and responsibilities of the Medical Director position, and the agreement should be completed using State guidelines for the role of the local Medical Director.

- 6-10 The City of Pawtucket should require Medical Director liability insurance with the coverage and minimum limits clearly listed in the Medical Director's contract for service. The cost of this insurance should be considered as part of the fee and expense compensation package provided by the City of Pawtucket in the contract.
- 6-11 The PFD should work closely with The Dawson Group to analyze the entire billing process and collection percentage rate to ensure maximum efficiency on revenue collection.
- 6-12 The PFD should consider the implementation of electronic patient care reporting as used by many other EMS response agencies throughout the State.
- 6-13 The PFD must immediately develop and implement a HIPAA-compliant process whereby the completed run reports can be securely stored at the station and then be securely transported to headquarters for processing.
- 6-14 The PFD should complete a comprehensive cost analysis of EMS supply, equipment, and maintenance funding needs so that proper operational funds can be allotted to the delivery of EMS.
- 6-15 The PFD must immediately develop and implement written policy and procedures for the delivery of EMS as required by the RIDOH regulations.
- 6-16 The PFD should evaluate the need for and use of MDCs on the PFD rescue units and make the necessary changes to effectively use the MDCs in incident dispatch and response operations.
- 6-17 The PFD should evaluate all EMS equipment and supply needs and adjust the funding allocated for the purchase of new equipment, supplies, and maintenance plans. At a minimum, this evaluation should include a replacement plan for the cardiac monitors, the acquisition of spare AEDs, and a purchase plan for EMS supplies not easily restocked at hospital facilities.

- 6-18 The PFD should implement the use of pain medications as part of its EMS delivery in accordance with the RIDOH DEMS Pre-hospital Care Protocols & Standing Orders, Pain and Sedation Management Protocol.
- 6-19 The PFD should examine its assignment and use of lieutenants and captains on the rescue units and, if the decision is to retain the rank structure, then the Audit Team recommends that all rescue unit officers be certified to the EMT-P level and be assigned specific collateral duties (EMS supply ordering, scheduling and tracking equipment maintenance, etc.) related to the delivery of EMS by the Department.
- 6-20 The PFD should re-evaluate its rescue unit assignment procedure and consider a reduction in the length of the tours that personnel are assigned to the units.
- 6-21 The PFD must develop and implement a written, EMS quality assurance program in compliance with RIDOH's Rules and Regulations Relating to Emergency Medical Services, Section 12—Standards for Ambulances and Ambulance Services.
- 6-22 The PFD should develop and administer a customer service survey that gathers information from customers of the service.
- 6-23 The City should consider utilizing a private ambulance company to provide pre-hospital emergency medical service in the City.

## **CHAPTER SEVEN**

# **FIRE SERVICES TRAINING**

This chapter includes sections on training standards, regulations, programs, and certifications at the national, state, county, and local level—including the process by which training is conducted in the Pawtucket Fire Department (PFD). [Note: EMS Training was discussed in Chapter 6: Emergency Medical Services]

### **OVERVIEW OF FIRE SERVICES TRAINING**

The main objectives of the fire service are to prevent injury and the loss of life and to protect property and the environment. All emergency response personnel providing these services must be fully qualified to safely and effectively perform a wide range of practical skills. These responders must have a broad knowledge base that allows them to adapt quickly to the many different scenarios faced by modern day emergency responders. While on-the-job experiences are important for gaining knowledge, most knowledge and skills must first be obtained through some type of training program. In today's fire department, effective training is the key to successful emergency operations and service delivery effectiveness.

Training in the fire service over the past decade has undergone a revolutionary process because of the changing environment in which it exists. There have been many changes in technology that have resulted in significant improvements in equipment for emergency responder use. The fire, rescue, and emergency medical situations that emergency responders encounter are often more complex in the post-9/11 era; emergency responders in all public safety agencies must now prepare for more large-scale, catastrophic types of incidents in addition to the traditional fire and rescue incidents.

The past decade has also seen society place more emphasis on environmental concerns, which also poses a challenge to the emergency services and their approach to fire and hazardous situations. Personnel safety has become a primary concern, and technology has evolved to provide firefighters and EMS staff with more effective protective clothing and equipment. Fire services line-of-duty deaths are more closely analyzed than ever before and have resulted in new, safety-directed training standards and emergency scene operating guidelines.

Nationally, the rate of firefighter injuries and fatalities remains high even with all the advances in technology, thus the emphasis on firefighter safety and survival. Fire departments across the United States have worked on refocusing some of their training efforts to “saving their own” from life-threatening situations and on returning to the basics of firefighting. Fire service professionals realize that a fire department’s commitment to training is an indicator of that department’s commitment to excellence—because the two values rely on each other.

Fire service personnel receive their training and education in many different ways and from many different sources. Traditionally, fire service training falls into one of three categories: training courses, company drills (in-service training), and formal education classes. Training courses normally address three areas of concern: (1) new or entry-level employee training; (2) skills maintenance training (refreshers and recertification); and (3) career development training (promotion requirements).

Training courses are generally structured classes conducted by an individual who is skilled and certified in the adult educational process. Training courses usually cover a specific subject area either in its entirety or in a sequential format (e.g., Fire Fighter I and Fire Fighter II). Examples of subjects that are covered in training courses for fire personnel include recruit firefighting; advanced firefighting courses; first responder and emergency medical technician courses; pump operations; aerial ladder operations; rescue techniques; hazardous materials; emergency vehicle driver training; company officer training; and incident command courses.

The reinforcement and maintenance of critical job skills and the updating of new information or practices usually occurs through in-service training or company drills. These company drills are planned practice sessions, which are usually conducted by a company officer covering a single, specific topic or practice of a manipulative skill. Examples of in-service drills include the practice of hose layouts, ladder raises, and knot tying.

An aggressive, well-planned company drill training program is very important to department readiness. Because so much of a firefighter’s job requires the use of manipulative skills, it is necessary to regularly reinforce those skills, ensuring that they are performed effectively, efficiently, and safely each and every time that they are needed.

Formal education courses are generally the responsibility of community colleges and other institutions of higher learning. Formal education is traditionally focused at the collegiate level and involves academic subject areas. These academic courses are designed to assist fire service personnel in performing their job as well as providing career development in preparation for promotion. Fire science and emergency medical services degree programs are now available from the Associate to the Masters Degree levels; there are even a few universities in the United States that have bestowed Doctorate degrees in related areas of study. The current trend in many career fire departments is to require the successful completion of college-level course work as pre-requisite training for promotion.

## **NATIONAL TRAINING STANDARDS AND PROGRAMS**

Over the course of the last three decades, more demands have been placed on emergency responders to increase their level of service, which means that the level of training has had to increase as well. Movements began back in the early 1970s to provide structure and organization to the fire services training process. Those efforts resulted in the development of nationally recognized standards to serve as the basis for fire service training programs.

### **National Professional Qualifications System**

In 1972, the Joint Council of National Fire Service Organizations founded the National Professional Qualifications System in an effort to help guide the fire services toward training professionalism through training accreditation and certification. Certification arose over a concern that fire service training was becoming very imbalanced between various jurisdictions, almost to the point of becoming inadequate in some instances. As a result, a nine-member National Professional Qualifications Board (Pro Board) was established by the Joint Council to direct the new accreditation and registry system.

In order to develop a system of nationalized training for firefighters, the Pro Board requested that the National Fire Protection Association (NFPA) delegate to their technical committees, the development of clear standards for use in the certification process. As these standards were developed, they were reviewed, edited, and updated by fire services professionals throughout the United States.

The new NFPA standards were adopted as the basis for the Pro Board certification program. Today, NFPA professional qualifications training standards are the foundation of most fire service training programs found in North America and are recognized as the standards of practice in the fire/rescue training arena.

As this push to develop professionalism in the fire service continued, a National Board on Fire Service Professional Qualifications was established in 1990 to accredit training organizations and to certify individuals meeting the NFPA training standards. Today, the National Board on Fire Service Professional Qualifications accredits 32 states (*including Rhode Island*) using 72 levels of 16 different NFPA training standards.

Fire departments with a commitment to the national certification process gain the respect, reputation, and prestige associated with an organization dedicated to professionalism. It is generally recognized in the fire service that departments that teach and certify their personnel to the professional standards will become stronger entities both in their communities and among fellow departments.

### **National Fire Academy**

In 1975, the National Fire Academy (NFA) was established in Emmitsburg, Maryland, as part of the United States Fire Administration (USFA) for the purpose of developing and delivering fire service training programs on a national basis. Much of the work done by the NFA has been in the areas of executive officer development, fire department operations planning, and organizational management. Through its courses and programs, the NFA works to enhance the abilities of fire and emergency services and allied professionals to deal more effectively with fire and related emergencies—both natural and man-made.

The NFA's delivery systems are diverse. Courses are delivered at its resident facility in Emmitsburg and throughout the nation in cooperation with state and local fire training organizations, colleges, and universities. In an effort to make training affordable, a travel expense and lodging stipend is made available to students attending resident NFA courses in Emmitsburg.

Currently, the NFA has a four-year program for the development of senior fire officers. The Executive Fire Officer (EFO) program consists of four, two-week resident programs:

Executive Development, Leading Community Risk Reduction, Executive Analysis of Fire Service Operations in Emergency Management, and Executive Leadership. Following each course, the EFO candidate must submit an original research paper before being allowed to take the next course. Upon completion of the four-year program, the EFO student is awarded a certificate and is invited to attend an annual conference that focuses on the latest trends in the fire services. Many career fire departments are moving to require their top-level chief officer ranks to hold or obtain an EFO certificate.

The NFA also offers courses at the college and university levels for staff and command officers, technical specialists, and executive fire officers. To reach the fire services population, the NFA has developed a train-the-trainer program to “hand off” its training courses to state and local agencies.

## **STATE TRAINING PROGRAMS**

Fire/rescue training programs in Rhode Island are available through the Rhode Island Fire Academy (RIFA). RIFA operates under the Division of the State Fire Marshal and is charged with developing and delivering training programs for firefighters and fire officers based on applicable NFPA standards. RIFA also develops and offers state certification programs for instructors based on NFPA standards.

Most of the RIFA’s programs are delivered on a regional basis at the request of local fire departments. The Academy currently offers the following training courses:

- Fire Fighter (NFPA 1001)—Levels I and II
- Fire Officer (NFPA 1021)—Level I
- Fire Instructor (NFPA 1041) —Level I
- Fire Inspector (NFPA 1031) —Level I
- Driver/Operator (NFPA 1002) —Pumper, Aerial, Tiller
- FD Safety Officer (NFPA 1521) —Incident Scene Safety Officer; Health and Safety Officer
- Arson Detection for the First Responder
- Incident Command System
- Rapid Intervention Team Operations
- Rescue Technician (NFPA 1006) Rope Rescue I, II; Trench Rescue I, II; Confined Space Rescue I, II

- Hazardous Materials (NFPA 472) Awareness, Operational, Ops Product Control, Ops PPE, Technician
- Emergency Vehicle Driving Practices
- Public Fire Education
- Beyond the Basics/Fireground Support Operations
- Emergency Response to Terrorism
- Shipboard Fire Fighting – Awareness, Operations.

### **Pro Board Certification**

In addition to delivering the training courses noted above, the RIFA is also accredited to provide Pro Board certification in the following areas:

- Fire Fighter I
- Fire Fighter II
- Fire Apparatus Driver Operator—Pumper
- Fire Apparatus Driver Operator—Aerial
- Fire Apparatus Driver Operator—Tiller
- Rescue Technician—Rope Rescue I & II
- Rescue Technician—Trench Rescue I & II
- Rescue Technician—Confined Space Rescue I & II
- Fire Officer I
- Fire Inspector I
- Fire Instructor I
- Hazardous Materials—Awareness
- Hazardous Materials—Operations
- Hazardous Materials—Technician
- Fire Department Safety Officer

### **Instructor Training**

One of the most important components of any training program is instructor training and certification. In Rhode Island, RIFA provides instructor training and certification. The state offers training and certification at the Fire Service Instructor I level following the

NFPA 1041, *Fire Service Instructor Professional Qualifications* standard. RIFA requires that all of its instructors be certified in order to instruct in RIFA programs.

The Audit Team feels that the State of Rhode Island has a good, state level training and certification program that is well organized and operates with professionalism. The State is commended for their efforts in developing, implementing, and operating such a quality program.

### **EMS Training**

In terms of emergency medical services (EMS) training programs at the state level, courses are available through the Rhode Island Department of Health's Division of Emergency Medical Services and are delivered utilizing various facilities across the state, based upon the demand for training. It is the opinion of the Audit Team that the Division of Emergency Medical Services does a very good job of coordinating and delivering EMS training and provider certification services on a statewide basis. [For more information on EMS training see Chapter 9 of this report.]

### **PAWTUCKET FIRE DEPARTMENT TRAINING**

Based on interviews and documentation there appears to be considerable inconsistencies in training and certification within the Pawtucket Fire Department (PFD). The Audit Team considers these inconsistencies very concerning because, as stated previously, the training function is one of its most critical internal functions of a fire department.

Training impacts nearly every aspect of emergency response operations. Without well-planned and executed training programs, an emergency response organization will most likely struggle to be successful in its endeavors, which may in return impact the safety of its customers and service providers. The items presented in this chapter reflect issues of concern. The Audit Team encourages PFD leadership to ensure that action is taken on each item.

## **PFD Director of Training**

The “Director of Training” is the title carried by the officer in charge of training for the PFD. Currently a fire lieutenant serves as the Director of Training with a firefighter as an assistant. These two individuals comprise the entire Division of Training. According to Rule #11 of the PFD Rules and Regulations, the Director of Training has a number of responsibilities related to training and several responsibilities that are not, such as:

- “In times of emergencies, operate and function as the Safety Officer of the Department and in that capacity shall observe and the general functioning of the men and apparatus insofar as possible to be able to recommend changes for the safety and more efficient operation of the Department;”
- “Order supplies and equipment for the upkeep and maintenance of the Department;” and,
- “Order turnout gear for members and make sure they are in good condition.”

In 2011, the Division of Training staff was also involved in the repair and upgrade of the radio communications system; the replacement of fire hoses; the purchase, repair, and distribution of equipment for engine and ladder companies; and the purchase and distribution of EMS supplies and equipment—all while also running a 25-person recruit academy.

The Audit Team finds it unusual that the Division of Training is assigned duties and responsibilities of significant scope outside the area of training. With a full-service fire department (meaning EMS transport as well) of over 140 uniformed positions operating on a four-platoon system, the training function is a full-time responsibility.

The PFD Director of Training should be responsible for coordinating the delivery of all certification-based training programs outlined later in this chapter. The Director of Training should also be responsible for coordinating the company drill program so that all facets of fire and rescue and EMS skill maintenance are covered on a regular basis and all personnel are provided ample opportunity to retain their certifications. The Director should be the custodian of all PFD training records through the use of modern record keeping processes.

The Audit Team found the current Division of Training staff motivated and capable individuals—the Team commends them for all of their work in 2011. After reviewing the duties and responsibilities of the Director of Training and the training needs of the PFD, the Audit Team recommends that all duties and responsibilities not related to training be reassigned to other officers in the PFD. For example, the ordering of station supplies (i.e., personal protective equipment and tools/equipment for the fire apparatus) and EMS supplies for the ambulances (rescues) should be reassigned to other capable officers with oversight given to a chief officer.

With the reassignment of the non-training related duties and responsibilities, the Division of Training staff members should be able to more fully utilize their time and abilities to improve the training functions of their division.

### **PFD Training Committee**

As noted, fire, rescue, and EMS training is deficient in PFD and is in need of some overhaul. In order to restore departmental training to an acceptable level, the Audit Team recommends the formation of a Training Committee comprised of the Director of Training, a battalion chief, one fire officer (captain or lieutenant), and one rescue officer (captain or lieutenant).

In addition, the Audit Team suggests that the newly established Training Committee be given limited authority in implementing departmental policy in cooperation with the Fire Chief. The committee should serve more in an advisory and workgroup role until departmental training is restored to an acceptable level. At first, the Training Committee may need to meet monthly to establish goals and evaluate program progress. Once improvements are seen in the overall training throughout the PFD, the Training Committee may be able to move to a quarterly meeting schedule, primarily for planning and evaluation purposes.

The Audit Team suggests that the Training Committee be charged with the following two actions during its first year of operation:

1. Determine the immediate training needs of officers and firefighters to comply with the recommended minimum training qualifications and develop a plan and time schedule by which to deliver that training.

2. Develop short-range considerations for the development of the company drill program including mutual aid interoperability training.

### **Training Records**

For the purpose of comparison and analysis of training course completion and certifications, the Audit Team utilized data from PFD's IMC training record database. The Audit Team found the training records to be acceptable in content, just not on par with what should be in place for a career fire department.

Record keeping was good for the training programs delivered or coordinated by the Division of Training in 2011. The problem lies in the documentation of training that occurred at the company level in the fire stations. The Audit Team learned (and confirmed via the records) that the documentation of company level training is very inconsistent across the four platoons and six fire stations.

Company level training documentation is important on many levels, including a fire department's ISO rating. In ISO's 2010 Public Protection Summary Report for Pawtucket, the PFD received only 33% of the total possible points for fire department training. Many of those missing points were related to the absence of company level training documentation.

The Audit Team recommends that the Director of Training establish a process by which all company level training data is recorded and stored with the ability to review company level training activity on a daily basis by station and platoon. This data entry should be accomplished at the station-level using the company officer entering the information directly into the database.

### **Training Certifications**

The Audit Team found it difficult to review the training certifications of PFD officers and firefighters because the training records have not been maintained in good order. The Audit Team could not produce a clear assessment or comparison of training certifications for officers and firefighters.

In terms of training or certification for officers, there is no requirement for an officer in the PFD to have completed any type of officer training course or certification. The promotional requirements for the ranks of Lieutenant through Assistant Chief are minimal. The promotional requirements are based on time in service and include no additional training or certification. Also, no specific officer training or certification is required for the position of the Fire Chief position, which is an appointed position.

The Audit Team finds the absence of officer training and certifications requirements in PFD very concerning. Officers in a fire department represent the leadership of the organization and to have leaders who must function using on-the-job experience only sets up those leaders for possible failure.

The NFPA Fire Officer I and Fire Officer II standards have been in existence since 1976 and are the recognized training standards for fire officers throughout both the public and private sector fire services. The Audit Team believes that a fire department that ignores the fire officer training standards also fails its officers. Unfortunately, in Rhode Island, only the Fire Officer I training course is offered at this time. However, given the absence of any training requirement, the Fire Officer I requirement is a solid first step.

The Audit Team recommends the following minimum training and certification requirements for PFD officers:

**1. Fire Chief**

- Officer I
- Fire Officer II (when it becomes available)
- Hazmat First Responder Operations Level
- Fire Instructor I
- Vehicle Driving Practices
- Incident Command System
- EMS – First Responder
- ICS 200, 300, 400, and 800
- National Fire Academy – Executive Fire Officer (EFO)

**2. Assistant Chief & Battalion Chief**

- Fire Officer I

- Officer II (when it becomes available)
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Driving Practices
- Incident Command System
- EMT-Basic
- ICS 200, 300, 400, and 800
- Consider National Fire Academy – Executive Fire Officer (EFO)

### **3. Captains & Lieutenants**

- Fire Officer I
- Hazmat First Responder Operations Level
- Fire Instructor I
- Vehicle Driving Practices
- EMT-Basic
- ICS 200 and 300
- Rescue Technician

The Audit Team also recommends that PFD develop a plan to deliver any training courses needed for the existing officers so that they have an opportunity to comply with the revised training and certification requirements. The Audit Team also recommends that the Training Committee establish a continuing education program for the officers of the department so that they can keep pace with the changes in service delivery, technology, and leadership practices.

### **Firefighter Training**

In the traditional fire department setting, firefighter training begins with the introduction of new personnel to the basics of fire and rescue operations through the recruit training process. Recruit training differs from state to state and from jurisdiction to jurisdiction depending upon local standards and requirements. In most career fire/rescue systems, the recruit training process depends on the size of the department and the proximity to a formal training center.

In the PFD, career firefighters receive their entry-level training through the Pawtucket Fire Academy as part of their hiring process. The “Pawtucket Fire Academy” is the last step in the hiring process. In 2011, 25 candidates completed the Fire Academy, which consisted of several weeks of firefighter training. Upon graduation from the Fire Academy, the candidates were placed on an eligibility list for hire.

The Audit Team finds the PFD Fire Academy process rather unusual in that funding is spent to train candidates who are not yet hired. The Team learned that a number of candidates in past Academies have been hired by other fire departments in the region, therefore, for all practical purposes, the City of Pawtucket paid for the training of another municipality’s new employee.

Currently, the PFD hiring process requires candidates to have a Rhode Island EMT certification. The Audit Team recommends that the PFD amend their hiring process to include RIFA Fire Fighter II certification as well, thus reducing the need to run a Fire Academy.

With the addition of the Fire Fighter II requirement to the hiring process requirements, the Audit Team also recommends the development and implementation of a Probationary Fire Fighter Manual/Program that provides (and evaluates) the knowledge, skills, and abilities needed for the job of PFD firefighter. The probationary program would be developed by the Division of Training, but would be managed at the company level with battalion chief oversight.

With the probationary program in place, a new employee would “come on board” as a certified Fire Fighter II/EMT and be able to operate as minimum staffing in a very short period of time. The probationary program would carry through to the end of the new employee’s first year and would provide the guidance needed to learn all aspects of the job.

### **Incident Management Training**

The Audit Team is not aware of any state or local regulation requiring that fire service chief officers be trained in the practice of incident management (command). However, Presidential Directive 5, issued in February 2003, requires all emergency response agencies across the nation to be trained in and implement the National Incident

Management System (NIMS) in order to be eligible to receive federal funding for Homeland Security initiatives.

Incident command training is critical to the success of incident management. If emergency responders expect to have positive outcomes at the incidents to which they respond, then those responders must be well-trained and well-versed in incident command. Fire department incident command has grown well past the days of the fire chief standing in the front yard of a burning home with nothing but his helmet on and his portable radio in his hand. Today's incidents can challenge even the most seasoned incident commander; all incident commanders must be able to command and operate in an era of mutual interoperability where many fire departments may be required to work together on incidents.

Without training and certification in incident command, fire departments are exposing their organizations to a high level of liability and the potential for disastrous outcomes. In almost every firefighter line-of-duty death that has occurred on the fire ground over the last 10 years in the United States, investigative findings have listed ineffective (or absent) incident command and poor crew accountability as common contributing factors to those deaths.

Insufficient data was provided to the Audit Team regarding PFD's compliance with the NIMS requirement. Therefore, the Audit Team recommends that the Division of Training conduct a complete review of NIMS course completion for the PFD and produce a report showing any deficiencies based upon the minimum training and certification requirements listed earlier in this chapter.

### **Skill Maintenance Training**

Another important area of a fire department's training program is the continued maintenance of knowledge and skills. In-service training, as it is commonly referred to, generally covers a wide area of topics including basic firefighting skills, emergency vehicle driving, and federal government mandated hazardous materials refresher training.

When developing a company drill training program, the Fire Suppression Rating Schedule used by the Insurance Services Office (ISO) should be considered. The Schedule is actually a manual that is used by ISO to review the firefighting capabilities of

individual fire departments. One section of the Schedule reviews a fire department's training functions and assigns points (credits) based upon certain training items. The following list from ISO provides examples of the training required for all fire department personnel for which credit points are allotted:

1. Half-day drills (three hours), eight per year
2. Half-day multiple company drills (three hours), four per year
3. Night drills (three hours), two per year
4. Company training at the fire station, 20 hours per member, per month
5. Leadership/command training for all officers, two days per year
6. Half-day sessions for driver and operator training, four per year

Skills-maintenance training was a noted point in many of the Audit Team's interviews with firefighters and officers. Almost everyone felt as though company-level training was inconsistent and that it has been that way for several years.

While the Audit Team could not determine precise numbers from the training records data, it was clear from the station level interviews of officers and firefighters that skill maintenance training is, in fact, inconsistent.

### **Interoperability Training**

In terms of multiple-company operations and mutual aid interoperability training, it was again unclear to the Audit Team the frequency of this hands-on, drill-type training. The Audit Team also found little evidence of any type of regional or mutual-aid training and the Team knows of no immediate plans to implement such training.

The Audit Team believes that multi-company training events are important to the development of teamwork and to reinforce the concept of fire ground discipline at the company level. The Audit Team suggests that PFD develop and implement a company drill program that:

1. Ensures that meaningful, multi-company drills are held at least six times a year and that these drills focus on the various emergency response activities that require multiple units to work together in order to mitigate an incident.

2. Ensures that these drills also include the use of mutual aid agencies from the surrounding Pawtucket area.
3. Addresses the training goals and objectives of the PFD and its individual companies.

### **Driver Operator Training**

Of all the services provided by a fire/rescue department, only two positions really provide great exposure to liability: a provider of emergency medical care and the driver of an emergency vehicle. In both cases, training needs to be extensive, well documented, and recertified on a regular schedule.

Two policies that address driving PFD apparatus are (1) Rule #23 of the PFD Rules and Regulations and (2) the Division of Training's Standard Operating Procedure for Driving Emergency Vehicles. Neither policy addresses the requirement for any knowledge or skill needed for learning to drive PFD apparatus. The Audit Team learned of no driver/operator training program for any of the PFD apparatus and the existing policies are not compliant with the requirements set forth in NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications, 2009 Edition*.

Because most PFD firefighters have to be able to at least drive an ambulance (rescue) or an engine (pumper), the presence of a comprehensive, written driver training program/policy is important. This program/policy is not only for the department and its employees, but also for the City in terms of minimizing its liability exposure. Therefore, the Audit Team urges PFD to develop and implement an emergency vehicle driver training program and policy that is NFPA 1002 compliant.

The Audit Team also recommends that PFD require all current and future engine (pumper) and aerial ladder drivers to complete the Rhode Island Fire Academy's Driver Operator programs for pumper apparatus and aerial devices.

### **Training Facilities**

The PFD operates a very small training facility that is co-located at the City maintenance facility on Armistice Boulevard. The training facility consists of a single classroom,

office space, and limited storage space. The second floor of the facility serves as the Emergency Operations Center and can be used on a limited basis for classroom instruction, if needed.

While the training facility's classroom space is adequate for most didactic instruction, the facility lacks the space and ability to conduct company-level practical skill drills. While it is true that the maintenance facility has adequate space, the problem is working around vehicular traffic in and out of the repair garages and dealing with various broken-down vehicles stored throughout the maintenance lot. Without a training facility, companies must find locations within their local response districts to conduct practical skill drills. The more challenging problem is that of live fire training. Without a training facility, live fire training is most likely non-existent, which is the case with PFD.

The Audit Team learned that the PFD had a drill tower at one time at Station 3. However, that tower was demolished as part of the development of the Pawtucket Red Sox stadium complex. Thus, the PFD is without any type of elevated drill tower, which impacts the department's ability to train with its aerial and ground ladders other than using buildings in the community. The PFD lost a significant number of points in the Training Category of the 2010 ISO rating because of the lack of drill tower or practical skill structure.

The Audit Team recommends that the City of Pawtucket work with the PFD to construct a multi-story drill tower that also has some enclosed space for hose line evolutions and perhaps a smoke maze. There appears to be sufficient space at the Armistice Boulevard site if some rearrangement of vehicle storage were to be completed.

## **SUMMARY**

The main objective of the fire service is to prevent injury and loss of life and to protect property and the environment. Training is a key element to successful emergency scene operations and organizational effectiveness. Training in the fire, rescue, and EMS disciplines is also a career-long venture, starting with recruit and basic training programs and progressing to more sophisticated advanced training and participation in higher educational opportunities. Between formal training programs and educational courses there must be ongoing reinforcement of knowledge and hands-on skills provided to all ranks.

It is very apparent from speaking with PFD officers and firefighters that they are committed to providing good service to their customers. It is also important for PFD to remember that its members and employees are its customers as well. Like many other fire departments across the United States, there are some serious shortfalls in training within PFD primarily involving company level training, the duties and responsibilities of the Division of Training, and the lack of training certification requirements at the officer ranks.

The Audit Team realizes that the findings presented in this chapter present serious challenges to the leadership of PFD and the Team urges all personnel to work together to overcome the challenges

## **RECOMMENDATIONS**

- 7-1 The Fire Chief should reassign all of the Director of Training's duties and responsibilities that are not related to training to other capable officers with oversight given to a chief officer.
- 7-2 The Fire Chief should establish a Training Committee to address the immediate and short-range training needs of the department. The Training Committee should consist of the Director of Training, a battalion chief, one fire officer (captain or lieutenant) and one rescue officer (captain or lieutenant).
- 7-3 The Training Committee should address the following two actions during its first year of operation:
1. Determine the immediate training needs of officers and firefighters to comply with the recommended minimum training qualifications and develop a plan and time schedule by which to deliver that training; and.
  2. Develop short-range considerations for the development of the company drill program including mutual aid interoperability training.
- 7-4 The Director of Training should establish a process by which all company level training data is recorded and stored with the ability to review company level training activity on a daily basis by station and platoon. This data entry should be

able to be accomplished at the station-level with the company officer entering the information directly into the database.

7-5 The City of Pawtucket and the Fire Chief should implement the following minimum training and certification requirements for PFD officers:

**1. Fire Chief**

- Officer I
- Fire Officer II (when it becomes available)
- Hazmat First Responder Operations Level
- Fire Instructor I
- Vehicle Driving Practices
- Incident Command System
- EMS – First Responder
- ICS 200, 300, 400, and 800
- National Fire Academy – Executive Fire Officer (EFO)

**2. Assistant Chief & Battalion Chief**

- Fire Officer I
- Officer II (when it becomes available)
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Driving Practices
- Incident Command System
- EMT-Basic
- ICS 200, 300, 400, and 800
- Consider National Fire Academy – Executive Fire Officer (EFO)

**3. Captains & Lieutenants**

- Fire Officer I
- Hazmat First Responder Operations Level
- Fire Instructor I
- Vehicle Driving Practices
- EMT-Basic
- ICS 200 and 300
- Rescue Technician

- 7-6 The Fire Chief and the Director of Training should develop a plan by which to deliver any training courses needed for the existing officers so that they have an opportunity to comply with the revised training and certification requirements.
- 7-7 The Fire Chief and the Director of Training should establish a continuing education program for the officers of the department so that they can “keep pace” with the changes in service delivery, technology, and leadership practices.
- 7-8 The City of Pawtucket and the Fire Chief should amend the PFD hiring process to include Rhode Island Fire Academy Fire Fighter II certification in addition to the Rhode Island EMT license.
- 7-9 The Fire Chief and the Director of Training should develop and implement a Probationary Fire Fighter Program that develops the job-specific knowledge, skills, and abilities needed for employment as a PFD firefighter.
- 7-10 The Director of Training should conduct a complete review of NIMS course completion for the PFD and produce a report showing any deficiencies based upon the minimum training and certification requirements listed earlier in this chapter.
- 7-11 The Director of Training should develop and implement a company drill program that:
1. Ensures that meaningful, multi-company drills are held at least six times a year and that these drills focus on the various emergency response activities that require multiple units to work together in order to mitigate an incident.
  2. Ensures that these drills also include the use of mutual aid agencies from the surrounding Pawtucket area.
  3. Addresses the training goals and objectives of the PFD and its individual companies.
- 7-12 The Fire Chief and Director of Training must develop and implement an emergency vehicle driver training program and policy that is NFPA 1002 compliant.

- 7-13 The Fire Chief should require all current and future engine (pumper) and aerial ladder drivers to complete the Rhode Island Fire Academy's Driver Operator programs for pumper apparatus and aerial devices.
  
- 7-14 The Fire Chief, Director of Training, and City of Pawtucket should work together to construct a multi-story drill tower that also has some enclosed space for hose line evolutions and a smoke maze.

## **CHAPTER EIGHT**

# **FIRE & RESCUE OPERATIONS**

This chapter addresses the operational aspects of fire protection and rescue service delivery in the City of Pawtucket. The chapter is divided into several sections that examine incident response workload analysis; specialty response services; departmental administrative and operational guidelines; pre-incident planning; and the fire department's Insurance Services Office rating. (Note: Emergency Medical Services [EMS] delivery is covered in Chapter 6.)

### **INTRODUCTION**

On the scene of a fire or rescue emergency there is no time to make decisions by committee. Although some quick consultation can take place, time for deliberation is limited. Decisions made at the emergency scene may be irreversible and the consequences of error can be disastrous. Such errors can lead to further property loss, as well as injury or death to civilians and firefighters. In many cases, the fire officer has to make a decision based on information that he gathered hastily.

- The fact is that all structure fire situations are different; these differences include:
- The type of fire and its location in the building;
- The building type and its construction;
- The interior contents and furnishings of the building;
- The presence of hazardous materials;
- The presence of built-in fire protection and life safety systems; and,
- The time of day and weather conditions.

All fire officers and firefighters must be well trained and prepared in order to be successful in handling emergency incidents. If this training and preparation is left up to “on-the-job experience,” the cost in property and life loss can be great.

There are several key factors needed to ensure that emergency scene operations occur as efficiently, effectively, and safely as possible. First, fire and rescue stations must be sufficient in number and geographic distribution in order to allow for the timely arrival of

emergency equipment. Second, emergency response apparatus must be adequately staffed to allow basic tasks to be completed in a timely and effective manner. Third, emergency responders must be properly trained and equipped to handle a wide variety of emergency incident scenarios. Finally, standardized operating procedures are needed to help guide emergency scene decision-making in the deployment of basic levels of service.

## **THE FIRE PROBLEM**

The term “working fire” is a common term used throughout the United States by fire service personnel to describe a structure fire where fire department resources are expected to engage in some type of fire attack operation in order to mitigate the incident. Unfortunately, there is no agreed upon standard definition of a “working fire;” it varies from region to region and, therefore, fire incident data vary as well.

For the purpose of this report, the Audit Team defines a working fire as any fire incident where fire department personnel must don their protective clothing and equipment and use at least one hose line to control and extinguish a structure fire.

In 2012, a fire department’s incident response statistics probably include a wide variety of call types ranging from emergency medical runs, to public service calls, to automatic fire alarms, to trash fires. Of all the incidents to which fire departments respond, the working structure fire is generally one of the least frequent events, yet it carries with it perhaps the greatest threat to life and property.

The majority of incidents handled by today’s fire departments are handled with one or two pieces of apparatus, and, with the exception of an emergency medical incident, these incidents are handled with a decreased level of urgency. A working structure fire on the other hand presents a series of urgent matters that must be quickly addressed by responding forces if lives and property are to be saved.

A structure fire requires the response of an adequate number of personnel and equipment; it requires quick and accurate decision-making; and it requires discipline. Without any of those three key items, the structure fire may very well be extinguished without incident—but not without additional risk to emergency responders and civilians.

Therefore, the Audit Team believes that a fire department must be sufficiently staffed, equipped, and prepared for the response to structure fires and that being ready for the structure fire response will help ensure the department's response readiness for all other call types.

### **A Look At National Fire Data**

Fire continues to be a serious problem throughout the United States and has been for many years. In general, persons and communities of lower socioeconomic status generally tend to suffer greater occurrences of fire and its related losses. Thus, the workloads of fire departments are generally greater in the lower economic neighborhoods of the United States.

A review of national data indicates the magnitude of the fire problem on a national basis. The following fire data and statistics\* present a "snapshot" of fire's impact on the United States in 2010.

- Fire departments responded to an estimated 1,331,500 fires;
- There were 3,210 civilians who lost their lives as a result of fire;
- There were 17,720 civilian injuries that occurred as a result of fire;
- There were 87 firefighters killed in duty-related incidents;
- Fire killed more Americans than all natural disasters combined;
- Eighty-three percent of these deaths occurred in residences;
- Direct property loss due to fires was estimated at \$11.6 billion;
- An estimated 27,500 intentionally set structure fires resulted in 200 civilian deaths;
- Intentionally set structure fires resulted in an estimated \$585 million property damage;
- A civilian fire death occurred every 163 minutes, an injury every 30 minutes;
- Home fires resulted in 83% of all civilian fire deaths;
- Almost 8% of all incidents were false alarms;
- Just under 5% of all incidents were actual fires;
- Discarded smoking materials, cooking, and heating were the leading causes of fatal fires; and,
- Persons most likely to die in a fire were elderly, children and the impaired.

\*Data was obtained from the National Fire Protection Association

**PAWTUCKET FIRE DEPARTMENT WORKLOAD ANALYSIS**

The Pawtucket Fire Department (PFD) reported a total of 13,527 calls for service (incidents) in CY2011 according to the department’s incident reporting data. This represented a slight decrease from CY2010, but a slight increase from CY2009. Total call volume seems to have remained steady over the last three calendar years.

Of these 13,000 plus incidents dispatched in CY2011, 8,788 were for medical emergencies, which represents about 65% of all dispatches. In CY2011, there were 247 dispatches made for the report of a structure fire of which 70 of those dispatches were confirmed structure fires requiring fire department extinguishment operations.

In CY2011, there were over 15,000 hours spent managing the 13,528 fire, rescue, and EMS incidents that occurred in the City: 1,875 of those hours were spent managing structure fires. (See Figure 8.1.) The data reinforce that, while structure fires may be low in frequency, they require considerable more work in terms of equipment, personnel, and time. In CY2011, time spent responding to and managing structure fires was second only to medical emergencies in terms of total time used.

**Figure 8.1**  
**PFD WORKLOAD ANALYSIS (CY2011)**

	CY2011	Percent
Total Incident Hours	15,246 hrs	—
Hours Spent on Medical Emergencies	6,842 hrs	44.9%
Hours Spent on Structure Fires	1,875 hrs	12.3%
Hours Spent on Master Box Alarms	1,359 hrs	8.9%

## **Fire Deaths**

One method of examining a community's fire problem is to examine its fire death rate. According to United States Fire Administration's 2008 data on State Fire Death Rates, Rhode Island's 11.3 deaths per million population is below the national average of 12.0 deaths per million population.

Over the last three years, there have been a total of 5 fire deaths in the City of Pawtucket; two each in CY2011 and CY2010, and one in CY2009. At first glance, the number of fire deaths appears low, but given that the City of Pawtucket has a population of 71,000 people, the fire death rate in the City is above the State average (see Figure 8.2).

**Figure 8.2**

**PAWTUCKET FIRE DEATHS AND COMPARISON OF FIRE DEATH RATES  
FOR PAWTUCKET, RHODE ISLAND, AND U.S. (CY2009-CY2011)**

	CY2011	CY2010	CY2009
Pawtucket Fire Deaths	2	2	1
Pawtucket FDR*	28.2 per million pop	28.2 per million pop	14.1 per million pop
Rhode Island FDR*	11.3 per million pop	11.3 per million pop	11.3 per million pop
United States FDR*	12.0 per million pop	12.0 per million pop	12.0 per million pop

\*FDR= Fire Death Rate

There are a number of socioeconomic factors that affect a community's fire death rate. The poverty and education levels of its residents are two of the most prevalent. Thus, traditional urban communities and extremely rural communities often have higher fire death rates than their suburban counterparts. Lower economic and lesser educated people often live in substandard housing, are forced to use alternative heating sources, and often fall victim to other social issues that place them in a prime position to suffer from a fire in their place of residence.

The Audit Team noted that using the fire death rate data illustrated above, an increase or decrease of one fire death in the City of Pawtucket makes a large change in the fire death rate. Therefore, it is perhaps best that the PFD focuses on the fact that one fire death in the course of a year puts the City's fire death rate above both the state and national rates.

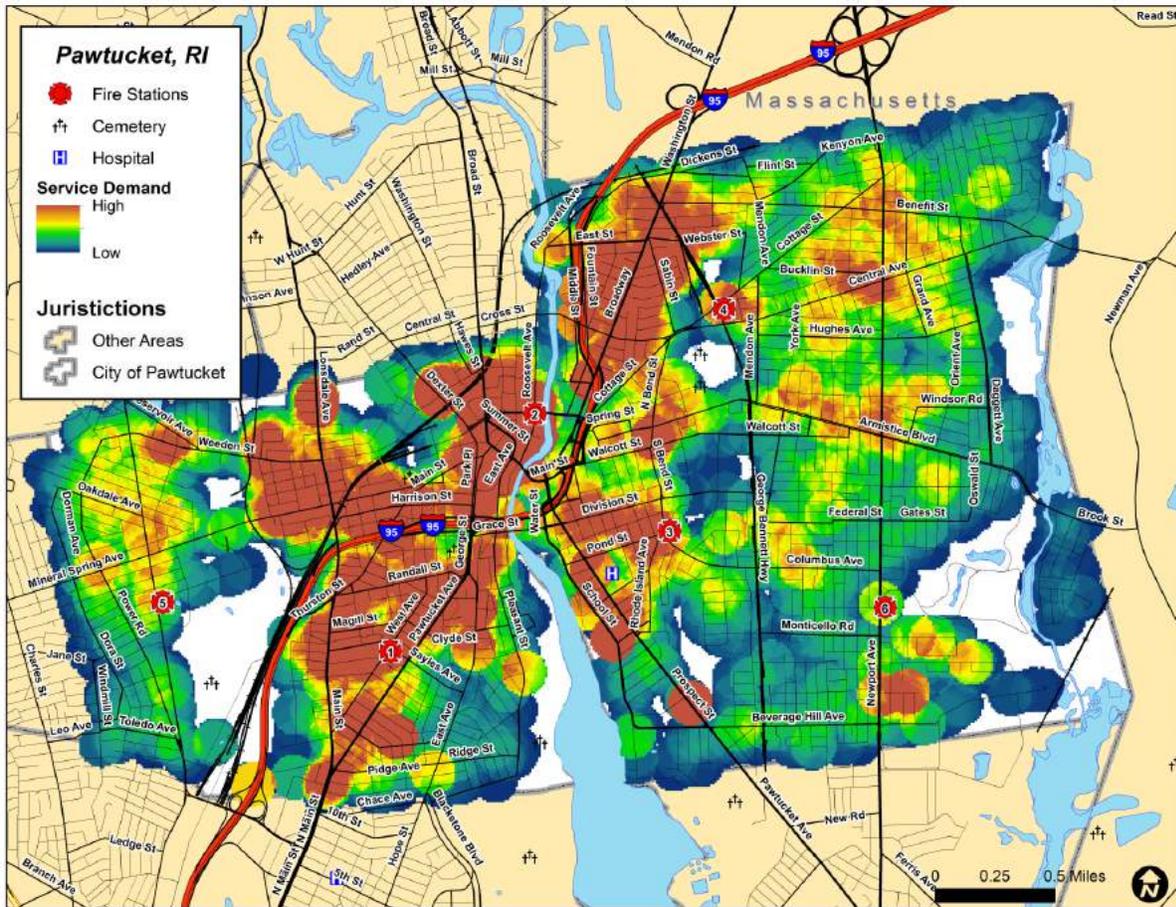
The Audit Team recommends that the PFD collect and analyze fire injury and death data, and develop and implement fire and life safety programs that target the population groups most likely to suffer from a fire in their home.

### **Geographic Depiction of PFD Incident Locations—2011**

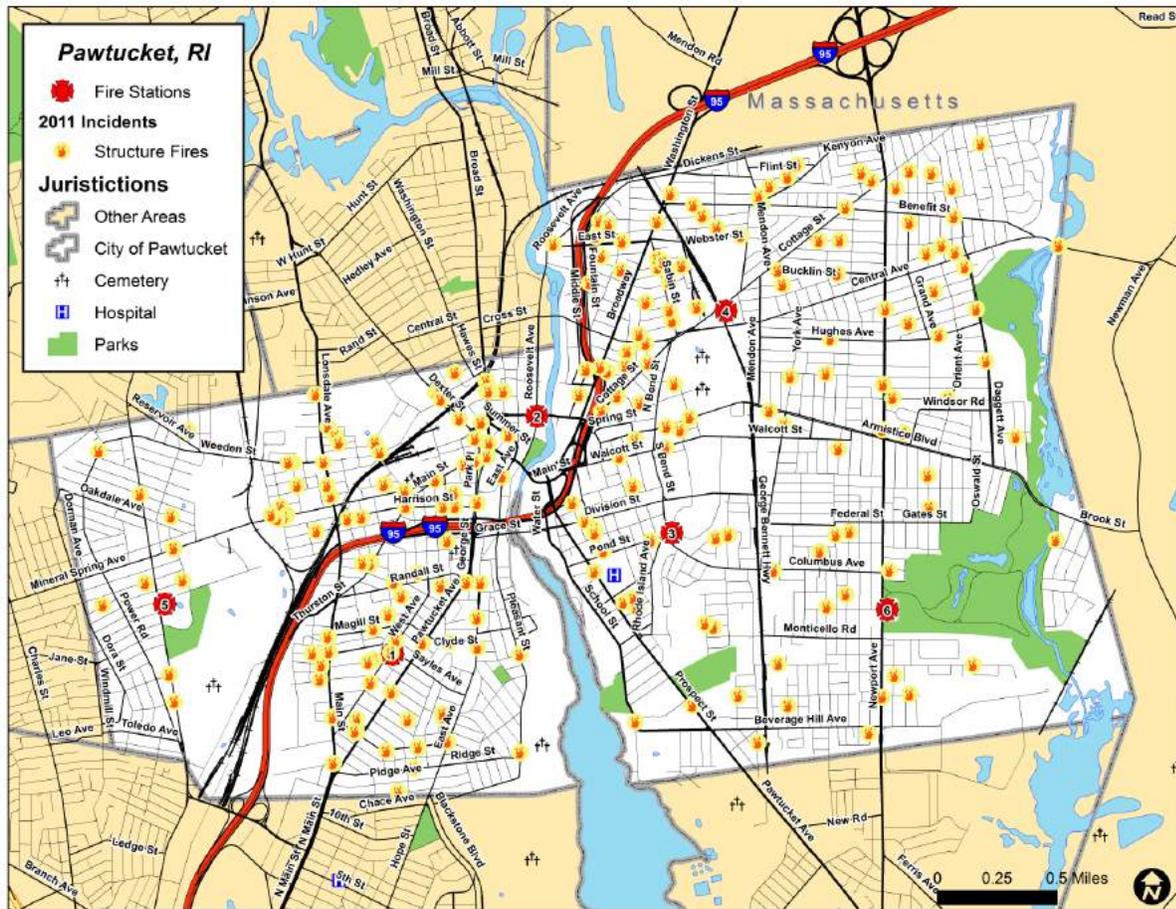
The calls for service are naturally more numerous during the daytime hours and into the early evening as human activity correlates greatly with the demand, especially for medical and other fire service type incidents. Similarly, the demands for services are not evenly distributed geographically. The Fire Department provided an incident database of several call types with address information utilized to plot service demand. Non-emergency calls and mutual aid calls to other jurisdictions were removed from consideration. In Figure 8.3, service demand points were measured for density comparison utilizing a 500 ft radius around each point and classified utilizing the standard deviation of the resulting density dataset. It can be seen that highest concentration of incidents is found in the central area of the city. The remainder of the district reflects more moderate concentrations of service demand.

Because emergencies, especially medical emergencies, can occur at the same location numerous times, Figure 8.3 reflects that phenomenon rather than a point or pin map since these locations would be stacked atop each other unbeknownst to the viewer. For structure fires, the amount of calls as discussed earlier, are much lower. The instance of repeat occurrences is very small and thereby a point map can be utilized to visualize clustering of calls in certain areas. Figure 8.4 shows the locations of structure fires within the city. Clustering can be seen most prevalently in the central area of the city similar to Figure 8.3. The aged inventory of most structures within the city is a concern for increased incidence of fire since outdated codes, limited upfit of sprinkler systems, and historical use of more flammable construction materials presents an added risk in Pawtucket compared to suburban areas.

**Figure 8.3**  
**SERVICE DEMAND CONCENTRATION**



**Figure 8.4**  
**FIRE INCIDENT TYPES**



**Urban Fire Risk**

During its research, the Audit Team found an interesting “draft” report titled, “Strategy for Reducing Risks from Natural Hazards in Pawtucket, Rhode Island: A Multi-Hazard Mitigation Strategy (2011).” The report was reportedly assembled by a number of different persons from various public safety and emergency management agencies at both the State and local level. One of the hazards reviewed in the report is the “urban fire” risk. By definition, urban fire refers to the fires that occur in a city-like setting where spread from one structure to another can be quick and catastrophic. The potential for urban fire is generally greatest in those American cities where structures are built of wood and are located very close together.

The Mitigation Report identifies that:

“Pawtucket’s closely built environment makes it particularly susceptible to urban fire, given the number and proximity of structures in defined areas. In 2003, a major fire at an unoccupied mill complex spread rapidly to 17 properties causing over \$3 million in damages.

Another major fire destroyed over half of the Union Wadding Company mill site in October 2010. Approximately 200 firefighters from 8 different communities spent several days extinguishing the fire, with an estimated \$2.5 million in damages.

Many of the wooden residential structures that are close together would allow fire to spread easily. In addition, the downtown area includes many buildings attached to one another, also allowing fire to spread easily.”

The Mitigation Report lists the probability of the future occurrence of urban fire events in Pawtucket as “high.” “Due to the closely-built urbanized nature of many residential and commercial areas throughout the City, it is likely that one isolated fire could spread rapidly. As the past has shown, a fire starting in one of the City’s many abandoned and/or underutilized mills/factories, can quickly evolve into a highly intense inferno, also spreading to the residential areas that surround these structures.”

**Figure 8.5**

**PAWTUCKET VULNERABILITY MATRIX 2011 UPDATE**

<b>Hazard</b>	<b>Future Occurrence</b>	<b>Potential Damage</b>
Flood-Related Hazards	High	Extensive
Wind-Related Hazards	Low	Minor/Severe
Winter-Related Hazards	High	Extensive
Urban Fire-Related Hazards	High	Extensive
Geologic-Related Hazards	Low	Catastrophic

Source: “Strategy for Reducing Risks from Natural Hazards in Pawtucket Rhode Island: A Multi-Hazard Mitigation Strategy (2011)

The Audit Team concurs with the findings in the Mitigation Report. The City has numerous urban fire risk areas, and the potential for future events remains high as long as

the abandoned properties are allowed to exist in their present state of disrepair and open access. (See Figure 8.6 for an example of a vacant property in Pawtucket.)

**Figure 8.6**  
**ONE OF A NUMBER OF LARGE VACANT MILL COMPLEXES**  
**LOCATED IN THE CITY**



Regarding the urban fire risk, the Audit Team has two recommendations. First, the City of Pawtucket should work to restrict the access to abandoned and vacant properties within the City, especially the vacant mills and factories. Second, the PFD should ensure that pre-fire plans and pre-fire planning activities are completed for each of the vacant mill and factory properties.

In summary, the PFD's fire incident workload appears to fall within reasonable limits and is comparable to other urban communities. Clearly, the response to EMS incidents is by far the greatest workload placed on the department, but that is also the norm for most fire-based EMS systems in the United States. The Audit Team recommends that the PFD should improve its ability to capture fire loss and fire injury and death data so that information can be used in the department's future planning and funding.

## **SPECIAL OPERATIONS SERVICES**

This section includes an overview of fire department special operations services and the process by which these services are delivered in the City of Pawtucket.

### **Overview of Special Operations Services**

In fire service jargon, the term “special operations” generally refers to those services that a fire department provides other than fire and EMS response. The traditional special operations services include hazardous materials (hazmat) response, vehicle extrication service, and technical rescue service. The delivery models for special operations services can vary greatly from community to community across the United States. With the exception of vehicle extrication service, the other special operations services are seldom needed in most communities. Because special operations services are highly technical in nature and require specialized training and equipment, many communities opt not to deliver the services, or they elect to partner with neighboring communities to share resources in either a mutual aid or a regional team format.

When considering the need for special operations services, it is important to remember that when these types of services are needed, there cannot be a delay in response. The common dilemma faced by many communities is “at what cost” does the community wish to support the delivery of fire department special operations services, because the delivery of these services is often expensive both in terms of training time and equipment.

The decision by a fire department or community to initiate any new service must be examined closely in terms of the expected demand for and the costs of delivering the service. The demand and costs must always be compared to the existing available resources in the department’s response region. This comparison is important in order to gather adequate information so that an informed decision on special operations services can be made. For example, it might be more practical for a fire department to train all of its responders to the “awareness” level of trench collapse emergencies and use a neighboring community’s trench rescue team as the primary response agency rather than fund the purchase of expensive trench rescue equipment and train its own trench collapse rescue team.

The regional team approach to the delivery of special operations services continues to be a common approach in suburban communities across the nation. In Rhode Island, hazmat team response is managed on a regular basis through the Rhode Island Association of Fire Chief's mutual aid response system.

### **Hazardous Materials Response**

Over the last few years, international disasters such as those in Yakima Nuclear Power Plant (Japan) and the *Deepwater Horizon* drilling rig (USA) have re-focused attention on the potential for catastrophic hazardous materials incidents throughout the world. In the 1980s, the concern for prevention of hazardous materials disasters served as impetus for federal legislation to prevent and control releases of hazardous materials and to protect workers involved in hazardous waste site clean-up and emergency response.

On October 17, 1986, President Ronald Reagan signed into law the Superfund Amendment and Re-authorization Act of 1986 (SARA). This legislation truly transformed the delivery of emergency response services and affected almost every jurisdiction throughout the nation. Although SARA is over 25 years old, its impact still affects how emergency responders handle present day hazardous materials incidents, both in terms of response operations and personnel training.

SARA provides for protection of the community under Title III and the protection of the worker under Title I. As a result of the legislation, the federal Environmental Protection Agency (EPA) and the federal Department of Labor, through the Occupational Safety and Health Administration (OSHA), both adopted regulations that had major impacts on communities' planning and response to hazardous materials incidents. The regulations impacted communities in a number of ways, but most significantly in the areas of planning, information gathering and retrieval, and emergency response capabilities.

In 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response, OSHA provides the following definitions for the various levels of emergency response capabilities:

- *First Responder—Awareness (FRA)*. Individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an

emergency response sequence by notifying the proper authorities of the release. Persons trained to the FRA level simply recognize the presence of an emergency involving hazardous materials and take action to notify emergency responders.

- *First Responder—Operations (FRO)*. Individuals who respond to releases or potential releases of hazardous substances as part of the initial response for the purpose of protecting nearby persons, property, or the environment from the effects of the release. Persons trained to the FRO level meet the FRA requirements and are trained to take defensive actions to control or minimize the effects of a hazardous materials release. FROs generally do not take any action that involves touching the hazardous material or its container and they are commonly trained in decontamination operations. The FRO is the “workhorse” of most every fire department in terms of basic response to hazardous materials incidents. More fire department personnel are trained to the FRO level than to any other hazardous materials training level.
- *Hazardous Materials—Technician (HMT)*. Individuals who respond to releases or potential releases of hazardous substances for the purpose of stopping the release and mitigating the incident. Persons trained to the HMT level meet the FRO requirements and are trained to take offensive actions to control the release of a hazardous material from its container. HMTs are basically trained to manage leaks involving a wide variety of hazardous materials containers. The HMT is the workhorse of most every hazmat response team. More hazmat team personnel are trained to the HMT level than to any other hazardous materials training level.
- *Hazardous Materials—Specialist (HMS)*. Individuals who respond with and provide support to hazardous materials technicians at hazardous materials incidents. Typically, persons trained to the HMS level specialize in certain topic areas either through specialized knowledge or specialized skill. A local or regional hazmat response team may have several “specialists” available to them through a callout or contact roster. For example, a local agricultural chemist might serve as a hazmat team’s pesticide specialist, but he would not respond or operate at an acid tanker incident.

In the post 9/11 era, most hazmat response teams have been tasked with accepting the new role of weapons of mass destruction (WMD) response in addition to their regular

hazmat response duties. When looking to identify who would fit the need for WMD response, the local hazmat team was the natural choice given their training in chemical protective clothing and their management of chemical releases. These additional WMD responsibilities were further reinforced by the anthrax events that followed September 11, 2001, when hazmat teams across the nation found themselves responding to potential biological agent emergencies.

Today, a local hazmat team is faced with a myriad of complex issues. The hazmat response field has grown tremendously over the last three decades, from responding to oil spills along the highways in the 1980s to being prepared for chemical, biological, and nuclear terrorist events in 2012.

### **Hazardous Materials Response in Rhode Island**

At the state level in Rhode Island, two agencies are involved in the hazardous materials arena: the Department of Environmental Management (DEM) and the Rhode Island Association of Fire Chiefs. The DEM is authorized by Rhode Island General Laws Section 42-17.1-2 to protect the environment from pollution and to maintain an acceptable environmental quality within Rhode Island. The emergency powers of DEM are broad and encompass a wide variety of environmental emergencies. DEM's environmental response authority supplements certain federal legislation, such as the Clean Air Act, 42 U.S.C. 7401 et seq. and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 42 U.S.C. 9601 et seq.

As noted earlier in this chapter, the Rhode Island Association of Fire Chiefs has established a mutual-aid response system for the State and hazmat team response is included in that mutual aid system. There are seven hazmat response teams located throughout the State, each capable of a Technician-level response. The teams for the most part are operated by municipal fire departments and are staffed by on-duty personnel with the ability to call out other response personnel as needed.

When examining hazmat emergency response programs across the United States, the Audit Team finds that the Rhode Island model appears organized and capable of managing hazmat response.

## **Hazardous Materials Response in the City of Pawtucket**

The hazardous materials response services provided by the PFD are limited to the first responder operations (FRO) level, although there are a few personnel trained to the hazardous materials technician (HMT) level. The Audit Team found the PFD hazmat response effort to be somewhat disorganized, as there is no one person in charge of hazmat response for the department.

Given the City of Pawtucket's size, population, and land use composition the Audit Team finds it unusual that the PFD does not have a more organized "team" approach to hazardous materials incidents. If needed, the PFD can request the mutual aid response of a regional hazmat team from either the Woonsocket Fire Department or the Providence Fire Department.

Currently, the PFD organizational chart shows a hazmat inspector position, which is a day work administrative position that works out of the Headquarters Station 2. The position is presently held by a firefighter who manages a large workload of activities related to the storage, use, and manufacture of hazardous materials in the City. Fortunately, the current hazmat inspector is quite capable of completing the work assigned to the position and is well trained and versed in the hazardous materials field.

While there certainly are a number of hazardous materials use and storage sites of significance within the City of Pawtucket, the demand for hazmat response service beyond the capabilities of the PFD has been low. According to data provided to the Audit Team by the PFD, in CY2011 there were two hazardous materials incidents other than a gas leak or fuel spill. In CY2010 and CY2009, there were 10 and 6 hazardous materials incidents, respectively.

The Audit Team finds that the level of demand for hazmat response services in the City of Pawtucket representative of other communities similar in size and composition located throughout the northeast. The Audit Team also finds that while there are several facilities/sites that use and store significant quantities of hazardous materials within the City, there is no current or immediate future need for an increase in the level of hazmat response services already being provided.

The Audit Team finds that the hazmat response services provided by the mutual aid response teams meet the demands of the community. However, the Audit Team did find that annual hazmat refresher training provided by the PFD to its personnel has been inconsistent over recent years. The Audit Team, therefore, recommends that the PFD ensure that all of its emergency response personnel complete their hazmat First Responder Operations and Technician level refresher training each year. This requirement should fall under the responsibility of the department's Director of Training.

The Pawtucket Fire Department owns and operates a Special Operations vehicle, which is housed at Station 5 (see Figure 8.7). The unit was purchased through a grant and was supposed to be outfitted to support various special operations activities. The Audit Team found the vehicle still unequipped of various special operations response items and was told that the vehicle "really is not used much."

The Audit Team assumes that the Special Operations unit is not used because it does not have staffing assigned to it. The Audit Team suggests that the unit should either be fully equipped and used on a cross-staffing basis or disposed of.

One approach would be to require the personnel assigned to Station 5 to be trained and certified to the HMT level in addition to having specialty rescue training in confined space and vehicle extrication. The Special Operations unit could then be fully outfitted with the tools and equipment needed to support those services and respond on all calls of such nature, in lieu of Engine 5. Granted, there would be times when Engine 5 might be committed to another incident and the unit would be delayed in responding, however, the Audit Team believes the unit would be available for a cross-staffed response the majority of the time.

Therefore, the Audit Team recommends that the PFD evaluate a cross-staffing program for the Special Operations unit to include trained and certified personnel as well as sufficient equipment to support hazardous materials and special rescue incidents. The Audit Team also recommends that one of the platoon Battalion Chiefs be assigned oversight of the Special Operations program as a collateral duty.

**Figure 8.7**  
**PFD'S SPECIAL OPERATIONS UNIT**



### **Vehicle Extrication Service**

Vehicle extrication is the most common type of rescue service provided by fire departments today. While the advancement in passenger vehicle safety features has certainly helped reduce the injury and death rates in motor vehicle collisions, there still remains the need for specialized emergency response equipment and specially trained response personnel capable of “cutting” patients out of mangled cars after a violent collision.

The manner in which vehicle extrication service is delivered generally varies by the locale and the demand for service. Three common service delivery models are the use of

(1) a heavy rescue squad model (a specialized vehicle that carries large quantities of various rescue equipment); (2) a rescue engine model (an engine company equipped with some rescue equipment in addition to firefighting equipment); and (3) a ladder truck model (aerial device that carries extrication equipment). Each model has its own strengths and weaknesses, but the most important component is that trained rescue personnel (technicians) arrive with the tools needed to complete the extrication so that the traumatically injured patient can be taken to a definitive medical care facility for treatment in a timely manner.

Extrication services in the City of Pawtucket use the rescue engine model. The PFD's Engine 2, which operates out of Station 2, is equipped with a variety of vehicle extrication tools and equipment—enough so that the unit and the personnel responding to a motor vehicle collision should be able to complete most vehicle extrication operations without the need for an additional heavy rescue squad or other extrication-capable unit.

In addition to Engine 2, the Audit Team learned that Engine 5 (Station 5) is also equipped with some vehicle extrication equipment—just not as much or as complex as Engine 2. If additional extrication services are needed, they are available on a mutual aid basis from nearby communities.

According to incident response data provided to the Audit Team, the PFD responded to 656 motor vehicle collisions in 2011 of which 15 (or 2.3 percent) required vehicle extrication services. Of those 656 collisions, 18.3 percent occurred on Interstate 95. In examining the previous two year's response data, the demand for extrication service remained steady.

The Audit Team finds the number of motor vehicle collisions and the need for extrication services normal for an urban environment the size of the City of Pawtucket. While the City has Interstate 95 passing through it, the remainder of the City has limited areas where the opportunity for severe collisions exists, thus there is not a large demand for vehicle extrication operations.

The Audit Team was not informed of any significant operational issues involving the delivery of vehicle extrication services, other than the training of personnel. There are two NFPA standards that address rescue training and incident scene operations: NFPA 1006 Standard for Rescue Technician Professional Qualifications, 2008 Edition, and

NFPA 1670 Standard on Operations and Training for Technical Search and Rescue Incidents, 2009 Edition.

Unlike the emergency medical services that have stringent training and certification requirements concerning patient care, fire and rescue services in many locales throughout the United States have few, if any, regulatory agencies that impose such requirements. The same is true in Rhode Island. A fire department can operate a heavy rescue squad or vehicle extrication unit with basically no training. While that is probably not in the best interest of that department in terms of liability, it definitely can be done.

The Audit Team recommends that all PFD personnel assigned to perform vehicle extrication rescue operations be trained and certified to the applicable NFPA and/or the Rhode Island state training standards—at a minimum to the Basic Vehicle Rescue Technician Level.

Regarding Engine 2, the Audit Team found the pumper well equipped to manage vehicle extrication operations. However, the Audit Team also felt that Engine 2 is probably overloaded in terms of weight and equipment. The Audit Team recommends that the PFD examine reducing the amount of vehicle extrication equipment carried on Engine 2 and moving that equipment to the Special Operations as recommended earlier in this chapter. The Special Operations unit would then be dispatched on all confirmed patient entrapments in addition to Engine 2. This configuration would also provide additional, extrication-trained personnel on the scene.

### **Technical Rescue Services**

Technical rescue services normally include confined space rescue, trench collapse rescue, structural collapse rescue, high-angle rescue, and water rescue.

#### **Confined Space Rescue**

In January 1993, OSHA issued a regulation entitled “Permit-Required Confined Spaces” (29 CFR 1910.146). Historically, confined space work has proven deadly for many workers and “would be” rescuers. Confined spaces are notorious for their poor atmospheric conditions and their internal configurations and entanglement hazards. The

OSHA regulation was enacted in an attempt to reduce the number of injuries and deaths that occur in confined spaces by requiring only trained entrants and rescuers be allowed to work in confined space environments.

While the OSHA confined space regulation is focused mostly on industry and those who work in and around confined spaces, there are important implications for fire department and emergency service personnel. Facilities that have permit-required confined spaces must identify the rescue team before workers are allowed to enter a confined space. Large industrial facilities or utility companies often have their own confined-space entry and rescue teams. However, smaller companies will often use the local fire department as the default rescue team—often unbeknownst to the fire department.

The Audit Team knows of no federal or state statutes that require a fire department to equip, train, and engage in confined space rescue service delivery. However, should a fire department elect to provide such service, then it is only prudent for them to comply with the nationally accepted training and regulatory practices.

Several industries in the City of Pawtucket present the potential for confined space emergencies. Some of the industrial facilities most likely have confined spaces that would require the use of specially trained rescuers if an emergency occurred. According to interviews by the Audit Team, there have been some PFD personnel over time engaged and pursuing confined space rescue service delivery capability. However, the Audit Team found no active organizational pursuit of confined space rescue service delivery.

The Audit Team did learn of some specialized technical rescue equipment on the Special Operations unit at Station 5, but there was no clear information provided concerning the use of the equipment or the training of the personnel.

On the incident data provided by the PFD for CY2009 through 2011, there were only 8 total responses for “Industrial Accidents” during that time period and none were identified as confined space rescue events.

In terms of confined space rescue response in the City of Pawtucket, the Audit Team recommends three actions. First, all of the known permit-required confined spaces in the City’s industrial facilities should be identified and pre-planned. This request could be made through the LEPC or through direct contact with the facility managers or safety

directors or through a facility fire/code enforcement inspection. It could also be accomplished through fire department-based pre-incident planning efforts.

Once the permit-required confined spaces are identified, the PFD should develop emergency response pre-plans for each confined space. These pre-plans do not need to be extremely detail oriented, but they should provide the basic information about the permit-required confined space so that rescuers can make informed decisions during the rescue phase of an incident.

The third recommendation is to formally evaluate the PFD's role in confined space rescue in terms of trained and certified responders, equipment carried on the Special Operations unit, and the ability to use mutual aid rescue services to handle confined space rescue events. At a minimum, the PFD should focus on "first responder" type of confined space rescue service rather than at the operations level—similar to how hazmat responses are handled in the City.

### **Trench Collapse Rescue**

Some fire departments across the United States provide trench collapse rescue service as part of their comprehensive rescue service plan. Many of these departments have experienced tremendous growth in their communities and have seen the need for the service. In other areas of the country, trench collapse rescue is provided by a regional response team, possibly one that is search and rescue based. Regardless of the delivery model, the cost of trench collapse rescue service is very expensive and often cost prohibitive to many departments.

There was no discussion with the Audit Team by PFD personnel concerning a desire to deliver trench collapse rescue service. In the response data provided to the Audit Team, there were no trench rescue incidents listed. The Audit Team finds the frequency of trench rescue incidents over the last five years normal for an older, urban environment such as the City of Pawtucket.

The Audit Team recommends the use of mutual aid rescue services for all trench rescue service needs in the City of Pawtucket.

### **Structural Collapse Rescue**

As with trench rescue, some fire departments across the United States provide structural collapse rescue service as well. The structural collapse rescue service is most often linked to the Urban Search and Rescue (USAR) network created by the Federal Emergency Management Agency. In addition to the USAR network, there are also numerous regional teams and agencies that provide such service on a smaller scale.

There was no discussion with the Audit Team by PFD personnel concerning a desire to deliver structural collapse rescue service and incident response data indicated no structure collapse rescue events over the last five years.

Currently, structural collapse rescue service is provided through FEMA's Rhode Island Task Force 1 USAR. The Audit Team recommends that the PFD maintains the status quo in terms of the delivery of structural collapse rescue services. The Audit Team is confident that adequate resources exist on a mutual aid, regional, and statewide basis to provide the needed structural collapse rescue response to the City of Pawtucket.

The Audit Team does recommend that all PFD personnel complete some type of structural collapse awareness training. However, when competing with other training requirements identified in this study, this recommendation should take a lower priority.

### **High-Angle Rescue**

High-angle rescue is also often known as rope rescue or rescue from heights. The need for high-angle rescue service is often a function of geography and structural design. Those communities with great variations in elevation or an abundance of high-rise structures are most often the communities that deliver this service. In recent years, high-angle rescue has been absorbed into many USAR teams as regional task forces continue to expand their service capabilities.

The demand for high-angle rescue in the urban environment is generally low and the City of Pawtucket's demand for this type of service falls in line with that presumption. While there are a number of multi-story structures in the City, the demand for high-angle rescue services normally diminishes once those structures are built and occupied. In terms of

industry, there are a few industrial sites in the City that present a high-angle rescue potential, however, the demand for that service has also been negligible.

There was no discussion with the Audit Team by any PFD personnel concerning a desire to deliver specialized high-angle rescue service and incident response data for the last five years show no calls for high-angle rescue services in the City.

As with the hazmat and confined space rescue response recommendations listed above, the Audit Team recommends that the PFD continue its basic level rope rescue training. Should a high-angle rescue incident occur, the Audit Team recommends the use of mutual aid service from specialized rescue services, such as the state's USAR team.

### **Water Rescue**

Water rescue service is normally divided into swift water rescue service and dive rescue service. Some departments provide both services; others provide only one. In many communities, dive rescue is a function of the law enforcement agency since they often must dive for evidence recovery. Dive rescue or SCUBA teams rarely make a rescue and frequently are involved in a body recovery operation. Swift water rescue, on the other hand, is most often a function of the fire department and is likely to involve dramatic rescues under extremely hazardous conditions.

Delivering swift water rescue service is a very dangerous operation requiring great attention to training, equipment, and safe operations. The history of swift water rescue in the fire service has been marked with numerous line-of-duty deaths due to the failure of rescuers to follow good rescue practices. A department's decision to deliver swift water rescue service must be carefully evaluated, well planned and fully supported.

With Blackstone and Ten Mile Rivers within the City of Pawtucket, the demand for water rescue services must be considered. While the Ten Mile River is relatively small, the Blackstone River presents a significant water rescue issue. The Blackstone is used recreationally even though there is limited access in many areas.

A review of the response data provided to the Audit Team revealed that PFD responded to 11 water-related rescue incidents from 2009 to 2011. None of those incidents were reported to the Audit Team as being of any significance.

The Pawtucket Fire Department operates two boats—both with water rescue capability. Marine 1 is a Boston Whaler style vessel that is housed at Station 3 and operated by the personnel assigned there. Marine 2 is an inflatable vessel that is housed at Station 2 and staffed by the personnel assigned to that station. (See Figure 8.8.) Additional water rescue vessels are available on a mutual aid basis as needed.

The Audit Team found the two marine units adequately equipped for basic water rescue operations. The Audit Team’s only concern involved the training and certification of the personnel assigned to operate the boats. The Audit Team received no indication that personnel were trained or certified in swift water rescue operations or any type of water rescue operations. The Team learned that some personnel had completed boat operator training, but it was also clear that there has been no consistency in water rescue or boat operator training.

The Audit Team recommends no change in the delivery of water rescue services in the City. The Audit Team does recommend that all PFD personnel expected to perform water rescue operations complete the Rhode Island Fire Academy’s Swift Water Rescue Course.

**Figure 8.8**  
**PFD’S MARINE UNITS**  
**[Marine 1 (left) and Marine 2 (right)]**



## **Summary of Special Operations**

In addition to the traditional fire and EMS services delivery, fire departments also provide a wide variety of other specialized services that are seldom needed, but really make a difference when used. The decision by a fire department to be in the special operations services business must be a decision that is well thought out and based upon a real need, not a perceived need presented by a few personnel who want to start a new program to satisfy their interests. When faced with limited resources and expanding calls for service from the community, a fire department should carefully select the services it provides. Often times a joint effort approach by several neighboring departments is a more efficient use of resources to accomplish the same task.

The Pawtucket Fire Department needs to closely examine all of its special operations services to see what the demands for service are and how to best prepare to respond to those demands. Establishing program goals and mutual aid partnerships will be important for each type of special operation service provided. In most cases, perhaps the best way to meet the established goals will be to utilize outside mutual aid or regional resources instead of trying to be the sole provider of the service.

## **POLICIES AND PROCEDURES**

Regarding the importance of a comprehensive set of policies and procedures, the NFPA Fire Protection Handbook states the following:

“Every Fire Department should have a set of rules and regulations that outline performance expectations for its members, the standard operating procedures for the department and disciplinary action that can be taken against personnel who do not follow the regulations. These rules and regulations can be, and often are, supplemented by orders from the fire chief who may add to or clarify the rules or change them for a special event or specific purpose. Both the rules and regulations and subsequent orders from the chief should be written and distributed in such a manner as to ensure all persons are made aware of them.”

The Audit Team reviewed the PFD's policies and procedures, which consist of the Fire Alarm Operations Manual, the Rules & Regulations, and the Division of Training Standard Operating Procedures (SOPs).

Generally, the existing policies and procedures are (1) out of date, (2) somewhat unclear, and in need of a complete and thorough review to ensure accuracy and applicability. The following is a sampling of a few observations regarding the Audit Team's review of the existing documents:

- The Division of Training SOPs contain operational topic areas such as high-rise response procedures, as though the Division of Training is in charge of emergency scene operations;
- There are what looks to be operational policies regarding incident command located in the Fire Alarm Operations Manual;
- All of the documents provided to the Audit Team were in electronic format and none were signed by the Fire Chief; and
- There were no emergency medical services guidelines or procedures to be found.

All elements of the PFD, individually and collectively, should concentrate on developing and implementing comprehensive policies covering the full range of administrative and operational subjects. The current system of documents is confusing, and the Audit Team recommends the consolidation of the three groups of guidelines into a policy and procedure manual that addresses all aspects of the department's administrative and operational functions.

The Fire Chief should consider establishing a policies and procedures committee to provide consistency and coordination of the policy and procedure development process. In addition, once established, the Fire Chief must ensure that all policies and procedures are followed and enforced.

## **PRE-FIRE PLANNING**

Traditionally, one major job responsibility for station personnel is to conduct pre-fire planning programs for "target hazards" within their first-due response area. Chief

William Clark, in his textbook entitled *Firefighting Principles and Practice*, discusses pre-fire planning in the following manner:

"When a fire department is acquainted with the potential of a fire before it occurs, that department has an advantage over the fire, provided that it makes preparation in keeping with the need shown by the advanced study. It is of little use to identify and isolate firefighting problems if nothing is done to offset them. The elements of a pre-fire plan should not only pinpoint needs but also provide for meeting them. Target hazards and their peculiar features should be identified. The requirements for combating a fire in any of them should be studied and plans should be prepared."

Although the PFD fire station assigned firefighters and officers may periodically complete a pre-fire plan or conduct a site "walk through" for new buildings in the response area, the Audit Team finds that there is no comprehensive pre-fire planning program. The lack of up-to-date pre-fire plans was of limited concern to station personnel interviewed by the Audit Team.

While the lack of adequate pre-fire plans is not uncommon in a fire department, the Audit Team believes that this should not be the case in an all-career fire department—especially one that protects a city that possesses so many varied hazards. Pre-fire planning should be assigned a high priority in the workload of the officers and station personnel. The information included in those plans will assist in the decision-making process when an emergency incident occurs.

To remedy this situation, the Audit Team urges the on-duty firefighting personnel to visit the target hazards in the city, tour each facility, prepare drawings and lists of hazards, and then, upon return to the station, develop the tactics and strategy for handling incidents at the particular facility. The drawings and information should then be shared with all personnel through training programs. This approach to pre-fire planning is progressive and improves the safety factor for firefighters and officers who may be required to fight fires in structures that have been previously pre-fire planned in this manner.

The pre-planning documents should be kept readily available for officers to refer to while en route to the incident and for incident commanders to refer to during the course of

appropriate incidents. In addition, officers should conduct regular station refresher drills utilizing this material.

The essential elements of a pre-fire plan suggested for the PFD should include the following:

1. Special Hazards:
  - Structural faults;
  - Cracked walls;
  - Overloading;
  - Hazardous materials; and,
  - Man-traps (locations, amounts, 704M class, etc.).
  
2. Entry and Access:
  - Types of doors and windows;
  - Recommended entry;
  - Force entry procedures if necessary;
  - Stair location; and,
  - Access to roof, basement, storage and utilities.
  
3. Special Apparatus Assignment:
  - Recommended revisions to the standard apparatus assignment based on one or more unique aspects of the structure and/or contents.
  
4. Life Safety:
  - Need for evacuation;
  - Number of people;
  - How to evacuate;
  - Where people are concentrated or potentially trapped;
  - Exit travel; and,
  - Operational restrictions.
  
5. Exposure:
  - Buildings and/or material in vicinity;
  - Distance from;
  - Type of occupancy;

- Type of construction;
  - Means of fire spread; and,
  - Combustibility.
6. Confinement:
- Possible fire and smoke travel (within or without);
  - Firefighting openings;
  - Fire walls;
  - Compartmentation;
  - Automatic dampers; and,
  - Fire doors.
7. Protection Systems:
- Sprinklers;
  - Automatic extinguishing systems;
  - Standpipe;
  - Internal alarm;
  - Emergency lighting; and,
  - Location of valves, controls, etc.
8. Ventilation:
- Building features;
  - Building equipment;
  - Location of controls;
  - Roof;
  - Wall; and,
  - Basement openings.
9. Occupancy and Fuel Load:
- Location;
  - Type or class; and,
  - Amount and concentration of combustibles.
10. Water Supply:
- Location of fire department connections and valves;
  - Hydrant locations;

- Main sizes; and,
  - Location and quantity of auxiliary sources.
11. Salvage:
- High value areas;
  - Stock susceptible to spike/water damage;
  - Water removal methods; and,
  - Location of drains and sumps.
12. Utilities:
- Location of air conditioning and heating controls and switches;
  - Location of Knox box;
  - Location of elevator keys;
  - Location of trash room/s; and,
  - Location of controls and valves for electricity, gas (inside and outside), and water (inside and outside).
13. Construction:
- Building specifications;
  - Type of construction;
  - Class type; and,
  - Construction of roof, interior walls and floors, false ceilings and shafts.
14. Personnel Needs:
- Personnel needs required to deliver the estimated water flow and their recommended locations around the facility; and,
  - Additional personnel requirements, such as additional alarms and mutual aid response.
15. Additional Agencies:
- Any additional agencies from within the City or the Commonwealth for handling an incident at this facility.

## **INSURANCE SERVICES OFFICE REVIEW**

This section examines the Insurance Service Office’s “Fire Suppression Rating Schedule” (Schedule) as it relates to the operations of the PFD. Information presented in the section includes an overview of the Schedule, an assessment of the PFD’s deficiencies, and recommendations for improvement.

### **Insurance Services Office**

The Insurance Services Office (ISO) is a private organization that provides a variety of services to the insurance industry in the United States. One of ISO’s services involves the assessment and rating of fire department performance—a service that is well-known among fire chiefs and municipal officials. Representatives from ISO use their agency’s Fire Suppression Rating Schedule to evaluate the performance of a fire department in an effort to help establish a basic guideline for insurance firms underwriting fire insurance policies in the community that the fire department protects.

### **ISO Fire Suppression Rating Schedule**

The ISO Fire Protection Rating Schedule (Schedule) “rates” a community’s fire department based upon three major fire protection factors: (1) how well the fire department receives alarms and dispatches its firefighting resources; (2) the number of engine and ladder companies and trained personnel the community needs to fight a fire; and (3) the community’s available water supply and distribution system.

Once an assessment is done, the measurement results are converted into a Public Protection Classification (PPC) number on a relative scale from 1 to 10, with Class 10 representing less than the minimum recognized level of protection and Class 1 representing the highest level. Few fire departments achieve a Class 1 rating and a Class 10 rating is treated as if no fire department exists.

It is important to note that the Schedule is a fire insurance rating tool, and it is not intended to analyze all aspects of a comprehensive public fire protection program. ISO advises that the Schedule should not be used for anything else other than insurance rating. In addition, an ISO rating is not something that is done on a frequent basis. Once a fire

department is evaluated and assigned a classification, that rating will remain in place until the next evaluation, which could be as long as 10 to 15 years away. However, a fire department can request a review of its rating classification if it believes that significant improvements have been made since ISO's last evaluation; otherwise the rating remains in place. According to the Fire Chief, prior to 2010, the Pawtucket Fire Department had a PPC of 2.

During ISO's 2010 survey of the PFD, points were lost in several areas and the PFD received a PPC of 3. As of 2010 in Rhode Island, there were:

0	Class 1 Fire Departments
3	Class 2 Fire Departments
7	Class 3 Fire Departments
25	Class 4 Fire Departments
15	Class 5 Fire Departments
2	Class 6 Fire Departments
2	Class 7 Fire Departments
1	Class 8 Fire Department
1	Class 8B Fire Department
12	Class 9 Fire Departments
1	Class 10 Fire Department

### **The Assessment**

The Schedule is divided into numerous areas of assessment. While only ISO representatives can conduct an assessment and provide a rating, the Audit Team reviewed the results of the 2010 survey and classification rating in order to identify possible areas of improvement.

### **Receiving and Handling Fire Alarms**

This section of the ISO Schedule reviews the fire department's ability to receive notice of a fire emergency and alert its personnel so that a timely response can be made. Items surveyed include the telephone facilities provided for the general public to report fires,

the operators on duty at the communications center, and the facilities used to dispatch fire department companies to the fire.

In the 2010 ISO survey, the PFD received 6.70 points out of a possible 10.00 points for this item, which is an acceptable rating given the size of the department. Had the PFD been rated simply on this section alone, they would have received a Class 4 PPC rating. The area of greatest demerit was the number of operators on duty. The PFD received only 50 percent of the possible points for that scoring category.

With the recommendations presented in Chapter 10: Communications and Dispatch of this report, the Audit Team believes that the PFD's credit for receiving and handling fire alarms will improve.

### **Fire Department Operations**

This section of the ISO Schedule evaluates fire department operations in terms of engine and ladder companies, the equipment carried on those vehicles, and their response to fires. In addition, this section also assesses firefighter training and response to incidents. During the last ISO evaluation, the PFD received 34.72 points out of a possible for 50 points for Fire Department operations. Had the department received its rating based on this category alone, they would have received a Class 4 PPC rating.

The Audit Team found the greatest areas of demerit in 2010 to be in training and pre-fire planning. In terms of training, the PFD received only 50 percent of the possible points for driver training activities, 42 percent of the possible points for officer training activities, and 35 percent of the possible points for company-level training activities. The PFD received zero points for their training facility, because of its lack of drill tower as well as a lack of a burn building/smoke house.

As noted in the Training Chapter of this report, the department's training records and company drill training program both need improvements in order to better support the department's daily operation—plus score additional points in an ISO assessment.

The PFD also received zero points for its pre-fire planning efforts; another area in need of much improvement as noted earlier in this chapter. Pre-fire planning is as important to every day activities as it is to a fire department's ISO rating.

### **Water Supply**

The final section of the ISO Schedule reviews the water supply system that is available for fire suppression in the community. In 2010, the PFD received 38.85 points out of a possible 40, which is a very good score. The Audit Team received little information about the City's water supply system, but also did not learn of any water supply problems during its extensive interview process with PFD personnel. Had the PFD been rated simply on this category alone, they would have received a Class 1 PPC rating.

### **Summary of ISO**

An ISO assessment can be a stressful time for a fire department; however, it is important to remember that the sole purpose of the assessment is for insurance underwriters, not for fire department critics. A Class 5 fire department could be a successful fire department that is involved in public fire safety education, and delivers EMS and paramedic services, and is very effective in keeping fire loss to a minimum. On the other hand, a Class 2 fire department could have huge fire and civilian life losses, not deliver EMS, and be ineffective in firefighting operations; yet because they have an adequate number of fire engines and ladder trucks and staffing and a good fire hydrant system, they receive a better rating.

The Audit Team urges the City of Pawtucket and the PFD to use the results of ISO's 2010 assessment in conjunction with the findings of the Audit Team's report as a basis for which to begin making operational improvements in the department.

### **SUMMARY**

Decisions made at the emergency scene may be irreversible and the consequences of error can be disastrous. Errors can lead to further property loss, as well as injury or death to civilians and firefighters. Successful fire operations require thorough pre-incident

planning; knowledge of the nature and location of buildings; interior contents; and built-in systems.

In addition to the traditional fire and EMS services delivery, fire departments also provide a wide variety of other specialized services that are seldom needed, but make a difference when utilized. The decision by a fire department to be in the special operations service business must be one that is well thought out and made based upon a real need, not a perceived need presented by a few personnel who just want to start a new program to satisfy their interests. When faced with limited resources and expanding calls for service from the community, a fire department should carefully select the services it provides. Often times a joint effort approach by several neighboring regional departments is a more efficient use of resources while still accomplishing the task.

In the case of the PFD, the department needs to look closely at all of its special operations services to see what the demands for service are and how to best prepare the department to respond to those demands. Establishing program goals will be important for each type of special operation service provided. In some cases, perhaps the best way to meet the established goals will be to utilize outside mutual aid or regional resources instead of trying to be the sole-source provider of the service.

Every fire department should have a set of rules and regulations that outline performance expectations for its members, the standard operating procedures for the department, and disciplinary actions that can be taken against personnel not following the regulations. The Audit Team found a serious need for an up-to-date, comprehensive policies and procedure manual within the PFD.

Pre-fire planning and building fire inspections performed by firefighters and officers can improve firefighting service. The increased knowledge by firefighting personnel of the buildings and other occupancies in their service area can be very beneficial. Additionally, these activities can result in more productive uses of staff time and improve public relations.

## **RECOMMENDATIONS**

- 8-1 The PFD should collect and analyze fire injury and death data, and develop and implement fire and life safety programs that target the population groups most likely to suffer from the occurrence fire in their home.
- 8-2 The City of Pawtucket should work to restrict the access to abandoned and vacant properties within the City, specifically the vacant mills and factories.
- 8-3 The PFD should ensure that pre-fire plans and pre-fire planning activities are completed for each of the vacant mill and factory properties.
- 8-4 The PFD should improve its ability to capture fire loss and fire injury and death data so that information can be used in the department's future planning and funding.
- 8-5 The PFD should ensure that all of its emergency response personnel complete their hazmat First Responder Operations and Technician level refresher training each year; this requirement should fall under the responsibility of the department's Director of Training.
- 8-6 The PFD should evaluate a cross-staffing program for the Special Operations unit to include trained and certified personnel as well as sufficient equipment to support hazardous materials and special rescue incidents.
- 8-7 The Fire Chief should assign one of the platoon Battalion Chiefs to oversee Special Operations program as a collateral duty.
- 8-8 The PFD should require all personnel assigned to perform vehicle extrication rescue operations be trained and certified to the applicable NFPA and/or the Rhode Island state training standards—at a minimum to the Basic Vehicle Rescue Technician Level.
- 8-9 The PFD should examine reducing the amount of vehicle extrication equipment carried on Engine 2 and moving that equipment to the Special Operations as recommended earlier in this chapter. The Special Operations unit would then be

- dispatched on a cross-staffed basis in addition to Engine 2 (or other appropriate fire station) on all vehicle collisions with confirmed patient entrapments.
- 8-10 The PFD should identify and pre-plan all of the known permit-required confined spaces in the City's industrial facilities.
  - 8-11 The PFD should evaluate the department's role in confined space rescue in terms of trained and certified responders, equipment carried on the Special Operations unit, and the ability to use mutual aid rescue services to handle confined space rescue events. At a minimum, the PFD should focus on "first responder" type of confined space rescue service rather than at the operations level—similar to how hazmat responses are handled in the City.
  - 8-12 The PFD should use automatic mutual aid rescue services for all trench rescue service needs in the City of Pawtucket.
  - 8-13 The PFD should use automatic mutual aid services for all structural collapse rescue service needs in the City of Pawtucket.
  - 8-14 All PFD personnel should complete some type of structural collapse awareness training.
  - 8-15 All PFD personnel should complete basic level rope rescue training.
  - 8-16 The PFD should not change its deployment of water rescue services in the City.
  - 8-17 The PFD should require all personnel expected to perform water rescue operations complete the Rhode Island Fire Academy's Swift Water Rescue Course.
  - 8-18 The PFD should consolidate all of its rules, regulations, and procedures into a policy and procedure manual that addresses all aspects of the department's administrative and operational functions.
  - 8-19 The Fire Chief should consider establishing a policies and procedures committee to provide consistency and coordination of the policy and procedure development process.

- 8-20 The PFD should implement a comprehensive pre-fire planning program that address all of the moderate to severe target hazards in the City.
  
- 8-21 The City of Pawtucket and the PFD should use the results of ISO's 2010 assessment in conjunction with the findings of the Audit Team's report as a basis for which to begin making operational improvements in the department.

## **CHAPTER NINE SAFETY AND HEALTH**

This chapter includes sections on national safety and wellness standards for emergency responders and describes how the Pawtucket Fire Department (PFD) measures up to those standards.

### **OVERVIEW**

Over the last 15 years, there has been an increasing focus on the safety of emergency responders, especially those who are engaged in the delivery of fire and rescue services. Several factors have contributed to this increased safety focus, including:

- An increase in the personal concerns of firefighters and medical responders for their own health and well being;
- An increase in the costs associated with occupational illnesses and injuries;
- A better understanding of the impact that poor physical fitness has on a firefighter's ability to perform his or her job; and,
- An increase in the regulation of occupational health.

Much of the emphasis on firefighter health and safety seems to have come from career fire departments or fire departments with paid staffing; primarily from those states where Occupational Safety and Health Administration (OSHA) standards apply to municipal workers.

Research has repeatedly shown that the physical and mental demands associated with firefighting and emergency medical care operations, coupled with the environmental dangers of extreme heat, humidity, and cold, create conditions that can have an adverse impact on the safety and health of the individual firefighter or medical responder.

Throughout the course of their work, emergency responders come in contact with many health hazards (e.g., blood borne pathogens and hazardous materials). In addition, firefighting has been recognized for many years as one of the most hazardous occupations in the nation due to its number of occupational-related deaths and injuries.

Several years ago, a United States Fire Administration (USFA) report said, “Firefighting is extremely strenuous physical work and is likely one of the most physically demanding activities that the human body performs.” It is important for all communities that provide fire protection services to remember that the best way to help their citizens in time of crisis is to have an emergency response force physically ready and capable of assisting those in need. This, of course, must be accomplished without the emergency responders themselves falling victim.

Over the last ten years, there have been more than 300,000 fire scene related injuries and more than 1,000 firefighters have lost their lives in the line of duty in the United States. According to the USFA’s report, 87 firefighters died in the line of duty in 2010.

### **NATIONAL FALLEN FIREFIGHTER SAFETY INITIATIVES**

In 2005, the National Fallen Firefighters Foundation (NFFF), in conjunction with other United States fire service organizations, released a program known as the “16 Firefighter Life Safety Initiatives.” The goal of the program is to develop a “blueprint for change” for the fire service. This national program is often referred to as the “Everyone Goes Home Program” and it aims to reduce the number of firefighter line-of-duty fatalities. With the number of firefighter line-of-duty deaths still a major concern, fire service leaders and organizations are convinced that dedicated, aggressive measures are needed if departments are to be serious about increasing firefighter safety.

The NFFF’s “16 Firefighter Life Safety Initiatives” are as follows:

1. Define and advocate the need for a cultural change within the fire service relating to safety, incorporating leadership, management, supervision, accountability and personal responsibility.
2. Enhance the personal and organizational accountability for health and safety throughout the fire service.
3. Focus greater attention on the integration of risk management with incident management at all levels, including strategic, tactical, and planning responsibilities.
4. All firefighters must be empowered to stop unsafe practices.

5. Develop and implement national standards for training, qualifications, and certification (including regular recertification) that are equally applicable to all firefighters, based on the duties they are expected to perform.
6. Develop and implement national medical and physical fitness standards that are equally applicable to all firefighters, based on the duties they are expected to perform.
7. Create a national research agenda and data collection system that relates to the initiatives.
8. Utilize available technology wherever it can produce higher levels of health and safety.
9. Thoroughly investigate all firefighter fatalities, injuries, and near misses.
10. Grant programs should support the implementation of safe practices and/or mandate safe practices as an eligibility requirement.
11. National standards for emergency response policies and procedures should be developed and championed.
12. National protocols for response to violent incidents should be developed and championed.
13. Firefighters and their families must have access to counseling and psychological support.
14. Public education must receive more resources and be championed as a critical fire and life safety program.
15. Advocacy must be strengthened for the enforcement of codes and the installation of home fire sprinklers.
16. Safety must be a primary consideration in the design of apparatus and equipment.

The initiatives are seen by national fire service organizations such as the International Association of Fire Chiefs (IAFC) and the International Association of Fire Fighters (IAFF) as key elements in a plan to reduce firefighter injuries and deaths. All fire departments, and the municipalities that support those fire departments, are urged to discuss the NFFF initiatives and develop a plan by which they can address how their organization can help improve the safety of all personnel.

According to the National Fire Protection Association's (NFPA) report, *Firefighter Fatalities in the United States—2010*, "More than half of the deaths resulted from overexertion, stress and related medical issues. Of the 39 deaths in this category, 34 were classified as sudden cardiac deaths (usually heart attacks) and five were due to strokes or brain aneurysm."

With the leading cause of firefighter deaths consistently being related to health and fitness, it is clear to see why organizations such as the IAFF and the IAFC have taken a strong stance on the importance of health and wellness programs for all firefighters. Today, fire service leaders are seeing the importance of a healthy and fit workforce and are striving to implement health and wellness programs in their departments.

## **NATIONAL STANDARDS AND REGULATIONS**

### **OSHA Regulations**

Traditionally, safety and health regulations, whether federal, state, or local, are most often enacted due to an event or series of events that have caused death or harm to employees. For example, perhaps several workers unfortunately die while working in an underground storage tank (confined space). An investigation reveals that the workers had little training, poor safety equipment, and no plan for rescue. From that event and a series of other similar events nationwide, a federal regulation might be enacted that addresses working in and around confined spaces. In fact, 29 CFR 1910.146 *Permit-Required Confined Spaces* is an OSHA regulation (standard) that was enacted using that type of scenario.

There are numerous OSHA standards that affect private industry across the nation. Industry often protests that these standards cost millions of dollars in training and equipment just to be in compliance; however, the safety professionals realize that compliance with the standards improves worker health and safety, and that a healthy and safe workforce is a more productive workforce.

One problem with OSHA standards is that they do not apply to state or local government employees unless a particular state has enacted its own plan that incorporates the federal standards. Currently, there are more than 20 states and territories, *including Rhode Island*,

that are considered “non-OSHA” states. This means that Rhode Island state and municipal workers are exempt from OSHA standards, unlike their private sector counterparts.

As one can see, public sector employees in non-OSHA states can be faced with unsafe working conditions or processes over which they have little control. Fortunately, a worker-conscious public sector agency may develop and implement its own safety policies and procedures that address OSHA-type issues without requiring the force of law.

In relation to fire department operations, there are several OSHA regulations that have implications: 29 CFR 1910.95 *Occupational Noise Exposure*, 29 CFR 1910.120 *Hazardous Waste Operations and Emergency Response*, 29 CFR 1910.134 *Respiratory Protection*, 29 CFR 1910.146 *Permit-Required Confined Spaces*, and 29 CFR 1910.1200 *Hazard Communication*.

In terms of fire department safety and health, many of the OSHA regulations have been adopted into the National Fire Protection Association (NFPA) standards—especially NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program, 2007 Edition*. For those municipal fire departments in the non-OSHA states, NFPA 1500 has proven to be a very effective tool when it comes to worker health and safety.

### **National Standards**

A “standard” is often thought of as an “accepted practice” that has been developed and recognized by a board of peers in a certain type of industry (industry standards). For example, the Society of Automotive Engineers (SAE) has a standard that addresses Automotive Lubricating Greases (J310). While certainly not a regulation, the SAE standard is recognized as an industry standard or “best practice” and should be followed by all parties interested in compliance with industry standards. From a customer service perspective, a reputable automotive service facility would only use SAE-approved lubricants when servicing the customer’s vehicle because that is what the customer would expect.

For the fire service, the industry standards are the NFPA Standards: they are known as consensus standards and are recognized by fire service professionals worldwide as the “best practices” for fire service related issues. Although none of the NFPA standards are regulatory in nature, they carry much of the same weight as a regulation when civil litigation is involved. Because the NFPA standards are recognized by fire service peers as industry practices, non-compliance with NFPA standards is often considered a “bad” business practice that can expose a fire department to liability issues. When fiscally possible, it is important for all fire departments to either comply with the NFPA standards or be in the compliance planning and development process.

### **PAWTUCKET FD — COMPLIANCE WITH STANDARDS AND REGULATIONS**

The last line-of-duty death in the Pawtucket Fire Department (PFD) occurred in 1993 at a structure fire on Cottage Street. A line-of-duty death for any public safety agency is often a sentinel event that impacts operational procedures and department policy. Given the urban fire potential throughout the City and the history of large-scale structure fires, the Audit Team finds it important for the PFD to focus on the safety and health of its emergency response force.

Just prior to the start of the Audit Team’s work, an extremely “close-call” occurred on January 6, 2012, at 111 Randall Street; the Audit Team would be remiss if it did not make mention of that event. Two firefighters came within seconds of losing their lives while working on the roof of a structure fire. The crew had gone to the roof to perform ventilation operations at the three-story, multiple-family occupancy when conditions suddenly changed and the roof began to collapse. Fortunately, both of the department’s ladder trucks were on the scene and a quick thinking apparatus operator was able to get the aerial ladder device into position allowing the trapped men to escape the roof.

The Audit Team believes that the January 2012 Randall Street structure fire “close call” should serve as the impetus for a complete, internal review of all operational procedures pertaining to the safety and well-being of all PFD emergency responders.

The Audit Team’s review of PFD policies and procedures reveals a very limited number of safety-related policies. While the Audit Team believes that the PFD leadership is

concerned for the safety and welfare of its responders, the lack of clear and substantive policies make it difficult to ensure consistency in application.

## **NFPA 1500**

Perhaps the most well-known fire service safety standard is NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program, 2007 Edition*. First issued in 1987, NFPA 1500 was the first national fire service standard to ever address a comprehensive approach to fire department safety and health programs. The 2007 edition is the most current edition of the standard, which has been revised five times since 1987 and is due to be revised again in 2013.

Even though NFPA 1500 is a voluntary consensus standard, it is the accepted industry practice for the fire service and has in many instances been used as an enforcing document when applying safety practices to traditional fire department operations. Senior fire officials all over the United States have used NFPA 1500 to improve the safe operation of their fire departments and to justify to state and local authorities the improvements needed in order to meet the standard.

The Audit Team finds the PFD in compliance with just a few parts of NFPA 1500. Significant work is needed in improving the PFD's safety programs. The following is a review of each chapter of NFPA 1500 in relationship to the PFD's operations.

### **Fire Department Administration**

The NFPA 1500 standard requires various written documents in the forms of policies, procedures, and programs. The purpose of the written documents is to clearly define and communicate all of the department's safety programs to its personnel. By having established procedures and following those procedures, a fire department is more likely to take a safer approach in all of its operational arenas. This chapter of the standard identifies items such as:

1. Having written policies and standard operating procedures that document the requirements and operations of the department for both the emergency and non-emergency settings.

2. Having a written risk management plan that addresses all facets of the fire department's operations from scene safety to injury reporting to facility inspections.
3. Having a written occupational safety and health program that identifies specific goals and objectives for the prevention and elimination of accidents and occupational injuries, exposure to communicable disease, illnesses, and fatalities.
4. Ensuring that the department establishes and enforces rules, regulations, and standard operating procedures throughout the department.
5. Developing and implementing an accident investigation program that investigates all accidents, injuries, fatalities, illnesses and exposures as well as the investigation of all accidents involving fire department vehicles, equipment, and facilities.
6. Forming an Occupational Health and Safety Committee for the purpose of conducting research, developing recommendations, and reviewing matters related to occupational safety and health within the department.
7. Having a record keeping system that requires the fire department to maintain a database on all accidents, injuries, illnesses, exposures, and deaths that are job related; this record keeping requirement also includes comprehensive health records (confidential), training records, and vehicle and equipment maintenance records.
8. Appointing a health and safety officer to the fire department in compliance with NFPA 1521 *Standard for Fire Department Safety Officer*. The responsibilities of the health and safety officer are many and they all relate to the communication and management of the department's risk management plan.
9. Having the health and safety officer ensure that all members of the department receive safety-related training for all aspects of their assigned duties and responsibilities; ensure that all accident and injury investigations are completed; ensure that safety supervision is provided at all training exercises and that all live fire training events are done in compliance with NFPA 1403 *Standard on Live Fire Training Evolutions*; and ensure that health and safety training programs and information are provided to the members of the department.

10. Having the department's health and safety officer be responsible for managing an accident and injury prevention program that includes items such as the evaluation of safe work practices in both the emergent and non-emergent settings, the training and certification of all fire department apparatus drivers and operators (NFPA 1002 *Standard for Fire Apparatus Driver/Operator Professional Qualifications*), the implementation of an accident and injury reporting system that accurately reflects causes and corrective actions, and the conducting of periodic facility inspections to ensure that workplaces are hazard-free for the employees.
11. Having the department's health and safety officer be responsible for ensuring that injury and accident data is gathered in a correct and useful manner, and responsible for issuing an annual report to fire department senior staff on the accidents, injuries, and exposures that occurred in the department.

While the PFD has a few policies and procedures relating to safety, the documents are scattered between the Fire Alarm Operations Manual, the Rules and Regulations, and the Division of Training's Standard Operating Procedure (SOP). In addition, the Audit Team learned through its interviews that written policies and procedures are not enforced consistently, which can be problematic when addressing safety and health matters in the department.

The PFD does not have a risk management plan as required by NFPA 1500. Such a plan is important in establishing the overall safety and health goals for the department and the processes by which the department will achieve those goals. The PFD should consider using the results of the Audit Team's work as a basis for development of a risk management plan.

The PFD does not have a written occupational safety and health policy or an occupational safety and health program. As noted earlier, the PFD does have a few policies and procedures that address certain health and safety issues (e.g. accountability, mayday, driving rules, personal grooming). However, these policies or procedures fall short of taking a strong, comprehensive safety and health approach to the issue. The Audit Team recommends that the PFD develop a written safety and health policy and implement an organized and effective safety and health program.

The PFD is not in compliance with the accident and injury investigation requirements of NFPA 1500. While the PFD has a written policy on vehicle accident reporting, the policy is somewhat vague and in need of revision. There is no formal policy on the investigation of apparatus accidents. It is also unclear how collision investigation is handled other than reporting the collision to the police department and to the Fire Chief. There is also no clear policy concerning disciplinary action for at-fault or preventable collisions involving PFD apparatus.

Another example of the need for an injury and collision investigation program is the PFD's current tracking of employee injuries and lost work time. Based upon data provided to the Audit Team, there were 50 instances of injury in 2009 resulting in 5,404 hours of injury on duty (IOD) time; 37 instances of injury in 2010 resulting in 7,430 hours of IOD; and 25 instances of injury in 2011 resulting in 12,328 hours of IOD. The Audit Team found it difficult to correlate the data since it was unclear what injuries resulted in what amount of lost time; in addition, it was difficult to ascertain how the injuries occurred. In some cases, "exposures" we included in the injury data. However, the Audit Team removed the exposure data from its injury data analysis where it could.

A review of the injury data presented above shows that while the frequency of injury occurrence seems to have declined over the past three years, the severity has more than doubled, based solely on the large increase of IOD hours reported.

The Audit Team found no investigative information and there is no investigative program in place. Therefore, the PFD senior staff may be unaware that IOD hours have more than doubled between 2009 and 2011. The current injury data system is merely a reporting mechanism.

While the Audit Team cautions that the above example is just a three-year sample of injury data, the example is used to illustrate the need for a good injury reporting and investigating program.

The Audit Team recommends that the PFD immediately develop and implement an injury reporting and investigation program that meets the requirements of NFPA 1500 and that assists in identifying corrective measures needed to reduce the number and severity of firefighter injuries.

The Audit Team also recommends that the PFD develop and implement a comprehensive written vehicle collision reporting policy that addresses all aspects of emergency vehicle collisions: driver training and certification; collision investigation and report writing; post-collision drug and alcohol screening; and driver remedial training.

While the PFD Director of Training also functions as the department's Safety Officer, the PFD does not have a designated health and safety officer as outlined in NFPA 1500. The PFD Safety Officer (Director of Training) functions as an on-scene safety officer at emergency incidents and not in an everyday capacity as the department's point of contact for all safety related matters.

The Audit Team believes that the role of the fire department health and safety officer is as important as the role of the fire department training officer: both serve critical functions of being the point of contact and manager for their areas of responsibility.

The Audit Team finds that when no one is assigned to the health and safety officer position, the responsibility for managing safety programs and addressing safety matters often does not get assigned. The Audit Team recommends that the PFD appoint one of the department's chief officers as the department's Health and Safety Officer in accordance with NFPA 1500 and NFPA 1521 *Standard for Fire Department Safety Officer, 2008 Edition*.

The Audit Team is not aware of any active health and safety committee in the PFD. In a career fire department with active union participation, safety and health issues are quite often key matters that both labor and management work closely on together. The benefit to the labor side is a safe work environment for their members and to management, a reduced number of loss-time injuries thus minimizing the creation of staffing vacancies and reduced worker's compensation costs.

The Audit Team therefore recommends the immediate creation of a joint, labor/management occupational health and safety committee. The committee should be comprised of the PFD Health and Safety Officer, representatives from the PFD senior staff, and representatives from IAFF Local 4421. This joint labor/management "Occupational Health and Safety Committee" should meet on a regularly scheduled basis (at least monthly, initially) to discuss and take action on safety-related items. The

committee should work to address any immediate safety needs of the department and also to develop a risk management plan that addresses future needs.

Currently, there is limited, formal health and safety training in the PFD as defined in NFPA 1500. Most of the health and safety training completed by the PFD is the result of annual refresher training on topics such as hazardous materials response and infectious disease control. The Audit Team believes that with the appointment of a Health and Safety Officer that the department should experience a significant improvement in safety-related training.

### **Training and Education**

In terms of training and education, NFPA 1500 requires that the “fire department establish and maintain a training and education program with a goal of preventing occupational deaths, injuries, and illnesses.” The standard requires that all personnel be trained in the duties and responsibilities that they are expected to perform and that the training is in compliance with recognized standards. Other requirements identified in this chapter include:

1. Having all members who engage in firefighting activities trained to meet the requirements of NFPA 1001 *Standard for Fire Fighter Professional Qualifications*.
2. Having all apparatus drivers/operators meet the requirements of NFPA 1002 *Standard for Fire Apparatus Driver/Operator Professional Qualifications*.
3. Having all personnel required to perform technical rescue operations meet the requirements of NFPA 1006 *Standard for Rescue Technician Professional Qualifications*.
4. Having all officers (company and chief) meet the requirements of NFPA 1021 *Standard for Fire Officer Professional Qualifications*.
5. Having all personnel who respond to hazardous materials incidents meet the operational requirements of NFPA 472 *Standard for Professional Competence of Responders to Hazardous Materials Incidents*.
6. Having all personnel trained in accordance with the guidelines established in NFPA 1581 *Standard on Fire Department Infection Control Program*.

7. Ensuring that all training exercises are conducted under the supervision of a qualified instructor.
8. Ensuring that all personnel are trained in the use and care of their personal protective clothing and equipment.
9. Implementing a recurring training program that is based on a proficiency cycle with the goal of preventing the degradation of skills.
10. Providing training and education activities that are needed to support the certifications of the department's personnel.
11. Ensuring that all personnel practice assigned skill sets on a regularly scheduled basis.
12. Ensuring that all respiratory protection training is conducted in accordance with NFPA 1404 *Standard for Fire Service Respiratory Protection*.

Basically, NFPA 1500 requires that a fire department have a response force that is trained in accordance with national standards, that is given ample opportunity to practice their skills in training exercises, and that is expected to maintain the level of proficiency needed to perform their jobs safely and effectively.

As described in this chapter on training, the PFD fails to meet many of the nationally recognized standards and practices for training and certification of its personnel.

A complete and thorough overhaul of the PFD's Training Division and its programs is needed—beginning with the duties and responsibilities of the Director of Training. The overhaul must also include an emphasis on certification-based training and the development and implementation of a thorough and effective in-service training program, all in compliance with NFPA 1500.

The department's training program should establish minimum training requirements for all officer ranks and should minimize the practice of "grandfathering" personnel who do not meet the established training requirements.

Until such time that the Rhode Island Fire Academy offers Fire Officer II certification (NFPA 1021), the Audit Team suggests that, at a minimum, all the PFD fire officers be certified to the Fire Officer I level and complete the NFA Incident Scene Safety Officer

Course. In addition, all chief officers should complete ICS 300 and 400 level training (NIMS) and all captains and lieutenants complete ICS 200 level training (NIMS). When the Fire Officer II certification becomes available, then all chief officers should be trained and certified to that level.

### **Fire Apparatus, Equipment and Driver/Operators**

NFPA 1500 addresses many areas related to the design, selection, and use of fire department apparatus and equipment. The standard also addresses the training requirements of drivers/operators. This section of the standard “considers health and safety as the primary concern in the design, construction, acquisition, operation, maintenance, inspection, and repair of all fire department apparatus and equipment.”

Items addressed in this section of the standard include:

1. Ensuring that all new, fire department apparatus meet the requirements set forth in NFPA 1901 *Standard for Automotive Fire Apparatus*.
2. Ensuring that all fire department apparatus that is refurbished meet the requirements of NFPA 1912 *Standard for Fire Apparatus Refurbishing*.
3. Ensuring that all apparatus is operated by personnel who have successfully completed an approved driver training program. (NFPA 1451 *Standard for a Fire Service Vehicle Operator Training Program*.)
4. Having established response guidelines in the form of written and enforceable operating procedures.
5. Ensuring that all personnel use seat belts and other passenger restraint devices.
6. Having an established procedure for vehicle inspection, at least on a weekly basis, but within 24 hours of last use.
7. Having an established inspection and preventive maintenance program that meets the requirements of NFPA 1915 *Standard for Fire Apparatus Preventive Maintenance Program*.
8. Ensuring that all pumps, aerial devices, fire hoses, and ground ladders are tested annually in accordance with their corresponding NFPA standards.

The list shown above illustrates that almost every aspect of fire apparatus and equipment design, use, and maintenance is addressed by at least one NFPA standard. In the case of

the PFD's apparatus, equipment, and operators, the Audit Team is of the opinion that the department does a marginal job of maintaining the apparatus fleet and its equipment.

In terms of the apparatus fleet, the Audit Team did not find any serious safety concerns; it just appears that the apparatus is not well attended to at all levels of the organization.

In terms of the PFD's compliance with this section of NFPA 1500, deficiencies noted were the lack of annual pump and ladder tests and the less than adequate driver training program. Annual pump tests are important for a department's ISO rating and for the maintenance of fire department pumping apparatus. The Audit Team learned that the department's annual pump testing program has been inconsistent and the Team recommends that the PFD implement an NFPA-compliant annual pump testing regimen for all front line and reserve status pumping apparatus.

Similarly, the Audit Team found that the department's ground ladders and aerial devices are also in need of an annual testing and preventive maintenance program. Therefore, the Team recommends the implementation of an NFPA-compliant annual testing regimen for ground and aerial ladder devices for all front line and reserve status aerial devices.

The driver training program deficiencies are noted and discussed in detail in Chapter 7 (Training) of this report.

### **Protective Clothing and Equipment**

One of the most comprehensive portions of the NFPA 1500 standard is the chapter on personal protective clothing and equipment. The primary focus of the protective equipment chapter is to ensure that each firefighter is provided with safe protective clothing and equipment, and that the clothing and equipment is cleaned and maintained on a regular basis in accordance with recommended practices. Items identified in this chapter include:

1. Ensuring that each firefighter is provided the protective clothing and equipment needed for the hazards to which he/she is expected to be exposed.
2. Ensuring that a written protective clothing and equipment use policy and program are in place and enforced by the department.

3. Ensuring that all structural firefighting protective clothing is cleaned at least once every six months in accordance with NFPA 1851 *Standard on the Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles*.
4. Having all station/work uniforms comply with NFPA 1975 *Standard on Station/Work Uniforms for Fire and Emergency Services*.
5. Having all structural firefighting clothing design and manufacturing comply with NFPA 1971 *Standard on Protective Ensemble for Structural Fire Fighting*.
6. Having a written protective clothing and equipment inspection and maintenance program.
7. Ensuring that all EMS providers are provided with adequate protective clothing and equipment to reduce the likelihood of exposure to blood-borne and air-borne diseases.
8. Ensure that all hazardous materials incident responders are provided adequate protective clothing and equipment to protect them from the known chemical hazards.
9. Having a written, hazardous materials protective clothing and equipment inspection and maintenance program.
10. Having a written, respiratory protection program that addresses the selection, safe use, care, maintenance, and air quality of respiratory protection devices.
11. Having a written standard operating procedure for the use of respiratory protection equipment.
12. Ensuring that all personnel receive annual training and recertification on the use of respiratory protection equipment.
13. Ensuring that adequate breathing air (quality and quantity) exists for the recharging of respiratory protection equipment. (NFPA 1989 *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.)
14. Ensuring that all Self-Contained Breathing Apparatus (SCBA) meet the requirements of NFPA 1981 *Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service*.
15. Ensuring that all personnel receive an annual face-piece fit test.

16. Ensuring that all SCBA are equipped with a functional Personal Alert Safety System (PASS) device.
17. Ensuring that all life safety rescue ropes are selected, used, maintained, and stored in accordance with NFPA 1983 *Standard on Fire Service Life Safety Rope and System Components*.
18. Ensuring that all personnel are provided eye protection and hearing protection devices that meet applicable design standards.

When reviewing compliance with this part of the NFPA 1500 standard, the Audit Team found a few areas of deficiency. The first deficiency was related to the regularly scheduled cleaning of the structural firefighting protective clothing ensemble. The Audit Team found minimal, NFPA-compliant written policies or procedures concerning the cleaning of protective clothing.

The Audit Team recommends that the PFD implement a protective clothing cleaning and maintenance program that complies with NFPA 1851 *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protection Ensembles, 2008 Edition*.

A second area of deficiency concerning this section of the NFPA 1500 standard is the failure to have a written, respiratory protection program. The PFD does reference the use of Self-Contained Breathing Apparatus (SCBA) in a couple of its SOPs; however, none of the SOPs meet NFPA 1500 in terms of a written respiratory protection program.

The Audit Team also found that SCBA face-piece fit testing has not been completed on a regular basis and that medical clearance is not required in order to wear and use SCBA. These deficiencies are direct violations of OSHA's *Respiratory Protection Standard 1910.134* and place a liability on the City and the PFD should a firefighter injury or line-of-duty death occur related to the use of SCBA. (Even if the PFD is exempt from OSHA regulations, the Audit Team still feels that these respiratory protection deficiencies present a significant liability).

The Audit Team recommends that the PFD, through the newly recommended Health and Safety Committee, develop and implement a written respiratory protection program that includes the use, maintenance, and repair of SCBA, as well as annual training and recertification for personnel. This respiratory protection program must also include

annual, face-piece fit testing and annual medical evaluations for all personnel expected to use SCBA (29 CFR 1910.134 Respiratory Protection).

### **Emergency Operations**

NFPA 1500 provides much direction in the area of incident scene management. The goal of the standard is to provide a safe, organized approach to mitigating all emergencies with the intent of utilizing resources in an effective and efficient manner. Items identified in this part of the standard include:

1. Using an incident management system that meets the requirements of NFPA 1561 *Standard on Emergency Services Incident Management System*.
2. Creating and using an incident action plan during the mitigation of all emergencies.
3. Dividing the management of an incident into tactical level management components that maintain an effective span of control.
4. Implementing an accountability system that keeps track of all personnel working on the incident scene.
5. Ensuring that dispatch and radio communications are effective and uncomplicated, and that emergency procedures are clearly identified.
6. Ensuring that risk management occurs at each emergency scene so that the risks taken are appropriate for the benefits acquired.
7. Ensuring that a written accountability procedure is in place and that all personnel follow the procedure on a regular basis.
8. Ensuring that adequate staffing is present on-scene to initiate a safe and effective fire attack. (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*, 2010 Edition.)
9. Ensuring that all personnel assigned to a hazardous environment work in teams of two and that no one ever works alone.
10. Ensuring that before entry is made into a hazardous atmosphere, a “standby” or initial rapid intervention company made up of two personnel is available and in

position to affect the rescue of firefighters entering the atmosphere. (2-in/2-out policy)

11. Ensuring that as the incident grows and additional resources arrive on-scene that a designated rapid intervention company be established for the rescue of fire department personnel.
12. Having a written procedure for the rehabilitation of all personnel at incident scenes.
13. Having a written post-incident analysis procedure that requires the written review of all major incidents including major property losses, civilian deaths, significant firefighter injuries, and firefighter deaths. All post-incident analyses must be made available to all fire department personnel.

In terms of emergency operations, the Audit Team found a limited number of written, incident management policies and procedures. While the lack of written incident management procedures does not mean that response personnel fail in their mission, but it does leave room for different work platoons to respond to and handle incidents differently. Perhaps more importantly, the lack of incident management procedures provides easier opportunity for operational liability matters to arise than when sound, operational procedures are established and enforced.

The Audit Team recommends that the PFD immediately:

- Develop clear and consistent incident management policies and procedures;
- Implement consistent command officer training that requires all chief officers to be certified to the Fire Officer I level (NFPA 1021), Incident Scene Safety Officer, and ICS 300 and 400 levels (NIMS); and,
- Develop and implement response and mutual aid policies and procedures so that service delivery throughout the City of Pawtucket metro region is consistent.

The PFD has no effective written policy or procedure regarding the protection (and rescue) of the initial arriving response crew. The standard practice in today's fire service is that no one operates alone in a hazardous environment unless a known civilian rescue exists; an initial team of firefighters cannot enter a hazardous atmosphere until a standby rescue team is available and in direct communication with the crew working inside a

structure. This practice is commonly known as a “2-in/2-out policy.” While the 2-in/2-out policy has been greatly debated throughout the fire service, it is the recommended business practice and is part of OSHA 29 CFR 1910.134 *Respiratory Protection*.

The Audit Team realizes that the PFD engages the use of Rapid Intervention Teams (RIT), however, those teams are not in place until after several minutes have expired and a “Code Red” has been declared.

The purpose of a Rapid Intervention Team is to ensure that there is a dedicated team of properly trained and equipped firefighters on the scene at working incidents. The team’s sole responsibility is to rescue any downed or trapped firefighters should that need arise. History has repeatedly shown that when a firefighter becomes trapped (a.k.a. MAYDAY) in a structure fire, it takes an entire team of individuals to locate and remove that trapped firefighter. History has also shown that when RIT crews are not used, the outcome for these trapped firefighters is often bleak. The recognized best practice in today’s fire departments is the consistent use of RITs to help ensure firefighter safety on the incident scene.

The Audit Team recommends that the PFD develop a comprehensive structure fire response procedure that meets the requirements set forth in NFPA 1500. This procedure should address the use of an initial 2-out team, the transition to a RIT operation, and a process by which a MAYDAY situation is managed.

Another reported area of concern was the use of an accountability system. The purpose of an accountability system is to document and manage who is present on the incident scene. There are a number of different accountability systems in use throughout the United States today, but they all basically function the same—they keep track of where individual companies and firefighters are operating on the incident scene. Should a MAYDAY situation occur, then the incident commander can refer to the accountability system (board or other tracking device) to quickly determine who is involved in the MAYDAY. As with the 2-out procedure and the RIT procedure, an accountability system (and procedure) is paramount to firefighter safety.

The PFD has a limited (and inconsistent) accountability system that is in need of overhaul. Therefore, the Audit Team recommends that the PFD develop and implement a

comprehensive accountability system that also integrates the use of mutual aid companies when they respond into the City.

The final issue concerning this part of the NFPA 1500 standard is the lack of written post incident analyses (PIA). A PIA is an important tool in evaluating the operation of emergency response services. A PIA is not a disciplinary tool or a tool to find fault; it is a process by which a significant event is dissected and analyzed so that operational procedures can be validated and possibly improved.

A PIA plays an important role in a department's self-evaluation and growth. Without a formal PIA process, rumors can abound, false accusations can be generated, and a general distrust of other agencies can grow. The PFD should develop and implement a post incident analysis policy and procedure that is used for all significant fire/rescue/EMS incidents that occur within the City of Pawtucket. The definition of "significant" may be determined by the Fire Chief, but it should at least include multiple alarm fires, fires involving deaths and/or serious injuries, mass casualty incidents, etc.

### **Facility Safety**

This part of the standard addresses the safe operation of fire department facilities. The goal is to ensure that all fire department personnel have a clean and safe environment in which to perform their non-emergency duties and responsibilities. Items included in this chapter are:

1. Ensuring that all fire department facilities comply with all legal, health, safety, building, and fire code requirements.
2. Ensuring that all fire stations have adequate facilities for disinfecting, cleaning, and storing various items in accordance with NFPA 1581 *Standard on Fire Department Infection Control Program*.
3. Ensuring that work sites have adequate fire and life safety protection systems in place such as smoke detectors, fire alarm systems, carbon monoxide detectors, and automatic sprinkler system.
4. Having a written procedure and program for the annual inspection of all work sites.

The Audit Team found the PFD facilities in poor condition and in need of attention. If the PFD Fire Marshal were to conduct life safety and fire code inspections at the department's six fire stations, there would be numerous violations found at all of the work sites. None of the fire stations have a fire alarm system and there likely is the presence of lead paint at several of the stations

During its station visits, the Audit Team found no presence of carbon monoxide detectors in any of the fire stations and limited presence of smoke detectors. Carbon monoxide is a lethal byproduct of internal combustion engines—such as a diesel engine—and is often known as the “silent killer” because of its chemical and physical properties. The Audit Team recommends the PFD immediately install carbon monoxide detectors in all fire stations with at least one detector being installed in each sleeping quarters area.

The Audit Team also recommends that the PFD immediately ensure that every fire station dormitory is equipped with working smoke detectors in compliance with all state and local codes.

The Audit Team recommends that the PFD ensure that each work site has a commercial grade washer and dryer dedicated to the laundering of station uniforms and personnel clothing. *There should be no washing and drying of protective clothing or apparatus towels or similar items in washers and dryers that are used for laundering uniforms and clothing.* In addition, firefighters should not be expected to launder their dirty uniforms at their homes.

Finally, the Audit Team recommends that the PFD in conjunction with the newly created Health and Safety Committee develop and implement a Facility Safety Inspection Program that complies with NFPA 1500 and ensures that a comprehensive safety inspection is completed at each the PFD facility on at least a quarterly basis.

### **Medical and Physical Requirements**

An important feature of any firefighting force is the health and well-being of the firefighters. NFPA 1500 clearly identifies several key areas of health and wellness that

directly impact the ability of firefighting forces to perform their duties. This chapter addresses health areas such as:

1. Ensuring that all candidates and active personnel meet the medical requirements of NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments*.
2. Ensuring that all personnel receive annual medical certification for the use of SCBA.
3. Ensuring that all personnel receive a physical performance evaluation in accordance with NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters*
4. Having an established health and fitness program for all personnel in accordance with NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters*.
5. Having a confidential and permanent personal health file maintained on each firefighter, which includes the results of all physical and medical evaluations; a history of all occupational injury and illnesses; and an accounting of all hazardous materials and communicable disease exposures.
6. Ensuring that the department has a written infection control program in accordance with NFPA 1581 *Standard on Fire Department Infection Control Program*.

The PFD is deficient in the area of medical and fitness requirements. This finding is not uncommon in career fire departments such as Pawtucket's; however, that does not make it acceptable. In fact, in an effort to help improve the overall health and wellness of the career fire services in the United States, the International Association of Fire Fighters along with the International Association of Fire Chiefs and 10 pairs of local union representatives and their municipalities joined together several years ago to form the Fire Service Joint Labor Management Wellness-Fitness Initiative Task Force (initiative). The initiative has become a model for many fire department wellness and fitness programs and the results have generally been positive on both the labor and management sides—employees remain healthy and fit and the employer sees longevity in a healthy and fit response force.

The Initiative identifies basic components of a health and wellness program for incumbent firefighters and includes areas such as physical fitness, medical assessments, injury rehabilitation, and behavioral health.

The PFD does not have an occupational medical program or fitness plan in place. The department does require prospective employees to complete the Physical Performance Assessment (PPA) Test, which is given by the Rhode Island Association of Fire Chiefs. The PPA has a medical waiver that must be signed by a physician, but no specific medical requirements are listed.

The Audit Team is a strong proponent of firefighter wellness and fitness and therefore recommends that the City of Pawtucket, the PFD, and newly formed Health and Safety Committee develop and implement an occupational medical plan in accordance with NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments*, and develop and implement a physical fitness program in accordance with NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters*.

The Audit Team also found that the PFD does not require any medical evaluation prior to a member being approved to wear an SCBA. It is made very clear in both the OSHA *Respiratory Protection* Standard and in NFPA 1500 that annual medical evaluations are needed for SCBA use—just like the requirement for an annual face-piece fit test. The City of Pawtucket, the PFD, and the Health and Safety Committee should develop and implement a medical evaluation program for all active emergency responders that should also include the annual medical assessment for all personnel who are expected to wear SCBA.

### **Member Assistance and Wellness Program**

Another important part of any fire department health and wellness program is access to help for substance abuse and/or work-related stress. Professionals in the emergency response field understand that the stresses associated with emergency response operations often lead to both physical and mental problems in responders. This chapter of NFPA 1500 addresses the need for personnel assistance and wellness programs; it includes items such as:

1. Providing personnel with a professional assistance program for help with substance abuse, stress, and personal problems that affect fire department work performance.
2. Having a written policy statement on alcohol and substance abuse.
3. Providing a wellness program for all personnel.

It was unclear to the Audit Team if PFD employees have access to an employee assistance program. Such assistance is often mentioned in a department's labor contract; no mention of said assistance was found in IAFF Local 4421's contract. In addition, the PFD does not have a written substance abuse policy that addresses aspects of alcohol and substance abuse as related to fire department operations.

The most important component of any emergency response organization is its people; therefore, an organization should strive to take care of its members, both physically and mentally. The Audit Team recommends that the PFD work in conjunction with the Health and Safety Committee to review the current policies and procedures and processes regarding the employee assistance program, alcohol and substance abuse policy, and critical incident stress management.

The PFD does not have an NFPA compliant, written infection control program that addresses the various topics relevant to the prevention of contagious disease exposures and treatment thereof. The Audit Team recommends that the PFD and the Health and Safety Committee develop and implement a fire department-based infection control program.

## **SUMMARY**

The health and safety of firefighters and EMS personnel should be a major concern of those delivering the services, those receiving the services, and those helping to pay for the services.

Individuals working in public safety, particularly firefighting and EMS personnel, perform one of the most physically demanding, and mentally stressful, occupations in the

nation. Quite often, fire and emergency medical personnel are subjected to environments that require rapid, physical and mental response with a minimum of preparation.

Traditionally, at the national level, there has been limited attention paid to the wellness and fitness of firefighters. However, over the past decade, the safety and health of all emergency services providers has come to the forefront of discussion. Fire department's nationwide are implementing programs that help improve and support the health and wellness of their workforce. A recent initiative between the International Association of Fire Chiefs and International Association of Fire Fighters has resulted in the development and distribution of a Wellness-Fitness Program for firefighters and EMS personnel. This program serves as an outstanding model of how labor and management can work together to reduce firefighter injuries and fatalities while improving the overall health of fire department personnel.

The Pawtucket Fire Department lacks a comprehensive safety and health program and falls short in many areas of compliance with NFPA 1500. Many professionals in the fire service say that safety is an attitude that must be believed in, that must be communicated, and most importantly, must be enacted. Much work is needed in order for the PFD to attain that position.

## **RECOMMENDATIONS**

- 9-1 The Fire Chief should develop a written risk management plan for the PFD.
- 9-2 The Fire Chief should develop a comprehensive, written safety and health policy and implement an organized and effective safety and health program for the PFD.
- 9-3 The Fire Chief should develop and implement an injury reporting and investigation program that meets the requirements of NFPA 1500.
- 9-4 The Fire Chief should develop and implement a fire department vehicle collision reporting and investigation program that meets the requirements of NFPA 1500.
- 9-5 The Fire Chief should appoint a departmental Health and Safety Officer with full authority to act on health and safety matters as described in NFPA 1500. The

- Health and Safety Officer should be at least at the rank of Battalion Chief, be trained in accordance with NFPA 1521 *Standard for Fire Department Safety Officer, 2008 Edition*, and be fully supported by the PFD.
- 9-6 The Fire Chief should create a joint labor/management Occupational Health and Safety Committee comprised of the PFD Health and Safety Officer, representatives from the PFD' senior staff, and representatives from IAFF Local 4421. This joint labor/management Occupational Health and Safety Committee should meet on a regular basis to discuss and recommend action on safety-related items.
- 9-7 The Fire Chief, Director of Training, and the Occupational Health and Safety Committee should complete a thorough overhaul of the PFD's training program to include the implementation of certification-based training and the development and implementation of a thorough and effective in-service training program—all in compliance with NFPA 1500.
- 9-8 The Fire Chief should implement an NFPA-compliant annual pump testing regimen for all front line and reserve status pumping apparatus.
- 9-9 The Fire Chief should implement an NFPA-compliant annual testing regimen for ground and aerial ladder devices for all front line and reserve status aerial towers (ladder trucks).
- 9-10 The Fire Chief must immediately develop and implement a formal, driver training and certification program in compliance with the NFPA standards.
- 9-11 The Fire Chief must develop and implement a protective clothing cleaning and maintenance program that complies with NFPA 1851 *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protection Ensembles, 2008 Edition*.
- 9-12 The Fire Chief should develop and implement a written, respiratory protection program that includes the use, maintenance, and repair of SCBA as well as annual training and recertification for personnel. This respiratory protection program must also include annual, face-piece fit testing for all employees expected to use SCBA (29 CFR 1910.134 *Respiratory Protection*).

- 9-13 The Fire Chief should develop and implement clear and consistent incident management policies and procedures using an “all-hazards” approach and be NIMS compliant.
- 9-14 The Fire Chief must require all fire officers, at a minimum, be certified to the Fire Officer I level (NFPA 1021), Incident Scene Safety Officer, and ICS 200 level (NIMS).
- 9-15 The Fire Chief must require all chief officers at a minimum to be certified to the ICS 300 and 400 levels (NIMS).
- 9-16 The Fire Chief should develop and implement a comprehensive structure fire response procedure that meets the requirements set forth in NFPA 1500 and addresses the use of an initial 2-out team, the transition to a RIT operation, and a process by which a MAYDAY situation is managed.
- 9-17 The Fire Chief should develop and implement a comprehensive personnel accountability system that also integrates the use of mutual aid companies.
- 9-18 The Fire Chief should develop and implement a post-incident analysis policy and procedure that is used for all significant fire/rescue/EMS incidents that occur within the City of Pawtucket.
- 9-19 The Fire Chief must immediately install carbon monoxide detectors in all six fire stations with at least one detector being installed in each sleeping quarters area.
- 9-20 The Fire Chief must immediately ensure that every fire station dormitory is equipped with working smoke detectors in compliance with all state and local codes.
- 9-21 The Fire Chief should ensure that each work site has a commercial grade washer and dryer dedicated to the laundering of station uniforms and personnel clothing. A separate washer dryer must be used for rags and apparatus towels.
- 9-22 The Fire Chief and the Occupational Health and Safety Committee should implement a facility inspection program in compliance with NFPA 1500 and

develop a comprehensive plan to bring all work sites into compliance with applicable codes.

- 9-23 The City of Pawtucket, the Fire Chief, and the newly formed Health and Safety Committee should develop and implement an occupational medical plan in accordance with NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments*.
- 9-24 The City of Pawtucket, the Fire Chief, and the newly formed Health and Safety Committee should develop and implement physical fitness program in accordance with NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters*.
- 9-25 The City of Pawtucket, the Fire Chief, and the Health and Safety Committee should develop and implement a medical evaluation program for all active emergency responders that will also include the annual medical assessment for all personnel who are expected to wear SCBA.
- 9-26 The Fire Chief in conjunction with the Health and Safety Committee should review the current policies and procedures and processes regarding the employee assistance program, alcohol and substance abuse policy, and critical incident stress management and identify and implement any changes needed so that the policies are more fire department-based.
- 9-27 The Fire Chief in conjunction with the Health and Safety Committee should develop and implement a fire department infection control program.
- 9-28 The City of Pawtucket, the Fire Chief, and the Occupational Health and Safety Committee should review the National Fallen Firefighter Foundation's Firefighter Life Safety Initiatives in an effort to determine how the initiatives can best be supported or accomplished.

## CHAPTER TEN

# COMMUNICATIONS AND DISPATCH

This Chapter addresses the basic concepts and processes related to 9-1-1; public safety communications and dispatch functions; and specific descriptions of the method of operations for the dispatch of the Pawtucket Fire Department. Relevant aspects, conclusions, and recommendations relating to the use of automation and technology; emergency communications center characteristics; state-of-the-art alarm process; and dispatch procedures, training, staffing, and scheduling of emergency communications center personnel are also discussed.

Information relating to a number of relevant dispatch subjects, such as objectives, performance measurements, 9-1-1 operations and automated dispatch systems, are included in this Chapter to familiarize the reader with the technology and processes. For the reader not interested in general information on 9-1-1 operations, the description of conclusions and recommendations for Pawtucket fire alarm operations begin on page 228.

### **OVERVIEW OF PUBLIC SAFETY ANSWERING POINT OPERATIONS**

A Public Safety Answering Point (PSAP), also commonly referred to as the 9-1-1 center, is a call center responsible for answering calls to an emergency telephone number for police, fire, and emergency medical services. In October 1999, the Federal Wireless Communications and Public Safety Act of 1999 (9-1-1 Act) took effect with the purpose of improving public safety by encouraging and facilitating the prompt deployment of a nationwide, seamless communications infrastructure for emergency services. One provision of the 9-1-1 Act directed the Federal Communications Commission (FCC) to make 9-1-1 the universal emergency number for all telephone services.

Trained telephone operators/dispatchers, known as telecommunicators, are responsible for obtaining pertinent information from callers and dispatching the appropriate emergency services to calls for help. Modern PSAPs and 9-1-1 systems automatically report the telephone number and location of 9-1-1 calls made from wireline or landline phones, a capability called Enhanced 9-1-1 or E9-1-1. The FCC also requires wireless telephone carriers to provide 9-1-1 and E9-1-1 capability, where a PSAP requests it.

Once it is implemented fully, wireless E9-1-1 will provide an accurate location for 9-1-1 calls from wireless phones.

A commonly held belief of the public is that public safety providers are as close as a telephone. While this is generally true of public safety service provisions, members of the general public have a significant misunderstanding and lack of knowledge of the myriad of functions that cause public safety officers to arrive where needed in a timely manner. Given the vast array of technological and human functions that must be carefully, accurately, and quickly executed to ensure a proper response to a demand for service, it is amazing to many, upon learning the sequence of actions, that existing dispatching systems work as well as they do. Without the ability to receive calls, gather necessary preliminary information, transmit that information, and dispatch appropriate resources in such a manner to ensure a timely response, any system is doomed to failure. While there are a variety of methods in use across the country today, each must be considered individually for applicability to the needs, capabilities, and technologies of the jurisdiction being served.

### **COMMUNICATION CENTER OBJECTIVES**

An emergency public safety communications center is the nerve center of primary emergency public safety services. It is the critical link—the lifeline—between the public and its protectors—the police officers, firefighters and rescue personnel. The general purpose and intent of the emergency communications center is best described by the following statement of objectives:

- A. Establish and maintain a call center that the public client can contact for emergency assistance with the expectation that some corrective action or emergency service will result from that call.
- B. Establish and maintain a system to which emergency calls for service result in prompt dispatch of proper agencies, personnel, and equipment to effectively address the emergency.
- C. Establish and maintain a system wherein properly trained and dedicated personnel closely monitor the progress of the agencies, personnel, and equipment en route to the scene of the emergency and assist in prompt arrival of the services.

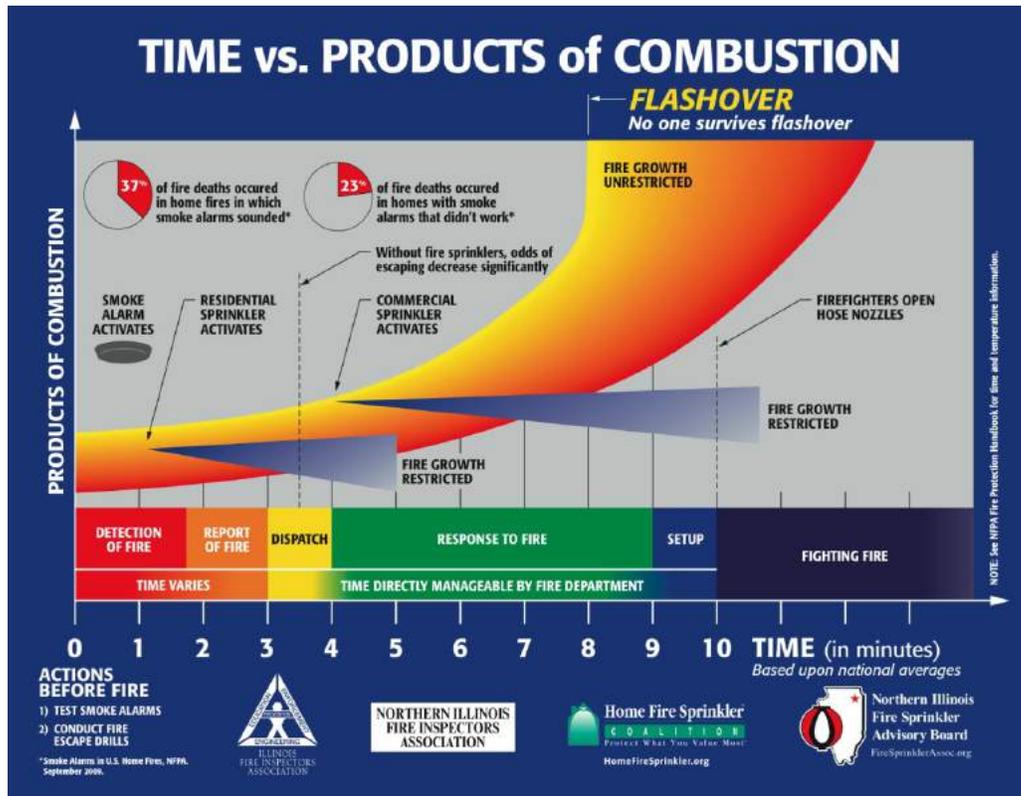
- D. Establish and maintain a system wherein the resources remaining available to an emergency service agency are redistributed throughout the service area to minimize extended service response times because of “holes” in the coverage.
- E. Provide, in a timely manner, and upon request from the field incident commander, additional resources that match the incident commander’s request as closely as possible.
- F. Generate and maintain accurate and precise records as required by the emergency response system. The emergency response system includes the communications center.
- G. Monitor the emergency to its conclusion, exchanging with field units any record-related or administrative information required by standing orders. Upon stabilizing or abating the emergency, properly close the records on the event or incident, file the record, and move on to the next incident.
- H. Establish and maintain a properly designed radio communications system able to provide reliable dispatch of emergency units in stations or the field and provide reliable information flow between the communications center and the field units, and the field units one with another at any time, including non-emergency periods.
- I. Establish and maintain a properly designed radio, information, and telecommunications system capable of providing reliable information flow between the agency that addresses an incident and other agencies or jurisdictions that may be called to assist.
- J. Develop and maintain a database and records system that allows the communications center to identify the location of the call for service so the proper operational agency can respond.

These stated objectives of a public safety communications and dispatch center are general in nature; but these objectives provide the framework within which to understand the overall goals and purposes of a modern model emergency communications center. The objectives also provide an overview of how the support systems involved in a model public safety communications system assist in realizing the mission of the typical communications center.

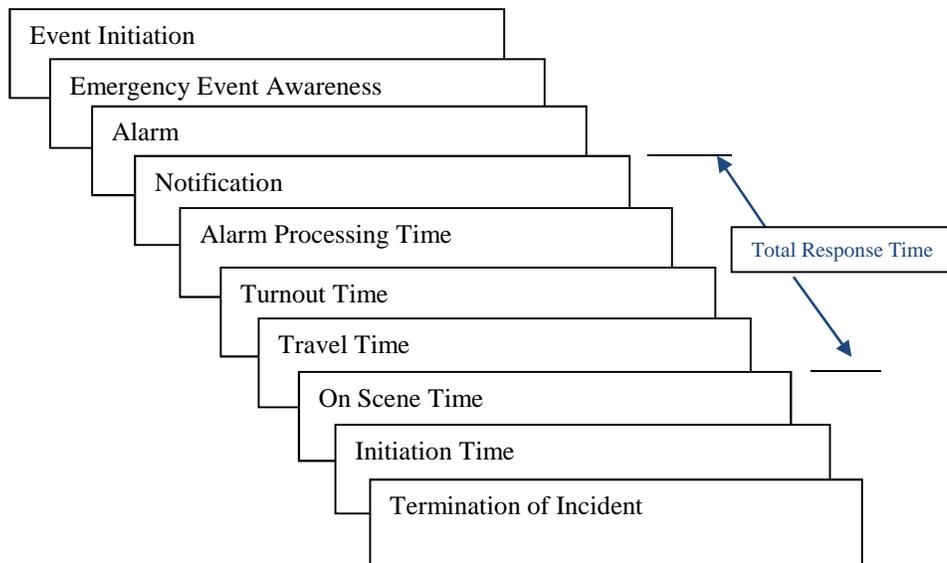
## **CASCADE OF EVENTS AND PERFORMANCE MEASURES**

An essential element in the assessment of any emergency service delivery system is the ability to provide timely and adequate resources for anticipated emergency situations such as fires, rescue situations, medical emergencies, and other foreseen occurrences. Each emergency situation requires a variable amount of staffing, apparatus, equipment, and other resources to be effective. Appropriately trained and equipped fire companies must arrive, deploy, and control the emergency within specific timeframes for successful emergency event strategies and tactical objectives to be met. For example, most fire departments and emergency medical providers strive to extinguish small structure fires quickly before they reach flashover potential to minimize risk and damage and to intervene in medical emergencies quickly to reduce clinical and biological death from cardiac arrest or severe blood loss. In both of these instances, response times, appropriate staffing, and adequate resources are critical factors that affect the outcome of the event. The capability of a fire department to respond to these events within four minutes of the initiation of the event improves the chances of saving lives and property. The entire premise of a fire department's successful response to a structure fire is based on its ability to effectively deploy properly trained personnel and adequate resources before the fire reaches flashover. Figure 10.1 from the Fire Sprinkler Association demonstrates fire growth to flashover and the critical timeline for fire department intervention.

Figure 10.1



The Commission on Fire Accreditation International (CFAI) has defined response time elements as a cascade of events. This cascade concerning the passage of time is the interval from when a fire or emergency medical event occurs and the fire service arrives on scene, and is a reflection of the time elements that make up the total response time in handling an event. The chart below illustrates that there are many components of time that must be kept as short as possible if a fire is to be controlled or a patient is to survive.



Event Initiation Point—The point at which factors occur that may ultimately result in activation of the emergency response system. Precipitating factors can occur seconds, minutes, hours, or even days before the point of awareness is reached. An example is the patient who ignores chest discomfort for days until it reaches a critical point at which time he/she makes the decision to seek assistance.

Emergency Event Awareness—The point at which a human being or technologic sentinel (i.e., smoke alarm, infrared heat detector, etc.) becomes aware that conditions exist requiring activation of the emergency response system.

Alarm—The point at which awareness triggers notification of the emergency response system. An example of this time point is the transmittal of a local or central alarm to a public safety answering point (PSAP). Again, it is difficult to determine the time interval during which this process occurs with any degree of reliability. The alarm transmission interval lies between the awareness point and the alarm point. This interval can be significant, as when the alarm is transmitted to a distant commercial alarm monitoring organization, which then retransmits the alarm to the local 9-1-1 dispatch center. When there is an automatic transmission of the signal, the fire department gains valuable time in controlling the event. Another example of this situation occurs in many jurisdictions when 9-1-1 is called from a cell phone, which often goes to a central answering point and is then rerouted to the appropriate dispatch center.

Notification—The point at which an alarm is received by the PSAP. This transmittal may take the form of electronic or mechanical notification received and answered by the PSAP.

Alarm Processing Time—The time between the first ring of the 9-1-1 telephone at the dispatch center and the time the computer-aided dispatch (CAD) operator activates the station and/or company alerting devices.

Turnout Time—The interval between the activation of station and/or company alerting devices and the time when the responding crew is aboard the apparatus and the apparatus is beginning to roll toward the call as noted by the mobile computer terminal or notifies dispatch by voice that the company is responding.

Travel Time—The point at which the responding apparatus signals the dispatch center that they are responding to the alarm and ends when the responding unit notifies the dispatcher of its arrival on scene (via voice or mobile computer terminal notification).

On-Scene Time—The point at which the responding unit arrives on the scene of the emergency.

Initiation of Action—The point at which operations to mitigate the event begin. This may include size-up, resource deployment, and patient intervention.

Termination of Incident—The point at which units have completed the assignment and are available to respond to another request for service.

Figure 10.1 contains at least three major critical components: alarm processing time, turnout time, and travel time. Collectively, they make up the total time from when a person activates the emergency response system and the system delivers a vehicle on site. It is imperative to keep in mind that certain intervals described, such as turnout and travel time, can be directly influenced by the fire service via station locations and design, staffing levels, as well as local rules and procedures for response. Others factors, such as notification and alarm processing, can be influenced indirectly through public education and engineering initiatives. The fire service can also influence the call-processing interval through its ability to define standards and compel performance by its dispatch centers.

National consensus standards developed by the National Fire Protection Association (NFPA) describe acceptable performance standards for alarm receipt, alarm processing, turnout, and response time. NFPA 1221, *The Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, defines acceptable alarm receipt performance as 95 percent of alarms received on emergency lines to be answered within 15 seconds and 99 percent answered with 40 seconds; acceptable alarm processing performance as processing 95 percent of alarms processed with 60 seconds and 99 percent of alarms processed within 90 seconds; and where alarms are transferred from the primary PSAP to a secondary PSAP the transfer proceed should not exceed 30 seconds for 95 percent of the alarms processed.

## **ORGANIZATION AND MANAGEMENT**

This section discusses model management and coordination approaches for communications centers used by other municipalities. The Audit Team has evaluated each of these models in the delivery of emergency communications services.

### **APPROACHES TO MODEL DISPATCH CENTER ORGANIZATION**

The Audit Team has observed a number of approaches to manage and direct combined public safety communications centers. These include management by:

- Police departments;
- Separate municipal agencies;
- Fire departments; and,
- Regional facilities (e.g., multiple municipalities or county).

The management of communications centers by law enforcement departments is the most predominant approach in the United States. This practice seems related to the law enforcement workload, which typically has a higher call load than fire/rescue/EMS agencies. Third-party agencies include separate telecommunications agencies or emergency management agencies. There are very few combination public safety communications centers managed by fire departments.

When either the police or fire department manages the combination communications center, there is a potential for a perceived or actual “favoritism” to develop where the dispatchers indirectly or openly favor the field personnel, policies and procedures of the agency for which they work. Regardless of whether the problem is perceived or real, public safety officials need to be proactive to avoid claims of “favoritism” in emergency communications service delivery.

The management of a number of combination public safety communications centers have dealt with this potential issue in three primary ways. Larger municipalities often budget for a police or fire liaison/supervisor position from the agency not responsible for the communications center. This position may be onsite either around the clock (in very large communications centers) or on the day shift to monitor, provide liaison, and/or actually provide a certain level of dispatch operations supervision.

Another method has been the establishment of a “board of advisors” or “users board” to provide a means for input and communications on issues of mutual concern to the management of the communications center.

### **COMMUNICATIONS CENTER STAFF SCHEDULING**

There are a number of work schedules utilized by public safety dispatcher centers, including:

- 8-hour shift—Three shifts of dispatchers work generally eight hours in a day to provide dispatcher staffing;
- 10-hour shift—This shift is generally a swing shift that is combined with another type of shift to provide 24-hour-a-day dispatcher coverage;
- 12-hour shift— Two shifts of dispatchers work generally 12 hours in a day to provide dispatcher staffing;
- 10–14 hour shift—Two shifts of dispatchers works a 24-hour shift each day; and,
- 24-hour shift— One shift of dispatchers works an entire 24-hour shift each day. Some sleep time is generally allocated during each shift for dispatchers assigned to this work shift.

Although the exact hours of work and the shift rotation may vary, these are the primary dispatcher work shifts that the Audit Team has observed in communications centers across the nation. The 8-hour and 12-hour shifts are used in most communications centers with civilian dispatch staffing. The Audit Team has observed very professional dispatch centers with 8-, 10-, and 10/14-, and 12-hour shift schedules. Two 24-hour schedules observed by the Audit Team were very inefficient.

### **COMPUTER AIDED DISPATCHING**

One of the most significant improvements in public safety dispatch in the last 40 years has been the introduction of computer aided dispatch (CAD) systems. These systems represent a well-proven technology that offers noteworthy benefits for the safety of law enforcement personnel; decreases in dispatch processing time; and improved accuracy of the dispatch process. The result is quicker and more accurate emergency public safety

responses. CAD systems have become an essential component of quality communications and dispatch centers in public safety throughout the United States.

In order to effect reductions in the response time components, elicit incident information, verify the location of the incident, identify potential hazards to public safety personnel, and determine the available unit(s) most appropriate to respond, automation of at least some of these processes should be implemented for public safety agencies.

The primary objectives of CAD systems are to:

- Increase the speed of the dispatch process, thus reducing response time;
- Increase the accuracy of the dispatch process;
- Increase safety by improving the information that is available to field personnel;
- Improve the utilization and management of resources by providing more information regarding incident locations, and by improved status keeping and display; and,
- Collect data concerning calls for service and subsequent responses in support of management information and resource allocation in departmental activity.

CAD systems vary widely in their functions and capabilities. The reasons for variances are the individual characteristics and requirements of different public safety agencies. The size of the service area involved, the population being served, and the funding available are all key factors the function and capabilities acquired as part of a CAD system.

### **Typical Features of CAD Systems**

A CAD system provides a number of specific beneficial features for public safety, such as:

#### **A. Geographic Base Files**

Generally, computer aided dispatch systems have five geographic files which are utilized in the operational CAD environment. These include:

- The block face file;
- The intersection file;
- The common place name file;

- The alias/misspelled street name file; and,
- The hazards/premise file.

These files are utilized to define to the CAD the street segments, address range, intersections and so forth that comprise the geographic aspects of the service area.

#### B. Location Data

CAD systems can quickly and accurately retrieve specific location data from a large data base.

Based on criteria developed by public safety officials, a CAD system has the capability to recommend specific fire unit(s) or other emergency service provider for a response assignment for any given address entered into the system as part of the call taking and dispatch process. As calls for service are received, the system can reorder response assignments.

#### C. Incident Records/Premise History

The CAD system storage of recent incident records allows for rapid access to various types of incident data for later analysis and study. For field public safety personnel, premise history can be very important. For example, if department resources are dispatched to an address of a known felon or hazmat storage location, the dispatch personnel and the responding public safety units dispatched may not know the volatility of this incident, and may become involved in a situation without essential information. Address-based “hazard information” that can be entered into the CAD system, based on prior calls to this same address, information provided by the property owner/occupant and/or fire investigations in progress, may well prevent injury or worse to the personnel responding, and allow for improved incident handling.

#### D. Message Capability

CAD can have a message-sending capability that, for many fire departments, has become critical to their internal operations. In addition, both dispatch messages, as well as administrative messages, may be transmitted and logged.

## **CAD / 9-1-1 Systems Interface**

The more recent, up-to-date versions of CAD systems include an interface with the 9-1-1 system. The 9-1-1 telephone number and address data can be entered into a CAD system to reduce the number of keystrokes that are necessary to carry out the dispatch function. This feature improves accuracy and speed of emergency dispatch.

CAD provides for the accurate logging of all operational activity associated with calls for service, incidents, nature of incidents, location of calls, time of calls, duration of calls, and units assigned. When coupled with a computerized records management system, this capability provides management with an accurate data base upon which to base rapid operations analysis and feedback for determining an efficient deployment and distribution model for basic service delivery.

When CAD is interfaced with the 9-1-1 system, citizens calling for fire or EMS services automatically have their address and telephone number displayed on the screen for the call-takers. In emergency situations the citizen caller is not required to explain in great detail the circumstances and the address. The exact address can be a very difficult issue as it relates to response in emergency situations because of the anxiety, possible language barrier, and/or physical impairment of the individual calling for emergency services.

## **Documentation of Incidents**

CAD systems generally document all dispatch and CAD systems activities on a computer. The specific data that CAD systems normally document include the following:

- Nature of incident;
- Incident number;
- Location (address) of incident;
- Fire and/or EMS agency response district where incident occurred;
- How call received: 9-1-1, business line, radio, etc.;
- Name of calling party;
- Telephone number of calling party;
- Time call received;
- Time call dispatched;
- Time units on-scene;

- Time units in-service;
- Time incident cleared;
- Unit(s) assigned;
- Name or ID number of call-taker receiving call;
- Name or ID number of dispatcher handling call; and,
- Other relevant incident data.

Most CAD systems are designed utilizing mini or PC-type computers. Incident data for a certain period of time is maintained in the data base of the CAD computer. Management reports can be produced and analysis can be performed with the incident data. Based on the storage capacity of the CAD computer(s), incident data are normally transferred to other larger computers for long-term record keeping and analysis.

### **MOBILE DATA COMPUTERS**

As part of state-of-the-art CAD systems, fire, and EMS agencies have been acquiring and implementing portable/mobile computing devices. This technology has been emerging in public safety communications systems since the late 1970s and is another well-proven technology. In the private sector, mobile digital terminals have been used since the early 1980s to speed transmission of assignments.

Initially, as the technology evolved, the units were mobile and, therefore, generally referred to as “mobile digital terminals” (MDTs). However, as the technology has continued to progress portable computing devices have come into use in this capacity and, therefore, a number of differing types of portable/mobile computing devices are in use, many currently referred to as “mobile digital computers” (MDCs).

In addition to being an integral part of the computer-aided dispatch process, these units may be a part of the records management system (RMS) and/or they can be standalone reporting mechanisms.

## **TIME SYNCHRONIZATION**

Maintenance of accurate dispatch times is important to many aspects of public safety dispatching. Some of the following require the maintenance and documentation of accurate times for various components of the dispatch process:

- Response to inquiries from the public;
- Management studies and analysis; and,
- Response to requests for documented information for legal and court cases.

Individually, many components of the communications center include time-keeping capability. Many of the following components of the typical communications center include internal time keeping capability:

- Voice recorders;
- Dispatch consoles;
- CAD systems;
- ANI/ALI controllers and other 9-1-1 equipment;
- Wall time displays;
- Time-lapse video units; and,
- Alarm receivers.

The accuracy of dispatch-related times maintained by the various dispatch center communications components is essential to the availability of reliable and consistent time information. Likewise, it is essential that the times maintained by the various communications system components be synchronized and consistent.

## **TRAINING OF DISPATCHERS**

Training is one of the most important factors when considering the requirements of a public safety communications center. Training is key to the effective operations of the center and the center's ability to provide the appropriate emergency response to the public, as well as providing the necessary support to fire and EMS personnel.

The required amount and content of training will depend greatly on the background and experience of the individuals staffing the communications center. When individuals

staffing the center have the institutional background and field experience, such as in the case of using uniformed personnel, then the training only has to focus on the equipment, skills, and procedures common to the communications center operations. When civilian personnel are used, the training may need to be more extensive so that the individuals are familiar with the service and field operations that impact or could be impacted by communication center operations.

Even with the automation of communication centers, there still must be provisions for human intervention and application of discretion. Because of human and situational variables, especially in emergency situations, decision making cannot be deleted from the dispatchers' responsibilities.

### **Dispatcher Training Model**

This section reviews a model public safety dispatcher training program.

#### **Basic Dispatcher Training**

A model fire/rescue/EMS dispatcher training program should include basic dispatcher training that would include some of the following basic topics:

- A. Mission of communications center
- B. Dispatcher duties and responsibilities
- C. Professionalism
- D. Telephone systems
- E. Telephone answering and other related procedures
- F. Radio communications systems
- G. Radio procedures and codes
- H. Telecommunications concepts and technology
- I. Dispatch related automation concepts
- J. 9-1-1 and CAD systems generally
- K. Stress management and critical incident stress debriefing
- L. Fire and rescue operations and terminology
- M. Emergency medical dispatching and pre-arrival instructions
- N. Records management systems

This basic training is generally concentrated classroom lectures and established lesson plans. The content of the basic training programs offered by or following the instructional programs of the Association of Public-Safety Communications Officials (APCO) meet the intent of the basic training envisioned in this model.

### **Internship**

Following completion of the basic dispatcher training program, each dispatcher candidate should complete an “internship” consisting of an appropriate number of shifts working with an experienced dispatcher. The candidate is evaluated on a daily basis.

### **Probationary Performance Standards**

As an adjunct support to the basic training requirements outlined above, the implementation of a dispatch personnel training program should include comprehensive probationary training with appropriate performance standards and a dispatcher training manual or handbook.

### **Continuing In-Service Training**

Following the completion of the basic dispatcher training, the internship, and successfully meeting the performance-based probationary standards and program, the dispatcher would be considered to be fully proficient. Subsequently, dispatchers should be required to maintain their dispatch knowledge through attending continuing in-service training programs.

Continuing in-service training programs vary with each communications center and are customized according to the needs and the personnel requirements. The majority of programs have regularly scheduled review and updating of basic subject areas and the addition of new topics and procedures. The amount of time varies since some are formal, off-site classes, while others are updates at line-up and shift change.

### **Supervisory Training**

Supervisory training and continuing education is individualized in each communications center. In most of the centers, the focus of the training is supervisory and management subjects. The nature and level of formality of supervisory dispatcher training would be dependent upon the size of the communications center and the number of dispatchers to be supervised.

### **Quality Assurance**

Quality assurance for call taking and dispatching should be an important part of ongoing dispatcher training. Senior dispatchers or a supervisor reviews dispatch records and recording of significant or unique events or incidents. Any problem observed or heard is noted and placed into line-up information and/or a follow-up drill or retraining program. Over the long-term, problem trends are identified and dispatch personnel are advised of methods for improvement.

### **RADIO SYSTEMS—GENERALLY**

A number of radio frequency bands have been made available for public safety agencies by the Federal Communications Commission (FCC). These bands are as follows:

- VHF low band
- VHF high band
- UHF 450 MHZ
- UHF 490 MHZ
- UHF 700 MHZ
- UHF 800 MHZ

Each frequency band has associated advantages and disadvantages. The selection of a particular frequency band by public safety agencies is dependent upon a number of factors, including frequency availability, area to be covered, type of geography, size of radio system designed, and frequency bands used by adjacent public safety agencies.

## **Typical Radio System Configurations**

There are a number of radio system configurations available for public safety use. These system configurations vary primarily in the number and usage of radio frequencies that comprise each of the systems. The different system configurations are as follows:

- Simplex—Utilizes a single radio frequency for both transmitting and receiving all radios for each channel. Only one radio can transmit at any time while all other radios receive.
- Two-frequency half duplex—Utilizes separate frequencies for transmitting and receiving. Only one radio can transmit at any one time; all others receive.
- Two-frequency full duplex—Utilizes separate transmit and receive frequencies and permits simultaneous conversations in two directions.
- Two-frequency repeater—Utilizes a centrally located high-powered base station “repeater.” The repeater receives a transmission from any radio in the system on one radio frequency and instantly retransmits or “repeats” the message on a second frequency that is received by the other radios on the system. Repeater systems are two-frequency half duplex systems.
- Trunking systems—Utilizes a group of radio frequencies that are controlled by a computer at the base station or communications center. When a transmitter is keyed, it transmits a unique identity code to the computer. The computer instantly selects an available radio frequency and automatically directs the transmitting radio to use that frequency for transmission.

A radio system is generally comprised of the following primary components:

- Base station transmitter and receiver equipment;
- Antennae tower and equipment;
- Mobile radio equipment;
- Portable radio equipment;
- Applicable automation hardware and software; and,
- Communications center control equipment and consoles.

## **800MHz Trunking System**

It is common knowledge that two-way radio communication is an essential tool for effective delivery of a wide range of public services. Fire, rescue, emergency medical services, law enforcement, public works, and transportation agencies cannot function well without access to reliable radio communications. Public safety radio communications is expected to grow by 55 percent over the next 10 years as a result of population and commercial growth. While the need is growing rapidly, the ability of users to upgrade their existing radio systems is limited, because most UHF/VHF frequencies have been licensed to users and are not available to jurisdictions or regions needing to upgrade or expand radio systems.

In recognition of this frequency availability problem, the Federal Communications Commission (FCC) has taken action to allocate large blocks of 800MHz spectrum radio frequencies to help satisfy this growing communications requirement of government, business, industry, and land transportation. While releasing these frequency blocks, the FCC stipulated that certain communications systems operating in the 800MHz band must employ trunking techniques (computer controlled) to achieve increased channel utilization and loading.

On the conventional single-channel, two-way radio system, several users have access to only one channel. When that channel is in use, other users in the shared system should not access the channel. Therefore, like telephone users on a “party-line,” they must wait until the channel is free. Another channel may be clear in the area, but conventional system users have no means to access it.

On a trunking radio system, each user has access to a number of radio channels. When a user places a call (pushes the transmit button), the user is automatically assigned a clear channel for the duration of the message. While that channel is in use, other users can access other channels. At the conclusion of each message, the vacated channel is returned to the common pool where it becomes available to other users in the system.

Several key advantages of utilizing computer controlled trunking 700/800MHz radio systems are as follows:

1. Measurable improvement in frequency utilization;
2. Transmission of messages on identical frequencies at every site in the trunking system simultaneously;
3. Dynamic frequency allocation by tracking users and keying only sites and channels required to reach a particular user group;
4. Enhanced records capability regarding frequency use by units and groups in the system;
5. Improved frequency security;
6. Total ability to exclude unauthorized units from transmitting on the system;
7. Ability to allocate frequency groups “on-the-fly” in response to emergency requirements, such as disaster situations; and,
8. Ability to handle the increasing communications requirements with improved frequency allocation.

For a number of years, the FCC has been encouraging and facilitating communications users, such as fire, EMS, and other local government agencies, to initiate regional planning efforts leading to the implementation of well-coordinated and planned 800MHz trunking radio systems. As a result, many such systems have been or are being planned and implemented across the United States.

### **DISPATCH CONSOLE FURNITURE**

For efficiency and effectiveness of operations, all dispatch components should be integrated into the consoles, including:

1. CAD screens, keyboards, and related support equipment;
2. Crime information access systems;
3. Map display system;
4. Telephone lines and controls;
5. Radio controls;
6. Quick recall short-term recording devices; and,
7. Time synchronization clock.

Clearly, both the computer and other equipment support requirements, as well as call taker, dispatcher, and supervisor staff needs, should be carefully considered as part of the design and implementation of consoles. Some of the more progressive ergonomic aspects of consoles include:

1. Adjustable height work surface;
2. Task lighting that may be dimmed;
3. Adjustable keyboard platform mechanism;
4. Radiant heat panel;
5. Footrest with provision for a foot switch;
6. Integrated trash bin;
7. Enclosed storage compartment;
8. Open design for equipment mounting flexibility; and,
9. Acoustic environment.

## **RECORDING RADIO AND TELEPHONE TRAFFIC**

The recording of radio and telephone traffic on all radio frequencies is an essential function that should be performed at all times. Instant and long-term access to these recordings is important for many reasons, including:

1. Assist with dispatcher training;
2. Support dispatcher personnel evaluation efforts;
3. Legally document incident-related occurrences;
4. Provide documentation for purpose of a specific incident critique;
5. Provide recording of dispatcher activities for immediate playback to clarify unclear verbal information for dispatch accuracy purposes.

As is the case with many PSAP products, 9-1-1 center managers have a wide range of vendors and options from which to choose when considering recording systems. Important consideration when selecting recording systems include: the size of center's operation, the volume of calls handled, number of telecommunicator positions to be recorded, duplicate recording in a backup center, the desire for instant replay, time synchronization of the recorders, and duration of records storage.

## **Short-Term Recording Systems**

Short-term (five to 30 minutes in duration) recording devices in communications centers can be of significant benefit to dispatch personnel. The availability of a short-term recording with immediate playback capability provides the call taker or dispatcher with the ability to play back a radio or telephone message in an effort to clarify what was said or occurred. This playback capability can be an invaluable tool to assist in situations where the dispatcher or call taker is unclear as to what the calling party or officer said or requested.

In many high-stress situations, people do not communicate as clearly and messages can be “garbled” or barely audible. For the dispatcher, immediately playing back the message may clear up the misunderstanding.

The technology involved with radio frequency recording has advanced significantly in the past few years. Today, many of the recording devices are computer controlled, utilize digital technology, and are very compact in size. A number of the more specific features of such equipment include:

1. Software based for ease of future upgrade ability;
2. Extended recording hours on digital data storage cartridges (e.g., 640 hours);
3. Simultaneous playback of multiple channels;
4. Extensive search capability;
5. Re-record capability;
6. Internal battery backup; and,
7. Voice compression to save media storage space.

## **Long-Term Recording Systems**

Initially, when radio dispatch frequencies were recorded for purposes of long-term documentation, the recording medium was magnetic reel-to-reel tape. These recorders were of various sizes. Subsequently, the reel-to-reel magnetic recording machines utilized 24-hour tape reels with one magnetic tape reel recording each 24-hour period. Generally, a communications center would retain each 24-hour magnetic tape for a specified period of time (90 to 120 days, for example). Unless the tape was placed on hold for specific reasons, the magnetic tape would be reused.

Most recently, a number of computer disk and digital recording devices have been developed that allow for the continuous recording of much greater periods of time (days and weeks) with high quality, permanent storage, and various levels of search and replay capabilities. Further Next Generation 9-1-1 (NG9-1-1) initiatives lead by the National Emergency Numbers Association and the U.S. Department of Transportation will require that new types of emergency communications (text, pictures, and video) be recorded along with the voice communications that have traditionally been recorded. Most existing communications recorders are not capable of recording anything other than audio, and major changes may be required to bring these devices into NG9-1-1 compliance.

## **PAWTUCKET FIRE ALARM DISPATCH**

The following sections review and make recommendations relating to fire communications and dispatch in Pawtucket.

### **Organization**

The fire alarm dispatchers providing fire and EMS dispatch for the Pawtucket Fire Department are uniformed firefighters employed by the City of Pawtucket.

According to the PFD Organization Chart, the Fire Alarm dispatch function comes under the auspices of the Assistant Fire Chief and the Fire Chief. However, in discussions with various Fire Alarm and other PFD officers, the function was variously stated to be the responsibility of the Training Officer, the Assistant Fire Chief, and the fire prevention captain. There seemed to be a general lack of understanding as to the chain-of-command for the firefighters working in Fire Alarm.

### **9-1-1 in Pawtucket**

Pawtucket is part of the E911 System, which is the responsibility of the State of Rhode Island.

### **Minimum Shift Staffing**

The Pawtucket Fire Alarm is staffed with a minimum staffing of two firefighters at all times.

### **Work Schedule**

Personnel assigned to the PFD Fire Alarm function work the same rotating shift as the fire division—assigned firefighters and officers. Consecutively, they work two 10-hour days, two fourteen (14) hour nights and then are off-duty for four days. This schedule provides that firefighters working Fire Alarm work an average 41-hour work week.

### **Training**

New dispatchers are provided the New World 40-hour dispatcher training. There reportedly is no further organized dispatch training provided subsequent to the 40-hour basic course.

### **Pawtucket Fire Radio System**

The Audit Team was advised that the current Pawtucket fire radio system utilizes the following frequencies for use as listed:

- 470.950 MHz            Channel 1 – Main fire frequency
- 471.325 MHz            Channel 2 – Fire ground frequency
- 154.445 MHz            Channel 3 – Training frequency
- 154.280 MHz            Inter-city Radio

### **Pawtucket Fire Alarm Computer Aided Dispatch (CAD) System**

The current computer aided dispatch system utilized in the Pawtucket Fire Alarm dispatch room is an Imc CAD system with corporate headquarters in San Diego, CA. Reportedly, this CAD system is primarily a police dispatch system, which is not particularly user-friendly for fire dispatchers. Further, the Pawtucket Police Department uses Imc CAD as its computer aided dispatch system.

### **Mobile Data Computers**

The Pawtucket Fire Department and Fire Alarm do not utilize mobile data computers.

### **Mapping Systems**

Although there is a street directory on at Console 2 on the administration computer, the Pawtucket Fire Department Fire Alarm is not provided with a computer aided dispatch system controlled mapping system.

### **Time Synchronization—Netclock**

The Pawtucket Fire Alarm is not netclock-equipped to provide all systems and sub-systems utilized with synchronized time keeping.

### **Back-up 9-1-1 Dispatch Center**

There is no back-up dispatch center to which to relocate the Pawtucket Fire Alarm in the event it must be evacuated.

### **Call Processing Time**

Call processing time was not available to the Audit Team for review and assessment.

### **Staffing the Pawtucket Fire Alarm**

According to policy, newly hired Pawtucket firefighters are placed in Fire Alarm as their initial assignment. New recruit firefighters are provided a basic 40-hour dispatcher training class. Subsequently, there apparently is no further dispatcher training provided other than “on-the-job” orientation provided by other dispatchers.

The **Audit Team has never seen this approach of assigning newly hired firefighters with no previous experience to a public safety dispatch center.** PFD personnel advised that most new hire firefighters, who had been hired to be firefighters, did not want to be

in Fire Alarm and felt this is a poor staffing approach that detracted from the provision of quality fire dispatch services.

### **Regionalization of Municipal Public Safety Dispatch Centers**

During the course of this project, the Audit Team perceived that there is a desire on the part of a number of area municipalities to consolidate their public safety dispatch centers.

The administrative and overhead costs to operate multiple centers are a sizeable sum. Effectiveness and efficiency improvements, such as shorter call and alarm processing times, can be realized through consolidation to a regional approach. Additionally, the costs of operating multiple full-time facilities, providing security, and maintaining a number of emergency standby generators could be avoided by co-locating 9-1-1 equipment and personnel.

The Audit Team would offer as an alternative that a regionalization of the PSAPs would be a more effective and efficient arrangement if the fire and police department were jointly dispatched.

### **RECOMMENDATIONS**

- 10-1 The City and Fire Chief should immediately consider ceasing the policy of assigning new hire firefighters to Fire Alarm.
- 10-2 The City and Fire Chief should initiate an effort to assign experienced firefighters to Fire Alarm.
- 10-3 The Fire Chief should clarify the chain of command as to who is in charge of Fire Alarm.
- 10-4 The City and Fire Chief should take action to implement closest unit automatic mutual aid dispatching of fire and EMS units.
- 10-5 The City is encouraged to initiate an effort to have area municipalities participate in the conduct of a comprehensive study and proceed to implement a regional

public safety dispatch center involving as many other area municipalities as possible, potentially including North Providence, Central Falls, East Providence, Lincoln, Cumberland, Johnston, Smithfield, North Smithfield and Woonsocket.

- 10-6 In the event that a regional public safety dispatch center is not workable the City should consider either privatizing or civilianizing the Pawtucket Fire Alarm with full-time professionally-trained emergency dispatchers and with a qualified civilian dispatch director concentrating the uniformed firefighters to the actual provision of fire services.

## CHAPTER ELEVEN

# FIRE PREVENTION AND EDUCATION

This chapter addresses all aspects of current life and fire safety inspections and code enforcement, public education, and fire investigation functions accomplished by the Pawtucket Fire Department (PFD). The programs were compared to national program standards with recommendations for improvement.

### OVERVIEW

The *NFPA Fire Protection Handbook*, Seventeenth Edition, Section 10, Chapter 4, describes the elements of a fire prevention program as follows:

- “1. Activities that relate to construction, such as building codes, the approval of building and facility plans, and occupancy certification and re-certification for new occupants. Also included may be a sign-off for the presence of smoke detectors when new or old properties are sold.
2. Activities that relate to the enforcement of codes and regulations, such as inspections of certain occupancies, the licenser of certain hazardous facilities, the design of new regulations and codes, and legislation to adopt model codes.
3. Activities that relate to the reduction of arson, such as fire investigation and the collection of information and data related to setting fires. Included may be arson investigation and related court proceedings, and programs such as counseling for juvenile firesetters.
4. Activities that relate to the collection of data helpful in improving fire protection, such as standardized fire reporting, case histories and fire research.
5. Activities that relate to public education and training, including fire prevention safeguards, evacuation and personal safety steps, plant protection training for industrial and other work groups, hazardous materials and device safeguards, and encouragement to install early warning and other built-in signaling and extinguishing devices. Very popular are programs for school children, such as NFPA’s Learn Not to Burn curriculum, and self-help classes such as water safety and similar “Stay Alive Till We Arrive” projects.”

## **AUTHORITY AND RESPONSIBILITIES**

Chapter 210 of the Code of the City of Pawtucket establishes the Fire Prevention Section of the PFD. Several sections relative to establishment, composition, and duties regulate the Section.

The PFD Fire Prevention Section works to prevent fire and ensure the safety of the residents and business owners/operators through the enforcement of the City Fire Prevention Code and applicable Rhode Island law.

## **ORGANIZATION AND STAFFING**

The Pawtucket Fire Department administers the applicable fire and life safety codes and carries out its related responsibilities within the City of Pawtucket through its Fire Prevention Section. The Section is headed by the Chief Fire Inspector who reports to the Chief of the PFD, as stated in City Code.

The Section is responsible for the following fire prevention-related functions:

- Building inspections
- Building plans review
- Public fire education
- Fire and arson investigations

These are typical responsibilities of a city fire department's fire prevention functions. The Fiscal Year 2012 PFD approved budget includes five (5) uniformed fire officer positions for the Fire Prevention Sections, including:

- Captain (1)
- Lieutenant (3 )
- Firefighter (1)

Note: The administrative/clerical and records support functions for the Section are provided by the single civilian staff person who provides this type of support for all elements of the Fire Department.

Reportedly, as part of an incentive program related to maintaining the staffing of the Section, each of these uniformed staff members is paid at next rank above their actual position. Therefore, the captain is paid at the battalion chief level, the lieutenants are paid at the captain level, and the firefighter is paid at the lieutenant pay level.

As of the time this Audit was being completed (May 2012), two positions—a lieutenant and the firefighter—were vacant.

The staff of the Fire Prevention Section seems to recognize the critical importance of fire prevention functions. They are primarily located at the Section offices at Fire Station 2, Fire Headquarters, 136 Roosevelt Avenue.

### **CALENDAR YEAR 2010 WORKLOAD**

The following is the fire prevention function workload performed by the Section, as outlined in the Fire Chief's 2010 Annual Report.

• Inspections	1233
• Plans review, buildings & fire alarm	238
• Smoke detector / CO inspections	535
• Court/Board of Appeals appearances	12
• Complaints related to fire safety	175
• Public education sessions	45
• Hazardous materials operations	28
• Various meetings	196
• Pyrotechnic events	7

The inspections conducted included compliance, places of assembly, schools, apartments, auto body, and walk through of developments.

### **FEE REVENUE**

Based on applicable ordinances, laws, and codes, the City collects fees for inspections performed, permits and licenses issued by the PFD's Division of Fire Prevention, as well as the collection of associated fees. The revenue generated by these activities is expected

to total \$282,450 in Fiscal Year 2012. Figure 11.1 summarizes this fee planned fee revenue.

**Figure 11.1**  
**PAWTUCKET FIRE DEPARTMENT**  
**REVENUE AMOUNTS – FY 2012**

<b>Service</b>	<b>Revenue Amount</b>
Tank	\$500
Inspection Fees	\$100,000
Fire Reports	\$1,750
Miscellaneous	\$200
Alarm Box Fees	\$180,000
<b>Total</b>	<b>\$282,450</b>

Source: City of Pawtucket approved FY 2012 Budget

### **FIRE SAFETY CODE ENFORCEMENT - INSPECTIONS**

A fire-related building inspection program that is accomplished by well trained personnel is the backbone of a total fire prevention program. Nothing can take the place of an onsite visit and one-on-one discussion with the property owner or manager to eliminate code violations and potentials for the cause of fire. A total building inspection program will cover both existing properties and new construction.

The approaches to the resolution of problems associated with existing properties are significantly different from those of new construction, which are handled by not issuing the building or occupancy permit. With existing properties, enforcement typically is a combination of logical convincing during discussions with the property owner or manager, and the issuance of violation notices, and in extreme cases, fines.

Further, some existing properties require specialized inspection, due to hazards associated with materials used, manufactured, or stored on the industrial or commercial site.

All available fire department personnel should be used to assist in the inspection programs, and each person should be provided specialized training in the types of

properties to be inspected. Equally important to a quality fire-related building inspections program is the availability of resource material, such as code books, reference standards, and data collection forms. Additionally, automated records management support for the inspections program is essential.

### **In-Service Inspections by Fire Department Personnel**

The Pawtucket Fire Department's building inspections program apparently includes an effort to periodically inspect as many commercial and industrial properties in the City as possible. However, the periodic inspection of all commercial and industrial properties in the City is not accomplished. This seems to be due to the large number of such properties in Pawtucket and the lack of sufficient inspection staff assigned to the Fire Prevention Section.

Nationally, the personnel of engine and ladder companies in many fire departments perform a significant number of the routine building inspections in their communities.

In a number of discussions with firefighting personnel in other fire departments, the Audit Team detected reluctance on the part of some fire company personnel to acknowledge the role of suppression personnel in fire prevention and code enforcement activities. This needs to be changed. NFPA Standard 1201, clearly states:

“The enforcement of fire and life safety codes shall be one of the major focus areas for a fire department.” And, “Where needed to ensure a thorough and sufficiently frequent inspection enforcement schedule, the fire chief shall utilize fire suppression personnel by incorporating fire prevention duties into fire company activities.”

Historically, many fire department personnel in the U.S. believed that they were simply part of a “standby” service. They believed their purpose was simply “waiting for the big one,” and that hazardous materials, EMS first responder, fire prevention, and other jurisdictional responsibilities for the welfare of its citizens “was someone else’s job.”

Typically, a fire department is given authority and responsibility to establish and maintain fire and life safety throughout its jurisdiction. Citizens depend on the fire department to ensure they are protected against the dangers of fire, panic, explosions, and

other hazardous conditions that may occur within their community. NFPA Standard 1201, Chapter A-14-5.2.1 states, in part:

“It is imperative that all fire department personnel recognize that fire safety education and prevention is a major part of the fire fighter’s responsibilities.”

“The concept of utilizing fire companies for fire prevention inspection duties has been used widely in the fire service for the past several decades. This practice has allowed the fire department to maintain an acceptable level of fire and life safety in a broad range of critical occupancies. In order for this concept to be effective, several basic rules should be followed:

- (a) The fire chief and personnel involved should thoroughly understand and fully support the concept.
- (b) Each fire company member should receive adequate training on inspection procedures, laws and basic codes, and departmental policies.
- (c) Fire company inspection manuals should be developed and issued to all personnel to provide general code violation and inspection procedures.
- (d) Geographical areas of responsibility should be assigned to each fire company. These areas should correspond to fire alarm suppression districts.
- (e) Full-time fire prevention personnel should be assigned to assist the fire companies with technical advice.
- (f) Criteria should be established to prioritize occupancies for life safety inspections (e.g., hospitals, schools).
- (g) Fire company officers should be held accountable for completion of their assigned inspection responsibilities.”

The advantages of utilizing in-service fire company personnel are numerous. Most importantly, when pre-fire plans are established or updated, fire company personnel identify and become familiar with risks they may have to deal with in an emergency. Public relations are improved, street and geographical files are updated, and mandated inspection frequencies are met. Fire company personnel can also be utilized to check after-hour occupancies for locked/blocked exits, overcrowding, and other violations.

A study involving 11 large cities in the United States entitled *Fire Code Inspections and Fire Prevention: What Methods Lead to Success?* was conducted by the Urban Institute and the National Fire Protection Association, with funding provided by the U.S. Fire

Administration and the National Science Foundation. The following findings regarding fire safety code inspection programs pertinent to Pawtucket were cited in the report:

“Summary of Conclusions and Recommendations on Fire-Code Inspection Practices:

1. Fire rates appeared to be substantially lower in cities that annually inspected all or nearly all public buildings...
2. Cities that used fire-suppression companies for a large share of their regular fire-code inspections appeared to have substantially lower fire rates than cities that used full-time fire prevention bureau inspectors exclusively. The probable reason is that cities using full-time inspectors exclusively often did not have sufficient personnel to make annual inspection of all inspectable properties...
3. Cities that assigned inspection responsibility by geographical districts appeared to be more successful in covering all inspectable properties. We recommend that fire departments use geographic areas of responsibility to assign inspections, and that they use a systematic block-by-block or street-by-street check off approach, to ensure that all inspectable properties are covered.
4. There was no evidence that differences in fire rates are sensitive to other differences in inspection practices examined: (a) techniques used to prepare inspectors, (b) techniques used to assure thorough inspections, (c) techniques used to persuade owners and managers to comply, (d) techniques used to enforce compliance when voluntary compliance is not possible, or (e) techniques used to control building features...”

With full support of the City government the Pawtucket Fire Department Chief and the IAFF Local, the City of Pawtucket Fire Marshal should initiate the effort to implement a citywide Fire Safety Code inspection and pre-plan program utilizing in-service fire company personnel.

The success of this program would depend upon:

- Primary coordination of the program being assigned to the City of Pawtucket Fire Marshal, who will serve to ensure compatibility with the enforcement and abatement process;
- Open communications between the IAFF Local, Fire Department management, and City officials;
- Support from City officials including legal counsel;
- Support for the program by IAFF Local;
- Company officers provided appropriate training;
- Informing property owners and managers that a comprehensive fire safety code inspection program is being initiated since most properties have never been inspected; and,
- Installation and use of computer network software that would connect each fire house and the Fire Marshal's Office, providing automated initiation of step one and step two of a violation abatement process.

The provision of appropriate training and certifications of company officers (captains and lieutenants) would serve to answer several potential concerns regarding liability of personnel. Company officers conducting these inspections would work under the direction and supervision of the Fire Marshal while enforcing the fire safety code.

There is no cost for the training and certification courses. However, additional salary costs may be incurred by a fire department for replacing personnel attending the training and for compensation of personnel attending classes on their scheduled days off.

### **Model Three-Tier Building Inspections Program**

The following sections describe a model three-tier building inspection program that should be considered for implementation in the City.

### **Tier 1: Business Self-Inspection Program**

The first tier of a three-tier building inspections program could be a self-inspection level where the building owner or manager is requested by the Fire Department to conduct a self-inspection. Small “mom and pop” sized business establishments, such as barber shops and convenience stores, are provided a self-mailer pamphlet, entitled “Business Fire Safety Checklist,” which explains the program and provides instructions, as well as the fire safety checklist.

The business owner/manager is requested to conduct the safety inspection of their business, complete the checklist and fold, staple, and mail the self-addressed mailer to the PFD Fire Prevention Section.

The fire safety checklist could include:

1. Business is kept clean;
2. Nothing is stored next to furnaces and heaters;
3. Extension cords are not used for permanent wiring;
4. There is clear access to electrical panels;
5. Circuit breakers/fuses do not trip routinely;
6. Fire extinguishers are permanently mounted and serviced annually;
7. Cigarettes are disposed of separately;
8. Building address is clearly visible from the street; and,
9. Dumpster and storage are away from the building.

If returned by the business owner/manager, this self-inspection program could essentially accomplish the same objective as having a PFD inspector take the time to personally inspect the property. This approach may save significant staff time while providing a record of the property having been inspected for fire safety purposes.

### **Tier 2: Fire Company In-Service Inspections**

Nationally, the personnel of engine and ladder companies in a number of fire departments perform a significant number of the building inspections in their communities. In fire studies, the Audit Team typically recommends that fire departments consider implementing a comprehensive fire station officer in-service inspections program.

With an in-service company inspection program, while on-duty, the PFD unit officer and crew would visit assigned properties, meet with the owner/manager, and conduct the inspection with the other members of the crew assisting and having the opportunity to become familiar with the building. Additional follow-up inspection visits would be made, as necessary, and any problematic unresolved building inspection issues are referred to the Fire Prevention Section.

### **Tier 3: Follow-up and Complex/Hazard-Related Properties**

The third level of such a PFD building inspections program would be handled by Fire Prevention Section inspectors. Section inspectors would handle follow-up inspections to deal with building inspection issues referred by station officers. Additionally, Section inspectors would conduct the building inspections on the complex, industrial and hazard-related properties which require a higher degree of knowledge, experience and time to conduct.

### **FIRE SAFETY CODE ENFORCEMENT — PLANS REVIEW**

Determining how the code requirements are applied to a new structure, premise, or process is accomplished through consultation with and plan review by assigned Section staff who work in close coordination with other City plans review staff. This close cooperative working relationship between all City plans review functions is typical of the more progressive plans review functions to facilitate the plans review process for the applicants.

Plans and specifications for new construction, additions, renovations, and alterations must be submitted by the applicant and must include sufficient data to confirm compliance with applicable codes and standards. Inspections and witnessing of fire protection and detection system tests, response to citizen and other agency inquiries, and all other code enforcement functions are also performed by the Section.

According to Fire Prevention Section data provided to the Audit Team, 238 plans were reviewed and processed in Calendar Year 2010.

## **FIRE INVESTIGATIONS**

In Pawtucket, the investigation of arson cases is managed in a team effort by several agencies. The Pawtucket Fire Department's Fire Prevention Section handles the initial cause and origin investigation with involvement of the Pawtucket Police Department in cases appearing to involve set fires. Subsequently, the Rhode Island Fire Marshal's Office and the Federal Alcohol, Tobacco, Firearms and Explosives (ATF) become involved, as needed, for more comprehensive fire investigation cases.

A critical element of a municipal fire prevention program is the development of a thorough understanding of the causes of fire in the community. A fire department's fire investigators seek to determine the cause of fires in the community by looking at what burns, when it burns, where it burns, how it starts, and what human interactions are involved in the ignition.

Finding the answers to these questions provides important feedback to other aspects of the fire department's fire prevention program. For example, if there are a significant number of candle-related fires occurring within a certain ethnic neighborhood, then the fire department can initiate a public education program that specifically targets the dangers of candle use within that community.

## **FIRE AND LIFE SAFETY EDUCATION**

An effective fire department has a life and fire safety education program, focusing on awareness and attitude that reduces the fire and injury risk in the community.

NFPA Standard 1201 states the following:

“13-1.1 Fire safety education shall be considered a major component of fire protection management.

A13-1.1 Fire officials recognize that public fire safety education is the most effective way to reduce fire incidence. The majority of fire and fire-related deaths and injuries occur in residential occupancies, which are more difficult to inspect because of social resistance and constitutional protection. Education brings safety attitudes into the home.

13-1.2 Fire safety education objectives shall focus on providing citizens with information to help them to protect their lives and their property from fire.”

### **PFD Public Fire Safety Education Programs**

The responsibility for public fire and safety education in the PFD is vested with the Fire Prevention Section. The Audit Team was advised that in 2010 the PFD’s Fire Prevention Section staff provided 45 public fire education sessions. Given the importance of public fire education in the fire protection program of a municipality every effort should be made to substantially improve this important program.

### **Public Fire and Life Safety Education**

The Audit Team suggests that the goal of the PFD public fire and life safety program should be to provide fire hazard education to the public in order to reduce injuries and the loss of life and property due to fire.

The focus of PFD fire and life safety education programs should include:

1. How to prevent fires;
2. What to do if there is a fire; and,
3. How to extinguish a fire, if trained and equipped to do so.

### **School Fire Safety Classes**

The fire safety classes in schools should cover various aspects of fire safety depending on the grade of the students that the presentation is being given. The topics generally covered could include:

1. Stop-drop-roll;
2. Get out and stay out;
3. Family meeting place;
4. Matches and lighters;
5. 911 telephone system;
6. Crawl low under smoke;
7. Hazards of smoking;

8. Exit drills in school and home;
9. Smoke alarms;
10. The fire triangle;
11. Fire extinguishers; and,
12. Careers in the fire service.

### **Out-of-School Programs**

The fire safety classes for out-of-school and adult fire safety programs could cover the basic fire safety lessons that are used in the school programs and extend to fire safety in the home. The added topics addressed should include:

1. Cooking safety;
2. Candles;
3. Electrical fires;
4. Extension cords;
5. Good housekeeping;
6. Family meeting places; and,
7. Carbon monoxide detectors.

### **Business Fire Safety Program**

The business fire safety program should include topics from the school and out-of-school programs and a detailed in-depth class on the use of fire extinguishers. The fire extinguisher class should include hands-on use. Other topics included in business classes are good housekeeping in the office, keeping aisles and exits clear, and use of portable electrical heaters.

## **VACANT BUILDINGS IN PAWTUCKET**

The Audit Team was advised of and observed a large number of vacant buildings in the City of Pawtucket. There should be an aggressive effort underway to deal with these buildings through a number of means, including demolition and reuse, where possible. Vacant buildings in communities are not only a blight on the neighborhood, but they also are an inherent significant fire and life safety issue for the community. They may be an

injury and/or life hazard to neighbors in adjoining buildings, vagrants, and firefighters and other City staff pursuing their responsibilities, fighting a fire. Every effort should be made by the various City departments and agencies involved to address this vacant building problem.

## **SUMMARY**

A fire prevention bureau, as part of a fire department, is an integral part of a municipality's responsibility to provide for the welfare of the city and its citizens. It is through an effective life and fire safety education, investigation, code administration, application and enforcement effort that a municipality will realize the greatest protection from fire and accident. No number of firefighters, fire/rescue houses, apparatus, and/or equipment can save the number of lives or the loss of property from fire as well as an educated public. Complement the fire prevention function with an effective suppression force and a municipality has the basis for a pro-active, efficient, cost effective, municipal life and fire safety program.

The State of Rhode Island and the City of Pawtucket have adopted a number of ordinances and laws applicable to the administration, regulation, enforcement, and investigation of fires in Pawtucket. The Pawtucket Fire Department administers these and other related codes and carries out its responsibilities within the City through its Fire Prevention Section and other organization elements.

Conducting fire-related building inspections is a key function of a fire department's fire prevention effort in that fire codes are enforced, and if firefighters are involved in the process, the field firefighters and officers have the opportunity to become more familiar with the buildings in their area during a none-emergency situation.

The PFD should consider utilizing an innovative three-tier approach to conducting building inspections in Pawtucket. This approach includes self-inspection for the small "mom and pop" type businesses, such as barber shops, and a comprehensive well-managed inspection program conducted by the officers of field engines and trucks, with follow-up on problematic field inspection issues and the more complex industrial and hazard-related property inspections conducted by Fire Prevention Section inspectors.

Reportedly, commercial and industrial properties in Pawtucket are not inspected periodically.

The PFD fire and life safety education program addresses many of the key fire-related life safety issues with the community. Fire and life safety education is an important part of service delivery by state-of-the-art fire department. The need for early intervention and prevention to avoid actual fires is important to fire protection in a community. Despite what some fire department personnel may think, the job of fire departments is far more than responding to fires when they occur; it is also an aggressive and comprehensive fire prevention effort to avoid the occurrence of fires.

A fire department's records management program is a key component to a successful community fire prevention effort, as well as to the provision of essential records and the planning and management of the department resources. The PFD is utilizing a network system and is considering alternatives for the future relating to a comprehensive fire department records management system.

## **RECOMMENDATIONS**

- 11-1 The Fire Department should take action to enhance the fire building inspections program by implementing a comprehensive three-tier building inspections program with complete documentation/records maintained.
- 11-2 The Fire Department is encouraged to develop the means for firefighters and officers to enter site information data into a computer program for subsequent access on the network by Fire Alarm, Fire Prevention, and any fire department element needing such information.
- 11-3 The City and Fire Department should consider the reallocation of two firefighter positions to the Fire Prevention Section's inspection staff to implement commercial and industrial building inspections.
- 11-4 The City and Fire Department are encouraged to implement computer support for the site information program, which should be expanded to be a full pre-fire planning program.

- 11-5 The City and Fire Department are encouraged to enhance the fire and life safety programs by involvement, on a part-time basis, of former firefighters with appropriate training to deliver fire and life safety programs.
- 11-6 The City and Fire Department are encouraged to consider various potential regional and/or shared services approaches to the provision of fire prevention functions involving neighboring municipalities, including potentially North Providence, Central Falls and East Providence.
- 11-7 The City and Fire Department are encouraged to assure that PFD information systems programs within the Fire Department are fully supported with either qualified City or PFD staff or by qualified contract firms.
- 11-8 The City and Fire Department are encouraged, as a fire safety measure, to initiate a progressive effort to deal with the vacant buildings in Pawtucket.
- 11-9 The Fire Chief and senior PFD officers are encouraged to implement an effort to orient all Fire Department staff members as to the importance of fire prevention programs to the overall delivery of fire service delivery by a state-of-the-art fire agency in order for all firefighters and officers to understand that fire service delivery is more than just staffing and responding with fire apparatus.

## **CHAPTER TWELVE THE CONCEPT OF CONSOLIDATION**

This Chapter explores and provides information on the various concepts of consolidation and applies those concepts to possible consolidation or regionalization opportunities for the City of Pawtucket.

This Chapter includes discussion regarding typical opportunities for fire and rescue services consolidation, including functional consolidation. It also explores the full consolidation alternative; associated fiscal impact; efficiency and effectiveness opportunities; and the impact of consolidation on personnel. The questions of what consolidation holds for personnel within the participating fire agencies and the municipality is addressed.

In addition, this Chapter addresses the impact of consolidation on those served: the taxpayers, residents, and business people within the planning area. These consolidation options are presented irrespective of the various potential fire services delivery models that may be utilized or considered. Due to differing terminology, this Chapter utilizes “fire services delivery agency” to describe the name of various models.

### **POTENTIAL CONSOLIDATION BENEFITS**

The focus of this review is to evaluate and assess opportunities for fire cooperation and consolidation in an effort to determine the potential for the following types of benefits:

1. Increased efficiency;
2. Improved effectiveness;
3. Seamless delivery of services;
4. Elimination of overlaps in positions;
5. Elimination of duplicate equipment;
6. Reduced response time for units dispatched;
7. Increased opportunity for staff specialization;
8. Upgrading recruit training programs;
9. Opportunity for increased promotional selectivity;
10. Increased promotional opportunity for personnel;

11. Potential revised perspective/outlook of personnel;
12. Enhanced or expanded services;
13. Improved safety of customers and services providers;
14. Reduced costs;
15. Improved incident command coverage;
16. Improved allocation and utilization of staffing;
17. Cost avoidance;
18. Coordination of planning;
19. Standardization of services and programs;
20. Improved and more effective training;
21. Potential improve ISO rating; and,
22. Impact on future state and federal grant funding.

Broadly speaking, the primary focus of this planning effort will be to assist in identifying **what is in the best interest of the customers being served by the fire services—the taxpayers, residents, property owners, and business owners/operators of the City of Pawtucket.**

### **FUNCTIONAL CONSOLIDATION**

Functional consolidation involves two or more fire services delivery agencies working together to either jointly or separately perform one or more functions in a fashion that shares resources and benefits. In other words, each fire services delivery agency still remains “whole” as a separate and independent entity, while allowing for the interchangeable use of equipment, facilities, and/or personnel throughout the organizations involved in the functional consolidation.

Functional consolidation can occur by one entity paying the other entity for services. Another approach in functional consolidation occurs when one fire services delivery agency agrees to perform a specific function if the other agency performs a function in exchange.

The purpose of functional consolidation is very similar to that of full consolidation:

1. Reduce duplication and redundancy;
2. Reduce the cost of providing services; and,

3. Improve levels of service without associated increased expenditures of tax funds.

Another reason why fire services delivery agencies and/or municipalities pursue functional consolidation is to take advantage of another fire services delivery agency's strengths, especially when one agency can provide certain services or perform certain functions that another may not be able to perform for fiscal or other reasons.

The remainder of this section reviews the various types of functional consolidation that have been implemented in one form or another in a number of other fire services delivery agencies throughout the United States.

### **Common Dispatching**

The communications and dispatch function offers obvious opportunities for consolidation on the part of two or more fire services delivery agencies and/or police departments. The dispatch function offers tremendous consolidation opportunities.

There is much work to be performed in creating consolidated communications and dispatch functions, as well as barriers to be eliminated. However, a large number of multiple fire services delivery agencies and/or police departments function daily across the country at a significantly reduced cost through consolidated dispatching.

For a number of years, public safety agencies (police, fire, and emergency medical) have been served by a consolidated communications and dispatch center and thereby gained significant benefits and lead the way in this type of consolidation in Rhode Island. The Audit Team has assessed a number of municipal emergency dispatch centers in the State with separate police and fire dispatch operations that incur increased cost of operations due to the separate approach. Consolidated or regional emergency dispatch centers have proven to be more cost effective when properly staffed and equipped.

### **Hazardous Materials Service Provision**

The functional consolidation of specialty services can provide mutual benefits for fire services delivery agencies working together. Several of the special services which could be involved are:

- Hazmat team coverage;
- Underwater rescue team coverage;
- Building collapse/underground rescue team coverage;
- Personnel/manpower squads; and,
- Technical/heavy duty rescue.

The participating fire services delivery agencies involved with the Audit receive hazmat services from the Woonsocket Fire Department or Providence Fire Department Hazmat Units under the State-wide program. This is an excellent example of the type of functional consolidation that is mutually beneficial.

Many such services can be performed by various fire services delivery agencies and coalitions on a region-wide basis for the mutual benefit of all of the consolidated fire services delivery agencies involved. It would be cost-prohibitive and impractical for every fire services delivery agency to be self-sufficient in all these types of specialty services areas.

### **Fire Prevention Functions**

For all jurisdictions, the building inspection and code enforcement responsibilities consume a great deal of time and are very technical functional areas. Although operating under the same State of Rhode Island codes, the various fire services delivery agencies perform these functions in different ways. In addition, where code interpretation is necessary, codes can easily be interpreted differently from one area of the municipality to the other.

Combining the fire prevention function resource commitments improves the level of service through consistent levels of service. Similar approaches are taken to the inspection of buildings as interpretation of State codes is applied.

## **Provision of Incident Command**

It is essential that command-level coverage provided for the fire services delivery agencies is on a 24-hour per day basis. A major function that is essential to the success of every emergency incident is command supervision. This presence assures that all apparatus and personnel perform their functions and carry out the necessary tactics and strategy. Without command supervision to assure coordination and communication, potential safety issues develop. Command coverage does not have to stop at jurisdictional boundaries.

The concepts of command should be similar from one agency to another; therefore, functional consolidation in terms of development of shared, scheduled command duty is mutually beneficial to fire services delivery agencies. It can reduce the number of command officers necessary to perform the function. It can reduce the stress on current command officers and the number of hours that they are required to work because of an inadequate number of command officers in the fire services delivery agency. Moreover, gaps in command coverage (day, night, weekend) can be covered by command officer/s from an adjacent agency who may be on-duty or on-call.

## **Standard Incident Operating Procedures**

A large number of emergency incident operating procedures are essential to the efficiency and effectiveness of fire crews, particularly during emergencies. It is important to maintain a standard approach adopted for the various types of procedures to assure cohesive performance. These types of procedures exist in many fire services delivery agencies. If firefighters from different fire services delivery agencies are expected to work together successfully, they need to be following the same operating procedures in order to assure optimum success.

Mutually adopting the same incident operating procedures is as simple as working together toward their development and implementation. Subsequent to adoption, the procedures should be included in the departments' in-service training programs to assure that all personnel are fully aware of and follow the adopted procedures.

### **Apparatus Dispatch Assignments**

Apparatus assignment refers to the number and type of apparatus dispatched on various types of incidents. Adopting the same apparatus assignments among multiple fire services delivery agencies goes hand-in-hand with the adoption of incident operating procedures and being dispatched by the same communications center.

Incident operating procedures are often based on a certain expectation regarding the number and type of apparatus to respond on specific types of incidents. With the consolidation of incident operating procedures the apparatus assignments should also be consistent.

### **Availability of Reserve Apparatus**

Every fire services delivery agency needs available apparatus to back up its primary units. However, the tendency is for fire services delivery agencies to view their reserve apparatus within the confines of their jurisdictional boundaries. The end result is, when viewed collectively, more apparatus is being maintained in reserve than would otherwise be necessary if the fire services delivery agencies planned and used reserve apparatus in a joint fashion.

Fire apparatus is very expensive in terms of maintenance, upkeep, and replacement. The deletion of one unit can present significant short- and long-term savings. In addition, there is less apparatus to clean and maintain in workable condition by on-duty firefighters.

### **Apparatus Type**

The primary types of apparatus suggested for functional consolidation in this section are pumpers and trucks. The Audit Team noted during its review of the available apparatus, (both in the departments involved in the Study, as well as surrounding fire services delivery agencies) that each department attempts to have a full complement of apparatus types. In other words, fire services delivery agencies have both one or more pumpers and one or more trucks in their effort to provide a total cross-section of services within their own geographic boundaries.

Each of these units provides a specific type of service. That service can be provided equally well from a neighboring agency. Therefore, functional consolidation of types of apparatus would require fire services delivery agencies to review the types of apparatus needed and determine which units are required at every station and which ones can be provided from selected stations based on the agreed joint planning effort.

Major savings can be attained, both in terms of apparatus maintenance, upkeep and replacement as well as staffing with this type of joint planning effort. It should be noted that functional consolidation in the type of apparatus operated from different stations is supported by implementing dual response-type mutual aid, adopting standard apparatus assignment, and incident operating procedures.

### **Cooperative Provision of Training**

Many fire services delivery agencies have one or more personnel assigned to the training function, either on a collateral duty basis or a full-time basis. Training activities are generally not dissimilar; however, if not coordinated in terms of the performance of joint training activities on a regular basis, the implementation of inconsistent training programs is more likely to occur.

The development and delivery of a training program is very expensive. A significant amount of time, effort and funding are required to deliver quality training. Developing and delivering training to a large number of personnel provides opportunities for cost efficiency.

With collective consolidation training functions the same or a better level of service can be provided to each jurisdiction on a more cooperative basis. It is through concentration of training staff resources that a higher level of training of officers becomes possible.

### **Pre-Fire Plan Development and Use**

Progressive fire services delivery agencies develop detailed information regarding the design, construction and contents of target fire hazards within their area of responsibility. These pre-fire plans become the basis for resource allocation and fire attack decisions on

major incidents. The consolidation of this function amongst several fire services delivery agencies insures that this information is readily available to all responding fire unit. The end result is improved operations and safety.

### **Fire Safety Education**

As with the training function, fire safety education is more effective when it is performed consistently on a larger geographic basis. In other words, multiple fire services delivery agencies would not be competing for the same media coverage or for public attention. Fire safety education programs are more successful if they are conducted in a planned large geographic area with the same message delivered in a concentrated manner over a certain period of time.

Consolidation of this function among adjoining fire services delivery agencies, with a focus on what messages will be delivered during specific times of the year, would have a stronger impact on the public. In addition, funds expended on public education media (such as slide/tape programs, movies, etc.) could have wider use, alleviating the need for two or more of the fire services delivery agencies to purchase the same fire safety education materials. Duplication and repetition are expensive practices in local governments.

### **Joint Purchasing in Quantity**

It is a proven fact that items purchased in quantity offer potential savings. All fire services delivery agencies purchase similar items such as station maintenance materials, clothing and uniforms, protective clothing, office supplies, and other essential items. Fire services delivery agencies may attain significant savings through cooperative purchasing in quantity.

### **FULL FIRE SERVICES DELIVERY AGENCY CONSOLIDATION**

The difference between functional consolidation and full consolidation is that full consolidation results in the formation of a single fire services delivery agency

organization. Creating one fully consolidated fire services delivery agency would bring about the following:

- One fire services delivery agency;
- One employer;
- One set of rules and regulations and/or standard operating procedures;
- One personnel management system;
- One union contract;
- One integrated chain-of-command; and,
- One work schedule.

### **Fiscal Impact — Savings**

Although discussed in more detail in other sections of this report, the potential for fiscal savings from consolidation is very high. The primary areas for savings involve the allocation of stations, personnel, and apparatus. Other chapters of this report address the possible results of consolidation in these areas. A summary of areas for potential savings is as follows:

- Reduction in annual operation and maintenance costs of duplicate fire stations;
- Increase in revenue from sale of buildings and land when fire stations are closed;
- Reduction in duplicate apparatus replacement costs;
- Reduction in annual apparatus operating and maintenance expense;
- Increase in revenue from sale of excess apparatus; and,
- Reduction in annual salaries and wages for duplicate personnel.

Another aspect of fiscal impact is the ability to utilize personnel on a broader basis. The cross-use of personnel by having the ability to detail firefighters and officers from one station to another on a day-to-day basis provides for more consistent apparatus staffing levels and potential for reduced overtime costs.

At the present time, the participating fire services delivery agencies must negotiate a total of three labor contracts on a periodic basis. Negotiating labor contracts is expensive, particularly if any aspects of those negotiations become litigated. The Audit Team is not in a position to estimate the cost savings by reducing the number of contracts to be

negotiated. However, based on informal discussions, measurable cost savings are likely to be attained in this area.

## **FIRE SERVICES IMPROVEMENT BENEFITS**

The national experience regarding fire services delivery agency consolidation indicates that major improvements in service to the public, or internal efficiencies that indirectly have a positive impact on the public, may be attained. Several key improvements typically include:

1. Improved fireground command and control communication;
2. Improved fireground operations by following the same standard operating procedures and working together as a team;
3. Reduced apparatus maintenance and upkeep required on the part of on-duty firefighters;
4. Reduced response times of apparatus, thus providing improved emergency service to incident scenes by dispatching the closest unit via mutual aid;
5. Improved customer and firefighter safety; and,
6. Improved dispatch function through improved incident command and control.

## **SUMMARY**

In reviewing the concept of fire, rescue, and/or emergency dispatch consolidation or regionalization, as applied to the City of Pawtucket and its fire, and/or emergency dispatch services, it is clear that many important steps need to be taken by the City and the participating services delivery agencies. The most important decision/s relate to the determination to consider and potentially implement an appropriate form/s of consolidation or regionalization.

Nationally, the study and implementation of various forms of fire, rescue, and dispatch consolidation or regionalization has clearly been the trend, particularly in the current difficult municipal fiscal climate. Likewise, discussion, study, and implementation of consolidation of these and other important municipal services in Rhode Island is being

viewed by many as a potential means for appropriate municipalities, such as the City of Pawtucket, to provide improved services while at the same time gaining cost efficiencies.

Based on the National experience and that of the Audit Team, it is clear that there are significant service improvement benefits, cost reduction, and avoidance opportunities that would benefit the taxpayers of the City of Pawtucket resulting from implementation of fire, rescue, and/or emergency dispatch consolidation. Further, it is also clear that there are important benefits to be provided to the involved municipal services providers resulting from implementation of appropriate forms of consolidation, not the least of which is improved safety and delivery of services.

## **RECOMMENDATIONS**

- 12-1 The City of Pawtucket should consider implementing an appropriate form of fire protection services delivery consolidation with participating surrounding municipalities, potentially including North Providence, Central Falls and East Providence.
- 12-2 The City of Pawtucket should consider implementing an appropriate form of emergency medical services delivery consolidation with participating surrounding municipalities, potentially including North Providence, Central Falls and East Providence.
- 12-3 The City of Pawtucket should consider implementing an appropriate form of emergency dispatch services delivery consolidation or regionalization with participating surrounding municipalities, potentially including North Providence, Central Falls, East Providence, Lincoln, Cumberland, Johnston, Smithfield, North Smithfield and Woonsocket.

## **CHAPTER THIRTEEN IMPLEMENTATION PLAN**

This Chapter provides a suggested implementation plan for the City of Pawtucket to consider. The mayor should make the final decision on recommendations, time lines, and fiscal outlays after gaining input from fire administration and stakeholders. There are more than 135 recommendations in this Report.

To frame the findings and advisory options and recommendations, the Audit Team members have drawn on their experiences as practitioners in fire departments and as fire and emergency medical service consultants for more than 150 fire/EMS agencies.

### **REVIEW OF REPORT**

Although there may be calls for quick action on the recommendations, the Audit Team suggests a three-month period for review of the findings and recommendations. One cannot expect to review several hundred pages of detailed and technical material and immediately decide on which suggestions to consider and the timing for their implementation. Moreover, in considering changes in the delivery of public safety services, incremental steps are necessary.

As part of the review, the mayor should provide an opportunity for the fire chief, firefighters, and officers to give their input relative to any observations, conclusions, and recommendations.

### **TIMING**

This Implementation Plan should be considered as a **strategic planning tool** for use over the next three to five years. Additional issues may need consideration in the future. Therefore, the Plan should be used as a flexible guide for decisions relative to the organization, management, and provision of fire/EMS services.

## **IMPLEMENTATION OBSTACLES**

There may be disagreement and criticism of a number of the recommendations contained in this Audit. However, a substantial number of the recommendations are suggestions made to the Audit Team by city officials, members of the PFD at all ranks, and from stakeholders.

Although labor issues may surface, open communications and input should assist in “getting beyond” these types of implementation issues.

## **FISCAL IMPACTS**

The non-personnel related fiscal impacts will depend on which, if any, recommendations are implemented by the City of Pawtucket. The primary areas related to costs and savings (cost avoidance) include:

1. Reducing the number of fire station facilities utilized and maintained by the PFD;
2. Upgrading the PFD fire station facilities;
3. Reducing the fire apparatus fleet;
4. Reducing the number of emergency communications centers utilized and maintained;
5. Cost avoidance related to maintaining/replacing the systems and subsystems for one dispatch rather than two;
6. Providing the facility upgrades related to combining the dispatch centers;
7. Implementing a state-of-the-art fire department records management system;
8. Implementing EMS training program upgrades; and,
9. Implementing fire training program upgrades to National/State certification requirements.

Once the City decides on a specific course, internal finance personnel should be consulted to assess the fiscal impacts of any changes.

## **RETURNS ON INVESTMENT**

In upgrading the personnel, operations, management, and administration of a fire department, it is not possible to delineate all the positive outcomes. Improving the quality of life in a community and saving lives do not necessarily involve quantitative analysis. A number of the anticipated returns on investment for the operations and management recommendations in this Audit include:

1. Improved management of the Pawtucket Fire Department by upgrading the senior uniformed staffing;
2. Increased pride in the organization;
3. Reduced loss of time on the job through comprehensive firefighter safety programs;
4. Enhanced management of human resources;
5. Improved cost effective service through automatic mutual aid;
6. Improved firefighter effectiveness through upgraded training;
7. Increased awareness, planning for major fire incidents, and improved effective use of firefighters through implementation of pre-fire planning by firefighters and officers in the fire stations;
8. Improved morale;
9. Improved accountability;
10. Reduced dispatch processing time;
11. More effective use of key senior staff members; and,
12. Enhanced status of the City being served by an accredited fire agency.

While a suggested time line is provided in Figure 13.1 as a guide for consideration of changes, the mayor should make the final decisions relative to timing.

## **UPDATING THE PLAN**

The City of Pawtucket and the Pawtucket Fire Department are encouraged to update this Plan each year. The update should include progress, obstacles, fiscal impacts, and anticipated outcomes.

## **CUSTOMER ORIENTATION**

In the judgment of the Audit Team, the City of Pawtucket is encouraged to embark on a course that will enhance the delivery of fire protection services. All decisions should be based on what is best for the customer in the City of Pawtucket.

## **FIRE DEPARTMENT ACCREDITATION**

Over a ten-year period, a committee of the IAFC, in cooperation with the International City Management Association, developed an analysis model for self assessment fire departments and services. That fire department self assessment process is now under the auspices of the Commission on Fire Accreditation International. The Audit Team employed portions of this model as a framework for this City of Pawtucket Audit to provide established criteria for review and the reader with information on the latest trends in the fire service.

In years past, standards available to the fire service have been the product of collaborative efforts involving organizations such as the National Fire Protection Association (NFPA). There have been other systems of standards and measurements for the fire and emergency services available; however, they were created to serve interests relating to the fire service, but not *specific* to the fire service. A good example of this type of process is the Insurance Services Office (ISO) grading schedule.

In 1988, the International City/County Management Association (ICMA) and the International Association of Fire Chiefs (IAFC) executive boards signed a memorandum of understanding that committed both organizations to the development of a voluntary national fire service accreditation system. Over a period of the intervening years, the framework for a fire department accreditation model was developed, beta test fire department accreditations were conducted, and an accreditation model was finalized and implemented under the management of the Commission on Fire Accreditation International.

The accreditation analysis categories included in the model are as follows:

1. Governance and Administration;
2. Assessment and Planning;
3. Goals and Objectives;
4. Financial Resources;
5. Programs;
6. Physical Resources;
7. Human Resources;
8. Training and Competency;
9. Essential Resources; and,
10. External Systems Relations.

The Audit Team considered appropriate aspects of this CFAI accreditation model for this Audit, and a member of the Team has been a peer fire department assessor. Additionally, the preparation made by the Pawtucket Fire Department for this Audit and the data and information collected is very similar to that necessary for the Fire Department to pursue accreditation.

As stated in the CFAI accreditation manual, the City and the Fire Department could benefit from becoming an accredited fire agency, including:

1. Further promotion of excellence in the Fire Department;
2. Quality improvement through self assessment;
3. Provision of assurance to peers and the public that the Fire Department has defined missions and objectives and strives to go beyond them;
4. Identification of strengths and weaknesses within the PFD;
5. Provision of detailed evaluation of the PFD and its services;
6. Establishes a method or system for addressing deficiencies and building on the strong points;
7. Growth for the Fire Department and its personnel;
8. Establishment of a forum for the communication of management and leadership philosophies;
9. National recognition for the PFD by peers and the public;

10. Creation of a mechanism for developing concurrent documents, such as strategic and business plans and a “desktop manual” inclusive of all areas the PFD is involved in; and,
11. Further development of pride in the organization, from PFD members, community leaders and citizens.

The Audit Team recognizes that the Pawtucket Fire Department exhibits a number of the characteristics of an excellent fire department. It appears that the City, the Fire Department, and stakeholders could benefit in many ways from the Pawtucket Fire Department becoming an internationally accredited fire agency with the CFAI.



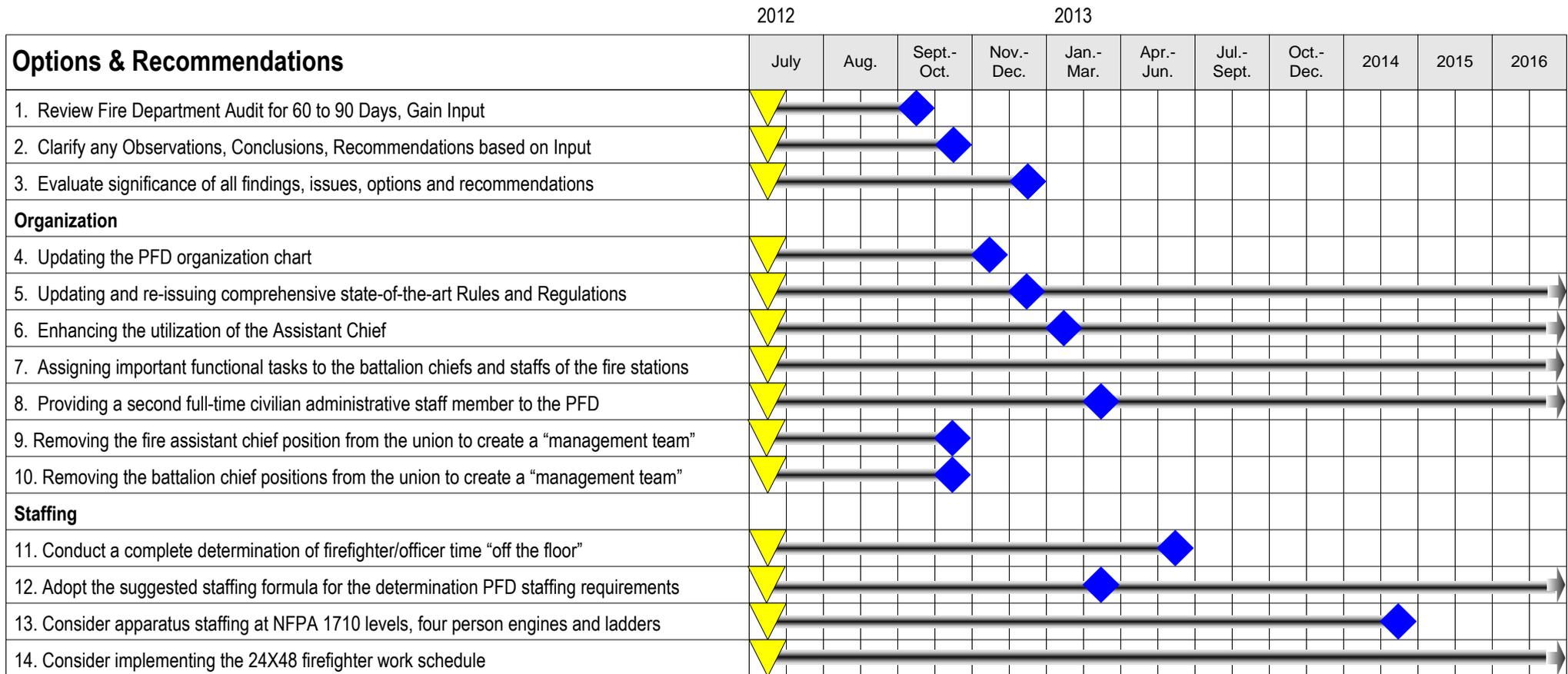
# City of Pawtucket - Fire Department

## Review & Audit

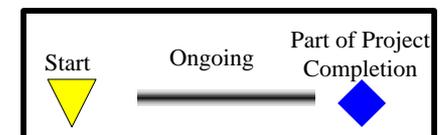
### Suggested Timeline

Page One of Four

Figure 13.1



Legend





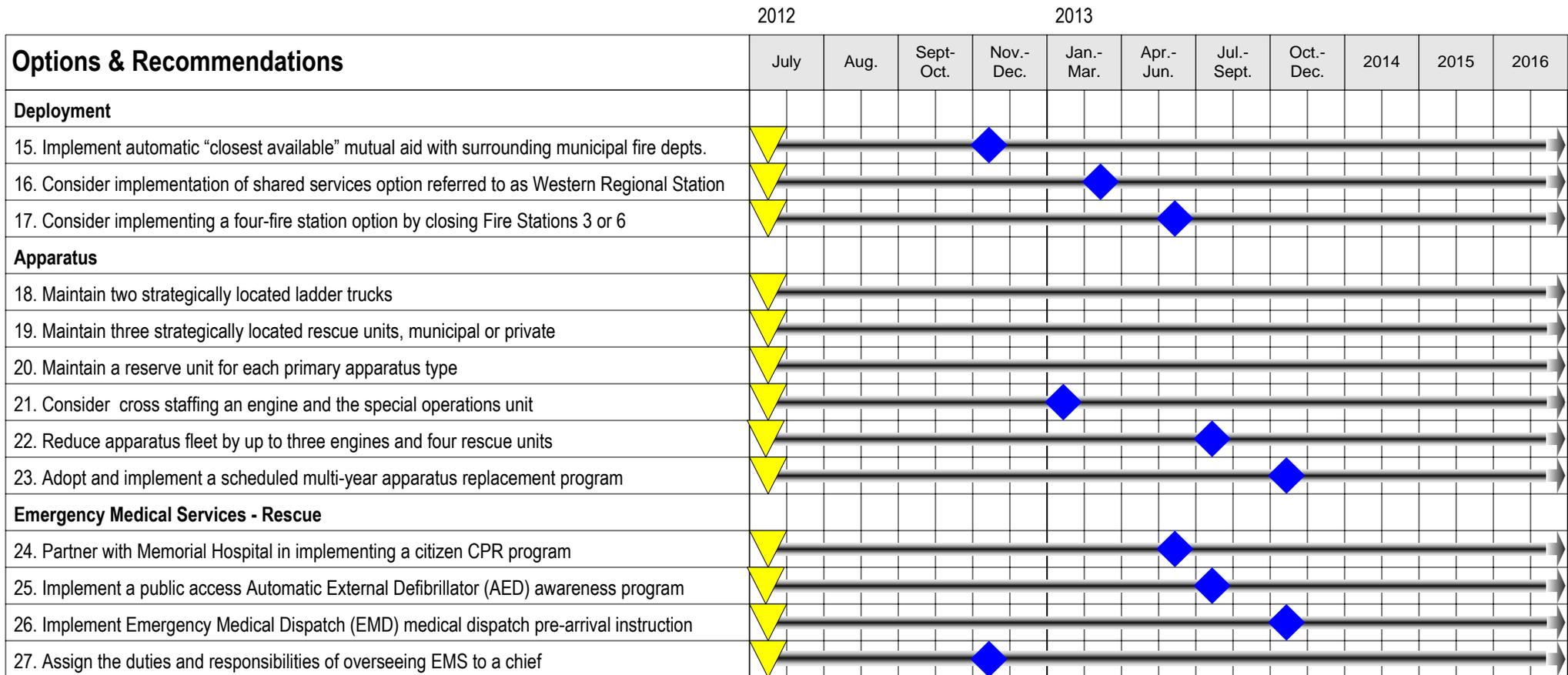
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## Review & Audit

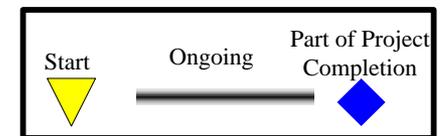
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#### Page Two of Four

Figure 13.1



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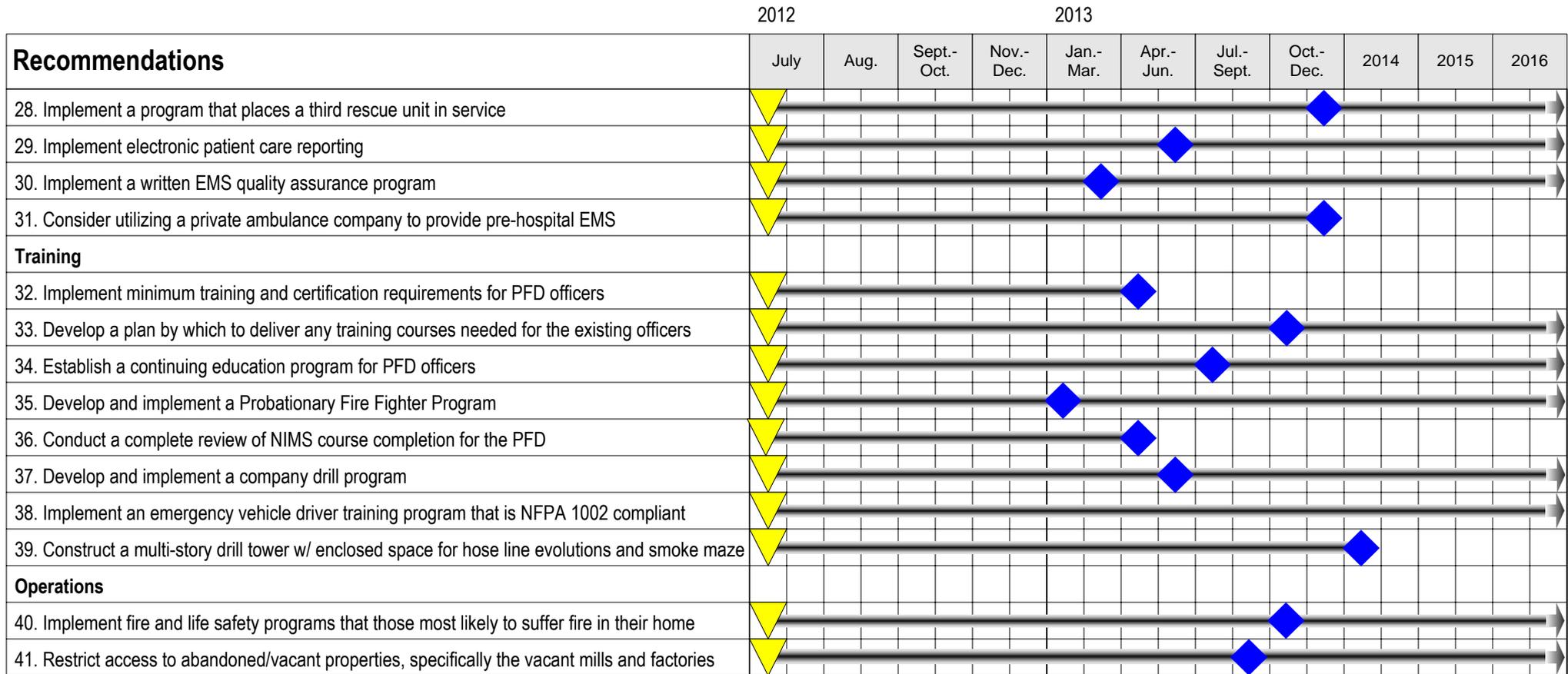
# City of Pawtucket - Fire Department

Figure 13.1

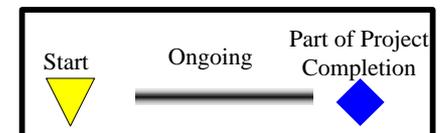
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### Suggested Timeline

### Page Three of Four



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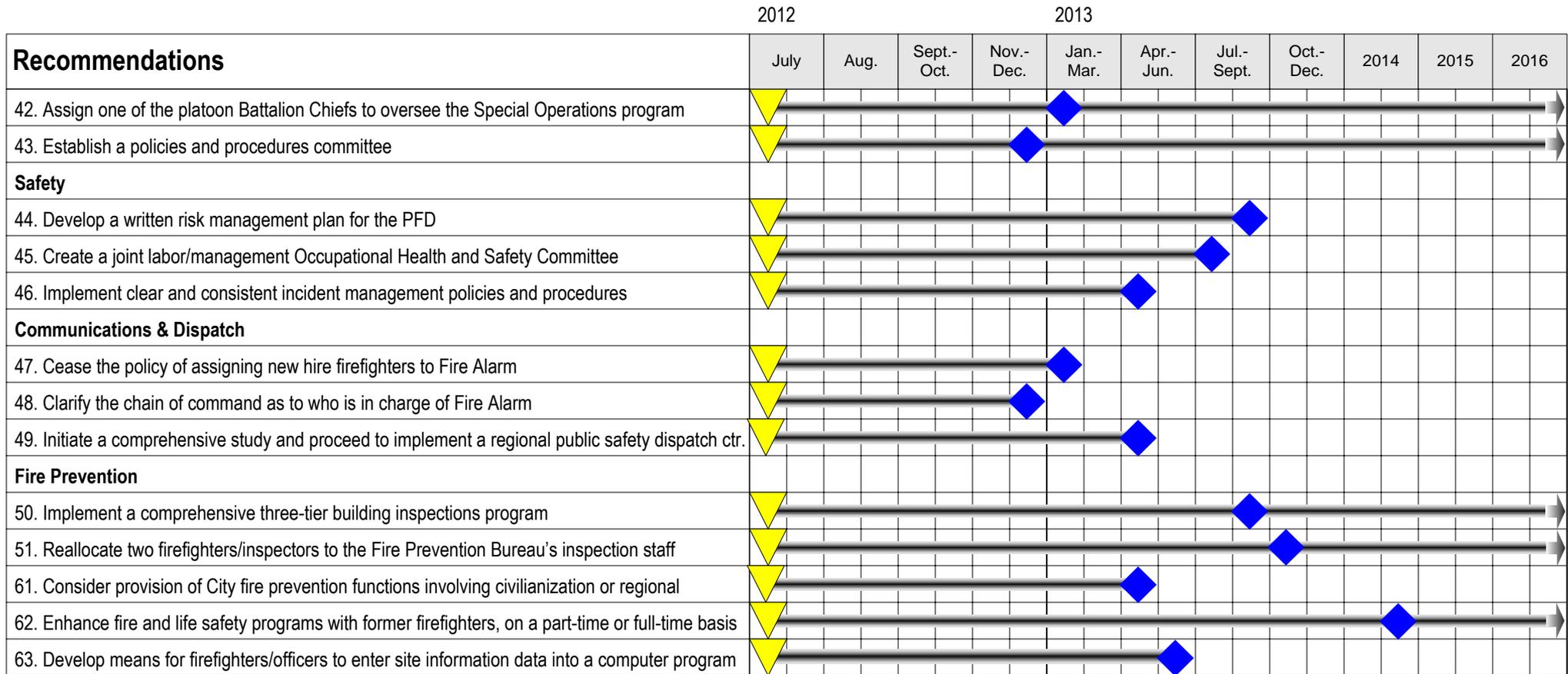
# City of Pawtucket - Fire Department

Figure 13.1

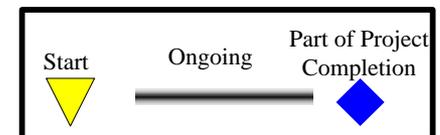
## Review & Audit

### Suggested Timeline

### Page Four of Four



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## **AUDIT RECOMMENDATIONS**

### **ORGANIZATION RECOMMENDATIONS**

- 2-1 The Fire Chief should consider placing a high priority on updating the organization chart and the Rules and Regulations of the PFD.
- 2-2 The Fire Chief should consider enhancing the utilization of the Assistant Chief to include responsibility for specific functional areas
- 2-3 The Fire Chief is encouraged to establish the progressive approach to the assignment of important daily tasks to the battalion chiefs and staffs of the fire stations.
- 2-4 The Fire Chief is encouraged to make full use of committees and cross-functional teams in the planning and implementation of appropriate PFD programs and tasks.
- 2-5 The City should consider providing an additional civilian administrative staff member to the Fire Department.
- 2-6 The City and the Fire Department are encouraged to pursue accrediting the PFD utilizing the Commission on Fire Accreditation model.
- 2-7 The City should pursue removal of the fire assistant chief position from the union for the creation of a true “management team” within the Fire Department.
- 2-8 The City should pursue removal of the battalion chief positions from the union for the creation of a true “management team” within the Fire Department.

### **STAFFING RECOMMENDATIONS**

- 3-1 The City should consider adopting the suggested staffing formula for the determination of current and future staffing requirements for the approved budget.

- 3-2 The City and PFD should consider conducting a complete determination of time “off the floor,” including vacation, sick, training, on the job injuries, and details, for example, and use this data to accurately determine what its budgetary firefighter and officer position requirements are from year to year.
- 3-3 The City should consider using the proposed staffing calculations formula for implementing any revisions in the approved budget related to the four or five - station models .
- 3-4 The City is encouraged to dual encumber firefighter/officer positions while awaiting final retirement actions in order to avoid related overtime.
- 3-5 The City should consider apparatus staffing options at NFPA 1710 levels, four person engines and ladders, as PFD organizational changes are made and/or fiscal opportunities are available.
- 3-6 The City should consider implementing the 24X48 firefighter work schedule.

### **DEPLOYMENT RECOMMENDATIONS**

- 4-1 The City should implement a vacant property tracking and monitoring data base and concentrate efforts to reduce the number of vacant properties and manage the vacant property issue to reduce blight and the problems involving such properties.
- 4-2 The City should consider implementing automatic “closest available” mutual aid with all surrounding municipal fire departments to provide improved safety of firefighters and customer services delivery through reduced travel time of apparatus to the scene of emergencies.
- 4-3 The City should consider implementing the shared services delivery option referred to as the Western Regional Station Scenario for reduced cost of operations.

- 4-4 The City could also consider implementing a four-fire station option (including the Western Regional Station Scenario) for improved cost effectiveness and apparatus staffing by closing either Fire Station 3 or Fire Station 6.
- 4-5 The City should consider the opportunity to improve fire company staffing to four-persons on an appropriate number of engine and ladder companies in the event automatic mutual aid and four-fire station model is determined to be appropriate.

### **APPARATUS RECOMMENDATIONS**

- 5-1 The City and PFD should consider continuing to maintain two strategically located ladder trucks.
- 5-2 The City should consider maintaining three strategically located rescue units, municipal or private.
- 5-3 The City is encouraged to maintain a reserve unit for each primary apparatus type (engine, ladder truck, and rescue).
- 5-4 The City is encouraged to consider cross staffing an engine and the special operations unit.
- 5-5 The City should consider reducing the PFD engine fleet by up to three engines and four rescue units, if the four- or five-station and rescue privatization options are adopted.
- 5-6 The City and PFD are encouraged to conduct a focused assessment of utility vehicle needs—car, pickup, trucks, and vans.
- 5-7 The City and PFD are encouraged to implement a scheduled apparatus replacement capital equipment multi-year program based on adopted criteria.

**EMS RECOMMENDATIONS**

- 6-1. The PFD in conjunction with Memorial Hospital of Rhode Island should consider implementing an EMS public education initiative focused around the American Heart Association Chain of Survival program. The program should be multi-lingual based and focused on generation appropriate topics.
- 6-2. The PFD should consider partnering with Memorial Hospital in implementing a citizen CPR program by offering CPR instruction on a regularly scheduled basis throughout the community. The program should be multilingual and should be in partnership with other local health care organizations.
- 6-3. The PFD, along with Memorial Hospital and the City of Pawtucket, should consider implementing a public access AED awareness program that is designed to increase the number of public access AEDs throughout the community. The three agencies should also work to have the City of Pawtucket become a RIDOH HeartSafe Community.
- 6-4. The PFD 911 call-takers and dispatchers should immediately be trained and certified in EMD.
- 6-5. The PFD should assign the duties and responsibilities of overseeing the department's delivery of EMS to a chief, while still using support staff to carry out critical functions.
- 6-6. The PFD should staff and implement a third PFD rescue unit as soon as possible.
- 6-7. The PFD should adopt a Unit Hour Utilization rate of 30 percent as its threshold for rescue unit use analysis in order to monitor and improve the future delivery of EMS throughout the City.
- 6-8. The PFD should closely track EMS call volume in an effort to identify peak demand for service periods, and then consider implementing a program that places a third rescue unit in service on a part-time basis during those peak demand periods as an alternative to full-time third rescue staffing.

- 6-9. The City of Pawtucket and the Medical Director should enter into a written agreement concerning the roles and responsibilities of the Medical Director position, and the agreement should be completed using State guidelines for the role of the local Medical Director.
- 6-10. The City of Pawtucket should require Medical Director liability insurance with the coverage and minimum limits clearly listed in the Medical Director's contract for service. The cost of this insurance should be considered as part of the fee and expense compensation package provided by the City of Pawtucket in the contract.
- 6-11. The PFD should work closely with The Dawson Group to analyze the entire billing process and collection percentage rate to ensure maximum efficiency on revenue collection.
- 6-12. The PFD should consider the implementation of electronic patient care reporting as used by many other EMS response agencies throughout the State.
- 6-13. The PFD must immediately develop and implement a HIPAA-compliant process whereby the completed run reports can be securely stored at the station and then be securely transported to headquarters for processing.
- 6-14. The PFD should complete a comprehensive cost analysis of EMS supply, equipment, and maintenance funding needs so that proper operational funds can be allotted to the delivery of EMS.
- 6-15. The PFD must immediately develop and implement written policy and procedures for the delivery of EMS as required by the RIDOH regulations.
- 6-16. The PFD should evaluate the need for and use of MDCs on the PFD rescue units and make the necessary changes to effectively use the MDCs in incident dispatch and response operations.

- 6-17. The PFD should evaluate all EMS equipment and supply needs and adjust the funding allocated for the purchase of new equipment, supplies, and maintenance plans. At a minimum, this evaluation should include a replacement plan for the cardiac monitors, the acquisition of spare AEDs, and a purchase plan for EMS supplies not easily restocked at hospital facilities.
- 6-18. The PFD should implement the use of pain medications as part of its EMS delivery in accordance with the RIDOH DEMS Pre-hospital Care Protocols & Standing Orders, Pain and Sedation Management Protocol.
- 6-19. The PFD should examine its assignment and use of lieutenants and captains on the rescue units and, if the decision is to retain the rank structure, then the Audit Team recommends that all rescue unit officers be certified to the EMT-P level and be assigned specific collateral duties (EMS supply ordering, scheduling and tracking equipment maintenance, etc.) related to the delivery of EMS by the Department.
- 6-20. The PFD should re-evaluate its rescue unit assignment procedure and consider a reduction in the length of the tours that personnel are assigned to the units.
- 6-21. The PFD must develop and implement a written, EMS quality assurance program in compliance with RIDOH's Rules and Regulations Relating to Emergency Medical Services, Section 12—Standards for Ambulances and Ambulance Services.
- 6-22. The PFD should develop and administer a customer service survey that gathers information from customers of the service.
- 6-23. The City should consider utilizing a private ambulance company to provide pre-hospital emergency medical service in the City.

## **TRAINING RECOMMENDATIONS**

- 7-1 The Fire Chief should reassign all of the Director of Training's duties and responsibilities that are not related to training to other capable officers with oversight given to a chief officer.
- 7-2 The Fire Chief should establish a Training Committee to address the immediate and short-range training needs of the department. The Training Committee should consist of the Director of Training, a battalion chief, one fire officer (captain or lieutenant) and one rescue officer (captain or lieutenant).
- 7-3 The Training Committee should address the following two actions during its first year of operation:
1. Determine the immediate training needs of officers and firefighters to comply with the recommended minimum training qualifications and develop a plan and time schedule by which to deliver that training; and.
  2. Develop short-range considerations for the development of the company drill program including mutual aid interoperability training.
- 7-4 The Director of Training should establish a process by which all company level training data is recorded and stored with the ability to review company level training activity on a daily basis by station and platoon. This data entry should be able to be accomplished at the station-level with the company officer entering the information directly into the database.
- 7-5 The City of Pawtucket and the Fire Chief should implement the following minimum training and certification requirements for PFD officers:

### **1. Fire Chief**

- Officer I
- Fire Officer II (when it becomes available)
- Hazmat First Responder Operations Level
- Fire Instructor I
- Vehicle Driving Practices
- Incident Command System
- EMS – First Responder

- ICS 200, 300, 400, and 800
- National Fire Academy – Executive Fire Officer (EFO)

## **2. Assistant Chief & Battalion Chief**

- Fire Officer I
- Officer II (when it becomes available)
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Driving Practices
- Incident Command System
- EMT-Basic
- ICS 200, 300, 400, and 800
- Consider National Fire Academy – Executive Fire Officer (EFO)

## **3. Captains & Lieutenants**

- Fire Officer I
- Hazmat First Responder Operations Level
- Fire Instructor I
- Vehicle Driving Practices
- EMT-Basic
- ICS 200 and 300
- Rescue Technician

- 7-6 The Fire Chief and the Director of Training should develop a plan by which to deliver any training courses needed for the existing officers so that they have an opportunity to comply with the revised training and certification requirements.
- 7-7 The Fire Chief and the Director of Training should establish a continuing education program for the officers of the department so that they can “keep pace” with the changes in service delivery, technology, and leadership practices.
- 7-8 The City of Pawtucket and the Fire Chief should amend the PFD hiring process to include Rhode Island Fire Academy Fire Fighter II certification in addition to the Rhode Island EMT license.

- 7-9 The Fire Chief and the Director of Training should develop and implement a Probationary Fire Fighter Program that develops the job-specific knowledge, skills, and abilities needed for employment as a PFD firefighter.
- 7-10 The Director of Training should conduct a complete review of NIMS course completion for the PFD and produce a report showing any deficiencies based upon the minimum training and certification requirements listed earlier in this chapter.
- 7-11 The Director of Training should develop and implement a company drill program that:
1. Ensures that meaningful, multi-company drills are held at least six times a year and that these drills focus on the various emergency response activities that require multiple units to work together in order to mitigate an incident.
  2. Ensures that these drills also include the use of mutual aid agencies from the surrounding Pawtucket area.
  3. Addresses the training goals and objectives of the PFD and its individual companies.
- 7-12 The Fire Chief and Director of Training must develop and implement an emergency vehicle driver training program and policy that is NFPA 1002 compliant.
- 7-13 The Fire Chief should require all current and future engine (pumper) and aerial ladder drivers to complete the Rhode Island Fire Academy's Driver Operator programs for pumper apparatus and aerial devices.
- 7-14 The Fire Chief, Director of Training, and City of Pawtucket should work together to construct a multi-story drill tower that also has some enclosed space for hose line evolutions and a smoke maze.

**OPERATIONS RECOMMENDATIONS**

- 8-1 The PFD should collect and analyze fire injury and death data, and develop and implement fire and life safety programs that target the population groups most likely to suffer from the occurrence fire in their home.
- 8-2 The City of Pawtucket should work to restrict the access to abandoned and vacant properties within the City, specifically the vacant mills and factories.
- 8-3 The PFD should ensure that pre-fire plans and pre-fire planning activities are completed for each of the vacant mill and factory properties.
- 8-4 The PFD should improve its ability to capture fire loss and fire injury and death data so that information can be used in the department's future planning and funding.
- 8-5 The PFD should ensure that all of its emergency response personnel complete their hazmat First Responder Operations and Technician level refresher training each year; this requirement should fall under the responsibility of the department's Director of Training.
- 8-6 The PFD should evaluate a cross-staffing program for the Special Operations unit to include trained and certified personnel as well as sufficient equipment to support hazardous materials and special rescue incidents.
- 8-7 The Fire Chief should assign one of the platoon Battalion Chiefs to oversee Special Operations program as a collateral duty.
- 8-8 The PFD should require all personnel assigned to perform vehicle extrication rescue operations be trained and certified to the applicable NFPA and/or the Rhode Island state training standards—at a minimum to the Basic Vehicle Rescue Technician Level.

- 8-9 The PFD should examine reducing the amount of vehicle extrication equipment carried on Engine 2 and moving that equipment to the Special Operations as recommended earlier in this chapter. The Special Operations unit would then be dispatched on a cross-staffed basis in addition to Engine 2 (or other appropriate fire station) on all vehicle collisions with confirmed patient entrapments.
- 8-10 The PFD should identify and pre-plan all of the known permit-required confined spaces in the City's industrial facilities.
- 8-11 The PFD should evaluate the department's role in confined space rescue in terms of trained and certified responders, equipment carried on the Special Operations unit, and the ability to use mutual aid rescue services to handle confined space rescue events. At a minimum, the PFD should focus on "first responder" type of confined space rescue service rather than at the operations level—similar to how hazmat responses are handled in the City.
- 8-12 The PFD should use automatic mutual aid rescue services for all trench rescue service needs in the City of Pawtucket.
- 8-13 The PFD should use automatic mutual aid services for all structural collapse rescue service needs in the City of Pawtucket.
- 8-14 All PFD personnel should complete some type of structural collapse awareness training.
- 8-15 All PFD personnel should complete basic level rope rescue training.
- 8-16 The PFD should not change its deployment of water rescue services in the City.
- 8-17 The PFD should require all personnel expected to perform water rescue operations complete the Rhode Island Fire Academy's Swift Water Rescue Course.
- 8-18 The PFD should consolidate all of its rules, regulations, and procedures into a policy and procedure manual that addresses all aspects of the department's administrative and operational functions.

- 8-19 The Fire Chief should consider establishing a policies and procedures committee to provide consistency and coordination of the policy and procedure development process.
- 8-20 The PFD should implement a comprehensive pre-fire planning program that address all of the moderate to severe target hazards in the City.
- 8-21 The City of Pawtucket and the PFD should use the results of ISO's 2010 assessment in conjunction with the findings of the Audit Team's report as a basis for which to begin making operational improvements in the department.

### **SAFETY RECOMMENDATIONS**

- 9-1 The Fire Chief should develop a written risk management plan for the PFD.
- 9-2 The Fire Chief should develop a comprehensive, written safety and health policy and implement an organized and effective safety and health program for the PFD.
- 9-3 The Fire Chief should develop and implement an injury reporting and investigation program that meets the requirements of NFPA 1500.
- 9-4 The Fire Chief should develop and implement a fire department vehicle collision reporting and investigation program that meets the requirements of NFPA 1500.
- 9-5 The Fire Chief should appoint a departmental Health and Safety Officer with full authority to act on health and safety matters as described in NFPA 1500. The Health and Safety Officer should be at least at the rank of Battalion Chief, be trained in accordance with NFPA 1521 *Standard for Fire Department Safety Officer, 2008 Edition*, and be fully supported by the PFD.
- 9-6 The Fire Chief should create a joint labor/management Occupational Health and Safety Committee comprised of the PFD Health and Safety Officer, representatives from the PFD' senior staff, and representatives from IAFF Local 4421. This joint labor/management Occupational Health and Safety Committee should meet on a regular basis to discuss and recommend action on safety-related items.

- 9-7 The Fire Chief, Director of Training, and the Occupational Health and Safety Committee should complete a thorough overhaul of the PFD's training program to include the implementation of certification-based training and the development and implementation of a thorough and effective in-service training program—all in compliance with NFPA 1500.
- 9-8 The Fire Chief should implement an NFPA-compliant annual pump testing regimen for all front line and reserve status pumping apparatus.
- 9-9 The Fire Chief should implement an NFPA-compliant annual testing regimen for ground and aerial ladder devices for all front line and reserve status aerial towers (ladder trucks).
- 9-10 The Fire Chief must immediately develop and implement a formal, driver training and certification program in compliance with the NFPA standards.
- 9-11 The Fire Chief must develop and implement a protective clothing cleaning and maintenance program that complies with NFPA 1851 *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protection Ensembles, 2008 Edition*.
- 9-12 The Fire Chief should develop and implement a written, respiratory protection program that includes the use, maintenance, and repair of SCBA as well as annual training and recertification for personnel. This respiratory protection program must also include annual, face-piece fit testing for all employees expected to use SCBA (29 CFR 1910.134 *Respiratory Protection*).
- 9-13 The Fire Chief should develop and implement clear and consistent incident management policies and procedures using an “all-hazards” approach and be NIMS compliant.
- 9-14 The Fire Chief must require all fire officers, at a minimum, be certified to the Fire Officer I level (NFPA 1021), Incident Scene Safety Officer, and ICS 200 level (NIMS).
- 9-15 The Fire Chief must require all chief officers at a minimum to be certified to the ICS 300 and 400 levels (NIMS).

- 9-16 The Fire Chief should develop and implement a comprehensive structure fire response procedure that meets the requirements set forth in NFPA 1500 and addresses the use of an initial 2-out team, the transition to a RIT operation, and a process by which a MAYDAY situation is managed.
- 9-17 The Fire Chief should develop and implement a comprehensive personnel accountability system that also integrates the use of mutual aid companies.
- 9-18 The Fire Chief should develop and implement a post-incident analysis policy and procedure that is used for all significant fire/rescue/EMS incidents that occur within the City of Pawtucket.
- 9-19 The Fire Chief must immediately install carbon monoxide detectors in all six fire stations with at least one detector being installed in each sleeping quarters area.
- 9-20 The Fire Chief must immediately ensure that every fire station dormitory is equipped with working smoke detectors in compliance with all state and local codes.
- 9-21 The Fire Chief should ensure that each work site has a commercial grade washer and dryer dedicated to the laundering of station uniforms and personnel clothing. A separate washer dryer must be used for rags and apparatus towels.
- 9-22 The Fire Chief and the Occupational Health and Safety Committee should implement a facility inspection program in compliance with NFPA 1500 and develop a comprehensive plan to bring all work sites into compliance with applicable codes.
- 9-23 The City of Pawtucket, the Fire Chief, and the newly formed Health and Safety Committee should develop and implement an occupational medical plan in accordance with NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments*.
- 9-24 The City of Pawtucket, the Fire Chief, and the newly formed Health and Safety Committee should develop and implement physical fitness program in accordance with NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters*.

- 9-25 The City of Pawtucket, the Fire Chief, and the Health and Safety Committee should develop and implement a medical evaluation program for all active emergency responders that will also include the annual medical assessment for all personnel who are expected to wear SCBA.
- 9-26 The Fire Chief in conjunction with the Health and Safety Committee should review the current policies and procedures and processes regarding the employee assistance program, alcohol and substance abuse policy, and critical incident stress management and identify and implement any changes needed so that the policies are more fire department-based.
- 9-27 The Fire Chief in conjunction with the Health and Safety Committee should develop and implement a fire department infection control program.
- 9-28 The City of Pawtucket, the Fire Chief, and the Occupational Health and Safety Committee should review the National Fallen Firefighter Foundation's Firefighter Life Safety Initiatives in an effort to determine how the initiatives can best be supported or accomplished.

### **COMMUNICATIONS RECOMMENDATIONS**

- 10-1 The City and Fire Chief should immediately consider ceasing the policy of assigning new hire firefighters to Fire Alarm.
- 10-2 The City and Fire Chief should initiate an effort to assign experienced firefighters to Fire Alarm.
- 10-3 The Fire Chief should clarify the chain of command as to who is in charge of Fire Alarm.
- 10-4 The City and Fire Chief should take action to implement closest unit automatic mutual aid dispatching of fire and EMS units.

- 10-5 The City is encouraged to initiate an effort to have area municipalities participate in the conduct of a comprehensive study and proceed to implement a regional public safety dispatch center involving as many other area municipalities as possible, potentially including North Providence, Central Falls, East Providence, Lincoln, Cumberland, Johnston, Smithfield, North Smithfield and Woonsocket.
- 10-6 In the event that a regional public safety dispatch center is not workable the City should consider civilianizing the Pawtucket Fire Alarm full-time professionally-trained emergency dispatchers and with a qualified civilian dispatch director concentrating the uniformed firefighters to the actual provision of fire services.

### **FIRE PREVENTION RECOMMENDATIONS**

- 11-1 The Fire Department should take action to enhance the fire building inspections program by implementing a comprehensive three-tier building inspections program with complete documentation/records maintained.
- 11-2 The Fire Department is encouraged to develop the means for firefighters and officers to enter site information data into a computer program for subsequent access on the network by Fire Alarm, Fire Prevention, and any fire department element needing such information.
- 11-3 The City and Fire Department should consider the reallocation of two firefighter positions to the Fire Prevention Section's inspection staff to implement commercial and industrial building inspections.
- 11-4 The City and Fire Department are encouraged to implement computer support for the site information program, which should be expanded to be a full pre-fire planning program.
- 11-5 The City and Fire Department are encouraged to enhance the fire and life safety programs by involvement, on a part-time basis, of former firefighters with appropriate training to deliver fire and life safety programs.
- 11-6 The City and Fire Department are encouraged to consider various potential regional and/or shared services approaches to the provision of fire prevention functions involving neighboring municipalities.

- 11-7 The City and Fire Department are encouraged to assure that PFD information systems programs within the Fire Department are fully supported with either qualified City or PFD staff or by qualified contract firms.
- 11-8 The City and Fire Department are encouraged, as a fire safety measure, to initiate a progressive effort to deal with the vacant buildings in Pawtucket.
- 11-9 The Fire Chief and senior PFD officers are encouraged to implement an effort to orient all Fire Department staff members as to the importance of fire prevention programs to the overall delivery of fire service delivery by a state-of-the-art fire agency in order for all firefighters and officers to understand that fire service delivery is more than just staffing and responding with fire apparatus.

### **CONSOLIDATION RECOMMENDATIONS**

- 12-1 The City of Pawtucket should consider implementing an appropriate form of fire protection services delivery consolidation with participating surrounding municipalities, potentially including North Providence, Central Falls and East Providence.
- 12-2 The City of Pawtucket should consider implementing an appropriate form of emergency medical services delivery consolidation with participating surrounding municipalities, potentially including North Providence, Central Falls and East Providence.
- 12-3 The City of Pawtucket should consider implementing an appropriate form of emergency dispatch services delivery consolidation or regionalization with participating surrounding municipalities, potentially including North Providence, Central Falls, East Providence, Lincoln, Cumberland, Johnston, Smithfield, North Smithfield and Woonsocket.

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