

**Fire Services  
Organizational Analysis**

**Chatham, MA**

**July 2011**

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**MUNICIPAL RESOURCES INC.**

Services for Effective Government

# Town of Chatham, Massachusetts



## **Fire Services Organizational Analysis July 2011**

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# ***FINAL REPORT***



Municipal  
Resources  
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## **EXECUTIVE SUMMARY**

The Town of Chatham, Massachusetts, covers 24.4 square miles (16.2 square miles consists of land) and has a base, year round population of 6,547. Based upon the seasonal nature of the community, population swells to more than 25,000 residents and visitors during the summer months. As the peak season has elongated over the years, weekends also see a tremendous increase in population. Demographics indicate that Chatham has an older than average permanent resident population. 52% of residences in the community are presently second homes although at least one study indicates a trend toward an increase in primary housing is underway.

The Town is served by a combination fire service organization, composed of 27 full-time personnel, including the Chief of the Department, a Deputy Fire Chief, and a fire inspector. The on-call component of the organization consists of 6 personnel. Availability of on-call personnel for weekday, daytime response is marginal. During our field visits to Chatham we were impressed with the ingenuity of Department members and their willingness to become involved in specialized projects as the organization has evolved. The organization has been carried by the strength and innovation of its personnel who have worked to maximize limited resources and provide a valuable service to the community. Emergency operations are well regarded by the public who feel the Department provides a high quality public safety service. In fact, based on the public meetings that we conducted, three clear themes emerged:

- The community as a whole supports the Department;
- The public does not want to see the level of service diminished; and
- The citizens present indicated they are willing to pay more for reasonable increases in service level.

Although the Department presented as a strong team, it was apparent that the Department as a whole feels a lack of support from and tension with some elected officials.

As the study progressed, seven themes emerged:

- Infrastructure planning for facilities and equipment
- Response times and the level of coverage within the community

- Staffing and deployment of career personnel
- Finance and grants
- Dispatch and communications
- Overtime
- Recruitment and retention of on-call personnel

**This report will concentrate on the following twelve focus areas. These areas can serve as a foundation for action and are discussed more fully later in the body of this report:**

- I. Fire Service Facilities
- II. Fire Service Equipment
- III. Capital Planning
- IV. Deployment of Resources
- V. Staffing and Re-Call of Personnel
- VI. Community Input
- VII. Emergency Medical Services
- VIII. Grants
- IX. Dispatch Operations
- X. Emergency Incident Volume Analysis
- XI. Benchmarking – Comparative Analysis
- XII. Insurance Service Office (ISO) Grading

The real issue facing Chatham is to determine an acceptable level of risk and then define an appropriate level of service for the community. Planned growth of the Department is essential to provide a consistent service level to the community.

During the previous five years, two other studies were conducted relative to fire service deployment and emergency response times. In 2007, a response time study was conducted by The Maguire Group and focused on maximizing emergency response times by the Fire Department, especially to South Chatham. A number of scenarios were explored and rated. This year, the Insurance Services Office (ISO) released their own Distribution Study that analyzed current emergency response data and plotted response time data on a distribution map. The lack of coverage in South Chatham is apparent and was cited.

The 2007 consultant's report explored four options for improving emergency service distribution and recommended a two fire station operation be pursued in the future. The ISO mapping study placed actual responses on a map for analysis. Neither study has resulted in changes to the Fire Department's deployment as of yet. As the Town moves forward, it will need to address both facility and staffing issues if nationally accepted time standards are adopted by Chatham as the acceptable level of community risk.



We considered regional approaches to the staffing and deployment issues, which are discussed in the body of the report.

In Massachusetts, the standard of care based on stroke and cardiac arrest protocols is to have a unit on scene at a medical emergency within six minutes. The National Fire Protection Association (NFPA) Standard 1710 calls for an eight-minute response time for first alarm units for fire calls. These standards have been considered within this study and should be considered by the community as a foundation to determine an acceptable level of service. The recommendations in this report consider both the standard of care and applicable NFPA standards.

Based upon national averages, Chatham should have the following resources:

- 3 pumpers
- 1 aerial ladder
- 2 fire stations

Of note is that Chatham has only six call firefighters, significantly fewer than other communities of Chatham's size who utilize on-call and career forces jointly. The lack of on-call and volunteer personnel is an issue faced by communities across the country. This scarcity of human resources is driven by the following factors:

- A reduction in leisure time
- The need to maintain multiple jobs
- Generational differences
- Increasing training requirements
- The cost of housing in many affluent communities

Although effort should be placed upon the recruitment and retention of on-call personnel, it is not realistic to add dozens of on-call personnel based upon the affluent nature of the community. It would be nearly impossible to find a large number of individuals who wish to pursue this type of part-time employment. An analysis of the 2,489 emergency calls responded to by the Fire Department last year suggests that the Department should be compared to other Massachusetts Fire Departments protecting populations in the 21,000 to 25,000 population ranges. We recommend that the Fire Department apply for several Federal SAFER Act Grants in an attempt to minimize increased permanent staffing costs and to increase the number of call firefighters as well.

In terms of operational safety, we are concerned with the Department's ability to meet the Occupational Safety and Health Administration's *Two-In/Two-Out* rule that requires four firefighters on the scene of an incident prior to initiating an interior fire attack (except to perform a visible rescue). The Fire Chief stresses adherence to the OSHA rule regularly, but our

experience points to fire crews doing what is necessary to get the job done and prevent fire spread with no consideration of either the Federal OSHA Rule or their own safety. Although this is a tribute to the dedication of the Chatham firefighters, it is a dangerous equation that can rapidly result in the serious injury or death of a firefighter.

The National Fire Protection Association's (NFPA) 1710 standard requires a first alarm assignment minimally of thirteen personnel on scene within eight minutes of a reported structure fire, 90% of the time. Chatham presently has five or six personnel on-duty and even with the immediate re-call of off-duty Chatham firefighters and summoning of mutual aid Fire Departments, this standard will be difficult to meet.

With the opening of the new Police Station, the existence of the County Sheriff's Communications Center, and a new Regional Dispatch study by the Barnstable Fire Chiefs Association just beginning, we were asked to review the current dispatcher model in use in Chatham (single civilian in the Police Department and a firefighter in the Fire Department). Across the country, this model has been proven to be an operational risk as a single person can be overwhelmed by a moderate incident or leave an operational gap in the event that the dispatcher becomes incapacitated in some way (medical emergency, slip and fall, etc.). In a community the size of Chatham, two dispatchers should be on-duty at all times. Although this is the case in Chatham, each dispatcher works alone (one at the Police Station and one at the Fire Station) and is at risk. This model should be revisited, not in an effort to save money and reduce personnel, but from the perspective of risk management and better deployment of existing resources.

The Department has a good public image and is well respected for its emergency operations by the average citizen, as we discovered in several community meetings conducted by MRI personnel.

Specifically, a brief overview of the Fire Department analysis would support the following:

- A "south fire substation" staffed 24 hours a day, housing an ambulance, fire pumper, and possibly a brush fire truck (wildland interface unit) to immediately respond to EMS and fire emergencies in South Chatham and beyond.
- The current headquarters station should be replaced and a modern facility should be constructed in its place.
- Appropriate fire service equipment, including a "quint" (a pumper that includes a 75 or 80' aerial ladder), be procured and budgeted in the Town's annual Capital Plan.

- Shift strength should be held at its current level transitioning the current fire dispatcher to staff the sub-station to accommodate the increasing number of emergency responses and the national standards.
- Dispatch operations should be transitioned to a regional platform.
- Efforts should be directed at developing a larger pool of on-call personnel.

### **Top Five Challenges for the Town of Chatham**

1. ***Deciding upon an acceptable level of risk for the community as it pertains to fire, rescue, and emergency medical services.***
2. ***Adopting a long-range capital plan that includes the construction and operation of two fire stations.***
3. ***Adopting a reasonable capital plan for fire service apparatus and equipment.***
4. ***Balance Fire Department staffing among career and call personnel.***
5. ***Determine an appropriate model for dispatching public safety services.***

### **Our Top Five Recommendations**

1. ***A temporary substation should be created and staffed with a minimum of two personnel at the new water treatment facility. Unless interior space can be reconfigured, a trailer should be brought on site to provide living quarters for personnel at this location. This facility should be utilized until a new South Chatham substation can be designed and constructed.***
2. ***Redesign and downsize the headquarters station to consider the implementation of a two-station response model. Based on the intensity of this need, if a Town Meeting has not been scheduled, a Special Town Meeting should be called to fund the redesign and construction of this project.***
3. ***Fill the two vacant firefighter positions and seek federal grants to assist with career and call firefighter staffing of a two fire station model and to control overtime costs.***

4. ***Dispatch operations should be transferred to a regional center and the firefighter that presently performs dispatch duties be reassigned to emergency response as rapidly as possible.***
  
5. ***Purchase a “quint” fire apparatus (pumper and aerial combination) and seek a new pumper through a federal FIRE Act grant.***

## **SYNOPSIS OF RECOMMENDATIONS**

In an effort to provide the best possible organization, we have listed all of the recommendations that are contained in the body of the report:

### **I. Fire Service Facilities**

- I.1 Recommendation: Dispatch operations should be transferred to a regional center and the firefighter that presently performs dispatch duties be reassigned to emergency response as rapidly as possible.***
- I.2 Recommendation: A temporary substation should be created and staffed with a minimum of two personnel at the new water treatment facility. Unless interior space can be reconfigured, a trailer should be brought on site to provide living quarters for personnel at this location. This facility should be utilized until a new South Chatham substation can be designed and constructed.***
- I.3 Recommendation: Redesign and downsize the headquarters station to consider the implementation of a two-station response model. Based on the intensity of this need, if a Town Meeting has not been scheduled, a Special Town Meeting should be called to fund the redesign and construction of this project.***
- I.4 Recommendation: Funding for the construction of a permanent substation on the lot at Main Street and Meetinghouse Road should be brought to the Fiscal 2013 Town Meeting.***
- I.5 Recommendation: A contingency plan should be developed to abandon the current headquarters should the building deteriorate further.***

### **II. Fire Service Equipment**

Recommendations pertinent to this section are contained under the Capital Planning section of this report.

### **III. Capital Planning**

- III.1 Recommendation: Consolidate the replacement of the 1986 fire pumper with the request for an aerial ladder. Purchase a "quint" unit that has a 75 -80' aerial ladder and is configured as a fire pumper in Fiscal 2013.***

- III.2 Recommendation: The procurement of the “quint” mentioned above should be funded at the Fiscal 2013 Town Meeting. A Federal FireAct Grant application for this unit should also be pursued during the 2011 grant period, which will open in July of this year. If the FireAct Grant application is successful, then the Fiscal 2013 capital project can be cancelled.**
- III.3 Recommendation: Move the replacement of the command vehicle into Fiscal 2013 and adjust the request to reflect current state bid pricing.**
- III.4 Recommendation: Adjust the amount request for several projects to be fiscally realistic in terms of ability to accomplish the project goal.**
- III.5 Recommendation: Replace the 1989 fire pumper in 2014, after twenty-four years of service. A FireAct Grant Application for a “pumper-tanker” should be pursued first.**
- III.6 Recommendation: Eliminate projects that do not meet the definition typically utilized in the public sector for capital projects. These projects should be funded through an adjustment within the Fire Department’s Capital budget.**

#### **IV. Deployment of Resources**

- IV.1 Recommendation: Hire two firefighter paramedics to bring the number of personnel assigned to each shift to six members.**
- IV.2 Recommendation: Set the minimum shift strength at a level of six personnel during the peak summer season and at a level of five personnel during the remainder of the year.**
- IV.3 Recommendation: In 2011, apply for a Federal SAFER Grant to hire four firefighter paramedics.**
- IV.4 Recommendation: If the SAFER Grant is awarded, raise the minimum staffing to a level of six personnel year round and set the assigned shift strength at a level of seven personnel.**
- IV.5 Recommendation: Reduce the number of times a third EMT accompanies the ambulance on a on a patient transport. This retains staffing for another emergency, for compliance with OSHA Two-In/Two-Out and reduces overtime.**
- IV.6 Recommendation: Impact bargain the reduction of recall to maintain the availability of four personnel (OSHA Two-In/Two-Out) for secondary responses.**

- IV.7 Recommendation: The Chatham Fire Department should conduct a comprehensive and formal training needs assessment for the purpose of determining training program priorities. Part of this needs assessment should be an initial evaluation of the current basic skills proficiency of ALL Department personnel.**
- IV.8 Recommendation: Based upon the results of the needs assessment, the Chatham Fire Department should take additional steps to develop a comprehensive training program that addresses, but is not limited to, mandatory OSHA training, recommended NFPA training, every operational mission and responsibility of the Department, and specialized training and personnel/officer development. The training should comply with accepted and/or recommended practices and standards, should include standardized evolutions, and should be consistent with Chatham Fire Department's operations and procedures.**
- IV.9 Recommendation: Formal training of some type, lasting a minimum of one hour, should be mandated to take place on every duty day, on every platoon. If necessary, personnel can swap off response assignments for training purposes to insure, as much as possible, that all personnel get to complete the training. Additional daily opportunities for training can be found during related activities such as daily/weekly apparatus and equipment inspections, and building pre-planning activities.**
- IV.10 Recommendation: Additional, high intensity training on various subjects, including periodic live fire training, should be conducted on at least a semi-annual basis (with quarterly being preferred), off duty at a formal fire academy where appropriate training facilities, structures, and props are available. This training should be mandatory for all personnel.**
- IV.11 Recommendation: All training that is conducted, no matter how brief, or inconsequential it may seem, MUST result in the completion of a formal training report. A formal operational procedure on the completion of training reports should be developed. The training module of a comprehensive fire department management data base program should be utilized for completion of training reports and to assist with the development of a training data base, keeping track of certifications, and related lapse dates, etc.**
- IV.12 Recommendation: The Chatham Fire Department should develop a training file for each member that is kept in the Training Division and can provide a supplement to the member's main personnel file. The training file should, at a minimum, include all course completion certificates, professional certifications,**

*skills performance evaluation sheets and reports, and an annual summary of completed training.*

- IV.13 Recommendation:** *As part of the development of a new comprehensive training program, the Chatham Fire Department should implement periodic skills proficiency evaluations for ALL uniformed Department personnel. These proficiency evaluations, consisting of standardized evolutions, can be based upon recognized standards and benchmarks, in conjunction with performance criterion and benchmarks, established through evaluation of and based upon, Chatham Fire Department's operations and procedures.*
- IV.14** *In order to assist with the large amount of training that needs to be done and in recognition of their important role in the delivery of training and the success of the program, the Chatham Fire Department should provide fire instructor training, along with subsequent certification, for any members of the Department who wish to take it. All Lieutenants should be formally certified at a minimum of Fire Instructor Level I, and all Captains and the Training Coordinator should be certified as Fire Instructor Level II. These certifications should be made a job requirement.*
- IV.15 Recommendation:** *The Chatham Fire Department should continue development of, and implement, a formal officer training and development program. There are several excellent programs available including from the International Association of Fire Chiefs and the Phoenix, Arizona, Fire Department. This program can also include bringing well-known fire service experts and instructors to Chatham to provide training for the officers and firefighters who may aspire to be officers. The Department should further seek to require its officers to obtain a certain level of fire officer certification as a job requirement such as Fire Officer I for Lieutenant, Fire Officer II for Captain, and Fire Officer Level III for Deputy Chief and Chief*
- IV.16 Recommendation:** *The Chatham Fire Department should enhance the level of Incident Management training provided to the members of the Department. In addition to the basic I-100/I-700 training mandated, all members of the Department should be trained to the I-200 level. All Lieutenants and Captains should be trained at the I-300 level and the Deputy Chief and Chief should be at the I-400 level.*
- IV.17 Recommendation:** *The Chatham Fire Department should encourage personnel to seek additional training on their own, and to the financial and practical extent possible, send personnel to outside training opportunities such as the Firehouse Expo in Baltimore and the Fire Department Instructors Conference in Indianapolis. Information gained at this training can then be brought back and*

*delivered to other members of the Department. Training reports should be completed for all of this training, and copies of any certificates earned should be placed in the member's personnel and training files. A dedicated training board should be placed in the station where upcoming training opportunities can be posted for all personnel to review.*

**IV.18 Recommendation:** *The Chatham Fire Department should make a concerted effort to send as many officers as possible to the National Fire Academy. The Training Coordinator and EMS Coordinator should be enrolled in the Academy's Management of Training Programs and Management of Emergency Medical Services courses respectively. Any officers who meet the admissions criterion should be encouraged to enroll in the Academy's Executive Fire Officer Program. Again, training reports should be completed for any NFA training and copies of certificates placed in the personnel and training files.*

**IV.19** *The Chatham Fire Department should seek annual funding in the training budget to upgrade its training resources such as manuals, DVDs, and subscriptions to other available training resources.*

**IV.20 Recommendation:** *The Chatham Fire Department should, as part of its written communications system, develop Training Bulletins, which would be issued to serve as reference with regard to tested and approved methods of performing various tasks, and Safety Bulletins, which should be issued to serve as references with regard to general and specific safety and health issues.*

**IV.21 Recommendation:** *The design of the new headquarters station for the Chatham Fire Department should include a dedicated area for classroom training to be conducted. The training area should, at a minimum:*

- *Be capable of seating a minimum of 40 to 50 people;*
- *Be located in such a way as to minimize distractions from other activities going on the station;*
- *Be comfortable, bright, and well lit;*
- *Be configured in such a way as to accommodate traditional lecture instruction, small group exercises and activities, and practical activities such as EMS skills practice;*
- *Be equipped with the most up to date, technologically advanced multi-media capabilities; and*
- *Have Internet access and have interactive capabilities.*

**IV.22 Recommendation:** *The design of the new headquarters station should also include an area where common, hands on, practical training evolutions can be*

*accomplished such as advancing hose lines, raising and climbing ladders, and hoisting tools and equipment. This area should also be conducive to conducting some limited technical rescue training evolutions.*

## **V. Staffing and Re-Call of Personnel**

- V.1 Recommendation: Set a realistic goal of expanding the number of on-call personnel to a level of twelve over three years.***
- V.2 Recommendation: Apply for a Federal SAFER Grant for on-call recruitment and retention. This grant should be utilized to develop a marketing program and provide incentives to on-call personnel such as tuition reimbursement.***
- V.3 Recommendation: Develop a more active on-call recruitment program led by the Deputy Fire Chief. This program should consist of mailings to all residents, public outreach through the media, and an active and visible presence within the high school.***
- V.4 Recommendation: Formalize the internship program that has been initiated and offer to host two interns per semester.***

## **VI. Community Input**

This section provides perspective and no specific recommendations were developed for this chapter.

## **VII. Emergency Medical Services**

- VII.1 Recommendation: Evaluate the need for the third EMT on all transports to a medical control facility. Return this third person back to a fire station for situations determined to be non-critical by the Medical Director. This will create more availability to staff simultaneous calls quicker and at less expense.***
- VII.2 Recommendation: If available, a third EMT should respond to all medical calls to assist the ambulance crew with logistics and lifting, thus preventing back injuries. This firefighter should remain in service and available to respond to other calls unless the patient's condition warrants an extra attendant as outlined above.***
- VII.3 Recommendation: The Town should continue to push for a regional facility on the lower Cape which could serve to handle some of the less severe medical***

*emergencies so that ambulances do not have to be tied up responding to CCH and then back to Chatham in the same manner they do now.*

**VII.4 Recommendation:** *Should there be maximum staffing of seven personnel on-duty due to a SAFER grant award (or some other cause), more medical monitoring of citizens, especially the elderly, could be provided by the Department on a programmed basis.*

**VII.5 Recommendation:** *The Town should consider adjusting ambulance-billing rates to a level of Medicare plus 75%.*

## **VIII. Grants**

**VIII.1 Recommendation:** *Seek external assistance in the development of Federal FireAct and SAFER Grant Applications.*

**VIII.2 Recommendation:** *During the 2013 grant period, apply for a grant for \$645,000 to replace the 1989 Tanker/Pumper.*

**VIII.3 Recommendation:** *In 2014, apply for a FireAct grant for sixteen sets of Self-Contained breathing Apparatus (SCBA) in the amount of \$80,000.*

## **IX. Dispatch Operations**

**IX.1 Recommendation:** *The Town of Chatham and the Chatham Police Department should immediately implement, and strictly enforce, a policy that requires the police department dispatcher to immediately forward the 9-1-1 caller and screen to the Fire Department dispatcher for EVERY incident that involves an actual, or potential, fire, rescue and/or medical emergency of any type allowing direct communications between the Fire Department dispatcher and the emergency caller. In addition, implementation and enforcement of this policy will facilitate the immediate dispatch of the appropriate resources to handle the emergency without the delay of the police investigating the situation first to determine need.*

**IX.2 Recommendation:** *The Town of Chatham should seriously consider transferring fire, rescue and emergency medical service dispatch operations from the Chatham Fire Department to the Barnstable County Sheriff's Office Dispatch Center as soon as funding can be appropriated for start-up costs and necessary contracts and agreements can be developed and executed.*

- IX.3 Recommendation:** *If the study currently being conducted by Barnstable County for the Barnstable County Fire Chiefs Association determines that a dedicated, county wide fire, rescue and EMS dispatch center is feasible and warranted, and, appropriate start up grant funding is obtained, the Town of Chatham should give serious consideration to participation in that endeavor from its inception.*
- IX.4 Recommendation:** *If the Town of Chatham decides to move fire, rescue and EMS dispatch operations to another agency, the minimum number of on-duty firefighters **SHOULD NOT** be reduced and should be maintained at the current five off season and six in season.*
- IX.5 Recommendation:** *If the Town of Chatham decides not to transfer fire, rescue and EMS dispatch operations to county dispatch **AND** a second station is constructed to provide adequate protection and response times to the South Chatham area, then minimum staffing will need to be increased by a minimum of one person per shift to accommodate adjusted staffing deployment for the second station.*
- IX.6 Recommendation:** *If the Town of Chatham decides to transfer dispatch operations to county dispatch, they should seek the most cost effective solution possible for a station alerting system in the existing fire station as it is anticipated that station will be replaced within a few years.*
- IX.7 Recommendation:** *Once fire, rescue and EMS dispatch operations are transferred from the Chatham Fire Department to another appropriate agency, the Chatham Fire Department procedure on paging/recalling off duty personnel should be revised to reflect the availability of an additional on-duty firefighter for immediate response, and reduce the circumstances/instances when additional off duty personnel are summoned, on overtime, to assist with providing station coverage.*

## **X. Emergency Incident Volume Analysis**

This section provides operational perspective and contains no additional recommendations.

## **XI. Benchmarking – Comparative Analysis**

- XI.1 Recommendation:** *Overtime should be reduced by restructuring recall procedures and optimizing shift float thus decreasing the need to hire personnel on overtime.*

**XI.2 Recommendation: The Department should be recognized for doing an exceptional job in limiting fire dollar loss within the community.**

**XI.3 Recommendation: The walk-in medical program is a source of pride for the Department and has become a community expectation. This program should continue and should not prohibit the transition to a regional dispatch operation.**

## **XII. Insurance Service Office (ISO) Grading**

**XII.1 Recommendation: Alter response patterns to dispatch two units to an alarm of fire in a structure.**

**XII.2 Recommendation: Conduct hose testing on an annual basis and maintain appropriate records.**

**XII.3 Recommendation: Record all emergency telephone lines even if the dispatch center is relocated. As the present recorder does not fully function this unit should be replaced immediately, a new unit could be easily transferred into the new headquarters once construction is complete.**

## GLOSSARY OF TERMS

**Accountability System:** A system used on the fireground or incident scene to methodically track the location of personnel operating at that location.

**ALS – Advanced life support:** refers to pre-hospital interventions that can be brought into the field by paramedics. Typically, this service level includes the ability to bring much of the emergency room capability to the patient. Paramedics can administer intravenous fluids, manage a patient's airway, provide drug therapy, utilize the full capabilities of a twelve lead cardiac monitor, and provide a vital communication link to the medical control physician who can provide specific medical direction based on the situation.

**BLS – Basic life support:** refers to pre-hospital interventions that can be brought into the field by basic level emergency medical technicians (EMTS). This would include semi-automatic cardiac defibrillation, oxygen administration, patient assessment, and stabilization.

**CAAS:** Commission on the Accreditation of Ambulance Services.

**Calendar Year:** The twelve-month period from January to December within a given year.

**Capital Project:** A project with a cost that exceeds \$10,000 and the asset being procured has a life span of at least five years.

**Cross Staffing:** A fire service practice of assigning personnel to multiple emergency response vehicles. As an example, these personnel may staff both an ambulance and an engine. They would respond to whichever call comes in first, if it was a fire call the engine would respond and the ambulance would then be placed out of service until the fire call was concluded. Although a common practice, service is provided on a first come first serve basis as a risk management strategy.

**EMD:** Emergency Medical Dispatch, a systematic program of classifying emergency medical calls by severity and providing callers with pre arrival instruction.

**EMS:** Transport based emergency medical services which often include the ability to deliver advanced life support.

**EMS Revenue:** The income generated primarily from insurance companies for providing transport based emergency medical services to the community.

**FireAct Grant:** The annual competitive grant program administered by the Federal Emergency Management Agency. This program provides funding for emergency response vehicles, safety equipment, training, minor fire station renovations, and the development of regional activities

**Fiscal Year (FY):** The 12-month period from July – June within a given year. Most municipal budgets are based upon a fiscal year rather than a calendar year.

**ICMA:** The International City/County Management Association

**Incident:** An event requiring the response of fire service resources.

**Incident Volume:** The total of fire suppression and emergency medical response demand for a given period of time.

**Industrial/Residential Mix:** The percentage of industrial or commercial property compared to the number of residential dwellings in a community.

**IOD:** Injured on duty status. This is a status provided to firefighters injured in the line of duty under Massachusetts General Law Chapter 41, Section 111F.

**ISO:** Insurance Services Office fire protection rating schedule. This is a number ranging from 1-10 that provides a perspective on the fire protection capabilities of an organization. One is the best possible score, while 10 indicates no substantive protection exists.

**Long-term Absence:** An absence from a scheduled shift for a period of more than two weeks.

**Medicare Rate:** The rate that Medicare will pay for emergency medical interventions and transportation. This is typically well below the market rate and has become a standard foundation to base ambulance service rates upon.

**NFPA:** The National Fire Protection Association (NFPA) is an international organization that develops professional consensus based standards for the fire service. This organization is based in Quincy, Massachusetts.

**NFPA 1710:** The NFPA Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.

**NFPA 1500:** The NFPA Standard on Fire Department Occupational Safety and Health Programs.

**NFIRS:** The National Fire Incident Reporting System.

**Officer:** A first line supervisor (Lieutenant) or shift Commander (Captain).

**OSHA:** The Occupational Safety and Health Administration

**Quint:** A piece of fire apparatus that is outfitted was a pumper but also has a junior aerial ladder, typically 75-85 feet. This concept allows the rapid deployment of a unit that can quickly effect rescue and produce the best possible firefighter safety.

**Response Time:** The time elapsed from when an emergency call is received until fire emergency responders arrive on the scene of an event. Typically, this includes both dispatch process and turnout time.

**SAFER:** The Federal Staffing for Adequate Fire and Emergency Response grant program.

**Shift Float:** The difference between the number of personnel assigned to a work group less the number of personnel required to maintain the minimum operational shift strength selected.

**Target Hazard:** A structure that based on occupancy, construction, or location creates a higher than average fire protection risk to the community. Examples of target hazards are nursing homes, hospitals, corrections facilities, large commercial complexes, industrial facilities, and facilities that utilize hazardous materials.

**Technical Rescue:** Special rescue operations requiring unique training and equipment. Examples of technical rescue operations are trench and building collapse.

**Turnout Time:** The time from when the fire department is alerted to respond to an incident until the responding unit leaves the fire facility. Typically, this is approximately 90 seconds.

**Two-In/Two-Out:** The OSHA rule (1910.134) relative appropriate respiratory protection and commencing safe operations on the fireground.

## **PURPOSE, SCOPE, AND METHODOLOGY**

MRI (Municipal Resources, Inc.) was engaged by the Town of Chatham, to review the operation of the Fire Department, to determine how it compares to contemporary fire service practices, and to assess the need for both staff and facilities. We have attempted to produce a report containing recommendations that will assist the Department and the Town to set a clear course of action for future improvement.

### **Our Objectives**

- To help municipalities and agencies obtain maximum value for limited tax dollars;
- To raise public awareness of the value and professionalism of their municipal resources; and
- To help local leaders develop and execute plans that best meet their community's needs, given available resources.

### **Scope of Work**

The work contemplated herein is designed to assist the Fire Department in its desire to provide the highest level of service, according to National Standards, to all its residents, balanced with reasonable, effective costs for personnel, equipment, and related benefits. Accordingly, the study will review and address the following Department issues:

1. Developing and/or reviewing and modifying a Capital Plan, including assessment of equipment;
2. Operational deployment of resources, including assessment of station location(s) and response time;
3. Developing a master plan that meets the community's present needs and presents a risk management strategy; and
4. Plans for a strong partnership between the community and the emergency services organizations into the future.

The scope of this project will include the following actions and methodologies:

- All recommendations for improvement will be based on ISO, NFPA, CFAI (Commission on Fire Accreditation International), CAAS (Commission on

Accreditation of Ambulance Services), nationally accepted standards, and administrative regulations.

- Recommendations on the optimum organizational structure for delivery of fire, rescue and emergency medical services in the Town for the immediate and five-year time frame. Our report will include recommendations regarding the potential for cost savings or consolidation of functions, if needed.
- Analysis of the fire, rescue, and emergency medical services shall include system strengths and weaknesses and analysis of responders for appropriate certification and mandated training compliance.
- An analysis of current reporting methodology employed and reliability of statistical information.
- An analysis of administration, staff and supervisory structures, and personnel assignments including response methodology.
- An analysis of the cost allocation for personnel, equipment, supplies, etc. for various functions of the Department.
- A review of current recruitment and retention programs and recommendations for enhancements.
- Training program analysis to include review of current training levels, training facilities, and equipment.
- Health and Safety program analysis to include current safety programs, accident review, wellness, and medical surveillance.
- Analysis of dispatch and communications functions and capabilities with recommendation for areas of potential improvement.
- Analysis of existing equipment, serviceability, needs, and excesses.
- Analysis of the location of existing fire stations, and type of the facility needed to best serve the Town in the future, if any. Consideration of consolidating locations will be made during our review, if needed.
- Analysis of services and their response readiness for potential terrorist activity, if desired.

- Analysis of comparable agencies and “best practices” in an effort to determine benchmarks that will assist in the planning process.
- Development of a set of recommendations and related action plan to be considered by the municipality for the delivery of quality fire suppression, emergency medical, emergency management, and civil defense services in a cost-effective manner so as to best serve the Town over the next decade or so.
- A review of potential sources of additional state and federal funding.
- Analysis of the utilization of advanced state-of-the-art technology, including automated data processing and procedures, and other technology capable of enhancing fire productivity and effectiveness.
- Development of task groups that logically group and prioritize recommendations. This strategy is essential as it allows the employees to become involved and through their efforts provides a foundation for positive change.

#### **Fire and Rescue Services Specifics**

- Fire station location analysis to include: consideration of response times, Insurance Service Office (ISO) and National Fire Protection Association (NFPA) considerations, staffing, future growth and development.
- Vehicle usage analysis, including the type of equipment for fire and rescue service based on nationally accepted practices and its appropriateness for response to the community. This analysis will include a review of the current condition and maintenance of the major apparatus and equipment with a consideration of a future replacement program.
- Evaluation of the degree to which the Department's goals and objectives are being met.
- Evaluation of the organizational and command structure of the Department.
- Review of state mandated training compliance and the Department’s in-service training program
- Analysis of hazardous materials response, including the current level of response, associated costs, conformance with appropriate codes, cost recovery and any alternate considerations.

- Analysis of firefighting and rescue capability response, including a review of the current firefighting response and any alternate considerations. The review will include structural firefighting, wildland firefighting, rescue capabilities, and any specialized considerations such as technical rescue.
- A review of the past ratings, current conditions, and any potential improvements that can be made with associated costs compared to benefits as they pertain to the Insurance Services Office (ISO) rating system. The Town recognizes the potential variances in point assignments by ISO and agrees to relieve the consultant of any responsibility for the actual numerical assignment provided in the future.
- A review of existing apparatus – development of an immediate, short and long-term capital plan with associated cost estimates.
- A review of response methodologies and response times and operational procedures.
- Public education activities and any cost recovery recommendations associated thereto.
- A comparative study of fire loss statistics among similar communities.
- Evaluation of risk management and liability issues.
- A review of incident reporting and record keeping.

### **Communications Services**

- A review of operational procedures.
- A review of physical facilities, equipment, and technology.
- A review of computer aided dispatching utilization.
- Evaluate communication at five moderate-to-significant incidents.

### **Fire Prevention Services**

- Analysis of fire prevention, to include the manner in which plans are reviewed, as well as public education activities that are conducted.

- A review of fire codes and ordinances to provide assessment of the adequacy of regulation of fire hazards.
- A review of the enforcement/investigative organization and procedures as they exist and suggest recommendations for improvements where appropriate.
- A study of statutory mandates for service as compared to services actually delivered; assess and report as to the liabilities that would attach to shortfalls in meeting legislative mandates of annual inspections.
- Suggestions for any cost recovery practices that seem appropriate.

### **Methodology**

There were fifteen major work elements involved in this review. These are:

1. A review of compiled data regarding key fiscal and operational aspects of the Department.
2. A review of standard operational procedures (SOPs) of the Department.
3. A fiscal analysis of current spending and previous trends in the amount of overtime caused by the replacement of personnel.
4. A thorough tour of the community to gain a sense of the physical environment, the primary fire and life safety risk exposures and the location of population and commercial centers in relation to existing facilities.
5. A target hazard analysis based on the unique tourist and seasonal aspects present within the Town of Chatham.
6. Interviews with key individuals including the Board of Selectmen, Fire Chief, Department Members, Fire Prevention Officer, Police Commander, members of the Capital Planning Committee, and multiple focus groups of interested citizens, including by telephone and e-mail.
7. Literature review and Internet based research.
8. Response time trials.
9. Evaluation of two regional dispatch options.
10. A review of facilities and equipment.

11. A review of response time statistics.
12. Develop a summary benchmarking analysis using national norms and practices of eight other Massachusetts communities. This analysis compared thirty-three data points.
13. Consider alternate station locations.
14. Meet with Area Fire Chiefs, including a discussion relative to the recent Barnstable County Fire Chiefs dispatch study grant from the Commonwealth of Massachusetts.
15. Review federal grants.

To address the scope of this project, members of the study team held an initial orientation meeting with Town officials and the Fire Chief by telephone (travel thwarted by a major snowstorm). In partnership with them, they gathered a variety of statistical information and data on the Department. MRI consultants also performed several days of on-site work, interviews, and observations in Chatham.

We investigated areas such as the command structure, chain of command, span of control, recruitment, selection and training, budgeting, staff recall, service demand, fire prevention services, the deployment of personnel, the communications and data processing functions, internal discipline, working relationships with other persons and agencies, responsiveness, internal regulations, facilities and equipment, and compliance with various state and federal regulations.

Following the on-site visits, the data collected and observations made were subjected to analysis by the project team, both individually and collectively. The information was then compared with contemporary fire service and public safety practices, in order to formulate the recommendations contained in this report.

We would be remiss in not thanking the people of the Town of Chatham who demonstrated their concern in person, by telephone, and e-mail to us to the Board of Selectmen, Chatham Police, Fire Chief Ambriscoe, Deputy Chief Hunter, and the entire staff of the Chatham Fire Department who were most cooperative and helpful in assisting us in carrying out our work.

## THE STUDY TEAM

The following MRI personnel participated in the study:

### ***Project Manager:***

**Brian P. Duggan** now commands the Fire Department in the City of Northampton, Massachusetts, where he has instituted substantial changes to modernize the entire department including equipment, facilities, personnel, training and organizational structure. He formerly commanded the Northborough, Massachusetts Fire Department, and has significant experience with the Massachusetts Department of Fire Services where he held several key positions. He also developed and directed the Graduate and Undergraduate Fire Science Programs at Anna Maria College in Paxton, Massachusetts, from 1995 - 2003. Chief Duggan has a Business Management/Fire Science degree from Providence College, and a Masters Degree of Business Administration (MBA) from Nichols College in Dudley, Massachusetts. He is also a graduate of the National Fire Academy's Executive Fire Officer Program, and is one of only a few fire service professionals to be designated as a Chief Fire Officer by the Commission on Fire Accreditation International. Chief Duggan also leads the Massachusetts fire service through his affiliation as Chairman of the Fire Chief Association of Massachusetts Technology Committee and as a Regional Director on the Massachusetts State Fire Mobilization Committee. In addition, he has authored several publications inclusive of writing Section 7, Chapter 3, "*Fire Department Information Systems*" in the Nineteenth Edition of the National Fire Protection Association's Fire Protection Handbook.

### ***MRI Associates:***

**Keith E. Hoyle** has served as a Fire Chief in two Massachusetts communities and has extensive fire prevention and safety experience through his years of working within the University of Massachusetts Environmental Health and Safety program at the University of Massachusetts Amherst. Keith served as Fire Chief within the Town of Franklin from 1994–1999, and served as the Fire Chief in the Town of Amherst, Massachusetts from 1989 - 2009. Keith offers a Masters degree in Fire Administration from the University of New Haven and is a graduate of the National Fire Academy's Executive Fire Officer Program. Keith has also worked as a consultant for Bennett Associates and has delivered several promotional assessment centers. Most recently, Keith has worked in the fire apparatus industry.

**Peter J. Finley, Jr.** most recently served as Chief of the Winslow Township Fire Department in New Jersey, where he was responsible for the planning, establishment, and initial deployment of the career component of the department. He previously served for 4 ½ years as the Chief of Department for the City of Vineland, New Jersey Fire Department where he initiated significant changes within the department including updating and modernizing equipment, providing the department's first ever formal officer training, and significantly increasing the capabilities of the regional hazardous materials response team. During his tenure, the department received more

than one million dollars in various grants. He formerly commanded the Vineland Rescue Squad gaining significant EMS operations and command experience, as well as completing an overhaul of that organization's operations. Chief Finley serves as an Adjunct Professor in the Fire Science Program at Camden County College. Chief Finley received his Associate in Applied Science degree from Atlantic Community College in New Jersey, and earned his Bachelor of Science degree in Fire Science/Administration from the University of Maryland. He is a graduate of the National Fire Academy's Executive Fire Officer Program, earning perfect scores on three of his four Applied Research Projects. He was awarded an Outstanding Research Award for his 2002 paper titled, "Residential Fire Alarm Systems: The Verification and Response Dilemma". Chief Finley holds nearly two dozen state and national certifications and is a member of a number of fire service organizations, including achieving the prestigious Chief Fire Officer designation from the Commission on Fire Accreditation International. He is a member of a number of fire service organizations and is currently serving as President of the New Jersey Career Fire Chiefs Association where he has been involved in the development and administration of fire service promotional examinations. From 2003–2005 he served on the Training and Education Committee of the Governor's Fire Service and Safety Task Force. He also previously served on the state committee that developed New Jersey's first Firefighter I Instructor Manual.

## RECOMMENDATIONS

As we developed the report we produced a series of 58 recommendations that are detailed in the following pages.

Recommendations shaded in gray have been listed earlier in the document and are duplicated for the purpose of reference.

### **I. Fire Service Facilities**

Chatham has two fire facilities presently: the 1952 Headquarters structure on Depot Road and the 1934 “garage” on Route 28 in South Chatham, which is not staffed. Interestingly enough, the location of these two facilities almost is optimal for the efficient delivery of EMS, fire and rescue services for the citizens of Chatham. The condition of these facilities, however, impedes the efficient delivery of services to Chatham’s citizens. Specifically, the current headquarters station hampers efficient and effective emergency operations. The replacement of this facility should be immediately pursued even if that requires calling a Special Town Meeting to approve funding for redesign and subsequent construction. Typically, fire service facilities are built envisioning a fifty-year life span. Given this industry norm, both facilities have outlived their useful life expectancy and deterioration of these structures is evident.

The significant issues at the current headquarters facility produce an impediment to operations based on a lack of space and the presence of utility, infrastructure, and personal safety issues. In fact, the issues noted by the study team parallel the issues found within facilities that have outgrown the operations of the organization. Specific facility issues exist within the following general categories:

- Insufficient apparatus space
- Utility issues within the structure
- Insufficient training and personnel space
- Lack of appropriate decontamination and personnel protect gear storage areas
- Insufficient office and administrative space
- Potential structural and utility deterioration
- Lack of records management space



**Figure 1 - 1952 Headquarters Station**

The space issues present at the current headquarters facility are documented in the following images that provide examples of the safety and operational challenges present within the current facility:









The South Chatham Station is a small single bay garage housing spare equipment. It lacks proper space for this equipment, as there is insufficient room for the garaging of modern apparatus and ambulances. In a functional fire station, there needs to be space for diesel exhaust removal systems and room for firefighters to check equipment located within compartments on the apparatus, as well as allowances for safety when operating in and around the large trucks. There is no working, living, or office space for firefighters to staff equipment in daylight hours, let alone think about overnight situations.



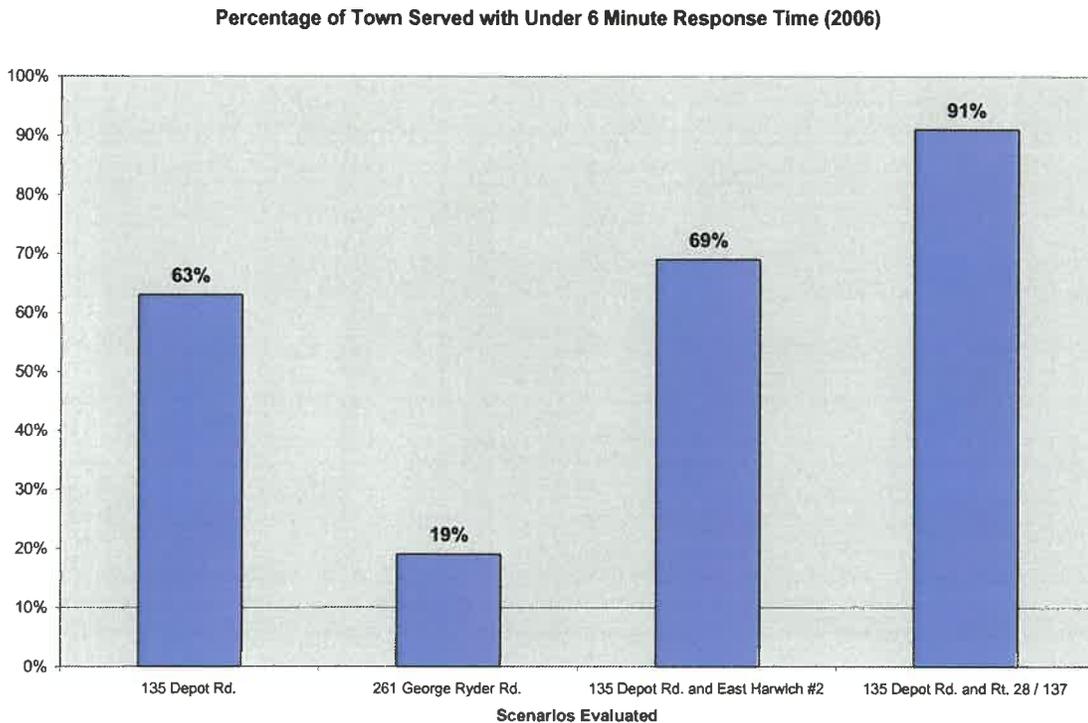
**Figure 2 - 1934 Equipment Storage Substation**

Approximately 25% of all emergency calls are generated in the South Chatham area and without a staffed station in the vicinity, most of these calls are outside the nationally recognized standard of arrival of ambulances in six minutes or fire trucks in eight minutes. With a staffed South Chatham Station and a staffed Headquarters Station, approximately 91% of the Town can be reached in the six to eight minute timeframe. Presently approximately 63% of the Town is serviced within the acceptable timeframe.

The current headquarters facility no longer fits the needs of the Town and presents several operational challenges to the Department. As we reviewed the facility, our observations validated the need to immediately replace this facility.

## Station Location

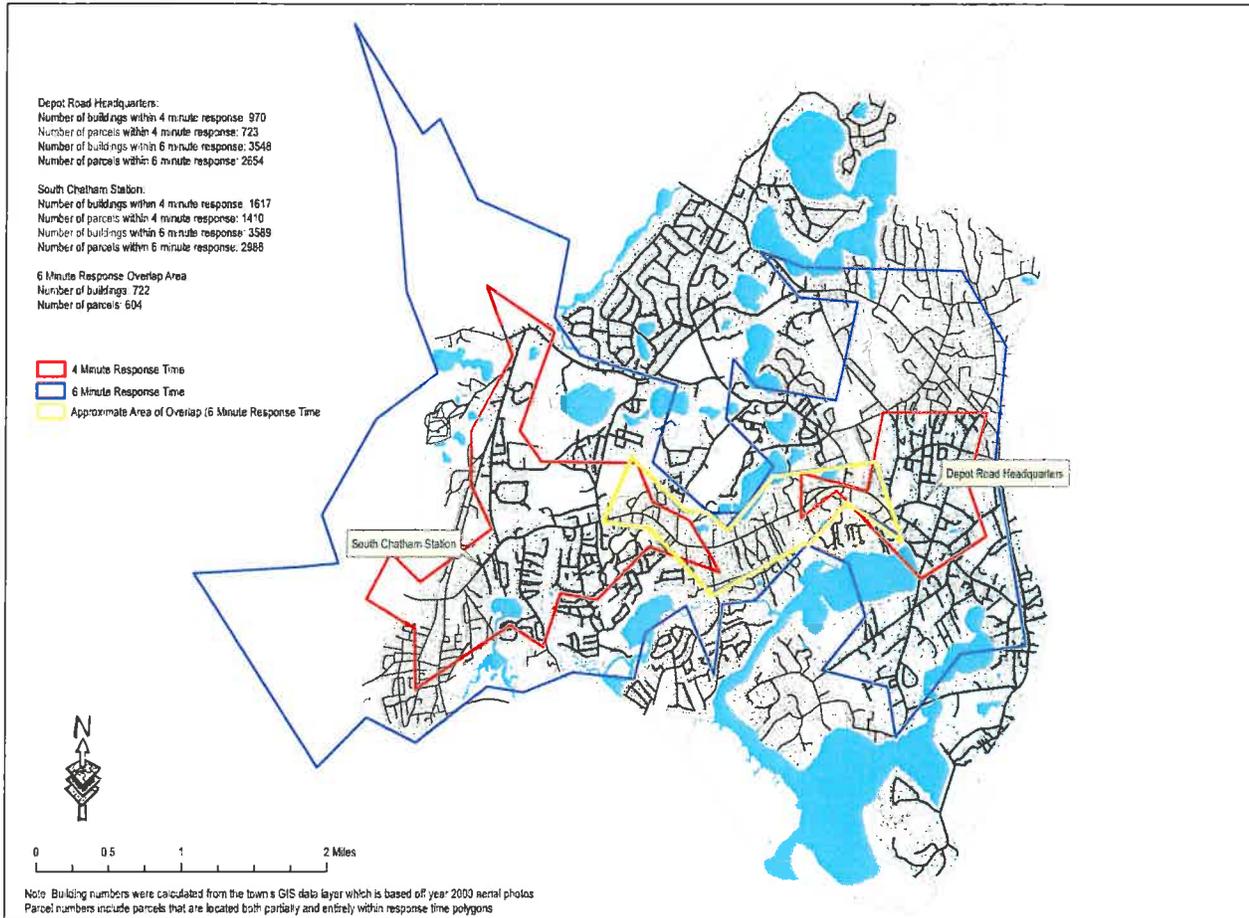
Based upon a review of response travel time and incident volume our team rapidly determined that the Town of Chatham was not well served by a single station model. We then considered several options that are based upon the response time standards associated with NFPA 1710, the CAAS Emergency Medical Service Standards, and the response time standards set by medical directors within the Commonwealth of Massachusetts. Based on a 2006 response time study, 63% of the community would receive a response in less than six minutes.

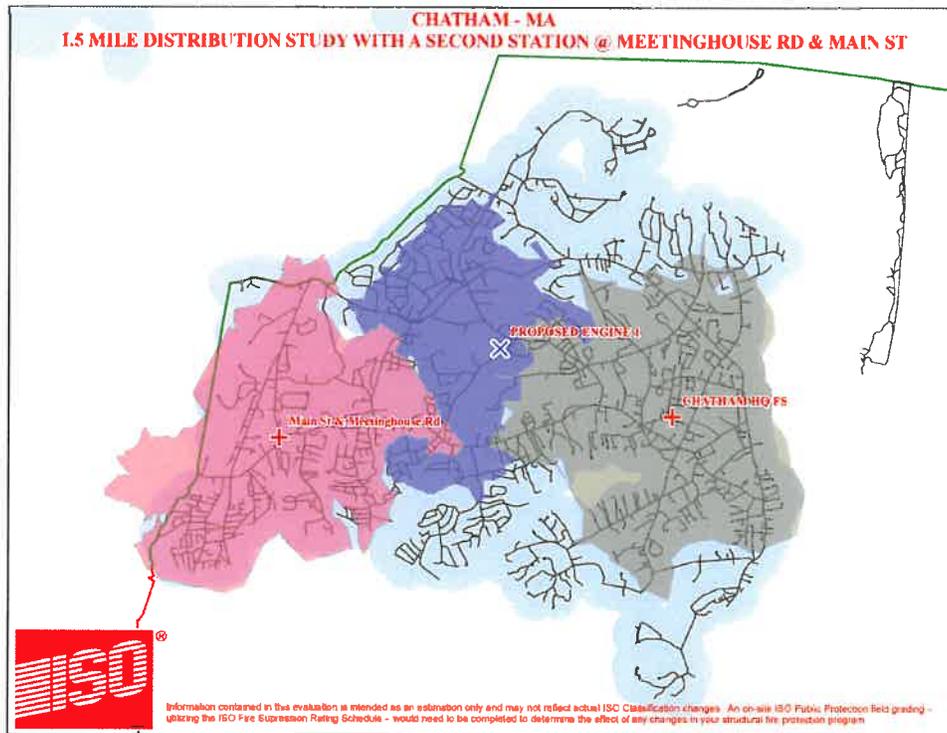


The Town of Harwich had recently approached the Town of Chatham with an offer to enter into a regional agreement for the staffing of the Harwich second station, that seemed to be the logical regional solution. However, response time analysis revealed that stationing Chatham firefighters within the Harwich station would produce only a 6% improvement in overall response times. Overall, this co-located deployment pattern would be a detriment to the Town of Chatham in that the station is located out of the optimal response zone. Therefore, basing firefighters at this location should not be considered.

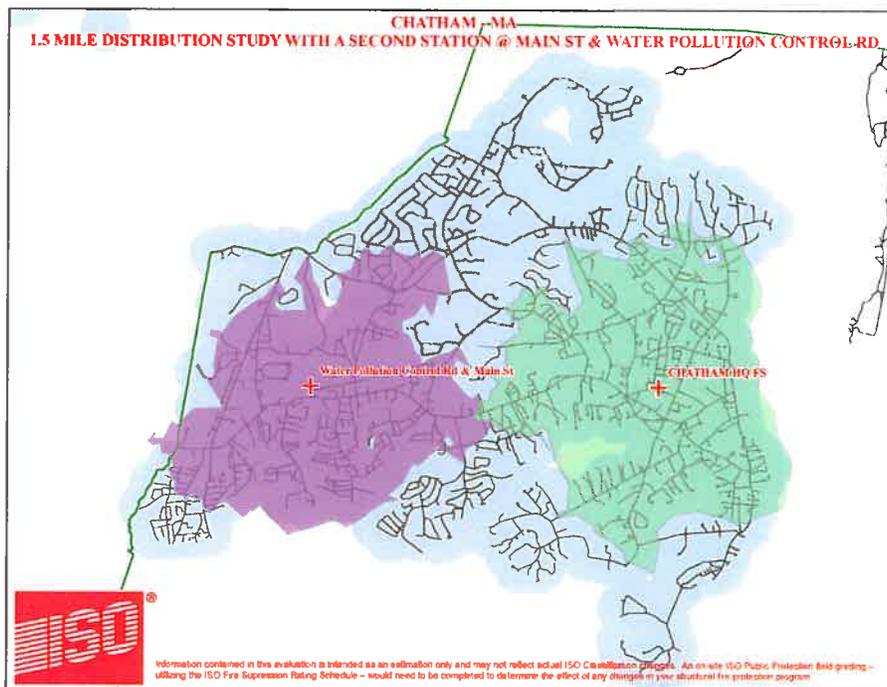
If Harwich was interested in co-locating at the New South Chatham station that could be considered although it would probably have the same impact upon Harwich response times. Given that the Harwich station is periodically closed, the development of a South Chatham station will address the response time issue that presently exists in South Chatham and will produce a secondary benefit by providing firefighters that can rapidly backup Harwich personnel.

In many instances, remote areas of a community do not produce sufficient incident volume to warrant a second station. In Chatham, this is not the case as over 25% of incidents occur in the remote area of South Chatham. The ISO distribution map below details the optimal response zones and clearly indicates how a second station will provide better overall coverage to the community.

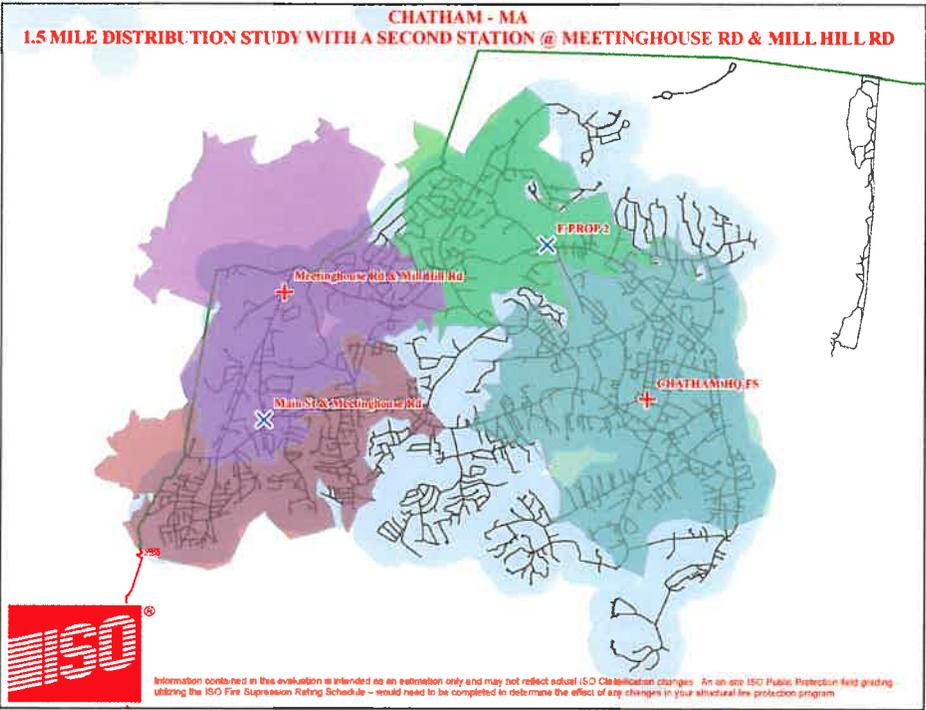


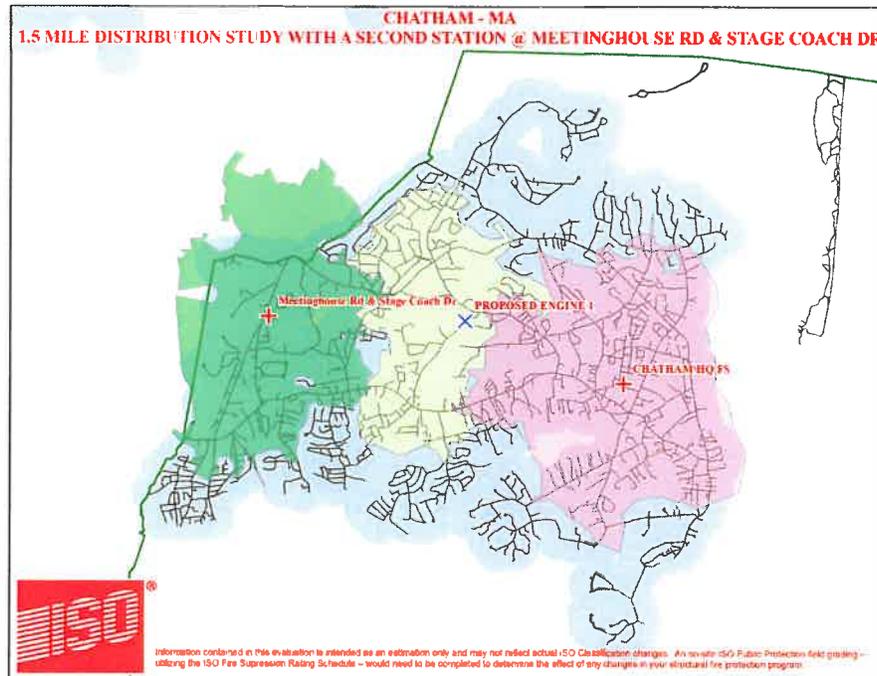


The ISO Distribution Map below indicates how, although not optimal, utilizing the Pollution control facility on a temporary basis enables the Department to provide better response times in the South Chatham area.



The next two distribution maps detail how moving a second station closer to the Harwich line starts to produce a tangible benefit to the Town of Harwich, but further removes firefighters from the South Chatham area and will elongate the response of substation units into the center of Chatham. If new firefighters were going to be hired to staff the substation this may be something to consider in the context of risk management. However, as we are dividing current on-duty personnel between the two stations, the need to rapidly provide backup and meet the OSHA *Two-In/Two-Out* standard makes the optimal positioning of resources essential.





The Capital Planning Review Committee (CPRC) has been extensively involved in the replacement of the Fire Headquarters facility. The Town should be commended for moving forward to replace the current antiquated building. As detailed at the beginning of this chapter, the existing structure inhibits the Fire Department in properly executing its mission. The siting of the new Fire Headquarters is appropriate for maintaining rapid EMS, fire and rescue services to the core target hazards in Chatham.

We will not debate individual characteristics of the new facility except to note that along with proper apparatus and equipment garaging and storage, the fire station should contain appropriate space for those functions essential to the efficient and effective operation and training of firefighters in the 21<sup>st</sup> Century.

Buildings erected in the latter 20<sup>th</sup> Century were not designed for the new hazards and roles that firefighters were assigned after September 11, 2001. Indeed, they also were not designed for the explosive role of emergency medical services that most municipalities assigned to the fire service in the 1980s and 1990s. What new roles will the fire service take on in the 21<sup>st</sup> Century? Certainly, there will be some.

New facilities should be designed to assume that presumption. New fire stations should be designed to serve a community for fifty years. Typically, besides office and bunkroom space, fire prevention, plan review and fire safety and medical education offices need to be addressed. Also, classroom training and firefighter physical fitness

rooms should be included. A trained and fit fire force reduces expensive on-the-job injuries and delivers better quality services to the citizens and taxpayers. Appropriate storage of EMS supplies and drugs and possible decontamination facilities is important. Proper storage of firefighter protective gear is another factor that not only is a safety concern, but a continuing capital expense as well. Protective gear fails at an alarming rate if not adequately cared for. It is expensive (over \$3,000 per firefighter – not including self-contained breathing apparatus). Proper storage of this gear in a temperature-controlled room with no ultraviolet light penetration can save money.

Lastly, Cape Cod seems to have a cultural emphasis on its citizenry seeking medical attention directly from firefighters at their fire stations. We noticed this trait in other Cape Fire Departments from time to time, but it especially is pronounced in Chatham, with over 1,200 citizens annually stopping by for medical emergencies or just to have their blood pressure checked. Any fire facility should have a room dedicated to treatment of walk-in emergencies/routine medical procedures (we witnessed the existence of these rooms in other Cape Cod fire stations).

Of course, the size of a new Headquarters station can be reduced if a substation in South Chatham is to be staffed in the immediate future. We strongly recommend that a two-bay substation be constructed in the Route 28 corridor in South Chatham as quickly as funding allows. In the meantime, we understand that the Town has an option to temporarily locate on-duty firefighters at the new sewer treatment facility. Such an alternative could quickly and economically provide rapid EMS, fire and emergency services to South Chatham. Such an alternative would also reduce the size of a new Headquarters station by one apparatus bay (from five to four) and other ancillary reductions as well. But, a temporary location of a South Chatham station at the sewer treatment plant needs to be recognized as just that – a temporary solution! A permanent new substation on the Route 28 corridor has to be planned for now and constructed as soon as possible.

Such a building should have a minimum of two apparatus bays for a pumper, ambulance and perhaps a brush fire/wildland fire interface vehicle. Also needed would be office and living spaces for firefighters, and minor ancillary spaces for EMS, storage and a small room for firefighter fitness. Such a structure presently would cost several million dollars, equipped.

We reviewed the 2007 report from the Maguire Group and agree with their conclusions. Sharing a fire station with Harwich either in Harwich or in Chatham, but close to the Harwich line would increase response times into South Chatham and back into Chatham Center for incidents there. The present Harwich station sees many mutual aid responses into Orleans and Brewster. Under that arrangement, Chatham firefighters would see more mutual aid into these communities as well – taking them away from the constituent group that pays their salaries and expects protection from them.

Sharing resources with Chatham's neighboring Fire Departments already occurs on a frequent basis. Most Cape Cod Fire Departments are not large enough to stand on their own based upon the sheer volume of emergency traffic encountered, especially during the tourist season and on weekends.

The most logical operation plan for Chatham would be to replace the Headquarters station and to locate and staff a South Chatham fire station on the Route 28 corridor to improve the delivery of emergency services to its citizens. Sharing a facility with Harwich detracts from the rapid delivery of services. Staffing only a centrally located station detracts from the rapid delivery of services. Fortunately or unfortunately, it's all about the rapid arrival of firefighters to medical and fire emergencies to properly treat the sick and injured or to control a fire situation before life or property can be destroyed.

- 1.1 Recommendation: Dispatch operations should be transferred to a regional center and the firefighter that presently performs dispatch duties be reassigned to emergency response as rapidly as possible.***
- 1.2 Recommendation: A temporary substation should be created and staffed with a minimum of two personnel at the new water treatment facility. Unless interior space can be reconfigured, a trailer should be brought on site to provide living quarters for personnel at this location. This facility should be utilized until a new South Chatham substation can be designed and constructed.***
- 1.3 Recommendation: Redesign and downsize the headquarters station to consider the implementation of a two-station response model. Based on the intensity of this need, if a Town Meeting has not been scheduled, a Special Town Meeting should be called to fund the redesign and construction of this project.***
- 1.4 Recommendation: Funding for the construction of a permanent substation on the lot at Main Street and Meetinghouse Road should be brought to the Fiscal 2013 Town Meeting.***
- 1.5 Recommendation: A contingency plan should be developed to abandon the current headquarters should the building deteriorate further.***

## II. Fire Service Equipment

A review of apparatus in terms of age, condition and capabilities finds that Chatham has an appropriate set of apparatus that is aging and in marginal condition. Although these vehicles meet or exceed the national standards commensurate with their age, deterioration is apparent and the Town will need to replace these units as outlined within the capital planning section of this report. As an industry guideline, one piece of major apparatus should be purchased every five years. The goal of this strategy is to spread major purchases out in an effort to match these purchases to a consistent level of debt service for the Town. In addition, the Department has developed some innovative concepts that have maximized capability and reduced cost to the community.

Based upon national averages, Chatham should have the following resources:

- 3 pumpers
- 1 aerial ladder
- 2 fire stations

After reviewing the fleet, we recommend that the third pumper and an aerial ladder be combined into a “quint” which will contribute to an optimal apparatus set for the Town without the expense of a separate dedicated aerial ladder or the expense of an additional apparatus bay to house a unit of this type. Given the current staffing pattern, having the capability of a “quint” is essential for safe and effective operations. We will fully develop this recommendation within the Capital Planning section of this report.

An inventory of the current and recommended apparatus set is detailed below:

<b>Current Apparatus Set</b>	<b>Recommended Apparatus Set</b>
<b>2 fire pumpers</b>	<b>1 fire pumper</b>
<b>1 tanker pumper</b>	<b>1 tanker pumper</b>
<b>1 wildland unit</b>	<b>1 quint (aerial pumper)</b>
<b>3 ambulances</b>	<b>1 wildland unit</b>
<b>2 utility vehicles</b>	<b>3 ambulances</b>
<b>3 administrative vehicles</b>	<b>3 administrative vehicles</b>
<b>3 special operations trailers</b>	<b>2 utility vehicles</b>
	<b>3 special operations trailers</b>

**Structural Response Units**



**Figure 3 - Engine 185 - 2001 Pierce Attack Fire Pumper – Good condition**



**Figure 4 - Engine 186 – 1989 Pierce Fire Pumper - Fair Condition, lacks enclosed seating**



Figure 5 - Engine 188 - 1986 Pierce Pumper - Poor Condition, lacks enclosed seating

## Forestry Unit



Figure 6 - Engine 187 - 2007 Brush Unit - Good condition

## Emergency Medical Services Units



Figure 7 - Ambulance 182 - 2006 Lifeline Ambulance - Good Condition



Figure 8 - Ambulance 183 - 2008 Lifeline Ambulance - Good condition



**Figure 9 - Ambulance 184 – 2010 Lifeline Ambulance - Good condition**

## Administrative Vehicles



Figure 10 - Car 180 - 2003 Utility Pickup Truck



Figure 11 - Car 390 – 1986 Chevy Blazer Utility Unit – Out of Service due to poor condition  
(was used to transport trailers and provide personnel transport to external training)



Figure 12 – One of two administrative vehicles for Deputy Fire Chief and Fire Prevention functions.



Figure 13 - Command vehicle utilized by the Fire Chief.

## Special Operations Trailers

The Department has addressed special operations in an innovative and fiscally prudent way. Although special operations such as the rescue of an individual from a trench or cave-in are not high frequency events, providing the proper equipment to mitigate these situations is far beyond that carried on a typical piece of fire apparatus. As a vehicle to house each equipment set would place a burden on the community in terms of both capital assets and storage, trailers provide an exceptional alternative. Trailers have an extended, virtually no maintenance life span and provide a level of operational flexibility. Each trailer can be easily delivered, towed to an incident site, and left for the entire operation.



**Figure 14 - Pollution Response Trailer**



Figure 15 - Technical Rescue Trailer



Figure 16 - Oil Spill Prevention and Response Trailer

### III. Capital Planning

The current apparatus set is in fair condition as outlined in the previous section of this report. We are concerned with the age and condition of both the 1986 and 1989 pumpers. The following images demonstrate the level of deterioration present in the 1986 unit.



A white paper developed through the Fire Apparatus Manufacturers Association (see Appendix C) suggests that the life span of active duty fire apparatus in a suburban setting ranges from sixteen to nineteen years. The International City Management Association (ICMA) suggests that the life span of a fire pumper should be twenty years and the life span of an aerial ladder should be twenty-five years. As both of the units mentioned above have already exceeded the parameters of these industry guidelines, Chatham will need to aggressively invest in the Department's capital assets.

Although we concur with the majority of the equipment set prescribed by the national averages, we feel that Chatham would be well suited to consolidate an aerial ladder and a pumper into a single unit; however, as this reduces a unit and limits reserve apparatus. Given this reduction, it is important that all units in the primary apparatus set be well maintained and replaced in accordance with a reasonable life expectancy. As we reviewed the capital plan, we would like to recognize both the Chief and the Town for taking a very organized and methodical approach. In many instances, we feel that the Chief has been too fiscally conservative and that the funds requested will not accomplish the project goal without adjustment. The current Chatham Fire Department Capital Plan is detailed in the table on the following page:

Current Capital Plan

TOWN of CHATHAM  
DEPARTMENTAL PROJECT PRIORITIZATION  
FISCAL YEAR 2012 - 2016

DEPARTMENT: 220

FIRE/RESCUE DEPARTMENT

	PROJECT TITLE/DESCRIPTION	AMOUNT REQUESTED
<b>2012</b>		
1	Ambulance	\$180,000
2	Thermal Imaging Camera	\$12,500
3	CO-Oximeter	\$4,600
4	Incident Command Vehicle (Chief Vehicle)	\$30,000
5	Replace one ambulance stretcher	\$10,000
<b>TOTAL</b>		<b>\$237,100</b>
<b>2013</b>		
1	Fire Engine Pumper	\$525,000
2	Ladder truck	\$850,000
3	SCBA Replacement Cylinders	\$10,000
4	Fire Nozzles, Appliances and Adapters	\$10,000
<b>TOTAL</b>		<b>\$1,395,000</b>
<b>2014</b>		
1	Ambulance	\$180,000
2	Engine 185 Body Rust Repair/Paint	\$15,000
3	Vehicle Mobile Data Terminals	\$12,000
4	Radios/Pagers	5,000
<b>TOTAL</b>		<b>\$212,000</b>
<b>2015</b>		
1	Vehicle Mobile Data Terminals	12,000
2	Staff Vehicle	\$30,000
3	Portable Radios	\$20,000
<b>TOTAL</b>		<b>\$62,000</b>
<b>2016</b>		
1	Ambulance	\$185,000
2	Self Contained Breathing Apparatus	\$20,000
3	Fire Engine Pumper	\$600,000
<b>TOTAL</b>		<b>\$805,000</b>
<b>Fiscal 2012-2016 Total Request</b>		<b>2,711,100</b>



After reviewing this capital plan, we have made several recommendations that would adjust the capital plan. These recommendations are detailed below and these changes are reflected in the proposed capital planning table on the following page:

- III.1 Recommendation: Consolidate the replacement of the 1986 fire pumper with the request for an aerial ladder. Purchase a “quint” unit that has a 75 -80’ aerial ladder and is configured as a fire pumper in Fiscal 2013.**
- III.2 Recommendation: The procurement of the “quint” mentioned above should be funded at the Fiscal 2013 Town Meeting. A Federal FireAct Grant application for this unit should also be pursued during the 2011 grant period, which will open in July of this year. If the FireAct Grant application is successful, then the Fiscal 2013 capital project can be cancelled.**
- III.3 Recommendation: Move the replacement of the command vehicle into Fiscal 2013 and adjust the request to reflect current state bid pricing.**
- III.4 Recommendation: Adjust the amount request for several projects to be fiscally realistic in terms of ability to accomplish the project goal.**
- III.5 Recommendation: Replace the 1989 fire pumper in 2014, after twenty-four years of service. A FireAct Grant Application for a “pumper-tanker” should be pursued first.**
- III.6 Recommendation: Eliminate projects that do not meet the definition typically utilized in the public sector for capital projects. These projects should be funded through an adjustment within the Fire Department’s Capital budget.**

## Recommended Capital Plan 2013- 2016

<b>2013</b>		
1	Replace 1986 Fire Pumper / Aerial ladder (Quint)	\$845,000
2	Command Vehicle	38,500
3	SCBA Replacement Cylinders	\$16,000
<b>TOTAL</b>		<b>\$899,500</b>
<b>2014</b>		
1	Ambulance	\$185,000
2	Replace 1989 Fire Pumper	\$645,000
3	Vehicle Mobile Data Terminals	\$24,000
4	Radios/Pagers – narrow banding	45,000
<b>TOTAL</b>		<b>\$899,000</b>
<b>2015</b>		
1	Staff Vehicle	\$42,000
2	Self Contained Breathing Apparatus	\$80,000
<b>TOTAL</b>		<b>\$122,000</b>
<b>2016</b>		
1	Ambulance	\$205,000
<b>TOTAL</b>		<b>\$205,000</b>
<b>Recommended Capital Spending 2013-2016</b>		<b>2,125,500</b>  <b>\$585,600 less than requested</b>

Note: We have eliminated some smaller projects based on the ICMA definition of a capital project is an asset with a cost of over \$10,000 and a life span of over five years. The Fire Department budget should be adjusted to include funding for hose, nozzles, adaptors, pagers, and other items that do not meet the definition of a capital project.

#### **IV. Deployment of Resources**

Currently the Chatham Fire Department has twenty-five career members, a civilian administrative assistant, and six call firefighters. The on-duty (line) complement of personnel who answer emergencies comprises twenty-two of the twenty-five career positions (there are another two line positions presently vacant due to budgetary reasons).

The Fire Chief, Deputy Chief, Fire Inspector, and administrative assistant handle office, administrative and fire prevention issues.

EMS, fire, and rescue services are carried out by the on-duty (line) career staff and six on-call firefighters, with assistance from the Chief, Deputy Chief, and Fire Inspector for major incidents or during simultaneous calls for service. Typically, there are five or six on-duty personnel staffing two ambulances and up to two pieces of fire apparatus. One of these personnel must act as the fire dispatcher as well. The dispatcher usually remains at the desk and does not respond on calls unless there are simultaneous emergencies or a major event at which the dispatcher must function as an EMT or firefighter. In these cases, the next arriving off-duty member to the station takes over the dispatching function.

During the busy summer period, the Fire Chief attempts to maintain six personnel on-duty. A single ambulance call then generates a re-call of several off-duty personnel if there is a transport to a medical control facility.

The on-duty (line) force is broken down into four workgroups of six personnel each: one Captain, one Lieutenant, and four firefighters. The typical workweek for each is forty-two hours. At this time, two of the groups only have five personnel, as the two who retired have not been replaced for budgetary reasons. However, there is a negative effect upon the overtime budget because of this.

The number of line personnel on-duty at a time is affected by a conscious decision to attempt to meet the national standards for arrival time by first responders at medical and fire events (four to eight minutes). Chatham currently experiences approximately 25% of its calls in a simultaneous pattern, stressing the Department's ability to meet national response time standards. We feel that it is important to attempt to deliver quality EMS care for cardiac and stroke patients especially, where the timelines are so critical. The same applies to fire/rescue services, whereby persons can succumb to poisonous smoke and heat developed by a fire situation in as quickly as four to six minutes.

That is why our recommendation on deployment of personnel and fire stations is to staff a Headquarters station and a South Chatham station with a minimum of three personnel each – or six personnel total during the summer months and a minimum of five personnel during off-season months. Further, we recommend that the dispatch function be turned over to the Barnstable County system.

The dispatch of a single ambulance, under this system, no longer should result in the immediate re-call of off-duty personnel. We recommend that a third EMT (typically a second paramedic) assigned to the ambulance provide assistance on the scene, but not accompany the ambulance to a medical control facility unless patient care as defined by Chatham's Medical Director dictates that a third EMT be present. In this way, when there are six personnel on shift, there will be four personnel remaining in Town for a fire call where the federal OSHA *Two-In/Two-Out* rule can be met and no recall will be necessary. If a shift is staffed at the minimum level of five personnel, impact bargaining should be pursued to recall only the personnel necessary to maintain a secondary response in compliance with OSHA *Two-In/Two-Out*. Such a deployment will reduce the amount of overtime allocated for re-call of off-duty members to cover the station.

We also recommend that the Town seek a federal SAFER Act grant for four more career firefighters. The Federal Government pays for the salaries for two years, after which the Town must pay for them for a minimum of three more years. This would create workgroups of seven personnel, allowing for a "float" position on each group to cover vacations, sick leave, injuries, and other time off. Should this grant be awarded, the minimum shift strength should be adjusted to a level of six personnel. The strategy of staffing each work group with a shift float of one (at a level over the minimum shift strength) will reduce the overtime required to sustain the level of service offered by the Department.

Filling the two present vacant career positions and obtaining a Federal SAFER Act Grant will result in added expense to the Fire Department budget for salaries in the long run. However, the level of service to the community will improve immensely in terms of response times and the ability to immediately handle two simultaneous emergencies. A safer environment will be created outright for employees with six personnel immediately available. The stress surrounding the re-call of off-duty members and the wait for their response back to the station to staff an additional ambulance or fire apparatus will be dissipated and the total amount of overtime reduced.

We believe that increasing EMS transport fees and utilizing the full potential of other revenue sources will prove beneficial to covering all of the costs associated with this proposal.

Relying upon Harwich, Orleans, and Brewster to provide sufficient mutual aid for EMS and fire emergencies is not a viable alternative and it is not the reason for which the mutual aid network was created in the first place. These communities are equally as stressed as Chatham and there are occasions when individually they cannot send an ambulance or a fire truck to Chatham. Chatham citizens then must wait longer for service (sometimes up to thirty minutes) when, in reality, there are solutions to the staffing issues that can be accomplished with little or no impact upon the Chatham taxpayer.

The level of public safety service for the Town of Chatham needs to be evaluated in the context of a risk management decision, and once that is accomplished, a system set in place to maintain that level as much as possible. Efficiencies and budgetary implications need to be factored into this decision, of course.

- IV.1 Recommendation: Hire two firefighter paramedics to bring the number of personnel assigned to each shift to six members.**
- IV.2 Recommendation: Set the minimum shift strength at a level of six personnel during the peak summer season and at a level of five personnel during the remainder of the year.**
- I.1 Recommendation: Dispatch operations should be transferred to a regional center and the firefighter that presently performs dispatch duties be reassigned to emergency response as rapidly as possible.**
- IV.3 Recommendation: In 2011, apply for a Federal SAFER Grant to hire four firefighter paramedics.**
- IV.4 Recommendation: If the SAFER Grant is awarded, raise the minimum staffing to a level of six personnel year round and set the assigned shift strength at a level of seven personnel.**
- IV.5 Recommendation: Reduce the number of times a third EMT accompanies the ambulance on a on a patient transport. This retains staffing for another emergency, for compliance with OSHA Two-In/Two-Out and reduces overtime.**
- IV.6 Recommendation: Impact bargain the reduction of recall to maintain the availability of four personnel (OSHA Two-In/Two-Out) for secondary responses.**

## **TRAINING AND PROFESSIONAL DEVELOPMENT**

Training is, without question, one of the two most important functions that a fire department should be performing on a regular basis; the other being response to emergency incidents. One could even make a credible argument that training is, in some ways, more important than emergency responses because a department that is not well trained, prepared, and operationally ready will be unable to effectively, efficiently, correctly, and safely, fulfill its emergency response obligations and mission. A comprehensive, diverse, and ongoing training program is critical to the fire department's level of success.

An effective fire department training program must cover all of the essential elements of that specific department's core missions and responsibilities. The program must include an appropriate combination of technical/classroom training and manipulative or hands-on/practical evolutions. Most of the training, but particularly the practical, standardized, hands-on training evolutions, should be developed based upon the department's own operating procedures and operations while remaining cognizant of widely accepted practices and standards that could be used as a benchmark to judge the department's operations for any number of reasons. Failure to use widely accepted firefighting practices was a significant conclusion in the many investigations that were conducted after the Charleston, South Carolina, Super Sofa Store Fire in June 2007 that resulted in the deaths of nine firefighters. As with all other fire department operations, there must be consistency in how the training is being conducted.

Certain Occupational Safety and Health Administration (OSHA) regulations outlines that minimum training must be completed on an annual basis, covering various topics including: a review of the respiratory protection standard, self contained breathing apparatus (SCBA) refresher and user competency training, SCBA fit testing (29 CFR 1910.134); Bloodborne Pathogens Training (29 CFR 1910.1030); Hazardous Materials Training (29 CFR 1910.120), Confined Space Training (29 CFR 1910.146), and structural firefighting training (29 CFR 1910.156). In addition, Presidential Directive #5 requires participation in, and compliance with, the National Incident Management System (NIMS), which mandates specific incident management/command training for all personnel. Finally, National Fire Protection Association (NFPA) standards contain recommendations for training on various topics such as a requirement for a minimum of twenty-four hours of structural firefighting training annually for each fire department member.

The MRI study team evaluated the Chatham Fire Department's training and professional development programs as part of our overall assessment of the department. Through staff interviews, and an evaluation of the current training program, the team reached the conclusion that the training program was neglected, or at least was not a high priority, for a number of years; was not effective and almost non-existent. There is no

type of formal professional development program. Our investigation into this area found that the previous training coordinator was on injury leave for more than a year; this absence produced a dramatic negative impact on training within the Department. However, there appears to have been a significant change since September of 2010 when Chief Ambriscoe appointed a new training coordinator. With Chief Ambriscoe's support, the efforts of this new coordinator, who is paid a \$2,000 per year contractual stipend, have already brought improvement to the program, and, if the recommendations contained within this report are enacted, there should be reason for considerable optimism that the training program will be given its appropriate level of prominence in the Department's operations. There are numerous opportunities for firefighters to engage in training each day and the Chatham Fire Department should seek to maximize these opportunities.

The study team was able to determine that prior to September 2010, the Department's training program was dysfunctional, at best. With the exception of mandated EMS training – which is handled by the EMS coordinator - training was infrequent and inconsistent, there were no formal lesson plans or drill outlines, and documentation of training completed was very limited. The new coordinator reports that he has basically started to rebuild the program from scratch, which will be a very time consuming, but worthwhile, endeavor.

At the time of this evaluation, the training coordinator does issue and post a monthly training schedule which consists of two to four drills per month on fire/rescue topics, with a similar number being posted by the EMS coordinator for EMS topics, for a total of five to six training sessions per month. The coordinator informed the team that he tries to provide a mix in the training between what is required/mandatory and what the Department's officers/firefighters want and/or need. Most of these drills are what is referred to as "Quick Drills", approximately 30-minute training sessions, on a wide range of topics that can easily be completed on duty, at the fire station. The coordinator reported that he is currently focusing on "Back to Basics" training to provide a foundation upon which to build more complex and challenging programs. The officers do have discretion to conduct additional training, as they determine necessary, on their respective platoons; and as one would expect, there is disparity in how much of this training is conducted on the various platoons.

The training coordinator currently prepares the lesson plans/drill outlines and forwards the majority of them to the shift officers who actually teach the lesson. Cooperation with the shift officers is generally very good. However, in order to insure consistency of delivery, for more complex training, the coordinator personally delivers the training to all four platoons. He uses some innovative presentation techniques to deliver the programs, and also tries to use various, non-traditional motivators to maintain interest among the members receiving the training.

A review of a number of the recently prepared lesson plans/drill outlines indicated that they are being developed in a very professional, thorough, and appropriate manner. These plans/outlines contain objectives, appropriate instructional topics, and, do contain references to where the material was obtained. Some of the drills include very nicely prepared Power Point presentations and some contain both classroom and practical components.

The majority of the training that is currently being conducted is being done by firefighters on their normal duty shift. Participation in this training is mandatory. There has been some limited off duty training conducted, notably live fire training at the Barnstable County Fire Academy in November 2010, and certain hands on, practical components of vehicle extrication and technical rescue training conducted in early 2011. Water rescue training is scheduled for the late spring/early summer 2011. Although most members do attend, off-duty training is not mandatory, so there is no guarantee that all members will receive the training. In addition, overtime limitations severely limit the amount of off-duty training that can be conducted.

The training coordinator reported to the study team that he is attempting to make sure that he takes all of the applicable OSHA, ISO and NFPA regulations and standards into account as he develops various programs, and that all mandated training will be conducted either annually, or at the specified interval. Although by his own admission, he still has a ways to go to fully accomplish this object, steady progress is being made. An officer-training program is also under development that will encompass about sixteen hours of annual training for all of the Department's officers. While a specific number could not be ascertained, it was reported to the team that approximately 75% of the Department's officers might be certified at the Fire Officer I level.

EMS certifications required by members of the Department, such as paramedic and EMTs, appeared to be up to date and in compliance with state law and regulations. All EMS training except for Advanced Life Support (ALS) training is conducted by the Department, in house, and when the personnel are on duty. Since EMS incidents make up a large percentage of the Department's responses, ensuring that personnel are proficient in their EMS skills and that these certifications continue to be maintained should remain a significant component of the Department's training focus.

While the coordinator has done an outstanding job improving the training program in a short period of time, and should be commended for his efforts, there are still shortcomings in the program that should be addressed moving forward. We are confident that the Fire Department will address the issues that they can, in an appropriate manner. However, some of these issues will require a commitment and funding from the Town in order to be abated.

The Department does not have a formal, yet vitally important, Respiratory Protection Plan and does not provide the annual training required by the standard. There are model plans available that would allow the Department to quickly, and relatively easily comply with this OSHA regulation. It is important to note that the /department does perform annual SCBA Fit Testing and flow testing as required.

While all members of the Department possess basic incident management training as required by various standards and regulations, there is room for improvement here as well. Being a relatively small Department, and being geographically located where incoming mutual aid departments may have some extended response times, all Department personnel need to have increased familiarity with the practical applications of incident management. Increasing the levels of incident management training for all Department personnel would serve to increase operational effectiveness, efficiency, and safety.

There are a number of ways to evaluate the effectiveness of the fire department's training program. One increasingly common way is through the use of annual skills proficiency evaluations where all members of the department are required to successfully perform certain skills, and/or complete standardized evolutions, either individually or as part of a team. This does not currently occur in the Chatham Fire Department. Post course evaluations, post incident critiques, and evaluation of incident operations and statistics can also provide important feedback regarding the training program. These are areas where there is still significant room for improvement.

Professional development for fire department personnel, especially officers, is also an important part of overall training. As previously noted, an in-house officer development program is currently under development. However, there are numerous excellent opportunities for firefighters and officers to attend training on a wide range of topics outside of Chatham, including the National Fire Academy in Emmitsburg, Maryland. Beyond the practical benefits to be gained from personnel participating in outside training, encouraging, or if possible, requiring, personnel to earn and/or maintain various specialized certifications such as Fire Instructor or Fire Officer increases the positive professional perception of the organization and can help to demonstrate a commitment to continued excellence. Currently only a limited number of Fire Department officers/personnel possess professional certifications. This is another area where the study team feels the Department could improve.

While the Fire Department has traditionally encouraged, and supported, outside training endeavors by its personnel, the Town has not, particularly at out of state venues. Numerous excellent training opportunities such as the annual Firehouse Expo in Baltimore and the Fire Department Instructors Conference (FDIC) in Indianapolis have largely been ignored, although one Captain does attend the FDIC. While several of the Department's officers have previously attended the National Fire Academy, it has been

at least five years since the Department has been able to send anyone. Presently seven officers have Associates Degrees and the remaining officers are in the process of completing this benchmark. The only Department officer who possesses a Bachelor's Degree in Fire Science is the Fire Chief; some other Department members do have a Bachelors Degree, but not in the field of Fire Science. A Bachelors Degree is required to be eligible for participation in the Executive Fire Officer Program at the National Fire Academy.

The Fire Department's annual training budget is around \$50,000 including the allocation for overtime for off-duty training. Well over half of the total allocation is utilized just for mandatory EMS refresher training. This leaves only very limited funds for any additional training endeavors and severely limits the ability of the Department to conduct complex and/or intensive off duty training, send personnel to outside training, or even add to the Department's meager training library/resources. During one of the study teams' field visits, it was noted that the training library consisted of an assortment of textbooks and VHS videos, many from the early to mid 1980s. The information contained in references more than twenty-five years old is certainly very outdated and/or obsolete, and therefore, of little to no value regarding current day firefighting operations, procedures and practices. It should be noted that the Chatham Fire Association, not the Town itself, purchased most of these materials.

As outlined in the facilities section of this report, the Fire Department's current infrastructure is itself is not conducive to good, effective training. There is no classroom facility to conduct technical training. Training of this type is usually conducted in the fire station's cramped kitchen/dining area/day room, none of which are conducive to good learning and are subject to many distractions. Training aids such as laptops and Power Point projectors are not always available and their use and effectiveness is limited by the physical location where training is conducted. Practical, manipulative, hands-on training is difficult to conduct due to a lack appropriate and/or adequate facilities where the training can be done effectively, safely, and without concern for unanticipated damage.

The Department's training report procedure is in transition right now; however, addressing this situation should be a priority. Currently, the officer who conducted training completes a hand written training report and all members who participated in/completed the training sign in on an attached form. Personnel who complete any type of outside training are supposed to follow the same procedure. This paperwork is then forwarded to the training coordinator who reported that he enters the information into the training module within Firehouse Software, which is the database records management system presently utilized by the Department. However, at the time of our interview, none of these reports had been entered. The team is concerned that this information is not being entered into an overall, centralized fire department management database such as Firehouse, which has a complete training module. It was

reported that the Fire Department is currently researching a new comprehensive management database program; however, a target date for acquisition and implementation has not been established.

- IV.7 Recommendation: The Chatham Fire Department should conduct a comprehensive and formal training needs assessment for the purpose of determining training program priorities. Part of this needs assessment should be an initial evaluation of the current basic skills proficiency of ALL Department personnel.**
- IV.8 Recommendation: Based upon the results of the needs assessment, the Chatham Fire Department should take additional steps to develop a comprehensive training program that addresses, but is not limited to, mandatory OSHA training, recommended NFPA training, every operational mission and responsibility of the Department, and specialized training and personnel/officer development. The training should comply with accepted and/or recommended practices and standards, should include standardized evolutions, and should be consistent with Chatham Fire Department's operations and procedures.**
- IV.9 Recommendation: Formal training of some type, lasting a minimum of one hour, should be mandated to take place on every duty day, on every platoon. If necessary, personnel can swap off response assignments for training purposes to insure, as much as possible, that all personnel get to complete the training. Additional daily opportunities for training can be found during related activities such as daily/weekly apparatus and equipment inspections, and building pre-planning activities.**
- IV.10 Recommendation: Additional, high intensity training on various subjects, including periodic live fire training, should be conducted on at least a semi-annual basis (with quarterly being preferred), off duty at a formal fire academy where appropriate training facilities, structures, and props are available. This training should be mandatory for all personnel.**
- IV.11 Recommendation: All training that is conducted, no matter how brief, or inconsequential it may seem, MUST result in the completion of a formal training report. A formal operational procedure on the completion of training reports should be developed. The training module of a comprehensive fire department management data base program should be utilized for completion of training reports and to**

*assist with the development of a training data base, keeping track of certifications, and related lapse dates, etc.*

- IV.12 Recommendation:** *The Chatham Fire Department should develop a training file for each member that is kept in the Training Division and can provide a supplement to the member's main personnel file. The training file should, at a minimum, include all course completion certificates, professional certifications, skills performance evaluation sheets and reports, and an annual summary of completed training.*
- IV.13 Recommendation:** *As part of the development of a new comprehensive training program, the Chatham Fire Department should implement periodic skills proficiency evaluations for ALL uniformed Department personnel. These proficiency evaluations, consisting of standardized evolutions, can be based upon recognized standards and benchmarks, in conjunction with performance criterion and benchmarks, established through evaluation of and based upon, Chatham Fire Department's operations and procedures.*
- IV.14** *In order to assist with the large amount of training that needs to be done and in recognition of their important role in the delivery of training and the success of the program, the Chatham Fire Department should provide fire instructor training, along with subsequent certification, for any members of the Department who wish to take it. All Lieutenants should be formally certified at a minimum of Fire Instructor Level I, and all Captains and the Training Coordinator should be certified as Fire Instructor Level II. These certifications should be made a job requirement.*
- IV.15 Recommendation:** *The Chatham Fire Department should continue development of, and implement, a formal officer training and development program. There are several excellent programs available including from the International Association of Fire Chiefs and the Phoenix, Arizona, Fire Department. This program can also include bringing well-known fire service experts and instructors to Chatham to provide training for the officers and firefighters who may aspire to be officers. The Department should further seek to require its officers to obtain a certain level of fire officer certification as a job requirement such as Fire Officer I for Lieutenant, Fire Officer II for Captain, and Fire Officer Level III for Deputy Chief and Chief*
- IV.16 Recommendation:** *The Chatham Fire Department should enhance the level of Incident Management training provided to the members of the*

**Department. In addition to the basic I-100/I-700 training mandated, all members of the Department should be trained to the I-200 level. All Lieutenants and Captains should be trained at the I-300 level and the Deputy Chief and Chief should be at the I-400 level.**

- IV.17 Recommendation: The Chatham Fire Department should encourage personnel to seek additional training on their own, and to the financial and practical extent possible, send personnel to outside training opportunities such as the Firehouse Expo in Baltimore and the Fire Department Instructors Conference in Indianapolis. Information gained at this training can then be brought back and delivered to other members of the Department. Training reports should be completed for all of this training, and copies of any certificates earned should be placed in the member's personnel and training files. A dedicated training board should be placed in the station where upcoming training opportunities can be posted for all personnel to review.**
- IV.18 Recommendation: The Chatham Fire Department should make a concerted effort to send as many officers as possible to the National Fire Academy. The Training Coordinator and EMS Coordinator should be enrolled in the Academy's Management of Training Programs and Management of Emergency Medical Services courses respectively. Any officers who meet the admissions criterion should be encouraged to enroll in the Academy's Executive Fire Officer Program. Again, training reports should be completed for any NFA training and copies of certificates placed in the personnel and training files.**
- IV.19 The Chatham Fire Department should seek annual funding in the training budget to upgrade its training resources such as manuals, DVDs, and subscriptions to other available training resources.**
- IV.20 Recommendation: The Chatham Fire Department should, as part of its written communications system, develop Training Bulletins, which would be issued to serve as reference with regard to tested and approved methods of performing various tasks, and Safety Bulletins, which should be issued to serve as references with regard to general and specific safety and health issues.**
- IV.21 Recommendation: The design of the new headquarters station for the Chatham Fire Department should include a dedicated area for classroom training to be conducted. The training area should, at a minimum:**

- ***Be capable of seating a minimum of 40 to 50 people;***
- ***Be located in such a way as to minimize distractions from other activities going on the station;***
- ***Be comfortable, bright, and well lit;***
- ***Be configured in such a way as to accommodate traditional lecture instruction, small group exercises and activities, and practical activities such as EMS skills practice;***
- ***Be equipped with the most up to date, technologically advanced multi-media capabilities; and***
- ***Have Internet access and have interactive capabilities.***

***IV.22 Recommendation: The design of the new headquarters station should also include an area where common, hands on, practical training evolutions can be accomplished such as advancing hose lines, raising and climbing ladders, and hoisting tools and equipment. This area should also be conducive to conducting some limited technical rescue training evolutions.***

## **V. Staffing and Re-Call of Personnel**

The Chatham Fire Department has three career fire positions and one civilian dedicated to administration and Fire Prevention (Fire Chief, Deputy Fire Chief, Fire Inspector , and Administrative Assistant).

There are twenty-four career fire positions (two vacant) dedicated to operations (EMS, fire and rescue), along with six on-call firefighters. These twenty-four career positions are broken into four groups of six line personnel, each having one Captain, one Lieutenant, and four firefighters assigned. These groups work an average of forty-two hours a week and provide emergency services around the clock, seven days a week. The on-call firefighters are used to supplement the line personnel during simultaneous calls or major events.

Administratively, the Department is organized appropriately. The Fire Chief leads the Department, plans, organizes and directs a myriad of activities, and is responsible for the current and future vision of EMS, fire and rescue services in Chatham.

The Deputy Fire Chief is second in command of the Department, and also supervises the Fire Prevention program, which includes code enforcement, building plan review, and inspections.

The Fire Inspector is responsible for reviewing new and renovated dwelling plans and the associated inspections created by these projects. He also performs state-mandated inspections of facilities under Massachusetts General Laws Chapter 148 and 527 Code of Massachusetts Regulations.

Pre-plans of existing and new buildings in Town have recently been assigned to a line firefighter. He is utilizing computer software and is being assisted by the Fire Inspector. Once these plans are completed, the line crews are directed to train on them. Plans are being uploaded on the computers installed in the fire apparatus.

Fire safety education in the schools and with the elderly is directed by a line firefighter, with assistance from other line personnel. This program consistently has been recognized at the state level as a very comprehensive curriculum.

A line Lieutenant, who recently was assigned this duty, handles fire Training. Fire training is fully described with Chapter IV of this report.

Emergency Medical Services training, which is extensive and mandated by the Commonwealth Department of Public health, is coordinated through the Department's EMS Coordinator. EMS is fully described within Chapter VII of this report

Monetary stipends are paid to the Training Officer, Fire Prevention education coordinator, SCBA Maintenance Coordinator, and the EMS Coordinator as outlined within the collective bargaining agreement.

There are six call firefighters. The Department began its life as a volunteer service, with the first career staff added in 1963. As the career staff increased, due initially to ambulance and EMS work which the Department began in 1949, the on-call complement began to wane. This is typical of what occurred all across the globe in the 80s and 90s.

There are various factors that are prevalent to the reduction in the number of volunteer and on-call firefighters in communities such as Chatham. Chief among them is that the demographics now do not support the type of person who is attracted to the fire service in the 21<sup>st</sup> Century – someone with time to dedicate to public service or a young person who wants to make a career of it.

The training commitment alone is daunting. To become a certified firefighter takes several hundred hours. Add to that over one hundred sixty hours to become a state-certified emergency medical technician. Then there are the dozens of hours training annually spent maintaining firefighter and EMT skills and certifications. The average citizen does not want to spend a great deal of personal time dedicated to the fire service, especially when family commitments take priority. Many on-call firefighters in departments that have a career force handling the day-to-day emergencies find it hard to stay motivated if they are not being utilized frequently. Other reasons are:

- An overall reduction in leisure time
- Employment obligations and the common need to maintain more than one job
- The virtual elimination of an employers understanding and flexibility relating to this form of community service
- Increased family demands

It is easy to believe that increasing the number of on-call firefighters can cure staffing problems. Unfortunately in 2011, this is a difficult solution to achieve.

However, the federal government has a version of the SAFER Act that pertains strictly to volunteer and on-call firefighters. It provides competitively awarded funds to municipalities to retain and recruit on-call and volunteer firefighters. The grants provide

funds for college curriculums in fire science, for EMT and paramedic training, health insurance, physical fitness, uniforms and other tax incentives to offer to attract candidates to join fire departments. The bottom line, though, is that if a community's demographics will not support an on-call firefighting force, the federal grant program will be of little assistance.

We believe that the Department should attempt to secure a SAFER grant to recruit and retain on-call members, citing an attempt to meet the NFPA 1710 fire response standard for the first time. A target of twelve on-call firefighters would be advantageous.

One factor, which leads to the large amount of budgeted overtime, is the re-call of off-duty members to the station after an emergency call depletes the on-duty staff contingent below four. The number of these re-calls is substantial, and there are times when insufficient numbers of personnel can be reached to respond back and staff the station or answer a second call. In these situations, citizens have to wait for mutual aid from Harwich, Orleans, or Brewster.

Besides the funds that are required to re-call off-duty personnel, is the issue of burnout. How many hours can a member work in a week before effectiveness and safety is compromised? The risk of injury and of a mistake in rendering medical care increases as work hours increase.

We recommend that the re-call policy be modified through impact bargaining so that off-duty personnel are not summoned until less than four personnel are available as other shift personnel are committed to an emergency call and they cannot easily be placed back in service from. Only two personnel should staff the ambulance as it transports to a medical control facility unless patient care as outlined by the Chatham Medical Director demands more.

We previously recommended that the two vacant firefighter positions be filled immediately. This will be critical to staff two fire stations simultaneously. The Fire Chief believes that it would save \$159,000 in overtime costs under the present staffing plan.

We have also recommended that the Town apply for a SAFER Act grant that provides career firefighters for two years free of charge. The Town has to agree to pay for these positions for three additional years, however. We recommend applying for four positions and assigning one per work group. This sets each group at seven members, allowing a "float" of one member per group to cover vacations, illness, injuries, and other time off without spending overtime to cover these shifts.

Along with saving more overtime dollars, approximately 15-20% of the time, there actually would be seven members available per shift. This will provide additional resources for emergency call coverage and could allow the Department to begin to do

more with on-duty forces in terms of education and medical monitoring for the citizens of Chatham.

Perhaps close to \$100,000 could be saved with a seventh or float position and a modified re-call procedure.

**IV.1 Recommendation: Hire two firefighter paramedics to bring the number of personnel assigned to each shift to six members.**

**IV.2 Recommendation: Set the minimum shift strength at a level of six personnel during the peak summer season and at a level of five personnel during the remainder of the year.**

**I.1 Recommendation: Dispatch operations should be transferred to a regional center and the firefighter that presently performs dispatch duties be reassigned to emergency response as rapidly as possible.**

**IV.3 Recommendation: In 2011, apply for a Federal SAFER Grant to hire four firefighter paramedics.**

**IV.4 Recommendation: If the SAFER Grant is awarded, raise the minimum staffing to a level of six personnel year round and set the assigned shift strength at a level of seven personnel.**

**IV.5 Recommendation: Reduce the number of times a third EMT accompanies the ambulance on a patient transport. This retains staffing for another emergency, for compliance with OSHA Two-In/Two Out and reduces overtime.**

**IV.6 Recommendation: Impact bargain the reduction of recall to maintain the availability of four personnel (OSHA Two-In/Two-Out) for secondary responses.**

**V.1 Recommendation: Set a realistic goal of expanding the number of on-call personnel to a level of twelve over three years.**

**V.2 Recommendation: Apply for a Federal SAFER Grant for on-call recruitment and retention. This grant should be utilized to develop a marketing program and provide incentives to on-call personnel such as tuition reimbursement.**

**V.3 Recommendation: Develop a more active on-call recruitment program led by the Deputy Fire Chief. This program should consist of mailings to**

*all residents, public outreach through the media, and an active and visible presence within the high school.*

**V.4 Recommendation: Formalize the internship program that has been initiated and offer to host two interns per semester.**

## **VI. Community Input**

An important factor in any fire department analysis that MRI conducts is determining how the department that we are studying is perceived and viewed within the community and the region that it serves. It is also important for us to try to determine what the community's expectations are with regards to the types and levels of service that the department provides to its customers, primarily the taxpaying citizens of the community. Every town and fire department has a number of different stakeholders, whose opinions, perceptions, and input, are important for us to know as we try to develop recommendations that are most applicable to that community's specific circumstances.

During our analysis of the Chatham Fire Department, we interviewed the members of the Board of Selectmen, who in essence serve as the Board of Directors for the Town and the Department. We also held two public meetings to solicit input from the Department's stockholders/customers, the citizens and taxpayers of the Town. Finally, we met with and interviewed the Fire Chiefs of surrounding communities.

### **Board of Selectmen**

As a group, the members of the Board of Selectmen have a very positive perception of the Chatham Fire Department and its members. They feel that the members of the Department are very professional, are well trained, and provide excellent to outstanding service to the community. The Fire Department has a very positive image in Town and with a significant elderly population, is actually cherished by those who request their services on a more frequent basis. The Board and Town Manager receive frequent testimonials about services provided by the Department. There are rarely any major issues involving the Department, or its personnel, like they experience with some of the other departments in town.

The Selectmen do, however, have some significant concerns regarding the Fire Department. These concerns, in conjunction with requests from residents of the Town, were the driving forces behind commissioning this study to be done. Chief among the concerns of the Selectmen is what they perceive as the constantly escalating costs of providing fire and EMS services, and in particular, skyrocketing overtime costs. Several members of the Board reported that approximately four years ago, they authorized the hiring of eight additional firefighters and approved implementation of a 24-hour shift schedule based upon assurances that it would significantly reduce overtime. They report that has not happened and in fact overtime expenditures continue to increase every year.

This above situation, in conjunction with continued requests for additional staff, has led to some credibility issues for the Fire Department's senior staff with regard to their interactions with the Board. For some members of the Board, it has also called into question the effectiveness of the Fire Department's organizational structure. These concerns can have wide-ranging implications for the Fire Department moving forward.

Another issue of significant concern for the Selectmen is the proposed new fire station. While they all agree that a new station is badly needed, they are very concerned that the new station as currently proposed, is far larger than what the community really needs. They are also unsure about whether the Town needs just one fire station, or if they need a second station in South Chatham that would change the headquarter's station needs. They are hopeful that this analysis of the Department will provide them with answers to these questions.

Other areas where the Selectmen have concerns, and are looking to this study to provide answers and direction, are:

- Is there a need for the Fire Department to have a ladder truck, as has been requested?
- What is the best, most cost effective way to provide fire and EMS dispatch services?
- What can be done to revitalize the dwindling call force?

### **Chatham Community**

MRI hosted two public community meetings at the Chatham Community Center, on March 9, 2011, to solicit input from the citizens of Chatham regarding their perceptions and expectations regarding the Fire Department. In order to make the meeting as convenient as possible for a wide cross section of the community, one meeting was held in the afternoon at 2:00 PM, and the second in the evening at 7:00 PM. The afternoon meeting was attended by approximately twenty-five people and the evening meeting by about twelve people.

The feedback received from those in attendance at these meeting was unanimous in its praise for the service(s) provided by the Chatham Fire Department and the dedication and professionalism of its members. Those in attendance felt that the members of the Fire Department were very much appreciated in Town. Several members of the audience spoke very positively regarding experiences where either they, or an immediate family member, had direct interaction with the Department under emergency circumstances. Most of those who spoke of having had direct interaction

with the Department were also satisfied with the response time of the Department and felt that it was probably under about six minutes. It should be noted, however, that this was strictly their perception and was not based upon any statistical data.

There were a number of residents of South Chatham in attendance at both meetings, and while not unanimous in this belief, the majority of them were very concerned about the absence of a staffed fire station in that area of Town and the potential negative implications on them should they have an emergency and require assistance. One person who spoke related two stories of fires in South Chatham where a quicker response time would have been preferred. In one instance, during a dwelling fire on Sylvan Way, near the current Station 2, the occupants reportedly had to jump out of the windows to escape the fire.

It was reported to the study team that in the past ten years there has been significant growth in the South Chatham area. This includes around two hundred new residences on more than one hundred streets with a reported assessed value of approximately \$180 million dollars. Several persons who spoke also pointed out that while not reflected in the newest census numbers, the population of the Town is actually increasing rather significantly, as more and more seasonal residences are occupied for a greater percentage of time during the year. In addition, an increasing number of these seasonal residents are becoming "unofficial" full time residents by virtue of the amount of time they now spend in Chatham. This trend is expected to continue, and perhaps even increase, in the coming years as people retire and their seasonal vacation home becomes their full time residence.

Several residents of the area who spoke were adamant that they would like to see a second fire station located in such a way as to better serve the South Chatham area. It should also be noted that some of those who were in favor of a new South Chatham station also stated that they felt this station should be constructed first, followed by a new scaled down headquarters station.

Other speakers mentioned exploring the possibility of utilizing Harwich Station 2 to provide better service and response times to South Chatham. One resident suggested constructing a single new fire station, near the new police station and Town Hall annex, as this would be more centrally located in the Town.

Those who spoke at the meeting generally support efforts to share services or explore regionalization of services with surrounding Towns such as Harwich, Orleans, and Brewster. Several speakers did state unequivocally that the current levels of service should absolutely be maintained and they would not be opposed to paying more in taxes to fund enhanced services as long as it was being done in a cost effective manner. It was noted by at least one speaker that when it comes to talking about constructing an

additional station, the brick and mortar construction is a very small part of the long-term costs; staffing and operations will ultimately cost far more.

### **Neighboring Fire Chiefs**

The Fire Chiefs from the surrounding communities of Harwich, Orleans, and Brewster were unanimous in their very positive impression of the Chatham Fire Department. They stated that since they are all struggling with minimal staffing, they rely on automatic and mutual aid on a daily basis and, as a result, all four departments operate very well together. All of the chiefs also noted that their call volume is increasing each year and they are not just seasonal increases as larger numbers of people spend more time at their “seasonal” or “vacation” home. They all stated very emphatically that they could count on Chatham when they need their assistance, that they view the Department as very professional, and they perform their job very well.

The Chiefs also emphasized that fire departments on Cape Cod have already regionalized in many facets of their operations. They provide automatic and mutual aid to each other on a daily basis, share regional technical rescue and hazardous materials operations, utilize a common EMS medical director, and dispatch additional chief officers on incidents to assist with incident management. They noted that the Sheriff’s Office Dispatch Center is available to all fire departments in Barnstable County. Finally, the Barnstable County Fire Academy is well regarded and provides opportunities for different departments to conduct joint operations thus improving their emergency incident coordination and interoperability.

## VII. Emergency Medical Services

The Department operates three ambulances and provides Advanced Life Support (ALS) services to the community. These services are well regarded by the citizens and the region as a whole. When interviewing members of the Department their pride in providing an exceptional level of care is clear.

Also clear to the MRI team is the value that the community places on the level of EMS provided by the Chatham Fire Department, especially by the elderly.

The Fire Department has provided EMS and medical transportation care to the community since 1949. Cape Cod was the first area in the Commonwealth to embrace the Emergency Medical Technician certification on a regional basis. In 1975, the Cape also became the first area to seize upon the paramedic program as it pertained to first response treatment and medical transport capability (Advanced Life Support or ALS). As such, Chatham has been on the cutting edge of providing the best level of patient care available to its citizens for well over a quarter of a decade.

It is expensive to provide the service, but approximately \$600,000 in revenue is developed annually – most of this being insurance reimbursement for service. We recommend that the Town consider increasing these rates to shift a greater portion of this expense. In Massachusetts, communities are using Medicare as a foundation. We would recommend selecting a rate of Medicare plus 75% as outlined in the table below:

EMS Services	Chatham's Current rates (Medicare Plus 60% Rural rates)	Recommended Rates (Medicare Plus 75% Urban Rates)
<b>Base Services:</b>		
<b>ALS Emergency</b>	694.90	828.66
<b>BLS Emergency</b>	585.17	697.81
<b>ALS - 2</b>	1,005.76	1,199.36
<b>Mileage</b>	15.00 per mile	15.00 per mile
<b>Additional Services:</b>		
<b>Oxygen</b>	55	55
<b>Airway Management</b>	140	140
<b>IV Therapy</b>	140	140
<b>Defibrillation</b>	140	140
<b>Extra Attendant</b>		140

About two-thirds of the emergencies answered by the Department are EMS, and a majority of these are ALS-based.

The Commonwealth's Department of Public Health administers the state's program of EMS, from developing the rules and regulations for care delivery and standards to inspecting the vehicles used for transport and the personnel who deliver the care. Chatham consistently receives high marks from the state's Office of Emergency Medical Services.

The Department has a physician serving as Medical Director (not a member of the Fire Department but a requirement from the state). There is an EMS Coordinator who is a Department member, and receives a monetary stipend to perform all coordination necessary to maintain EMS as mandated by the Commonwealth. This involves personnel certifications, equipment certifications, continuing education, training on new protocols, and reviewing staff performance for quality assurance.

The usual medical control facility utilized by Chatham is Cape Cod Hospital in Hyannis, a distance of 20 miles by road, but sometimes far in excess in terms of time, due to traffic conditions. The time factor creates patient care treatment difficulties if delays occur, so some Cape Cod Fire Departments have assigned three personnel to ambulances to combat this situation. In Chatham, this means that if an ambulance transports to a medical control facility, there probably will be insufficient firefighters remaining on-duty to answer the call. Off-duty personnel then need to be re-called to staff up for the next emergency. Overtime is the only methodology to use to accomplish this. As 25% of all calls now are simultaneous – there is a distinct possibility that Chatham citizens could wait for the arrival of an ambulance if it is a second EMS emergency and the first ambulance already is transporting.

We believe that the third EMT should not accompany the ambulance to a medical control facility unless it is a situation that the Medical Director has deemed "serious", such as a cardiac event, stroke, childbirth, poisoning, etc. This frees up personnel to immediately staff a second ambulance or a fire truck on a fire call. Perhaps the OSHA rule on minimum numbers of firefighters assembled on a scene (four) could be met without the use of overtime when there are six personnel on-duty.

As previously mentioned, Chatham is unique for the number of citizens that choose to utilize the fire stations as health maintenance organizations or to seek medical care for minor injuries or pains. Almost 1100 such visits occurred last year. The Department has a room set aside for such incidents. In a few cases, an ambulance transport occurs because of the medical evaluation made – but usually not. Many other Cape Cod Fire Departments experience the same level of community reliance.

Finally, the ambulances and medical monitoring equipment need constant care and maintenance. Chatham is diligent in the upkeep of capital equipment and its replacement on programmed basis or when needed.

- VII.1 Recommendation: Evaluate the need for the third EMT on all transports to a medical control facility. Return this third person back to a fire station for situations determined to be non-critical by the Medical Director. This will create more availability to staff simultaneous calls quicker and at less expense.**
- VII.2 Recommendation: If available, a third EMT should respond to all medical calls to assist the ambulance crew with logistics and lifting, thus preventing back injuries. This firefighter should remain in service and available to respond to other calls unless the patient's condition warrants an extra attendant as outlined above.**
- VII.3 Recommendation: The Town should continue to push for a regional facility on the lower Cape which could serve to handle some of the less severe medical emergencies so that ambulances do not have to be tied up responding to CCH and then back to Chatham in the same manner they do now.**
- VII.4 Recommendation: Should there be maximum staffing of seven personnel on-duty due to a SAFER grant award (or some other cause), more medical monitoring of citizens, especially the elderly, could be provided by the Department on a programmed basis.**
- VII.5 Recommendation: The Town should consider adjusting ambulance-billing rates to a level of Medicare plus 75%.**

## VIII. Grants

The Chatham Fire Department has applied for various grants, both state and federal. The Department has been very successful in obtaining state grants, but less so with the federal type. State grants obtained were for fire safety education in the schools (every year for sixteen years), fire equipment, and last year the Department received a competitive grant for \$68,500 from the state to augment the overtime to staff up on shifts. This was federal government stimulus money but administered by the state.

The federal FIRE Act and SAFER Act competitive grants have seen less success by the Department at obtaining it. Part of the reason for this is that the federal government sees Chatham as an affluent community, less in need than other municipalities who apply for federal assistance. Our recommendation is to keep applying and pay close attention to the parameters of each grant to attempt to comply with them.

The federal FIRE Act grant program provides \$350 million annually in funds for fire apparatus, safety equipment for firefighters, training and physical fitness programs for firefighters, rescue equipment and fire station safety systems such as emergency generators, diesel exhaust removal systems, and building fire alarm systems. A department can also apply for a Regional grant that encompasses several departments in a regional approach for equipment or a program. A department can apply for up to three FIRE Act grants in a single year. Depending upon the population base of the community, there is a co-pay arrangement of 0, 5, 10, or 25 percent of the total project cost by the municipality.

The federal SAFER Act program makes available approximately \$300 million annually to add career firefighters for two years free of charge and also to bolster the number of volunteer and on-call firefighters for those departments who rely upon this type of staffing. One cannot apply for both types of SAFER grants in one year; only one is allowed.

The full-time employment type SAFER Act grant adds a number of career positions over three years; the first two years are free from the federal government, and the municipality pays for the last year. This must be guaranteed and is monitored by the federal government. If there are lay-offs prior to year six of these positions, the entire grant must be re-paid to the federal government.

The on-call or volunteer recruitment and retention type SAFER Act grant utilizes various strategies to recruit numbers of on-call or volunteer firefighters and seeks to retain them once they join up. The funds can be used for college fire safety degrees, EMT or

paramedic training, health insurance, new uniforms, other tax incentives, and a host of other methodologies to get people to join their local fire departments.

The federal grants employ a four-step system for review. First, each application is subjected to a computer review whereby certain statistical elements of the application are reviewed to determine if the applicant meets the criteria as established by the federal government. Approximately 50% of all applicants fail to move on past the computer review.

The second element of the system is peer review. This entails a hands-on review of the application and narrative portion by a panel of three "peer reviewers"; firefighters or an allied profession. They grade each application in four content areas and the application then receives an overall grade. Usually those with an 80 or above move on to the next phase of the program.

The third element is the review by professionals from FEMA. The applications are checked again for relevancy to the areas applied to and the costs of each element are scrutinized against accepted industry standards and pricing. Once this is completed, there usually is a negotiation session with the municipality over the cost of the grant. This usually is a downward negotiation for the receiving department, by the way.

The last element is monitoring by FEMA. Once a department receives an award, it is subject to continual review by FEMA, including telephone contact and actual on-site visits by a FEMA representative to insure that the grant is being administered as it was approved.

Typically, in any year, only 8% of all grants are approved by the federal government. There is such a limited amount of money available, it is impossible to satisfy even a tenth of the grant pool. The applications for new fire apparatus alone total over \$1 billion annually.

Despite these stringent guidelines and procedures, we believe that Chatham should seek both types of federal grants this year. A SAFER Act grant for \$500,000 for four new firefighters and at least one FIRE Act grant for a "quint" type fire apparatus for \$845,000.

The SAFER Act grant should seek four firefighter positions. The federal government will pay for the first two years in salaries and benefits; approximately \$250,000 annually. Chatham then would have to guarantee to pay for years three, four, and five. We already have identified several funding sources that we believe can be used to pay for these positions in years subsequent to the federal payout. The benefits of these positions will reap rewards for years to come.

After a successful SAFER Act award for employment of career firefighters, the Town should seek another SAFER Act application to recruit and retain on-call firefighters, increasing the membership to twelve. A college curriculum in fire science technology or administration, an EMT course or paramedic program certification, health insurance, and various other tax incentives (free trash pick-up, reduction in property tax, etc.) can be utilized to recruit and retain new members.

At least one FIRE Act application should be made immediately. A 75 or 80-foot “quint” apparatus should be sought for \$845,000. Chatham needs an aerial presence for fire rescue, firefighting, and other rescues that may occur (swift water, trench, rescue from heights, etc.). It is not necessarily for vertical reach either; horizontal reach with the new mega-houses equally is important. New homes are being squeezed onto lots that were not designed for them and fire apparatus access was never considered. With so few firefighters on-duty in Chatham, the need to raise a ground ladder for a rescue is hampered at times by numbers and terrain. A short-wheelbase, maneuverable “quint” is what the doctor ordered!

The Fire Chief may want to apply for another FIRE Act grant in the Training or Safety areas. This is allowed.

The keys to obtaining these grants is to meet the initial parameters as explained in the grant application and then build a convincing case that Chatham needs the grant. Firefighter safety, meeting national standards, efficiencies and effectiveness in operations, and the ability to share the resource with neighboring communities are big selling points and receive favorable marks from peer reviewers.

Finally, the Department of Homeland Security also distributes grants, most notably for equipment not usually awarded in the FIRE Act grants, like harbor boats, sophisticated hazardous materials or radioactive monitoring equipment, or national security items. When the Department needs another fireboat, it should seek Hyannis’ assistance, as they were successful in obtaining a large grant for a multi-purpose craft.

***IV.3 Recommendation: In 2011, apply for a Federal SAFER Grant to hire four firefighter paramedics.***

***V.2 Recommendation: In 2012, apply for a Federal SAFER Grant for on-call recruitment and retention. This grant should be utilized to develop a marketing program and provide incentives to on-call personnel such as tuition reimbursement.***

***VIII.1 Recommendation: Seek external assistance in the development of Federal FireAct and SAFER Grant Applications.***

**VIII.2 Recommendation: During the 2013 grant period, apply for a grant for \$645,000 to replace the 1989 Tanker/Pumper.**

**VIII.3 Recommendation: In 2014, apply for a FireAct grant for sixteen sets of Self-Contained breathing Apparatus (SCBA) in the amount of \$80,000.**

## **IX. Dispatch Operations**

The Barnstable County Sheriff's Department is the gateway entry point into the emergency response system for most emergency requests for assistance, including fires, rescues, and medical emergencies, within the Town of Chatham. The Sheriff's department is the designated primary Public Safety Answering Point (PSAP), where all 9-1-1 emergency calls originating in the Town are answered. The Chatham Police Department is the secondary PSAP. Once the Sheriff or police dispatcher answers a 9-1-1 call and determines that the request for assistance involves a fire, rescue, and/or medical emergency, they are supposed to direct the caller to hold and immediately, and almost instantaneously, transfer the call, and the E 9-1-1 screen (which shows the caller's location), to the fire department dispatcher.

Emergency calls originating from cell phones are initially answered at the Massachusetts State Police barracks in Framingham, and then transferred to the local PSAP, usually the Chatham Police Department, for appropriate action. One of the disconnects with that part of the system is that the State Police will only transfer the call to another law enforcement agency, even if the emergency request for assistance is not law enforcement related. This places another link in the chain that can be broken and, at a minimum, delays dispatch of the necessary emergency responders as the call is transferred through multiple dispatch centers. This system is gradually changing as improved technology is allowing cell phone calls to be directly routed to the nearest PSAP.

Dispatch and communications operations for the Chatham Fire Department are currently primarily handled in-house by Fire Department personnel, a practice that has been in place since the first career firefighters were hired in the 1960s. Each day, one of the on duty firefighters is assigned as the Fire Department's dispatcher for the duration of that tour of duty. It is the firefighter/dispatcher's duty to:

- Receive all 9-1-1 calls involving fires, rescues, and/or medical emergencies;
- Receive any emergency calls to the Fire Department that are received other than through the 9-1-1 system (this can include automatic fire alarms, requests for automatic and/or mutual assistance from surrounding communities, etc.);
- Notify and initiate appropriate response of the on-duty personnel to the incident;

- Request additional automatic and/or mutual aid resources that may be necessary/required to mitigate the incident, based upon incident type, seriousness, complexity, etc.;
- Handle all radio communications involving all fire, rescue and emergency medical incidents where Chatham units are operating;
- Monitor police department and surrounding communities fire/EMS channels;
- Document incident times and pertinent information;
- Page/notify off duty career and/or call personnel of station coverage needs; and
- Prepare any incident reports, dispatch logs, etc. that are required by department operating procedure or as directed by an officer.

A unique aspect of the emergency services delivery system in Chatham, as well as other communities on Cape Cod, is the number of customers who actually walk into the fire station seeking assistance. Chatham Fire Department statistics indicate that these walk-in emergencies consistently number two hundred to two hundred-fifty each year. The fire station actually has a patient treatment room, much like you would find in a doctor's office, set up to provide a place for initial assessment and treatment of these emergencies. Having dispatch operations in the fire station insures that the station is occupied 24/7 by at least one person – the dispatcher - who can provide immediate care during these situations, even if the remainder of the on-duty personnel are committed elsewhere. In addition to the walk-in emergencies, the Department also provides more than one thousand routine blood pressure checks and other non-emergent services each year to citizens of the community.

The current dispatch room in the fire station, while adequately sized, has several significant deficiencies. First, the room is physically located on an exterior wall of the station and has windows. This physical configuration could cause the integrity of the room to be compromised, and thus rendered unusable, in the event of severe storm conditions or an intentional act designed or intended to disable emergency communications. Second, the communications and computer hardware in the room, while currently functional, is aging and is in need of upgrading which would require a significant investment of capital resources. Critical system redundancy to allow continued operations after failure of one or more components is limited. Finally, there is no sound barrier between the alarm room and the apparatus floor, which results in high noise levels from responding apparatus, sirens, air horns, and general activity that could impede emergency radio communications and incoming emergency calls.

During interviews with Fire Department personnel, the MRI study team determined that there are several operational issues with regard to the receipt/transfer of emergency 9-1-1 calls. First, the Police Department dispatcher does not transfer the 9-1-1-call screen on all emergency calls that will be handled by the Fire Department. There are times when they take the information from the caller and then relay that information verbally to the Fire Department dispatcher. This limits the ability of the Fire Department dispatcher to have all of the critical caller information available for immediate reference during dispatch, possibly delaying and/or hindering quick, effective, and efficient dispatch of the appropriate resources, gathering additional information for responding emergency personnel, and/or providing critical life safety instructions, such as how to perform CPR, to the caller.

Fire Department personnel also described an issue of even greater concern regarding emergency call receipt and transfer, where the police department received 9-1-1 calls for emergencies that would be handled by the Fire Department. Rather than immediately transferring the call to the Fire Department, as they should, the police dispatcher takes the information then dispatches police officers to investigate the situation without notifying the Fire Department. In most of these instances, the Fire Department learned of the incident through their normal monitoring of the police radio frequency. They then self-dispatched to the incident. However, there were other incidents that they were not notified until the responding police officer(s) determined that they were "needed". Both of these situations are unacceptable, resulting in delayed response by the Fire Department, with the very real potential for a less than optimal outcome for the person in need of assistance. This practice would also seem likely to expose the Town to increased liability.

As previously mentioned, one of the on duty firefighters is assigned as the Fire Department dispatcher each day. During the off-season, when minimum staffing at the Fire Department is five personnel on-duty, this equates to 20% of the on-duty staff. During the summer tourist season, minimum staffing increases to six on-duty personnel committing 18% of the on-duty staff to dispatch operations. This practice results in a significant commitment of limited firefighting/ EMS personnel to non-firefighting/EMS duties. When significant and/or simultaneous emergencies occur resulting in the paging and recall of off duty and/or call personnel, the unwritten procedure within the Department is to assign one of the call firefighters as the dispatcher thus freeing up the full time member to respond to emergencies.

Although it is an acknowledged part of their duties and responsibilities, the Fire Department personnel who are assigned as dispatchers generally do not want, or enjoy, that assignment as it keeps them away from the aspects of their job where they can put their intensive training and significant experience to best use. Furthermore, although they function as dispatchers, the firefighters assigned to this duty are not professional emergency dispatchers and have little formal dispatch training. All training regarding

this aspect of their job is done in-house and on the job. However, all things considered, given their limited training and relative experience in emergency dispatch operations, the Chatham Fire Department and its personnel perform a very difficult job very well.

Based upon our on-site review and analysis of operations, the MRI study team believes that while there may be some limited reasons to continue fire, rescue and EMS dispatch functions as they currently exist, overall the benefits of shifting dispatch operations to another entity through a local shared services, or county/regional, dispatch center will improve emergency services to the Town of Chatham and do so in a very cost effective manner. By transferring responsibility for dispatching to another entity, yet absolutely maintaining current minimum staffing levels, the Department will benefit from a net increase in the number of on-duty personnel available for immediate response to emergencies by 18% to 20%, depending upon the season, yet not incur any additional personnel costs. It is important to note that we are not increasing the number of on-duty personnel under this scenario – it will still remain at five off season and six in season - just a more effective deployment of the personnel already on-duty and available to respond. In fact, through the revision of recall procedures for station coverage to handle simultaneous emergencies, the team believes there should be a reduction in overtime as there will be fewer times when it is necessary to bring in additional personnel, on overtime, to provide this coverage.

It should be noted that with technology continuing to enhance the ability of emergency response organizations to gather and manage information, the argument that a Chatham dispatcher needs to handle Chatham emergency calls because they know the Town, or the caller, is no longer valid. With 9-1-1 call location, Computer Aided Dispatch (CAD), and, GIS mapping technology continually improving, as long as the correct data has been entered into the system(s) the correct location for any caller should be able to be quickly ascertained, and the appropriate resources dispatched, no matter where the dispatcher is located. The Chatham Fire Department would need to embark on a notification and public education campaign in the town though to educate residents on the fact that they should call 9-1-1 when they need assistance, rather than going to the fire station, since the station may no longer always have someone available to assist them.

There are currently three possible options available to the Town for transferring Fire Department dispatch operations. A fourth option is currently under review and may be available with the next few years.

Chatham Police Department – The Chatham Police Department recently moved into a new facility that includes a modern, technologically up to date dispatch center. Although the dispatch center features two complete dispatch consoles, that set up provides necessary redundancy only for police communications operations and/or provides space for a second dispatcher during times of emergency, significant events, etc. There is normally only one dispatcher on-duty at a time, not an adequate number to provide for the increased call volume, and unique, very different, emergency communications needs of both law enforcement and fire/rescue/EMS.

**An assessment of the dispatch center by the MRI team with the Police Captain indicated that combining police and fire/rescue/EMS dispatch in this facility is probably not feasible, nor would it be economically sensible. A complete additional dispatch console would need to be installed, and as currently configured, there is not adequate available space in the room for this to be accomplished. In the event that the room could be rearranged to allow for an additional console, the hardware and set up costs would be significant. Finally, an additional dispatcher would need to be added 24/7 for a total of two on-duty at all times: one for police operations and one for fire/rescue/EMS operations. This would require the hiring of at least four additional dispatchers at a significant additional cost to the Town.**

Harwich Fire Department – The Harwich Fire Department provides consolidated police and fire dispatch operations for their community. They would like to expand this service through shared service contracts with any interested neighboring communities. They assumed dispatch operations in order to save Fire Department jobs from being eliminated. Other area fire departments that would be interested in joining Harwich's dispatch operation include Orleans and Brewster. According to the Harwich Fire Chief, he does have additional dispatch capability available and would be able to accommodate Chatham's dispatch operations easily and fairly seamlessly.

The advantage to sharing this service with Harwich is that since Chatham and Harwich border each other on two sides, and therefore frequently operate together on emergency incidents, there would be an expectation of improved overall emergency scene communications and interoperability. These are important considerations and could be enhanced even further should Orleans and/or Brewster, who are also frequent automatic/mutual aid partners with Chatham and Harwich, were to join the operation. There is however, some uncertainty over the long-term survivability for this dispatch operation as the Town of Harwich, like most communities today, continues to struggle with significant budgetary issues. The concern of the study team is that dispatch operations could eventually fall victim to budget cutting by the Town.

The study team also noted several other concerns over Harwich dispatching for Chatham. First, since all 9-1-1 calls go to Barnstable County Sheriff or Chatham Police, having to transfer the call to Harwich prior to Chatham being dispatched, adds another

link in the chain and potentially delays dispatch. In addition, for multiple alarm fires and/or other large-scale incidents, Harwich would end up transferring communications back to the Sheriff's dispatch, which coordinates and handles communications for these types of incidents throughout the county. Finally, Harwich would need to hire additional dispatchers to accommodate Chatham, significantly increasing the cost. The cost of joining the Harwich dispatch center is estimated at approximately \$40,000 in initial start up costs and then \$100,000 annually.

**Barnstable County Sheriffs Regional Dispatch Center** – The Barnstable County Sheriff operates a countywide emergency communications center that includes fire/rescue/EMS dispatch services that are available to all fire departments in the county. This center is located Otis Air Force Base. According to all of the fire chiefs in the Chatham area, the Sheriff's Office dispatchers are well trained, professional, and responsive to the needs of the emergency response personnel that they serve. The Sheriff's dispatch center is the one who locates, obtains, and coordinates resources for multiple alarm and/or large-scale emergency operations throughout the County. Like the smaller scale coordination that is available through Harwich, this on scene coordination and interoperability can provide significant benefits, and improvement of the efficiency, effectiveness, and safety of emergency scene operations.

The only negative comment that was made about the Sheriff's communications center was that since the Sheriff's Office was taken over by the Commonwealth (as were all the Sheriff Offices) there has been somewhat less responsiveness to the fire departments, and a few more problems have been noted. It was stressed to the study team though that these issues are not significant and are believed to be as a result of some uncertainty over what the long-term effects of the takeover will be for the employees.

The cost for the Chatham Fire Department to join the Sheriff's dispatch center has appeared to be relatively inexpensive, but keeps increasing. As of January 2011, the Sheriff provided a quote that estimated initial start up fees at approximately \$38,000 with another \$15,000 necessary on the Fire Department end. There is a \$20,000 annual base fee; a charge of \$18.00 per incident for an additional \$45,000 (18 x 2,500); and \$3,500 for phone lines, bringing the total annual cost to approximately \$68,500. However, in May 2011, the Sheriff notified all fire chiefs that he plans to begin charging an additional \$10.00 per medical incident to cover the CMED operation. This could potentially add an additional \$18,000 to the annual operating cost for this service, bringing it to approximately \$86,500.

Transferring dispatch operations to any of the three agencies discussed above would result in one-time start up, or transfer, expenses estimated between \$40,000 and \$60,000 to pay for hardware and software needs, moving phone lines, etc. After these initial start-up costs are funded, the Sheriff's Department provides the most cost effect annual dispatch operations and does so with trained and professional emergency

services dispatchers. In addition, since they are the primary Barnstable County PSAP emergency dispatch turnaround time should be reduced slightly by eliminating the need to transfer an emergency call an additional time to Chatham Fire. Finally, for significant emergency incidents in Chatham, the Sheriff's Department will end up coordinating communications and mutual aid resources from throughout the Cape, so there are continuity benefits relative to them handling the incident from the initial dispatch.

There are several other incidental costs associated with transferring dispatch operations from the Chatham Fire Department to another agency. First, there would be a cost, estimated at approximately \$1,000 per year for dedicated phone lines and central station monitoring of the fire alarm systems in all buildings owned by the Town. That cost could be reduced by about 70% to about \$350.00 per year, if dedicated phone lines for transmitting fire and/or security system alarms already exist in these buildings. In addition, a new alerting system would need to be installed in the fire station to alert the on-duty firefighters to emergency incidents. The Fire Chief states that he has received cost estimates of between \$45,000 and \$75,000 to install this type of system in the station. The study team feels that these estimates are very high for a basic in station alerting system.

At the request of the Barnstable County Fire Chiefs Association, Barnstable County has a study that is currently being conducted by Intertech Associates that is examining the feasibility of establishing a dedicated countywide fire, rescue, and EMS dispatch for all fire departments in Barnstable County. The results of this study are due in September 2011. If the study concludes that a countywide dispatch center is feasible and should be pursued, start up funding will be sought through a grant application to the Massachusetts 9-1-1 Department. It is anticipated that should this new center come to fruition, that they would assume responsibility for fire, rescue and EMS dispatch operations from the Sheriff's Department, as well as most if not all of the individual towns on the Cape.

**IX.1 Recommendation: The Town of Chatham and the Chatham Police Department should immediately implement, and strictly enforce, a policy that requires the police department dispatcher to immediately forward the 9-1-1 caller and screen to the Fire Department dispatcher for EVERY incident that involves an actual, or potential, fire, rescue and/or medical emergency of any type allowing direct communications between the Fire Department dispatcher and the emergency caller. In addition, implementation and enforcement of this policy will facilitate the immediate dispatch of the appropriate resources to handle the emergency without the delay of the police investigating the situation first to determine need.**

- IX.2 Recommendation: The Town of Chatham should seriously consider transferring fire, rescue and emergency medical service dispatch operations from the Chatham Fire Department to the Barnstable County Sheriff's Office Dispatch Center as soon as funding can be appropriated for start-up costs and necessary contracts and agreements can be developed and executed.**
- IX.3 Recommendation: If the study currently being conducted by Barnstable County for the Barnstable County Fire Chiefs Association determines that a dedicated, county wide fire, rescue and EMS dispatch center is feasible and warranted, and, appropriate start up grant funding is obtained, the Town of Chatham should give serious consideration to participation in that endeavor from its inception.**
- IX.4 Recommendation: If the Town of Chatham decides to move fire, rescue and EMS dispatch operations to another agency, the minimum number of on-duty firefighters SHOULD NOT be reduced and should be maintained at the current five off season and six in season.**
- IX.5 Recommendation: If the Town of Chatham decides not to transfer fire, rescue and EMS dispatch operations to county dispatch AND a second station is constructed to provide adequate protection and response times to the South Chatham area, then minimum staffing will need to be increased by a minimum of one person per shift to accommodate adjusted staffing deployment for the second station.**
- IX.6 Recommendation: If the Town of Chatham decides to transfer dispatch operations to county dispatch, they should seek the most cost effective solution possible for a station alerting system in the existing fire station as it is anticipated that station will be replaced within a few years.**
- IX.7 Recommendation: Once fire, rescue and EMS dispatch operations are transferred from the Chatham Fire Department to another appropriate agency, the Chatham Fire Department procedure on paging/recalling off duty personnel should be revised to reflect the availability of an additional on-duty firefighter for immediate response, and reduce the circumstances/instances when additional off duty personnel are summoned, on overtime, to assist with providing station coverage.**

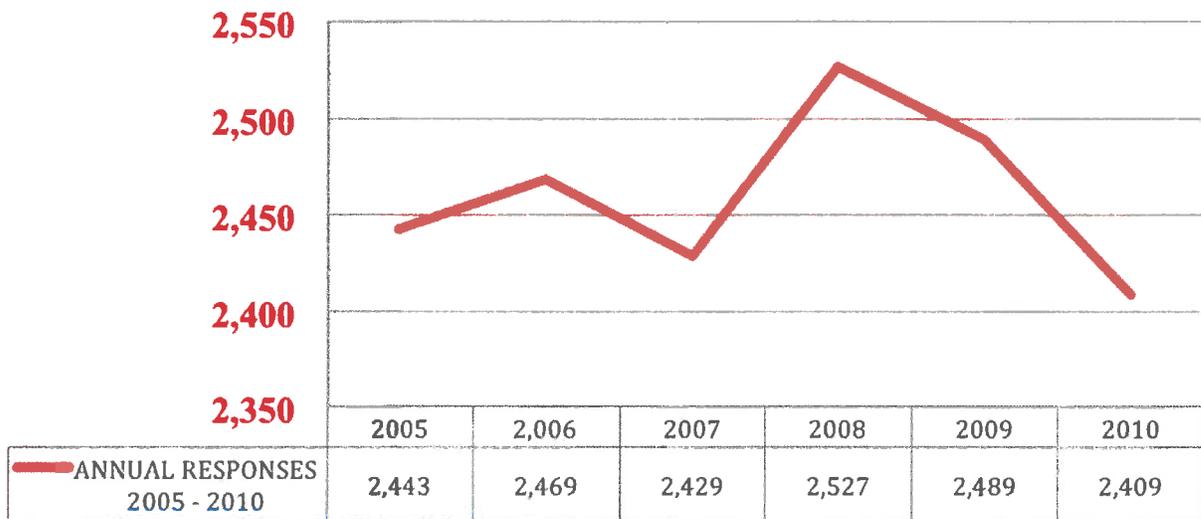
## **X. Emergency Incident Volume Analysis**

One of the best ways to get a broad overview picture of an emergency services provider is to look at and analyze their emergency response/incident statistics. Looking at statistical data that is compiled from incident reports that are generated for each and every emergency response and/or request for assistance will assist with determining the adequacy of current operations, as well as identify trends in responses (i.e., increasing vs. decreasing, changing types of incident requests, increasing response times, frequency of simultaneous incidents, etc.). Utilizing current trends to help predict future ones, while not an exact science, can be helpful to communities and fire departments in predicting and planning for future operational needs. However, as with any other type of statistical analysis, the information that is analyzed is only as good and/or reliable as the data that was originally entered and has been provided for evaluation.

The Chatham Fire Department provided the data that was analyzed for this report to the MRI study team. The statistical reports were automatically compiled through report generation features of the Firehouse fire department management software, which is a comprehensive and widely utilized fire department management database. The specific module that the data was extracted from is known as the National Fire Incident Reporting System (NFIRS) module. Each and every emergency incident that the Chatham Fire Department responds to results in the generation of an NFIRS incident report. This analysis of data notwithstanding, the Chatham Fire Department is required to submit a monthly report to the Massachusetts State Fire Marshal who compiles statewide fire and incident response statistics for the Commonwealth. Statewide data is then submitted to the United States Fire Administration where data and statistics are compiled and analyzed nationally. While three very broad categories are analyzed for this report, in NFIRS each category has numerous sub categories that allow the type of incident handled to be classified very specifically.

The MRI team evaluated incident response data over a six year period from 2005 through 2010. The data that we analyzed appeared to be accurate as to its reporting. In the six year period from January 1, 2005 through December 31, 2010, the Chatham Fire Department responded to a total of 14,766 emergency requests for assistance, an average of 2,461 per year, or 6.7 per day. The highest number of responses was in 2008 when there were 2,527 emergency incidents. The smallest number of responses was 2,409 in 2010. That means a difference of just 118 responses (4.9%) between the slowest year (2010) and the busiest year (2008). The busiest response year (2008) had just 66 more responses than the six year average while the slowest year (2010) had just 52 fewer than average, a reduction of just one incident per week.

## TOTAL ANNUAL RESPONSES BY YEAR 2005 - 2010



As was noted in other chapters of this report, the Chatham Fire Department, like many if not most fire departments, responds to far more emergency medical incidents than actual fires or other types of emergency incidents. The six year statistical data illustrates this very fact very clearly. From 2005 through 2010, the Department responded to a total of 9,835 emergency medical incidents. The number of responses ranged from a high of 1,715 in 2006 to a low of 1,533 in 2010. The average number of responses for those years is 1,639, an average of 4.5 per day. The difference in number of responses between the slowest year (2010), and the busiest year (2006), is 182 incidents (11.9%). The busiest year (2006) had just 63 more responses than the average, a little more than one per week. The slowest year (2010) was only 106 responses below the average, just over two responses per week. Emergency medical responses ranged from 64% of total department responses in 2005 and 2010 to 69% in 2006 and 2007. While these percentages are significant, they are slightly below the national average of 75% to 80% of responses being EMS related for departments that provide the primary EMS service to their community.

For actual fire incidents, the statistical sample is much smaller; however, that would not be unexpected in a smaller community such as Chatham. It is very important to note that per NFIRS protocols, the category for "Fire Incident" must be an actual fire situation that in many, but not all situations caused some type of damage. Many of the incidents that are classified under the third broad category of "Other Incidents" were probably

dispatched as some type of fire incident, but ultimately were classified otherwise for reporting purposes, based upon the situation actually found at the scene. From 2005 through 2010, the Department responded to a total of 263 actual fire incidents, an average of 43.8 per year, or just somewhat less than one per week. The number of fire incidents for the years studied was lowest in 2009 with 38 incidents, while it peaked in 2006 with 49 incidents. Actual fires consistently accounted for 2% of the Department's total incidents with the exception of 2010 when it was 1%. As the actual number of fires was consistent with other years, this reduction is believed to be a statistical anomaly.

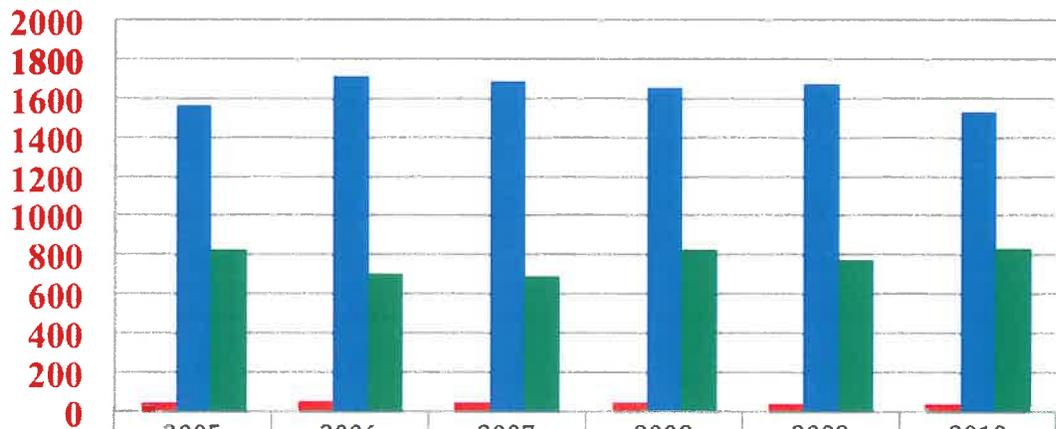
The third broad category of incidents responses is the "Other Incidents" category. This category is where many different types of emergency responses that are not actual fires or EMS incidents are classified. Examples of incidents that would be classified in this category, include, but are not limited to:

- Automatic fire alarm and/or sprinkler system activations with no fire
- Carbon monoxide alarms
- Wires down
- Hazardous materials/chemical/fuel spills
- Gas leaks
- Service calls and assistance to other agencies
- Mutual aid/cover assignments to other municipalities
- Various standbys

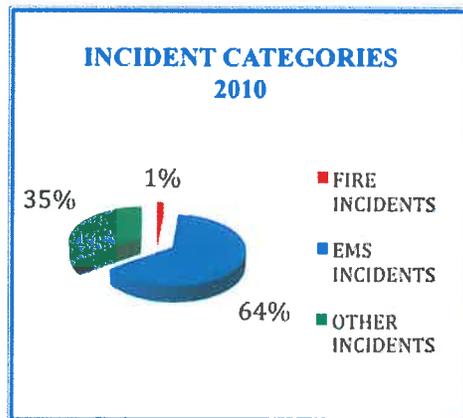
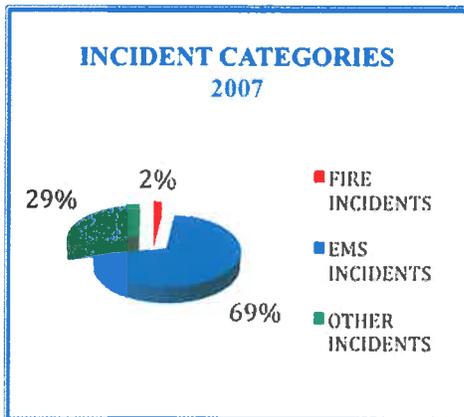
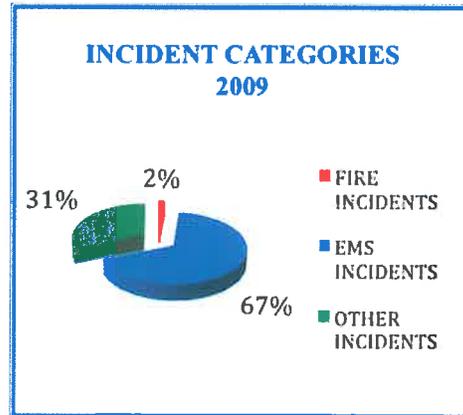
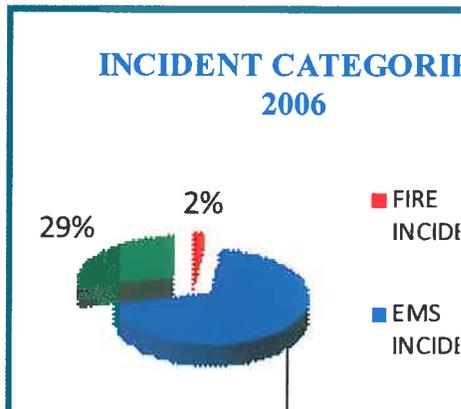
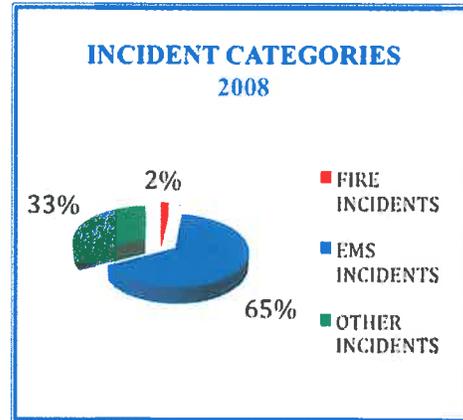
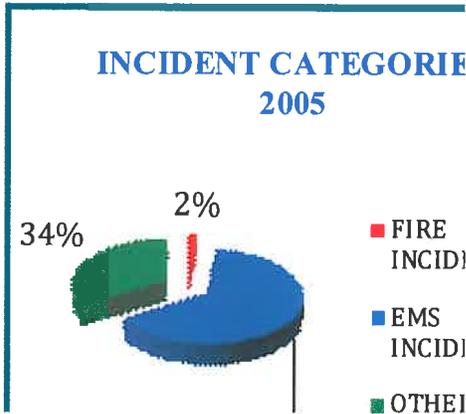
From 2005 through 2010, there were a total of 4,668 incidents broadly classified as other, an average of 778 per year, or 2.2 per day. The busiest year for these incidents was 2010 with a total of 837, while the slowest year was 2007 with 694. As a percentage of overall Department operations, these incidents ranged from 29% in 2006 and 2007, to 35% in 2010. Although there were not wide fluctuations in the year-to-year statistics, there was a total difference of 143 incidents (20.6%) between 2007 and 2010. The busiest year, 2010, had only 59 more of these incidents than the six year average, just over one per week. The slowest year, 2007, had just 84 fewer incidents than the average, about 1.6 per week.

Year	Total Incidents	Average per Day	EMS Incidents	Average Per Day	Other Incidents	Average Per Day
2005	2,443	6.7	1,569	4.3	831	2.3
2006	2,469	6.8	1,715	4.7	705	1.9
2007	2,429	6.6	1,687	4.6	694	1.9
2008	2,527	6.9	1,654	4.5	827	2.6
2009	2,489	6.8	1,677	4.6	774	2.1
2010	2,409	6.6	1,533	4.2	837	2.3
<b>Average</b>	<b>2,461</b>	<b>6.7</b>	<b>1,639</b>	<b>4.5</b>	<b>778</b>	<b>2.2</b>

## ANNUAL RESPONSES BY INCIDENT TYPE 2005 - 2010



	2005	2006	2007	2008	2009	2010
<span style="color: red;">■</span> FIRE INCIDENTS	43	49	48	46	38	39
<span style="color: blue;">■</span> EMS INCIDENTS	1,569	1,715	1,687	1,654	1,677	1,533
<span style="color: green;">■</span> OTHER INCIDENTS	831	705	694	827	774	837



Officially, Chatham is still considered to be a seasonal vacation/resort destination whose relatively small year round population increases dramatically during the summer vacation season, especially July and August. However, anecdotally, the study team heard that the “unofficial” year round population is now much greater than the “official” population as many part time residents spend more and more time at their

vacation homes. As a general rule, emergency incidents, particularly EMS incidents will increase proportionally with the corresponding increase in population. In other words, if the population doubles, emergency incidents can be expected to at least double. While there is an annual spike in emergency incidents during the vacation season, it is not as dramatic as one would be anticipated given the reported population surge. The number of emergency incidents handled by the Department, even in what would be anticipated to the slowest “off season” months, is higher than what would normally be seen in similar sized communities. Conversely, the consistently high number of annual emergency incidents in Chatham tends to suggest a much higher actual population than the “official” one. The two tables below provide some comparisons.

**COMPARISON OF THE NUMBER OF INCIDENTS IN TOWNS WITH POPULATIONS SIMILAR TO CHATHAM’S FOR 2009**

<b>Town</b>	<b>Population</b>	<b>Number of Incidents</b>	<b>Provide EMS</b>
STOW	6,327	743	YES
MERRIMAC	6,425	796	YES
BERKEY	6,433	561	YES
MATAPOISETT	6,447	360	UNKNOWN
UPTON	6,526	220	YES
DALTON	6,582	627	YES
ORLEANS	6,315	2,317	YES
<b>CHATHAM</b>	<b>6,726</b>	<b>2,489</b>	<b>YES</b>
DIGHTON	6,748	898	YES
NEWBURY	6,926	543	YES
LANCASTER	7,047	299	YES
AYER	7,369	610	YES
ROCKPORT	7,633	247	NO
WESTMISTER	7,388	899	YES



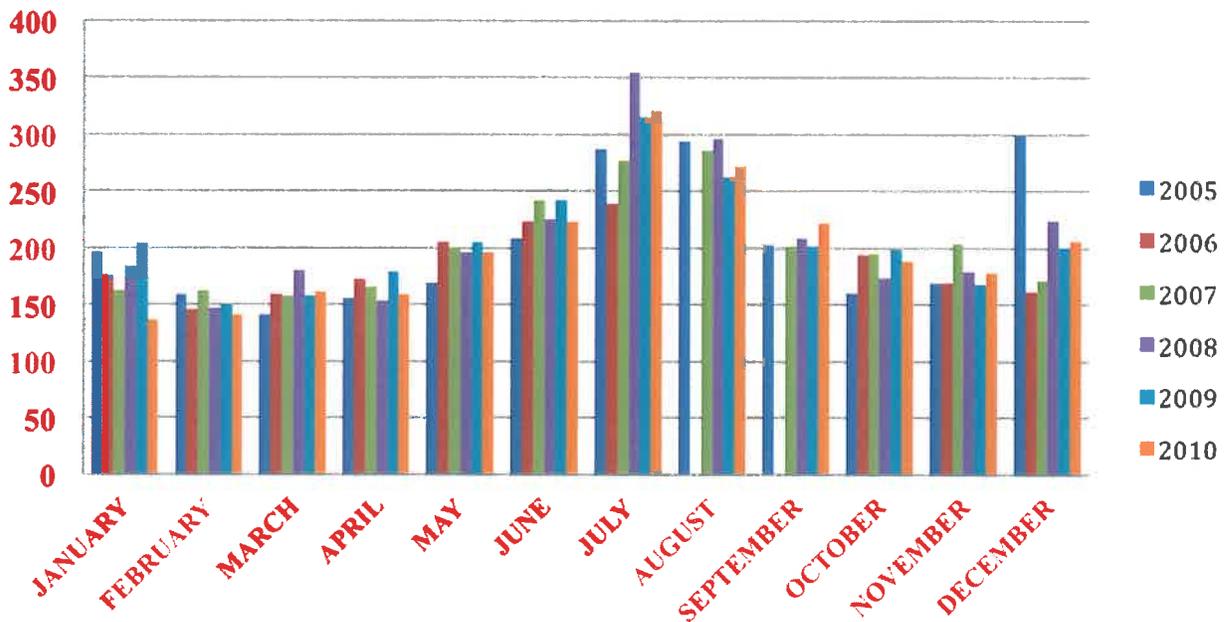
**COMPARISON OF TOWNS WITH A SIMILAR NUMBER OF INCIDENTS IN 2009 TO THE  
POPULATION OF CHATHAM**

<b>Town</b>	<b>Number of Incidents</b>	<b>Population</b>	<b>Provide EMS</b>
WESTON	1,912	11,698	YES
DUXBURY	1,937	14,444	YES
CHARLTON	1,946	12,576	YES
LONGMEADOW	2,008	15,315	YES
SHARON	2,013	17,033	YES
SUDBURY	2,037	17,159	YES
E. BRIDGEWATER	2,090	13,879	YES
SEEKONK	2,188	13,593	YES
WESTFORD	2,219	21,790	YES
BEDFORD	2,343	13,146	YES
HANOVER	2,343	13,966	YES
MARBLEHEAD	2,385	20,039	YES
FAIRHAVEN	2,411	16,124	YES
WHITMAN	2,451	14,385	YES
<b>CHATHAM</b>	<b>2,489</b>	<b>6,726</b>	<b>YES</b>
WILMINGTON	2,506	21,679	YES
MIDDLEBOROUGH	2,566	21,245	YES
SOMERSET	2,587	18,268	YES
NORTON	2,689	19,222	YES

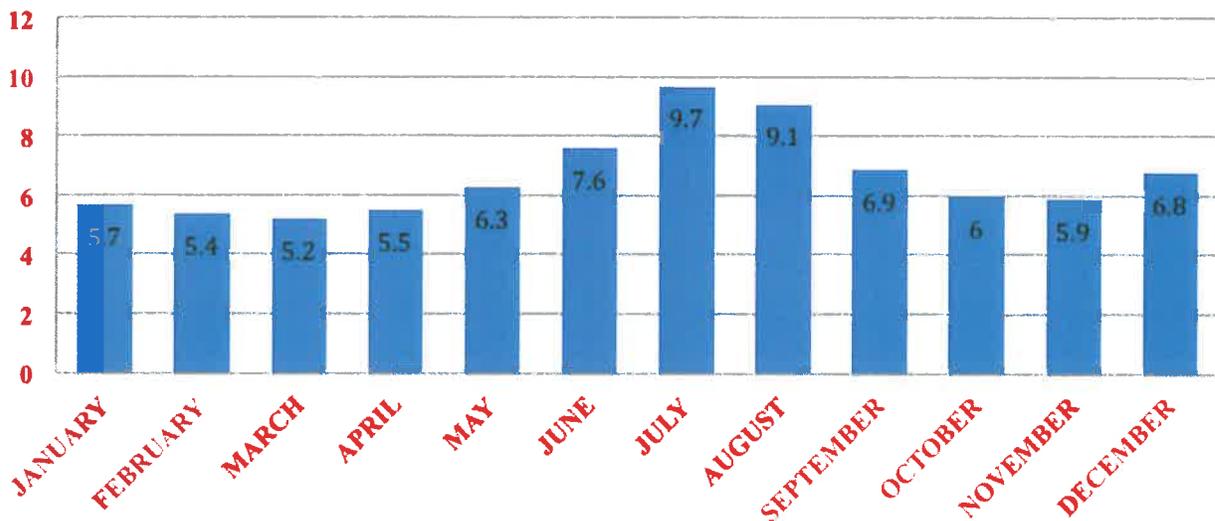
As the following chart illustrates, while there were some spikes in activity during various months, for instance December 2005, the number of incidents were relatively stable, and consistent, annually, for the same month, throughout the six year period analyzed. Significant and inconsistent increases in activity such as December 2005 could be surmised to result from some unusual event such as a severe storm. However, the definitive reason for this large abnormality in the number of responses for that month cannot be determined without additional research and analysis.

Over the six year period analyzed, the average number of daily emergency incidents ranged from 5.2 per day in March to 9.7 per day in July, a difference of 4.5 responses per day, or 93%. While significant and certainly expected by the influx of tourists and vacationers during the summer, the increase is not nearly as dramatic as would be expected if the summer population was four, five, or even six times the year round population.

## TOTAL EMERGENCY INCIDENTS BY MONTH 2005 - 2010

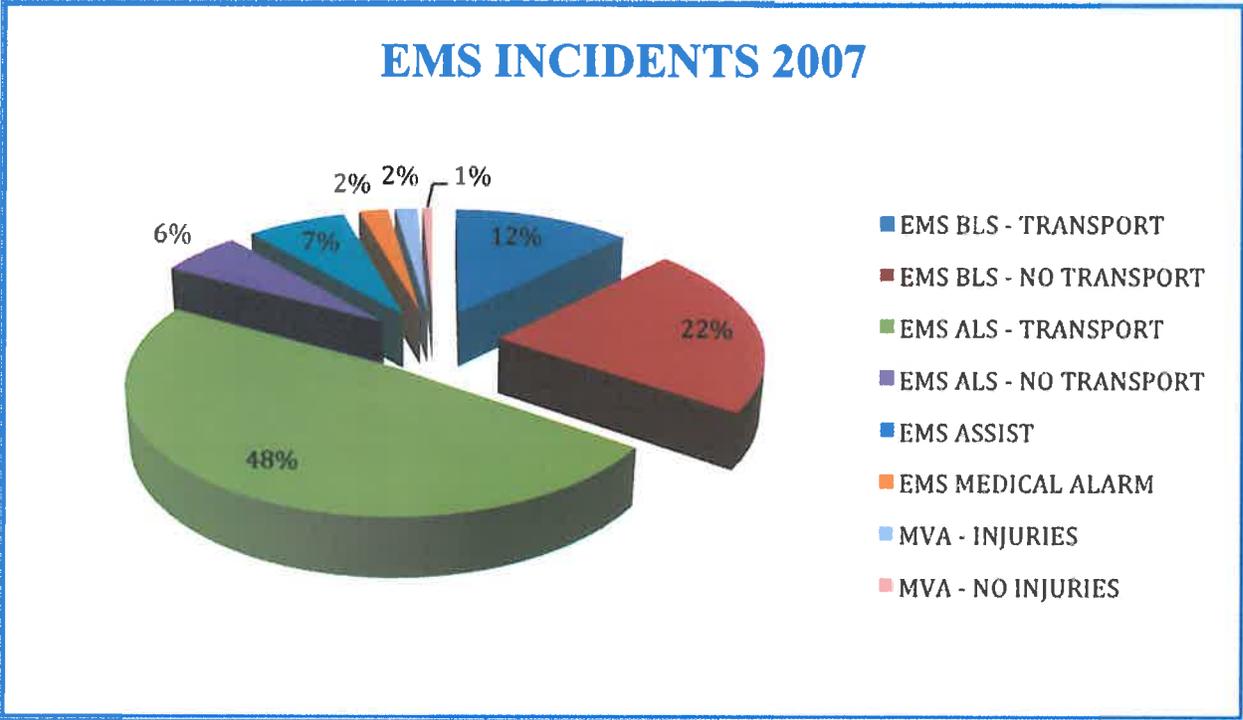


## AVERAGE NUMBER OF DAILY RESPONSES BY MONTH 2005 - 2010

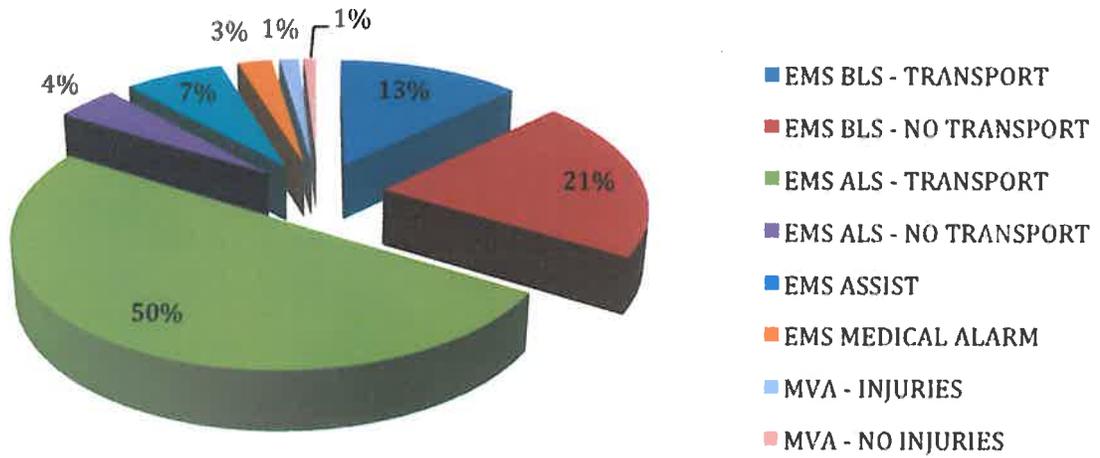


The following charts provide a breakdown of the major sub-categories of the Chatham Fire Department's annual EMS related emergency incidents. It should be noted that certain sub-categories with only a few statistically insignificant incidents are not

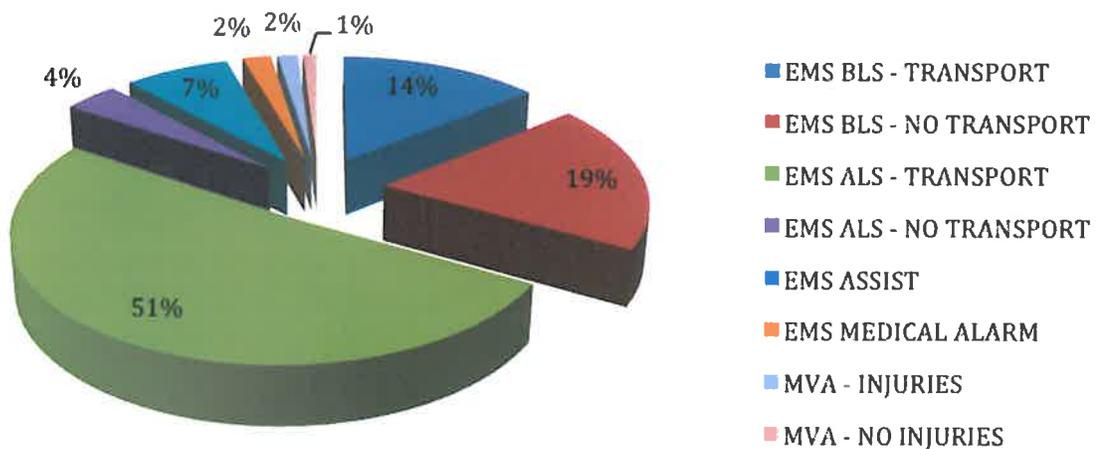
included. Data was only used for the 2007 through 2010 as prior to that these incidents were categorized differently. The largest number of responses in this category was EMS ALS (Advanced Life Support) incidents, which resulted in a transport to the hospital, which accounted for between 46% and 51% of EMS responses. EMS BLS (Basic Life Support) responses that did not result in a transport to the hospital ranged from 19% to 23% of these incidents. The percentage of overall responses in these two categories appears to be higher than normal. In fact, out of 2,194 BLS EMS incidents from 2007 through 2010, just 840 (38%) resulted in transport to the hospital. The Chatham Fire Department should conduct additional analysis to determine if there are any underlying reasons for this.



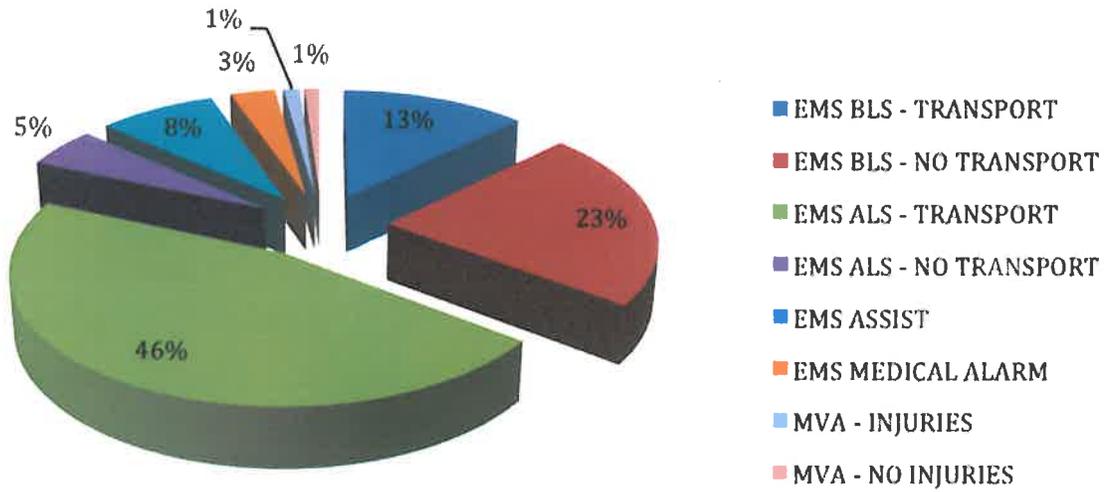
## EMS INCIDENTS 2008



## EMS INCIDENTS 2009



## EMS INCIDENTS 2010



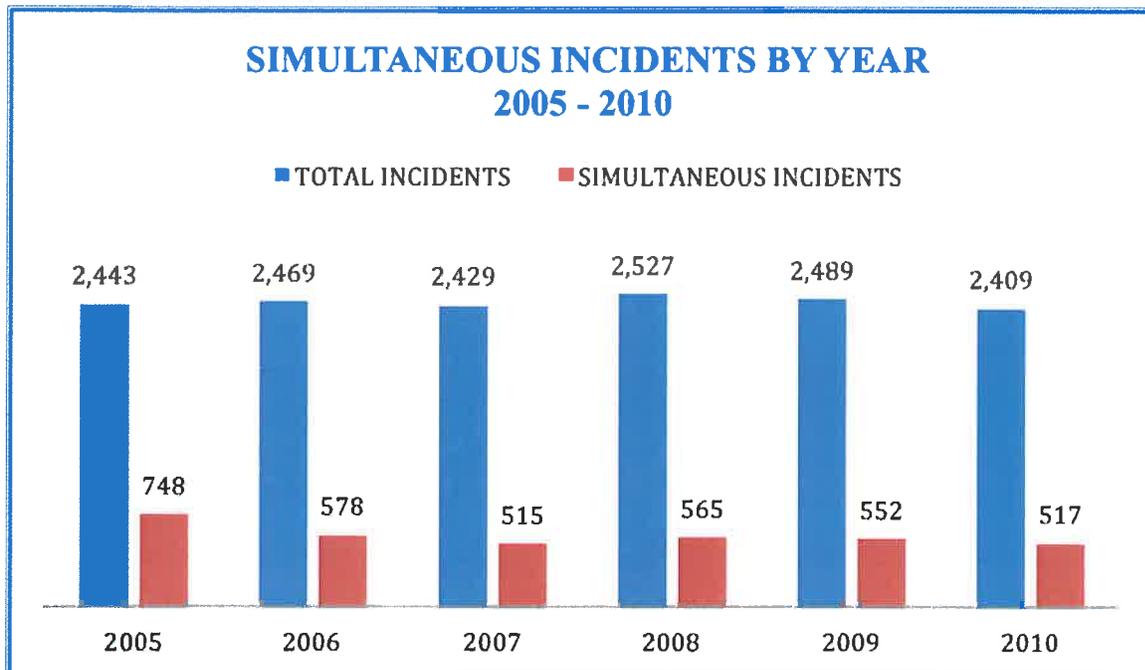
Between 2005 and 2010, the Chatham Fire Department transported a total of 5,948 EMS patients to the hospital. The greatest number of patients transported was 1,055 in 2009 and the fewest was 889 in 2005. Over the six year period the percentage of EMS incidents, which resulted in a patient being transported to the hospital, ranged from 56.7% in 2005 to 62.9% in 2009. The overall average for the period analyzed was 60.5%.

Year	Total EMS Incidents	Total patients Transported	% Of Incidents that Resulted in a Patient Transport
2005	1,569	889	56.7%
2006	1,715	1,041	60.7%
2007	1,687	1,029	61.0%
2008	1,654	1,037	62.7%
2009	1,677	1,055	62.9%
2010	1,533	897	58.5%
<b>AVERAGE</b>	<b>1,639</b>	<b>991</b>	<b>60.5%</b>

Note: 2010 data is from January 1 – November 25, 2010 and does not represent a full year of data.

Every emergency services organization periodically experiences simultaneous, or overlapping, incidents. Whether they are handled by that department themselves, or,

through automatic/mutual aid provisions need to be made to insure that these incidents are handled effectively, efficiently and, in a timely manner. However, as the number of simultaneous, or overlapping, incidents increases, that community and/or department can no longer rely on their neighboring communities/departments to handle an ever-increasing percentage of their incidents. In Chatham, nearly one in four emergency incidents is simultaneous with, or overlaps with, at least one other incident. The chart below illustrates the data. By percentage of overall incidents, the simultaneous incidents ranged from a low of 21.2 % of all responses in 2007 to a high of 30.6% in 2005. Over the six year period, the average was 23.5%.



Note: 2010 data is from January 1 – November 25, 2010 and does not represent a full year of data.

Response time is another important measuring instrument to determine how well a fire department is currently performing, to help identify response trends, and to predict future operational needs. Getting emergency assistance to the scene of a 9-1-1 caller in the quickest time possible may be critical to the survival of the patient and/or successful mitigation of the incident. Achieving the quickest and safest response times possible should be a fundamental goal of every fire department.

National Fire Protection Association (NFPA) Standard 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)

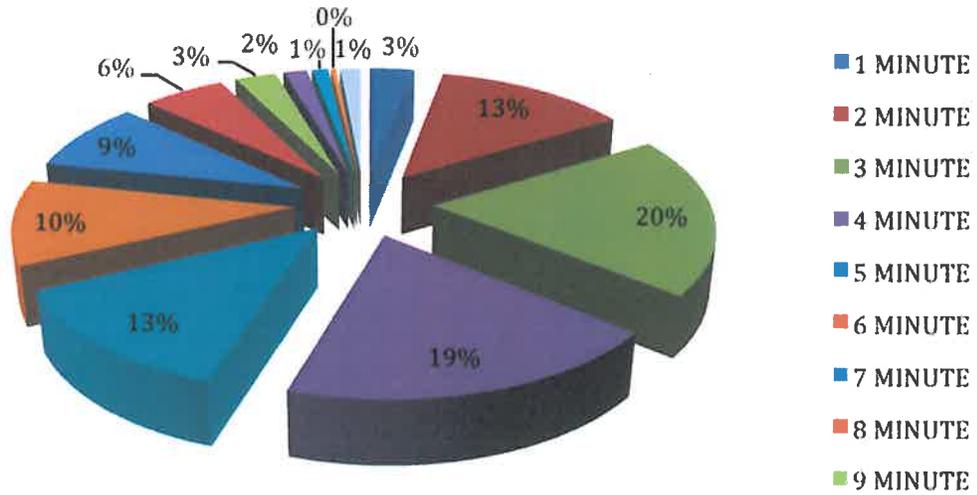
Edition) - is the nationally recognized consensus standard on staffing and deployment by career fire department. It is the benchmark standard that the United States Department of Homeland Security utilizes when evaluating applications for staffing grants under the Staffing for Adequate Fire and Emergency Response (SAFER) grant program. The provisions of this standard are applicable to the Chatham Fire Department since it is primarily a career department.

- Paragraph 4.1.2.1 states that the first arriving engine company shall arrive at the scene of a fire suppression incident within four minutes or less and/or the entire full first alarm response should arrive on scene within eight minutes. For EMS incidents, a unit with first responder or higher-level trained personnel should arrive within four minutes, and, an Advanced Life Support (ALS) unit should arrive on scene within eight minutes. Paragraph 4.1.2.2 requires the establishment of a 90% performance objective for these response times.

**NOTE:** The four minute response time is from when the units are physically moving to the incident. One minute can be added for call processing and dispatch, and one minute can be added for turnout time; that is from when firefighters in the station are notified until they are actually responding, providing six total minutes from the time the 9-1-1 call is answered until the first unit arrives on location.

An analysis of response time data from December 1, 2009, through November 30, 2010, indicated that the department responded to a total of 2,325 incidents. Of these, 218 were walk in medical emergencies at the fire station so there was no response time and they would skew the results. This leaves 2,107 incidents where there was a recordable response time. Of these 1,431 (67.9%) has a response time of five minutes or under (including one minute turnout time); 1,649 (78.2%) had a response time of six minutes or less; 1,831 (86.9%) have a time of seven minutes or less; and 1,950 (92.5%) have a response time of eight minutes or less. The average response time, including the station walk-in emergencies was 3 minutes, 49 seconds. Additional analysis should be performed to allow a prediction of potential improvements in the five minute response time percentage with the addition of a second station in South Chatham.

### RESPONSE TIMES IN MINUTES DECEMBER 2009 - NOVEMBER 2010



Year	Fire Dollar Loss
2005	\$ 141,500
2006	\$ 386,650
2007	\$ 236,000
2008	\$1,235,000
2009	\$ 130,000
2010	\$ 138,000

## **XI. Benchmarking – Comparative Analysis**

As the study progressed, we asked that Chief Ambriscoe contact the eight benchmark communities selected by the Board of Selectmen. This is done purposefully to avoid any contention that members of the Fire Department selected favorable comparables. The communities of Brewster, Duxbury, Eastham, Harwich, Nantucket, Orleans, Westport, and the Massachusetts Military Reservation were selected. In addition, the communities of Cohasset and Mashpee were contacted, but were unable to complete the data survey. The data provided by these communities indicates the following and should be one of several tools utilized to provide the Town with a perspective on Department operations.

This survey reveals the following pertinent points:

- Chatham is composed of a smaller permanent resident population and overall land area than the majority of the communities surveyed.
- Chatham has more than twice the coastline when compared to the average coastline in the sample communities surveyed – the amount of coastline typically presents as a factor in selecting an appropriate deployment pattern, as land area is often not easily traversed.
- The fire services budget is 11% above the average and overtime is 57% above average.
- Fire dollar loss is below average and overall emergency incident volume is average
- The number of career firefighters is slightly below average, while the number of on-call firefighters is significantly below average.
- The number of walk-in medical treatments (a community expectation) is 2.5 times the average experienced in other communities. Many of these events do not result in patient transport. Although not a revenue generator, this service is publically viewed as an exceptional service.
- Most communities operate more than one fire station. The average size of the headquarters fire station is 18,592 square feet.
- Emergency medical services revenue is lower than the average but based on the distance to Cape Cod Hospital, then per call revenue is higher than average.

Community	Community Base Population	Square Miles
Brewster	11,000	25.5
Duxbury	15,000	25
Eastham	6,000	28
Harwich	12,677	20.93
Mass Military Reservation		30
Nantucket	11,500	56
Orleans	6,800	13.2
Westport	15,141	64
<b>Average</b>	<b>11,160</b>	<b>32.83</b>
<b>Chatham</b>	<b>6,700</b>	<b>16.8</b>
<b>Deviation</b>	<b>0.60</b>	<b>0.51</b>

Community	Miles of Coastline Protected	Fiscal 2011 Total Community Budget
Brewster	8.0	\$36,641,000
Duxbury	30.0	
Eastham	21.0	\$19,295,325
Harwich	10.9	
Mass Military Reservation	0.0	
Nantucket	52.0	\$95,784,372
Orleans	46.0	\$27,539,182
Westport	53.0	\$28,392,244
<b>Average</b>	<b>27.6</b>	<b>\$41,530,425</b>
<b>Chatham</b>	<b>65.0</b>	<b>\$32,596,421</b>
<b>Deviation</b>	<b>2.35</b>	<b>0.78</b>

Community	Fire / EMS Budget for Fiscal Year 2011	NFIRS, Building Fires in 2010
Brewster	\$1,628,032	6
Duxbury	\$2,200,000	47
Eastham	\$1,697,136	11
Harwich	\$3,057,855	37
Mass Military Reservation	\$2,300,000	2
Nantucket	\$2,933,850	40
Orleans	\$2,429,941	Invalid response
Westport	\$1,703,578	30
<b>Average</b>	<b>\$2,243,799</b>	<b>25</b>
<b>Chatham</b>	<b>\$2,499,868</b>	<b>21</b>
<b>Deviation</b>	<b>1.11</b>	<b>0.85</b>

Community	Total Fire Calls in 2010	Fire Dollar Loss in 2010
Brewster	614	\$557,200
Duxbury	789	\$400,000
Eastham	417	\$75,000
Harwich	1,355	\$618,651
Mass Military Reservation	837	
Nantucket	1,987	NA
Orleans	531	\$72,000
Westport	820	
<b>Average</b>	<b>919</b>	<b>\$344,570</b>
<b>Chatham</b>	<b>990</b>	<b>\$138,000</b>
<b>Deviation</b>	<b>1.08</b>	<b>0.40</b>



Community	EMS Calls in 2010	Total Incident Volume 2010
Brewster	2,051	2,665
Duxbury	1,244	2,033
Eastham	1,457	1,874
Harwich	2,600	3,955
Mass Military Reservation	89	926
Nantucket	1,142	3,823
Orleans	1,805	2,336
Westport	1,417	2,374
<b>Average</b>	<b>1,476</b>	<b>2,498</b>
Chatham	1,420	2,410
Deviation	0.96	0.96

Community	EMS Level ALS/BLS	Number of Career Personnel
Brewster	ALS	12
Duxbury	ALS	24
Eastham	ALS	18
Harwich	ALS	33
Mass Military Reservation	BLS	36
Nantucket	BLS	23
Orleans	ALS	21
Westport	No response	22
<b>Average</b>		<b>24</b>
Chatham	ALS	22
Deviation		0.93

Community	Minimum / Maximum Shift Strength	Number of Officers on Each Shift
Brewster	4-min./5 max.	1
Duxbury	6	1
Eastham	Min 3/Max 4	1
Harwich	Min 6/Max 8	2
Mass Military Reservation	9	3
Nantucket	3/5	1
Orleans	2/4 w/1daytime	1
Westport	4	1

<b>Average</b>	<b>5.125</b>	<b>1.4</b>
<b>Chatham</b>	<b>5/6</b>	<b>2</b>
<b>Deviation</b>		<b>1.45</b>

Community	Number of On-call / Volunteer Firefighters	Number of Walk-in Medical Treatments in 2010
Brewster	25	122
Duxbury	10	Unknown
Eastham	0	244
Harwich	0	83
Mass Military Reservation	0	4
Nantucket	14	0
Orleans	12	166
Westport	22	7

<b>Average</b>	<b>10</b>	<b>89</b>
<b>Chatham</b>	<b>6.00</b>	<b>221</b>
<b>Deviation</b>	<b>0.58</b>	<b>2.47</b>

Community	Number of Personnel Assigned to Each Ambulance	Actual Total Overtime FY 2010
Brewster	2	\$359,000
Duxbury	2	\$422,293
Eastham	2 or 3	\$246,642
Harwich	2 or 3	\$426,001
Mass Military Reservation	0	\$89,547
Nantucket	3	\$403,000
Orleans	3	\$468,116
Westport	2	\$145,194

<b>Average</b>	<b>2</b>	<b>\$319,974</b>
Chatham	2BLS/3ALS	\$503,000
Deviation		1.57

Community	Are Personnel Recalled immediately when a Crew Responds to an emergency call?	Average Response Time to Emergency Calls
Brewster	Varies	6:20
Duxbury	No	5-6 mins. 87%
Eastham	No	4 to 6 Min
Harwich	Varies	6.2
Mass Military Reservation	No	3:19
Nantucket	No	9.98
Orleans	Yes	6min 20 secs
Westport	Yes	3 - 5 mins.

<b>Average</b>	<b>Mixed response</b>	<b>5.82</b>
Chatham	No	5.82
Deviation		1.00

Community	Number of Stations	Square Footage Size of Fire Headquarters
Brewster	1	12,000
Duxbury	2	9,800
Eastham	1	14,000
Harwich	2	20,000
Mass Military Reservation	1	50,000
Nantucket	3	11,000
Orleans	1	11,808
Westport	2	20,125
<b>Average</b>	<b>1.63</b>	<b>18,592</b>
<b>Chatham</b>	<b>1</b>	<b>7,080</b>
<b>Deviation</b>	<b>0.62</b>	<b>0.38</b>

Community	ISO rating	How is Dispatched Staffed (fire, civilian, police, regional)
Brewster	4	Regional
Duxbury	4	PD/civilian
Eastham	9	Civilian
Harwich	4	Civ. Combined
Mass Military Reservation	Unknown	Regional
Nantucket	4	Fire
Orleans	4	County
Westport	8	Fire
<b>Average</b>	<b>5</b>	<b>Mixed</b>
<b>Chatham</b>	<b>5</b>	<b>Fire</b>
<b>Deviation</b>	<b>0.95</b>	

Community	Fiscal EMS Revenue 2010	EMS Billing Rate (Medicare plus?)
Brewster	745,000	100%
Duxbury	637,108	40%
Eastham	389,189	Medicare rate
Harwich	1,012,340	ALS 635/BLS 475
Mass Military Reservation		No response
Nantucket	325,000	Invalid response
Orleans	668,957	\$140 above
Westport	498,611	No response

Average	610,886	Varies
Chatham	553,000	60%
Deviation	0.91	

Community	Revenue per EMS Call	Number of Pumpers
Brewster	363	3
Duxbury	512	3
Eastham	267	2
Harwich	389	4
Mass Military Reservation		3
Nantucket	285	5
Orleans	371	2
Westport	352	4

Average	363	3.25
Chatham	389	2
Deviation	1.07	0.62

Community	Number of Aerial Ladders	Number of Tankers
Brewster	1	0
Duxbury	1	0
Eastham	0	1
Harwich	1	1
Mass Military Reservation	0	1
Nantucket	1	2
Orleans	1	0
Westport	1	2

<b>Average</b>	<b>1</b>	<b>0.88</b>
Chatham	0	1
Deviation	0.00	1.14

Community	Number of Brush Units	Number of Heavy Rescues
Brewster	2	1
Duxbury	3	0
Eastham	1	0
Harwich	1	1
Mass Military Reservation	2	0
Nantucket	0	1
Orleans	1	0
Westport	2	0

<b>Average</b>	<b>1.5</b>	<b>0.38</b>
Chatham	1	0
Deviation	0.67	0.00



Community	Number of Rescue Boats	Number of Ambulances
Brewster	2	3
Duxbury	2	2
Eastham	2	2
Harwich	2	3
Mass Military Reservation	0	0
Nantucket	1	3
Orleans	2	3
Westport	3	3
<b>Average</b>	<b>1.75</b>	<b>2.38</b>
Chatham	1	3
Deviation	0.57	1.26

- XI.1 Recommendation: Overtime should be reduced by restructuring recall procedures and optimizing shift float thus decreasing the need to hire personnel on overtime.**
- XI.2 Recommendation: The Department should be recognized for doing an exceptional job in limiting fire dollar loss within the community.**
- XI.3 Recommendation: The walk-in medical program is a source of pride for the Department and has become a community expectation. This program should continue and should not prohibit the transition to a regional dispatch operation.**

## **XII. Insurance Service Office (ISO) Grading**

The Insurance Services Office (ISO) issues a public protection classification for each community based on the department's capabilities. The Fire Suppression Rating Schedule provides a basis for some insurance rates considers three main areas of a community's first alarm fire-protection capability. Although industrial and commercial rates are set specifically for each property, residential rates (Class 3 -5) are banded together and a homeowner would not see a dramatic difference in premiums unless the Department received a rating of a Class 2. However, every improvement in rating produces a tangible benefit for the rates realized by industrial and commercial property owners. A brief overview of the rating system is detailed below:

### **Fire Alarm/Communications:**

Ten percent (10%) of a community's overall score is based on how well the Fire Department receives and dispatches fire alarms.

- The communications center, including the number of operators at the center
- The telephone service, including the number of lines coming into the center
- The listing of emergency numbers in the telephone book
- How the center notifies firefighters about the location of the emergency

### **Fire Department Capability:**

Fifty percent (50%) of the overall score is based on the Fire Department. ISO reviews the distribution of fire companies throughout the area and checks that the Fire Department tests its pumps regularly and inventories each engine company's nozzles, hoses, breathing apparatus, and other equipment. ISO also reviews the fire-company records to determine things such as:

- Type and extent of training provided to fire company personnel
- Number of people who participate in training
- Number of firefighters that respond to emergencies
- Maintenance and testing of the Fire Department's equipment

### **Community Water Supply:**

Forty percent (40%) of the overall score is based on the community's water supply. This part of the survey focuses on whether the community has sufficient water supply for fire suppression beyond daily maximum consumption. ISO surveys all components of the water-supply system, including pumps, storage, and filtration. ISO observes fire-flow tests at representative locations in the community to determine the rate of flow the water mains provide. ISO also reviews the condition and maintenance of fire hydrants. Last, ISO counts the distribution of fire hydrants no more than 1,000 feet from the representative locations.

In the last ISO evaluation, Chatham received a class 5 rating and an overall score of 53.41.

- **FIRE ALARMS COMMUNINCATION – 8.30 out of 10.**
- **FIRE DEPARTMENT – 20.07 out of 50**
- **WATER SUPPLY – 34.02 out of 40**

Since the last evaluation, several significant improvements have been made. Given the proposed changes in deployment and dispatch operations, the Town would benefit from seeking to defer the re-evaluation process until these improvements are completed or at least in process. Chief Ambriscoe has a goal of moving the Department toward a Class 3 designation. We would encourage the Chief to continue those efforts but feel that obtaining a Class 4 designation is feasible within the scope of the recommendations provided within this report. Many of the recommendations contained in other sections of this report will contribute to an improved ISO Public Protection Classification Score. Based on the previous ISO evaluation we offer the following recommendations:

- XII.1 Recommendation: Alter response patterns to dispatch two units to an alarm of fire in a structure.***
- XII.2 Recommendation: Conduct hose testing on an annual basis and maintain appropriate records.***
- XII.3 Recommendation: Record all emergency telephone lines even if the dispatch center is relocated. As the present recorder does not fully function this unit should be replaced immediately, a new unit could be easily transferred into the new headquarters once construction is complete.***

# ***APPENDIX A***



# 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

### 2001 Edition



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**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**

**2001 Edition**

This edition of 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*, was prepared by the Technical Committee on Fire and Emergency Service Organization and Deployment — Career and acted on by NFPA at its May Association Technical Meeting held May 13–17, 2001, in Anaheim, CA. It was issued by the Standards Council on July 13, 2001, with an effective date of August 2, 2001.

This edition of NFPA 1710 was approved as an American National Standard on August 2, 2001.

**Origin and Development of NFPA 1710**

The development of this benchmark standard is the result of a considerable amount of hard work and tenacity by Technical Committee members and the organizations they represent. In the case of this standard, their work is the first organized approach to defining levels of service, deployment capabilities, and staffing levels for those “substantially” career fire departments.

Research work and empirical studies in North America were used by the Committee as a basis for developing response times and resource capabilities for those services being provided, as identified by the fire department. Committee members have collectively well over 1000 years of fire-fighting experience in small, medium, and metro fire departments.

The work done by the Committee provides the user with a template for developing an implementation plan on the standard. Most importantly, it will provide the body politic and the citizens a true picture of the risks in their community, and the fire department’s capabilities to respond to and manage those risks.

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**Committee Scope:** This Committee shall have primary responsibility for documents on the organization, operation, deployment, and evaluation of substantially all career public fire protection and emergency medical services.

*This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.*

**NOTE:** Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

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## 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

## 2001 Edition

NOTICE: An asterisk (\*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. The complete title and edition of the document the material is extracted from is found in Annex B. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the appropriate technical committee.

Information on referenced publications can be found in Chapter 2 and Annex B.

### Chapter 1 Administration

#### 1.1\* Scope.

**1.1.1** This standard contains minimum requirements relating to the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by substantially all career fire departments.

**1.1.2** The requirements address functions and objectives of fire department emergency service delivery, response capabilities, and resources.

**1.1.3** This standard also contains minimum requirements for managing resources and systems, such as health and safety, incident management, training, communications, and pre-incident planning.

**1.1.4** This standard addresses the strategic and system issues involving the organization, operation, and deployment of a fire department and does not address tactical operations at a specific emergency incident.

#### 1.2 Purpose.

**1.2.1\*** The purpose of this standard is to specify the minimum criteria addressing the effectiveness and efficiency of the career public fire suppression operations, emergency medical service, and special operations delivery in protecting the citizens of the jurisdiction and the occupational safety and health of fire department employees.

**1.2.2** Nothing herein is intended to restrict any jurisdiction from exceeding these minimum requirements.

**1.3 Equivalency.** Nothing in this standard is intended to prohibit the use of systems, methods, or approaches of equivalent or superior performance to those prescribed in this standard. Technical documentation shall be submitted to the Authority Having Jurisdiction to demonstrate equivalency.

### Chapter 2 Referenced Publications

**2.1 General.** The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

**2.1.1 NFPA Publications.** National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-1901.

NFPA 295, *Standard for Wildfire Control*, 1998 edition.

NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*, 1998 edition.

NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*, 1997 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 1999 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 1997 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System*, 2000 edition.

NFPA 1670, *Standard on Operations and Training for Technical Rescue Incidents*, 1999 edition.

#### 2.1.2 Other Publications.

**2.1.2.1 U.S. Government Publications.** U.S. Government Printing Office, Washington, DC 20402.

Title 29, *Code of Federal Regulations*, Part 1910.120, "Hazardous Waste Operations and Emergency Response," 1986.

Title 29, *Code of Federal Regulations*, Part 1910.146, "Permit-Required Confined Space."

### Chapter 3 Definitions

**3.1 General.** The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not included, common usage of the terms shall apply.

#### 3.2 NFPA Official Definitions.

**3.2.1\* Approved.** Acceptable to the authority having jurisdiction.

**3.2.2\* Authority Having Jurisdiction.** The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

**3.2.3 Shall.** Indicates a mandatory requirement.

**3.2.4 Should.** Indicates a recommendation or that which is advised but not required.

#### 3.3 General Definitions.

##### 3.3.1 Aid.

**3.3.1.1\* Automatic Aid.** A plan developed between two or more fire departments for immediate joint response on first alarms. [1142:1.4]

**3.3.1.2\* Mutual Aid.** Reciprocal assistance by emergency services under a prearranged plan. [402:1.4]

**3.3.2\* Aircraft Rescue and Fire Fighting.** The fire-fighting actions taken to rescue persons and to control or extinguish fire involving or adjacent to aircraft on the ground. [1500:1.5]

**3.3.3\* Aircraft Rescue and Fire-Fighting (ARFF) Vehicle.** A vehicle intended to carry rescue and fire-fighting equipment for rescuing occupants and combating fires in aircraft at, or in the vicinity of, an airport. [1002:1.4]

**3.3.4\* Airport Fire Department Personnel.** Personnel under the operational jurisdiction of the chief of the airport fire department assigned to aircraft rescue and fire fighting or other emergency response activities. [403:1.3]

**3.3.5\* Alarm.** A signal or message from a person or device indicating the existence of a fire, medical emergency, or other situation that requires fire department action. [1221:1.4]

**3.3.6\* Apparatus.** A motor-driven vehicle or group of vehicles designed and constructed for the purpose of fighting fires. [295:1.3]

**3.3.6.1 Fire Apparatus.** A fire department emergency vehicle used for rescue, fire suppression, or other specialized functions. [1404:1.4]

**3.3.6.2 Quint Apparatus.** A fire department emergency vehicle with a permanently mounted fire pump, a water tank, a hose storage area, an aerial device with a permanently mounted waterway, and a complement of ground ladders.

**3.3.6.3 Specialized Apparatus.** A fire department emergency vehicle that provides support services at emergency scenes, including command vehicles, rescue vehicles, hazardous material containment vehicles, air supply vehicles, electrical generation and lighting vehicles, or vehicles used to transport equipment and personnel.

### **3.3.7 Attack.**

**3.3.7.1 Initial Attack.** Fire-fighting efforts and activities that occur in the time increment between the arrival of the fire department on the scene of a fire and the tactical decision by the incident commander that the resources dispatched on the original response will be insufficient to control and extinguish the fire, or that the fire is extinguished.

**3.3.7.2 Sustained Attack.** The activities of fire confinement, control, and extinguishment that are beyond those assigned to the initial responding companies.

**3.3.8\* Company.** A group of members: (1) Under the direct supervision of an officer; (2) Trained and equipped to perform assigned tasks; (3) Usually organized and identified as engine companies, ladder companies, rescue companies, squad companies, or multi-functional companies; (4) Operating with one piece of fire apparatus (engine, ladder truck, elevating platform, quint, rescue, squad, ambulance) except where multiple apparatus are assigned that are dispatched and arrive together, continuously operate together, and are managed by a single company officer; (5) Arriving at the incident scene on fire apparatus.

**3.3.9 Emergency Incident.** A specific emergency operation. [1500:1.5]

**3.3.10 Emergency Medical Care.** The provision of treatment to patients, including first aid, cardiopulmonary resuscitation, basic life support (EMT level), advanced life support (Para-

medic level), and other medical procedures that occur prior to arrival at a hospital or other health care facility. [1581:1.3]

**3.3.11 Emergency Operations.** Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene. [1500:1.5]

**3.3.12 Fire Chief.** The highest ranking officer in charge of a fire department. [1201:1.7]

**3.3.13 Fire Department Member.** See 3.3.29 Member. [1500:1.5]

**3.3.14 Fire Department Vehicle.** Any vehicle, including fire apparatus, operated by a fire department. [1002:1.4]

**3.3.15 Fire Protection.** Methods of providing for fire control or fire extinguishment. [801:1.5]

**3.3.16\* Fire Suppression.** The activities involved in controlling and extinguishing fires. [1500:1.5]

**3.3.17\* First Responder (EMS).** Functional provision of initial assessment (i.e., airway, breathing, and circulatory systems) and basic first-aid intervention, including CPR and automatic external defibrillator (AED) capability.

**3.3.18 Forcible Entry.** Techniques used by fire personnel to gain entry into buildings, vehicles, aircraft, or other areas of confinement when normal means of entry are locked or blocked.

**3.3.19\* Hazard.** The potential for harm or damage to people, property, or the environment. [1500:1.5]

**3.3.20 Hazardous Material.** A substance that presents an unusual danger to persons due to properties of toxicity, chemical reactivity, or decomposition, corrosivity, explosion or detonation, etiological hazards, or similar properties. [1500:1.5]

**3.3.21\* High Hazard Occupancy.** Building that has high hazard materials, processes, or contents.

**3.3.22 Incident Commander.** The fire department member in overall command of an emergency incident. [1500:1.5]

**3.3.23\* Incident Management System (IMS).** An organized system of roles, responsibilities, and standard operating procedures used to manage emergency operations. [1021:1.4]

**3.3.24 Incident Safety Officer.** An individual appointed to respond or assigned at an incident scene by the incident commander to perform the duties and responsibilities of that position as part of the command staff.

**3.3.25 Initial Full Alarm Assignment.** Those personnel, equipment, and resources ordinarily dispatched upon notification of a structural fire.

**3.3.26 Initial Rapid Intervention Crew (IRIC).** Two members of the initial attack crew who are assigned for rapid deployment to rescue lost or trapped members.

### **3.3.27 Life Support.**

**3.3.27.1 Advanced Life Support (ALS).** Functional provision of advanced airway management, including intubation, advanced cardiac monitoring, manual defibrillation, establishment and maintenance of intravenous access, and drug therapy.

**3.3.27.2\* Basic Life Support (BLS).** Functional provision of patient assessment, including basic airway management; oxygen therapy; stabilization of spinal, musculo-skeletal, soft tissue, and shock injuries; stabilization of bleeding; and stabilization and intervention for sudden illness, poisoning and heat/cold injuries, childbirth, CPR, and automatic external defibrillator (AED) capability.

**3.3.28\* Marine Rescue and Fire Fighting.** The fire-fighting action taken to prevent, control, or extinguish fire involved in or adjacent to a marine vessel and the rescue actions for occupants using normal and emergency routes for egress.

**3.3.29\* Member.** A person involved in performing the duties and responsibilities of a fire department under the auspices of the organization. [1500:1.5]

**3.3.30 Officer.**

**3.3.30.1\* Company Officer.** A supervisor of a crew/company of personnel.

**3.3.30.2\* Supervisory Chief Officer.** A member whose responsibility is to assume command through a formalized transfer of command process and to allow company officers to directly supervise personnel assigned to them.

**3.3.31\* Public Fire Department.** An organization providing rescue, fire suppression, emergency medical services, and related activities to the public.

**3.3.32 Public Safety Answering Point (PSAP).** Any facility where 911 calls are answered, either directly or through re-routing. [1221:1.4]

**3.3.33\* Rapid Intervention Crew (RIC).** A dedicated crew of fire fighters who are assigned for rapid deployment to rescue lost or trapped members.

**3.3.34 Related Activities.** Any and all functions that fire department members can be called upon to perform in the performance of their duties. [1500:1.5]

**3.3.35 Rescue.** Those activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health care facility. [1410:1.3]

**3.3.36\* Special Operations.** Those emergency incidents to which the fire department responds that require specific and advanced training and specialized tools and equipment. [1561:1.3]

**3.3.37\* Staff Aide.** A fire fighter or fire officer assigned to a supervisory chief officer to assist with the logistical, tactical, and accountability functions of incident, division, or sector command.

**3.3.38 Standard Operating Procedure.** An organizational directive that establishes a standard course of action.

**3.3.39 Structural Fire Fighting.** The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, aircraft interiors, vehicles, vessels, aircraft, or like properties that are involved in a fire or emergency situation. [1500:1.5]

**3.3.40 Tactical Considerations.** Specific fire-fighting objectives that will present an unusually significant fire or life safety hazard when they are conducted in a fire or other emergency.

**3.3.41 Team.** Two or more individuals who have been assigned a common task and are in communication with each

other, coordinate their activities as a work group, and support the safety of one another.

**3.3.42 Time.**

**3.3.42.1 Alarm Time.** The point of receipt of the emergency alarm at the public safety answering point to the point where sufficient information is known to the dispatcher to deploy applicable units to the emergency.

**3.3.42.2 Call Processing Time.** See 3.3.42.3 Dispatch Time.

**3.3.42.3\* Dispatch Time.** The point of receipt of the emergency alarm at the public safety answering point to the point where sufficient information is known to the dispatcher and applicable units are notified of the emergency.

**3.3.42.4 Response Time.** The time that begins when units are en route to the emergency incident and ends when units arrive at the scene.

**3.3.42.5 Turnout Time.** The time beginning when units acknowledge notification of the emergency to the beginning point of response time.

## Chapter 4 Organization

### 4.1 Fire Department Organizational Statement.

**4.1.1\* The authority having jurisdiction shall maintain a written statement or policy that establishes the following:**

- (1) Existence of the fire department
- (2) Services that the fire department is required to provide
- (3) Basic organizational structure
- (4) Expected number of fire department members
- (5) Functions that fire department members are expected to perform

**4.1.2\* The fire department organizational statement shall include service delivery objectives.**

**4.1.2.1 These objectives shall include specific response time objectives for each major service component (i.e., fire suppression, EMS, special operations, aircraft rescue and fire fighting, marine rescue and fire fighting, and/or wildland fire fighting) and objectives for the percentage of responses that meet the response time objectives.**

**4.1.2.1.1 The fire department shall establish the following time objectives:**

- (1) One minute (60 seconds) for turnout time
- (2)\*Four minutes (240 seconds) or less for the arrival of the first arriving engine company at a fire suppression incident and/or 8 minutes (480 seconds) or less for the deployment of a full first alarm assignment at a fire suppression incident
- (3) Four minutes (240 seconds) or less for the arrival of a unit with first responder or higher level capability at an emergency medical incident
- (4) Eight minutes (480 seconds) or less for the arrival of an advanced life support unit at an emergency medical incident, where this service is provided by the fire department

**4.1.2.1.2 The fire department shall establish a performance objective of not less than 90 percent for the achievement of each response time objective specified in 4.1.2.1.1.**

**4.1.2.1.3 The fire department shall evaluate its level of service and deployment delivery and response time objectives on**

an annual basis. The evaluations shall be based on data relating to level of service, deployment, and the achievement of each response time objective in each geographic area within the jurisdiction of the fire department.

**4.1.2.1.4** The fire department shall provide the authority having jurisdiction with a written report, quadrennially, which shall be based on the annual evaluations required by 4.1.2.1.3.

**4.1.2.1.4.1** The quadrennial report shall define the geographic areas and/or circumstances in which the requirements of this standard are not being met.

**4.1.2.1.4.2** This report shall explain the predictable consequences of these deficiencies and address the steps that are necessary to achieve compliance.

**4.2 Fire Suppression Services.** The fire department organizational statement shall set forth the criteria for the various types of fire suppression incidents to which the fire department is required to respond.

#### **4.3 Emergency Medical Services.**

**4.3.1** The fire department organizational statement shall set forth the criteria for the various types of emergency medical incidents to which the fire department is required and/or expected to respond.

**4.3.2** The fire department organizational statement shall ensure that the fire department's emergency medical response capability includes personnel, equipment, and resources to deploy at the first responder level with automatic external defibrillator (AED) or higher treatment level.

**4.3.2.1** Where emergency medical services beyond the first responder with automatic defibrillator level are provided by another agency or private organization, the authority having jurisdiction, based upon recommendations from the fire department, shall include the minimum staffing, deployment and response criteria as required in Section 5.3 in the following:

- (1) The fire department organizational statement
- (2) Any contract, service agreement, governmental agreement, or memorandum of understanding between the authority having jurisdiction and the other agency or private organization

#### **4.4 Special Operations.**

**4.4.1** The fire department organizational statement shall set forth the criteria for the various types of special operations response and mitigation activities to which the fire department is required and/or expected to respond.

**4.4.2\*** The fire department organizational statement shall ensure that the fire department's hazardous materials response capability includes personnel, equipment, and resources to deploy at the first responder operational level as required by 29 CFR 1910.120.

**4.4.3** The fire department organizational statement shall ensure that the fire department's confined space response capability includes personnel, equipment, and resources to deploy at the confined space operational level as required by 29 CFR 1910.146.

**4.4.4** The fire department organizational statement shall set forth the criteria for the various types of fire department response during natural disasters or terrorism incidents, weap-

ons of mass destruction incidents, or large scale or mass casualty events.

**4.5 Airport Rescue and Fire-Fighting Services.** The fire department organizational statement shall set forth the criteria for the various types of airport rescue and fire-fighting incidents to which the fire department is required and/or expected to respond.

**4.6 Marine Rescue and Fire-Fighting Services.** The fire department organizational statement shall set forth the criteria for the various types of marine rescue and fire-fighting incidents to which the fire department is required and/or expected to respond.

**4.7 Wildland Fire Suppression Services.** The fire department organizational statement shall set forth the criteria for the various types of wildland fire suppression incidents to which the fire department is required and/or expected to respond.

#### **4.8 Intercommunity Organization.**

**4.8.1\*** Mutual aid, automatic aid, and fire protection agreements shall be in writing and shall address such issues as liability for injuries and deaths, disability retirements, cost of service, authorization to respond, staffing, and equipment, including the resources to be made available and the designation of the incident commander.

**4.8.2** Procedures and training of personnel for all fire departments in mutual aid, automatic aid, and fire protection agreement plans shall be comprehensive to produce an effective fire force and to ensure uniform operations.

**4.8.3** Companies responding to mutual aid incidents shall be equipped with communications equipment that allow personnel to communicate with incident commander and division supervisors, group supervisors, or sector officers.

## **Chapter 5 Fire Department Services**

### **5.1 Purpose.**

**5.1.1** The services provided by the fire department shall include those activities as required by Chapter 4.

**5.1.2** The procedures involved in these services, including operations and deployment, shall be established through written administrative regulations, standard operating procedures, and departmental orders.

**5.2\* Fire Suppression Services.** Fire suppression operations shall be organized to ensure that the fire department's fire suppression capability includes personnel, equipment, and resources to deploy the initial arriving company, the full initial alarm assignment, and additional alarm assignments. The fire department shall be permitted to use established automatic mutual aid and mutual aid agreements to comply with the requirements of Section 5.2.

### **5.2.1 Staffing.**

**5.2.1.1\*** On-duty fire suppression personnel shall be comprised of the numbers necessary for fire-fighting performance relative to the expected fire-fighting conditions. These numbers shall be determined through task analyses that take the following factors into consideration:

- (1) Life hazard to the populace protected

- (2) Provisions of safe and effective fire-fighting performance conditions for the fire fighters
- (3) Potential property loss
- (4) Nature, configuration, hazards, and internal protection of the properties involved
- (5) Types of fireground tactics and evolutions employed as standard procedure, type of apparatus used, and results expected to be obtained at the fire scene

**5.2.1.2\*** On-duty personnel assigned to fire suppression shall be organized into company units and shall have appropriate apparatus and equipment assigned to such companies.

**5.2.1.2.1\*** The fire department shall identify minimum company staffing levels as necessary to meet the deployment criteria required in 5.2.3 to ensure that a sufficient number of members are assigned, on duty, and available to safely and effectively respond with each company.

**5.2.1.2.2** Each company shall be led by an officer who shall be considered a part of the company.

**5.2.1.2.3\*** Supervisory chief officers shall be dispatched or notified to respond to all full alarm assignments.

**5.2.1.2.4** The supervisory chief officer shall ensure that the incident management system is established as required in Section 6.2.

**5.2.1.2.5\*** Supervisory chief officers shall have staff aides deployed to them for purposes of incident management and accountability at emergency incidents.

**5.2.2 Operating Units.** Fire company staffing requirements shall be based on minimum levels for emergency operations for safety, effectiveness, and efficiency.

**5.2.2.1** Fire companies whose primary functions are to pump and deliver water and perform basic fire fighting at fires, including search and rescue, shall be known as engine companies.

**5.2.2.1.1** These companies shall be staffed with a minimum of four on-duty personnel.

**5.2.2.1.2** In jurisdictions with tactical hazards, high hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors as identified by the authority having jurisdiction, these companies shall be staffed with a minimum of five or six on-duty members.

**5.2.2.2** Fire companies whose primary functions are to perform the variety of services associated with truck work, such as forcible entry, ventilation, search and rescue, aerial operations for water delivery and rescue, utility control, illumination, overhaul, and salvage work, shall be known as ladder or truck companies.

**5.2.2.2.1** These companies shall be staffed with a minimum of four on-duty personnel.

**5.2.2.2.2** In jurisdictions with tactical hazards, high hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors as identified by the authority having jurisdiction, these companies shall be staffed with a minimum of five or six on-duty personnel.

**5.2.2.3** Other types of companies equipped with specialized apparatus and equipment shall be provided to assist engine and ladder companies where deemed necessary as part of established practice.

**5.2.2.3.1** These companies shall be staffed with a minimum number of on-duty personnel as required by the tactical hazards, high hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors as identified by the authority having jurisdiction.

**5.2.2.4** Fire companies that deploy with quint apparatus, designed to operate as either an engine company or a ladder company, shall be staffed as specified in 5.2.2. If the company is expected to perform multiple roles simultaneously, additional staffing, above the levels specified in 5.2.2, shall be provided to ensure that those operations can be performed safely, effectively, and efficiently.

### **5.2.3 Deployment.**

#### **5.2.3.1 Initial Arriving Company.**

**5.2.3.1.1** The fire department's fire suppression resources shall be deployed to provide for the arrival of an engine company within a 4-minute response time and/or the initial full alarm assignment within an 8-minute response time to 90 percent of the incidents as established in Chapter 4.

**5.2.3.1.2\*** Personnel assigned to the initial arriving company shall have the capability to implement an initial rapid intervention crew (IRIC).

#### **5.2.3.2 Initial Full Alarm Assignment Capability.**

**5.2.3.2.1\*** The fire department shall have the capability to deploy an initial full alarm assignment within an 8-minute response time to 90 percent of the incidents as established in Chapter 4.

**5.2.3.2.2** The initial full alarm assignment shall provide for the following:

- (1) Establishment of incident command outside of the hazard area for the overall coordination and direction of the initial full alarm assignment. A minimum of one individual shall be dedicated to this task.
- (2) Establishment of an uninterrupted water supply of a minimum 1480 L/min (400 gpm) for 30 minutes. Supply line(s) shall be maintained by an operator who shall ensure uninterrupted water flow application.
- (3) Establishment of an effective water flow application rate of 1110 L/min (300 gpm) from two handlines, each of which shall have a minimum of 370 L/min (100 gpm). Attack and backup lines shall be operated by a minimum of two personnel each to effectively and safely maintain the line.
- (4) Provision of one support person for each attack and backup line deployed to provide hydrant hookup and to assist in line lays, utility control, and forcible entry.
- (5) A minimum of one victim search and rescue team shall be part of the initial full alarm assignment. Each search and rescue team shall consist of a minimum of two personnel.
- (6) A minimum of one ventilation team shall be part of the initial full alarm assignment. Each ventilation team shall consist of a minimum of two personnel.
- (7) If an aerial device is used in operations, one person shall function as an aerial operator who shall maintain primary control of the aerial device at all times.
- (8) Establishment of an IRIC that shall consist of a minimum of two properly equipped and trained personnel.

#### **5.2.3.3 Additional Alarm Assignments.**

**5.2.3.3.1** The fire department shall have the capability for additional alarm assignments that can provide for additional

personnel and additional services, including the application of water to the fire; engagement in search and rescue, forcible entry, ventilation, and preservation of property; accountability for personnel; and provision of support activities for those situations that are beyond the capability of the initial full alarm assignment.

**5.2.3.3.2** When an incident escalates beyond an initial full alarm assignment or when significant risk is present to fire fighters due to the magnitude of the incident, the incident commander shall upgrade the IRIC to a full rapid intervention crew(s) (RIC) that consists of four fully equipped and trained fire fighters.

**5.2.3.3.3** An incident safety officer shall be deployed to all incidents that escalate beyond an initial full alarm assignment or when significant risk is present to fire fighters. The incident safety officer shall ensure that the safety and health system is established as required in Section 6.1.

### **5.3\* Emergency Medical Services.**

**5.3.1 Purpose.** EMS operations shall be organized to ensure that the fire department's emergency medical capability includes personnel, equipment, and resources to deploy the initial arriving company and additional alarm assignments. The fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 5.3.

**5.3.1.1** The purpose of this section shall be to provide standards for the delivery of EMS by fire departments.

**5.3.1.2** The fire department shall clearly document its role, responsibilities, functions, and objectives for the delivery of EMS.

### **5.3.2\* System Components.**

**5.3.2.1** The basic treatment levels within an EMS system, for the purposes of this standard, shall be categorized as first responder, basic life support (BLS), and advanced life support (ALS). The specific patient treatment capabilities associated with each level shall be determined by the authority having jurisdiction for the approval and licensing of EMS providers within each state and province.

**5.3.2.2** The minimal level of training for all fire fighters that respond to emergency incidents shall be to the first responder/AED level. The authority having jurisdiction shall determine if further training is required.

### **5.3.3 EMS System Functions.**

**5.3.3.1** The five basic functions within a career fire department EMS system shall be as follows:

- (1) Initial response to provide medical treatment at the location of the emergency (first responder with AED capability or higher)
- (2) BLS response
- (3) ALS response
- (4) Patient transport in an ambulance or alternative vehicle designed to provide for uninterrupted patient care at the ALS or BLS level while en route to a medical facility
- (5) Assurance of response and medical care through a quality management program

**5.3.3.2** The fire department shall be involved in providing any or all of the functions as identified in 5.3.3.1(1) through 5.3.3.1(5).

### **5.3.3.3 Staffing.**

**5.3.3.3.1** On-duty EMS units shall be staffed with the minimum numbers of personnel necessary for emergency medical care relative to the level of EMS provided by the fire department.

**5.3.3.3.2** EMS staffing requirements shall be based on the minimum levels needed to provide patient care and member safety.

**5.3.3.3.2.1** Units that provide emergency medical care shall be staffed at a minimum with personnel that are trained to the first responder/AED level.

**5.3.3.3.2.2** Units that provide BLS transport shall be staffed and trained at the level prescribed by the state or provincial agency responsible for providing emergency medical services licensing.

**5.3.3.3.2.3** Units that provide ALS transport shall be staffed and trained at the level prescribed by the state or provincial agency responsible for providing emergency medical services licensing.

### **5.3.3.4 Service Delivery Deployment.**

**5.3.3.4.1** The fire department shall adopt service delivery objectives based on time standards for the deployment of each service component for which it is responsible.

**5.3.3.4.2** The fire department's EMS for providing first responder with AED shall be deployed to provide for the arrival of a first responder with AED company within a 4-minute response time to 90 percent of the incidents as established in Chapter 4.

**5.3.3.4.3\*** When provided, the fire department's EMS for providing ALS shall be deployed to provide for the arrival of an ALS company within an 8-minute response time to 90 percent of the incidents as established in Chapter 4.

**5.3.3.4.4** Personnel deployed to ALS emergency responses shall include a minimum of two members trained at the emergency medical technician – paramedic level and two members trained at the emergency medical technician – basic level arriving on scene within the established response time.

### **5.3.4 Quality Management.**

**5.3.4.1** The fire department shall institute a quality management program to ensure that the service has appropriate response times as required in 4.1.2.1.1 for all medical responses.

**5.3.4.2** All first responder and BLS medical care provided by the fire department shall be reviewed by the fire department medical personnel. This review process shall be documented.

**5.3.4.3** All fire departments with ALS services shall have a named medical director with the responsibility to oversee and ensure quality medical care in accordance with state or provincial laws or regulations. This review process shall be documented.

**5.3.4.4** Fire departments providing ALS services shall provide a mechanism for immediate communications with EMS supervision and medical oversight.

### **5.4 Special Operations Response.**

**5.4.1** Special operations shall be organized to ensure that the fire department's special operations capability includes personnel, equipment, and resources to deploy the initial arriving

company and additional alarm assignments providing such services. The fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 5.4.

**5.4.2** The fire department shall adopt a special operations response plan and standard operating procedures that specify the role and responsibilities of the fire department and the authorized functions of members responding to hazardous materials emergency incidents.

**5.4.3** All fire department members who are expected to respond to emergency incidents beyond the first responder operations level for hazardous materials response shall be trained to the applicable requirements of NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*.

**5.4.4** All fire department members who are expected to respond to emergency incidents beyond the confined space operations level for confined space operations shall be trained to the applicable requirements of NFPA 1670, *Standard on Operations and Training for Technical Rescue Incidents*.

**5.4.5** The fire department shall have the capacity to implement an RIC during all special operations incidents that would subject fire fighters to immediate danger of injury, or in the event of equipment failure or other sudden events, as required by NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

**5.4.6** If a higher level of emergency response is needed beyond the capability of the fire department for special operations, the fire department shall determine the availability of outside resources that deploy these capabilities and the procedures for initiating their response. The fire department shall be limited to performing only those specific special operations functions for which its personnel have been trained and are properly equipped.

## **5.5 Airport Rescue and Fire-Fighting Services.**

**5.5.1** Airport fire departments shall adopt operations response plan and standard operating procedures (SOPs) that specify the roles and responsibilities for non-aircraft incidents as required by 5.1.2.

**5.5.2** Airport rescue and fire-fighting operations shall be organized to ensure that the fire department's capability includes personnel, equipment, and resources to deploy the initial arriving company, the full initial alarm assignment, and additional alarm assignments as required in 5.2.3.

**5.5.3** Airport fire departments shall have access to special tools, equipment, supplies, personal protective equipment (PPE), and other airport resources that are required to perform operations safely and effectively in their assigned roles and responsibilities.

### **5.5.4 Deployment.**

**5.5.4.1** The airport fire department's ARFF resources shall deploy the required number of vehicles as required for the airport assigned category as established by NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*.

**5.5.4.2** Airport fire department companies equipped with specialized apparatus and equipment shall be provided to assist ARFF companies where deemed necessary as identified in 5.5.1.

**5.5.4.3** Airport fire department companies that deploy to structural incidents on airport property shall meet the response time requirements of 4.1.2.1.1.

**5.5.4.4** Airport fire department companies that deploy to emergency medical incidents on airport property shall meet the response time requirements of 5.3.3.4.

**5.5.4.5** The airport fire department shall be permitted to use established automatic mutual aid or mutual aid agreements to comply with the requirements of Section 5.5.

### **5.5.5 Staffing.**

**5.5.5.1** Airport fire department ARFF companies shall be staffed as required by NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*.

**5.5.5.2** Airport fire department companies that deploy to structural incidents on airport property shall meet the staffing requirements of 5.2.1.

**5.5.5.3** Airport fire department companies that deploy to emergency medical incidents on airport property shall meet the staffing requirements of 5.3.3.3.

### **5.5.6 Emergency Operations.**

**5.5.6.1** At all emergency scene operations, an Incident Management System shall be used that meets the requirements of Section 6.2.

**5.5.6.2\*** Incident command shall be established outside of the hazard area for the overall coordination and direction of the initial full alarm assignment.

**5.5.6.3** An individual shall be dedicated to this task of Incident Commander.

**5.5.6.4** An incident safety officer shall be deployed to all incidents that escalate beyond a full alarm assignment or when there is a significant risk to fire fighters. The incident safety officer shall ensure that the safety and health system is established as required in Section 6.1.

### **5.6\* Marine Rescue and Fire-Fighting (MRFF) Services.**

**5.6.1** MRFF operations shall be organized to ensure that the fire department's marine capability includes personnel, equipment, and resources to deploy to the alarm assignments associated with a marine emergency incident.

**5.6.2** The fire department shall adopt a marine operations response plan and SOPs that specify the roles and responsibilities of the fire department and the authorized functions of members responding to marine emergencies.

**5.6.2.1** Fire department marine SOPs shall be coordinated with the applicable agencies, such as the port or harbor authority and supporting agencies.

**5.6.3** Marine fire departments shall have access to special tools, equipment, supplies, PPE, and other marine resources that are required to perform operations safely and effectively in their assigned roles and responsibilities.

### **5.6.4 Staffing.**

**5.6.4.1** On-duty marine personnel shall be comprised of the numbers necessary for safe and effective fire-fighting performance relative to the expected MRFF conditions.

**5.6.4.1.1** These numbers shall be determined through task analyses as required for types of marine vessels and through

additional task analyses that take the following factors into consideration:

- (1) Life hazard to the populace protected
- (2) Provisions of safe and effective fire-fighting performance conditions for the fire fighters
- (3) Potential property loss
- (4) Nature, configuration, hazards, and internal protection of the properties involved
- (5) Types of tactics and evolutions employed as standard procedure, type of marine vessel used, and results expected to be obtained at the fire scene
- (6) Requirements of the regulatory authorities having jurisdiction over navigable waters, ports, and harbors

**5.6.4.2** On-duty personnel assigned to marine fire fighting shall be organized into company units and shall have appropriate vessels and equipment assigned to such companies.

**5.6.4.2.1** Each marine company shall be led by an officer who shall be considered a part of the company.

#### **5.6.5 Operating Units.**

**5.6.5.1\*** Fire companies whose primary function is to deliver and pump water and extinguishing agents at the scene of a marine incident shall be known as marine companies.

**5.6.5.2** These companies shall be staffed with a minimum number of on-duty personnel as required by the tactical and occupancy hazards to which the marine vessel responds and by the regulatory authorities having jurisdiction over navigable waters, ports, and harbors.

#### **5.7 Wildland Fire Suppression Services.**

**5.7.1** Wildland fire suppression operations shall be organized to ensure that the fire department's wildland fire suppression capability includes personnel, equipment, and resources to deploy wildland direct operations that can address marginal situations before they get out of control and wildland indirect fire-fighting operations that can be assembled and placed into operation against major wildland fires.

**5.7.2** Fire departments performing wildland operations shall adopt a wildland fire-fighting operations response plan and SOPs that specify the roles and responsibilities of the fire department and the authorized functions of members responding to wildland fire emergencies.

**5.7.2.1** All wildland fire suppression operations shall be organized to ensure compliance with NFPA 295, *Standard for Wild-fire Control*.

**5.7.3** Fire departments performing wildland operations shall have access to special tools, equipment, supplies, PPE, and other wildland resources that are required to perform operations safely and effectively in their assigned roles and responsibilities.

#### **5.7.4 Staffing.**

**5.7.4.1** On-duty wildland fire-fighting personnel shall be comprised of the numbers necessary for safe and effective fire-fighting performance relative to the expected wildland fire-fighting conditions.

**5.7.4.1.1** These numbers shall be determined through task analyses that take the following factors into consideration:

- (1) Life hazard to the populace protected

- (2) Provisions of safe and effective fire-fighting performance conditions for the fire fighters
- (3) The number of trained response personnel available to the department including mutual aid resources
- (4) Potential property loss
- (5) Nature, configuration, hazards, and internal protection of the properties involved
- (6) Types of wildland tactics and evolutions employed as standard procedure, type of apparatus used, and results expected to be obtained at the fire scene
- (7) Topography, vegetation, and terrain in the response area(s)

**5.7.4.2** On-duty personnel assigned to wildland operations shall be organized into company units and shall have appropriate apparatus and equipment assigned to such companies.

**5.7.4.2.1** The fire department shall identify minimum company staffing levels as necessary to meet the deployment criteria to ensure that a sufficient number of members are assigned, on duty, and available to safely and effectively respond with each company.

**5.7.4.2.2** Each company shall be led by an officer who shall be considered a part of the company.

**5.7.4.2.3** Supervisory chief officers shall be dispatched or notified to respond to all full alarm assignments. The supervisory chief officer shall ensure that the incident management system is established as required in Section 6.2.

#### **5.7.5 Operating Units.**

**5.7.5.1** Fire companies whose primary function is to deliver and pump water and extinguishing agents at the scene of a wildland fire shall be known as wildland companies.

**5.7.5.1.1** These companies shall be staffed with a minimum of four on-duty personnel.

**5.7.5.2** Engine and ladder (truck) companies that respond to wildland fire-fighting and/or urban interface wildland fire-fighting incidents shall be staffed as required by 5.2.2.

**5.7.5.3** Other types of companies equipped with specialized apparatus and equipment for wildland fire fighting, including aircraft, heavy equipment, mini pumpers, and fast attack vehicles, shall be provided to assist wildland engine and ladder companies where deemed necessary as part of established practice.

**5.7.5.3.1** These companies shall be staffed with a minimum number of on-duty personnel as required by the tactical, topographical, environmental, fuel (vegetation), and occupancy hazards.

#### **5.7.6 Deployment.**

**5.7.6.1 Required Number of Vehicles.** The fire department's wildland resources shall deploy the required number of vehicles as required for a direct and/or an indirect attack.

**5.7.6.1.1\*** Prior to the initiation of any wildland fire attack, the fire department shall have the capacity to establish a look-out(s), communications with all crew members, escape route(s), and safety zone(s) for vehicles and personnel.

#### **5.7.6.2 Direct Attack.**

**5.7.6.2.1** The fire department shall have the capability to safely initiate a direct wildland attack within 10 minutes after arrival of the initial company or crew at the fire scene.

**5.7.6.2.2** One individual in the first arriving company or crew shall be assigned as the incident commander for the overall coordination and direction of the direct attack activities.

**5.7.6.2.3** The direct wildland attack shall include the following:

- (1) Establishment of an effective water flow application rate of 111 L/min (30 gpm) from at least two 150 m (500 ft) 1½ in. diameter attack handlines from two engines. Each attack handline shall be operated by a minimum of two personnel to effectively and safely deploy and maintain the line.
- (2) Provision of one operator who shall remain with each fire apparatus supplying water flow to ensure uninterrupted water flow application.
- (3) Provision of a wildland crew leader or company officer with each crew who shall be responsible for overall supervision of each of the crew and for maintaining personnel accountability and crew safety.

#### **5.7.6.3 Indirect Attack.**

**5.7.6.3.1** The fire department providing wildland fire suppression operations shall have the capability to deploy an indirect attack, including application of water to the fire, engagement in search and rescue and preservation of property, accountability for personnel, and provision of support activities for those situations that are beyond the capability of the direct attack.

**5.7.6.3.2** An incident safety officer shall be deployed to all incidents that escalate beyond a direct attack alarm assignment or when there is a significant risk to fire fighters.

#### **5.7.7 Nonwildland Emergencies.**

**5.7.7.1** Wildland companies that deploy to structural incidents shall meet the response time requirements of 4.1.2.1.1.

**5.7.7.2** Wildland companies that deploy to emergency medical incidents shall meet the response time requirements of 4.1.2.1.1.

## **Chapter 6 Systems**

**6.1 Safety and Health System.** A fire-fighter occupational safety and health program shall be provided in accordance with NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

#### **6.2\* Incident Management System.**

**6.2.1** An incident management system shall be provided in accordance with NFPA 1561, *Standard on Emergency Services Incident Management System*, to form the basic structure of all emergency operations of the fire department, regardless of the scale of the department or the emergency.

**6.2.2\*** An effective incident management system shall be designed to manage incidents of different types, including structure fires, wildland fires, hazardous materials incidents, emergency medical operations, and other types of emergencies that could be handled by the department.

**6.3 Training Systems.** The fire department shall have a training program and policy that ensures that personnel are trained and competency is maintained to execute all responsi-

bilities consistent with the department's organization and deployment as addressed in Chapters 4 and 5.

#### **6.4 Communications Systems.**

**6.4.1** The fire department shall have a reliable communications system to facilitate prompt delivery of public fire suppression, emergency medical services, and special operations.

**6.4.2** All communications facilities, equipment, staffing, and operating procedures shall comply with NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*.

**6.4.3** Operating procedures for radio communications shall provide for the use of standard protocols and terminology at all types of incidents.

**6.4.3.1** Standard terminology, in compliance with NFPA 1561, *Standard on Emergency Services Incident Management System*, shall be established to transmit information, including strategic modes of operation, situation reports, and emergency notifications of imminent hazards.

**6.5\* Pre-Incident Planning.** The fire department shall set forth operational requirements to conduct pre-incident planning. Particular attention shall be provided to all target hazards.

## **Annex A Explanatory Material**

*Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.*

**A.1.1** The standard includes minimum requirements that are intended to provide effective, efficient, and safe protective services that operate on a sound basis to prevent fires and reduce risk to lives and property, to deal with incidents that occur, and to prepare for anticipated incidents. It sets minimum standards considered necessary for the provision of public fire protection by career fire departments. It addresses the structure and operation of organizations providing such services, including fire suppression and other assigned emergency response responsibilities, which include emergency medical services and special operations.

**A.1.2.1** A fundamental concept of fire risk is associated with modern society. Public fire service organizations are expected to reduce the risk within their areas of jurisdiction by taking measures to prevent the outbreak of fires, to limit the extent and severity of fires, to provide for the removal or rescue of endangered persons, to control and extinguish fires that occur within the jurisdiction, and to perform other emergency response operations and delivery of emergency medical services.

The cumulative effects of preventive efforts, risk reduction and control, and fire suppression capabilities result in variable levels of risk to the jurisdictions and their residents.

The risk remaining after deducting the cumulative effect of the public fire service organization's efforts is the responsibility of each individual, including owners, operators, occupants, and casual visitors to properties. It should be noted that fire risk cannot be completely avoided or eliminated.

**A.3.2.1 Approved.** The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evalu-

ate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

**A.3.2.2 Authority Having Jurisdiction.** The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

**A.3.3.1.1 Automatic Aid.** The capabilities of personnel and equipment for a predetermined response to a neighboring jurisdiction upon receipt of an alarm, this process is accomplished through simultaneous dispatch, is documented in writing, and is included as part of a communication center's dispatch protocols.

**A.3.3.1.2 Mutual Aid.** A written policy or contract that allows for the deployment of personnel and equipment to respond to an alarm in another jurisdiction, this is part of the written deployment criteria for response to alarms as dispatched by a communication center. (See also 3.3.1.1.)

**A.3.3.2 Aircraft Rescue and Fire Fighting.** Such rescue and fire-fighting actions are performed both inside and outside of the aircraft.

**A.3.3.3 Aircraft Rescue and Fire-Fighting (ARFF) Vehicle.** The apparatus is typically equipped with a large water tank (commencing at 1000 gal and extending to over 6000 gal); a supply of fire-fighting extinguishing agents; remote-controlled large roof turret(s), extendable turret nozzle(s), and bumper turret(s) (ground sweep nozzles) that are used for the discharge of extinguishing agent; and pre-connected handlines.

**A.3.3.4 Airport Fire Department Personnel.** These individuals can also be responsible for additional fire protection and suppression, emergency medical, and other emergency response within the boundaries of the airport facility.

**A.3.3.5 Alarm.** In some jurisdictions this is referred to as an incident or call for service.

**A.3.3.6 Apparatus.** Examples include fire engines, water tenders, and ladder trucks.

**A.3.3.8 Company.** For fire suppression, jurisdictions exist where the response capability of the initial arriving company is configured with the response of two apparatus. In some jurisdictions, apparatus is not configured with seated and belted positions for four personnel and therefore would respond

with an additional vehicle in consort with the initial arriving engine to carry additional personnel. This response would be to ensure that a minimum of four personnel are assigned to and deployed as a company. The intent of this definition and the requirements in the standard are to ensure that these two (or more) pieces of apparatus would always be dispatched and respond together as a single company. Some examples of this include the following:

- (1) Engine and tanker/tender that would be responding outside a municipal water district
- (2) Multiple-piece company assignment, specified in a fire department's response SOPs, such as an engine company response with a pumper and a hose wagon
- (3) Engine with a vehicle personnel carrier
- (4) Engine with an ambulance or rescue unit

"Company," as used in this standard, is synonymous with company unit, response team, crew, and response group, rather than a synonym for a fire department.

**A.3.3.16 Fire Suppression.** Fire suppression includes all activities performed at the scene of a fire incident or training exercise that expose fire department members to the dangers of heat, flame, smoke, and other products of combustion, explosion, or structural collapse.

**A.3.3.17 First Responder (EMS).** The first responder also assists higher level emergency medical service providers.

**A.3.3.19 Hazard.** Hazards include the characteristics of facilities, equipment systems, property, hardware, or other objects; and the actions and inactions of people that create such hazards.

**A.3.3.21 High Hazard Occupancy.** Also included would be high-risk residential occupancies, neighborhoods with structures in close proximity to one another, special medical occupancies, high-rise occupancies, and hazardous materials occupancies.

**A.3.3.23 Incident Management System (IMS).** Such systems are often referred to as incident command systems (ICS).

**A.3.3.27.2 Basic Life Support (BLS).** Basic life support personnel also assist higher level EMS providers.

**A.3.3.28 Marine Rescue and Fire Fighting.** Marine companies can be utilized for special operations, including a platform for dive and scuba operations and for providing a secure water supply for land-based operations.

**A.3.3.29 Member.** A fire department member can be a full-time or part-time employee or a paid or unpaid volunteer, can occupy any position or rank within the fire department, and can engage in emergency operations.

**A.3.3.30.1 Company Officer.** This person can be someone appointed in an acting capacity. The rank structure could be either sergeant, lieutenant, or captain.

**A.3.3.30.2 Supervisory Chief Officer.** A supervisory chief officer is above that of a company officer, who responds automatically and/or is dispatched to an alarm beyond the initial alarm capabilities, or other special calls. In some jurisdictions this is the rank of battalion chief, district chief, deputy chief, assistant chief, or senior divisional officer (UK fire service).

**A.3.3.31 Public Fire Department.** The term *fire department* includes any public, governmental, private, or military organization engaging in this type of activity.

**A.3.3.33 Rapid Intervention Crew (RIC).** The RIC report directly to the incident commander or operations chief. This dedicated crew is not to be confused with the IRIC.

**A.3.3.36 Special Operations.** Special operations include water rescue, extrication, hazardous materials, confined space entry, high-angle rescue, aircraft rescue and fire fighting, and other operations requiring specialized training.

**A.3.3.37 Staff Aide.** This member is assigned to a supervisory chief officer who assists at incident scene operations, which can include personnel accountability, communications, and other logistical and administrative support. In addition, this member can assist in coordinating training activities, respond to citizen inquiries, coordinate staffing issues and sick leave follow-up, and resource allocations for facilities and apparatus under the supervisory chief officer's jurisdiction. Staff aides can be known as field incident technician, staff assistant, battalion fire fighter, or battalion adjutant.

**A.3.3.42.3 Dispatch Time.** Dispatch times are addressed in NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*. These include call-taking and call-processing requirements.

**A.4.1.1** The authority having jurisdiction generally has the responsibility to determine the following:

- (1) Scope and level of service provided by the fire department
- (2) Necessary level of funding
- (3) Necessary level of personnel and resources, including facilities

In order to provide service, the authority having jurisdiction should have the power to levy taxes or solicit funding, to own property and equipment, and to cover personnel costs. The authority necessary is conveyed by law to a local jurisdiction.

In addition, the governing body also should monitor the achievement of the management goals of the department, such as fire prevention, community life safety education, fire suppression, employee training, communications, maintenance, and department administration.

The organizational statement is a very important basis for many of the provisions of this standard. The statement sets forth the legal basis for operating a fire department, the organizational structure of the fire department, number of members, training requirements, expected functions, and authorities and responsibilities of various members or defined positions.

A key point is to clearly set out the specific services the fire department is authorized and expected to perform. Most fire departments are responsible to a governing body. The governing body has the right and should assert its authority to set the specific services and the limits of the services the fire department will provide, and it has the responsibility to furnish the necessary resources for delivery of the designated services. The fire department should provide its governing body with a specific description of each service with options or alternatives and an accurate analysis of the costs and resources needed for each service.

Such services could include structural fire fighting, wildland fire fighting, airport/aircraft fire fighting, emergency medical services, hazardous materials response, high angle rescue, heavy rescue, and others.

Spelling out the specific parameters of services to be provided allows the fire department to plan, staff, equip, train,

and deploy members to perform these duties. It also gives the governing body an accounting of the costs of services and allows it to select those services they can afford to provide. Likewise, the governing body should identify services it cannot afford to provide and cannot authorize the fire department to deliver, or it should assign those services to another agency.

The fire department should be no different than any other government agency that has the parameters of its authority and services clearly defined by the governing body.

Legal counsel should be used to ensure that any statutory services and responsibilities are being met.

The majority of public fire departments are established under the charter provisions of their governing body or through the adoption of statutes. These acts define the legal basis for operating a fire department, the mission of the organization, the duties that are authorized and expected to be performed, and the authority and responsibilities that are assigned to certain individuals to direct the operations of the fire department.

The documents that officially establish the fire department as an identifiable organization are necessary to determine specific responsibilities and to determine the parties responsible for compliance with the provisions of this standard.

In many cases, these documents can be part of state laws, a municipal charter, or an annual budget. In such cases, it would be appropriate to make these existing documents part of the organizational statement, if applicable.

**A.4.1.2** There can be incidents or areas where the response criteria are impacted by circumstances such as response personnel who are not on duty, nonstaffed fire station facilities, natural barriers, traffic congestion, insufficient water supply, and density of population or property. The reduced level of service should be documented in the written organizational statement by the percentage of incidents and geographical areas for which the response time criteria are achieved.

**A.4.1.2.1(2)** This service delivery requirement is intended to have a fire department plan and situate its resources to consistently meet a 4-minute initial company fire suppression response and an 8-minute full alarm fire response assignment. However, it is recognized that while on some occasions (for example, a company is out of service for training) the initial company response may not be met in the 4-minute requirement, the 8-minute criterion must always be met.

**A.4.4.2** Occupational Safety and Health Administration (OSHA) regulations require that all fire departments be trained to respond to hazardous materials incidents at the first responder operations level.

Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), known as the Emergency Planning and Right-to-Know Act, established requirements for federal, state, and local governments and industrial facilities regarding emergency planning for spills or other releases, and community right-to-know reporting of hazardous and toxic chemicals.

The Emergency Planning and Right-to-Know Act of 1986 covers the following four major areas that will provide the fire service and communities with a broad perspective on the chemical hazards within the local area and those at individual facilities:

- (1) Sections 301 through 303 — emergency planning
- (2) Section 304 — emergency release notification
- (3) Sections 311 and 312 — community right-to-know reporting requirements
- (4) Section 313 — toxic chemical release inventory

**A.4.8.1** Where appropriate, the mutual aid agreement should include automatic responses on first alarms (automatic aid). This concept contemplates joint response of designated apparatus and personnel on a predetermined running assignment basis.

Mutual aid concepts should be considered on a regional basis. In an effective mutual aid arrangement, each fire department should retain reserves of personnel and apparatus. Traditionally and legally, overall command of the incident is vested with the senior officer of the jurisdiction experiencing the emergency.

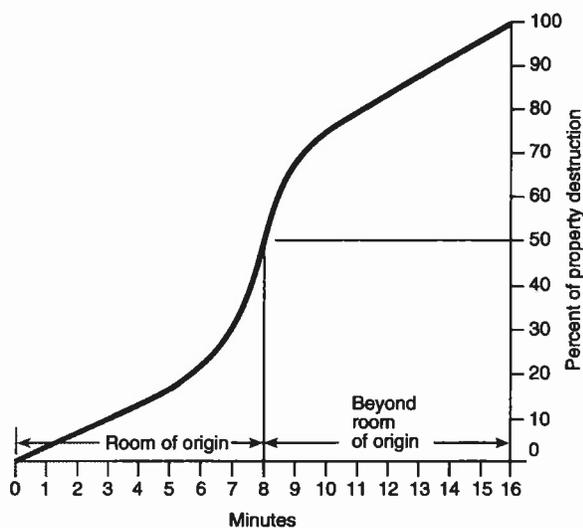
Some areas use consolidated dispatching to coordinate the response of fire companies to assist an outside fire department. The management of responses can be made easier by utilizing computerization, "running cards," and other advance planning.

**A.5.2** Suppression capability is an expression of how much fire-fighting power can be put into action when there is a fire. It includes the amount of apparatus, equipment, and personnel available; the time needed to respond and place equipment in action; the water supply; the application of strategy and tactics; the level of training; and all of the components that add up to effective fireground operations.

**A.5.2.1.1** For more information, see NFPA 1250, *Recommended Practice in Emergency Service Organization Risk Management*; FEMA, National Fire Academy, "Fire Risk Analysis: A Systems Approach"; Phoenix, AZ Fire Department, "Fire Department Evaluation System (FIREMAP)."

**A.5.2.1.2** For further information on companies, see 3.3.8 and A.3.3.8.

**A.5.2.1.2.1** An early aggressive and offensive primary interior attack on a working fire, where feasible, is usually the most effective strategy to reduce loss of lives and property damage. In Figure A.5.2.1.2.1 the line represents a rate of fire propagation, which combines temperature rise and time. It roughly corresponds to the percentage of property destruction. At approximately 10 minutes into the fire sequence, the hypothetical room of origin flashes over. Extension outside the room begins at this point.



**FIGURE A.5.2.1.2.1** Fire propagation curve.

Consequently, given that the progression of a structural fire to the point of flashover (i.e., the very rapid spreading of the fire due to superheating of room contents and other combustibles) generally occurs in less than 10 minutes, two of the most important elements in limiting fire spread are the quick arrival of sufficient numbers of personnel and equipment to attack and extinguish the fire as close to the point of its origin as possible. For more information, refer to *Fire Service Today*, "Reduced Staffing: At What Cost," and NIST, "Hazard I Fire HAZARD Assessment Method." Also, refer to National Fire Academy, "Fire Risk Analysis: A Systems Approach," and Office of the Ontario Fire Marshal, *Shaping the Future of Fire Ground Staffing and Delivery Systems within a Comprehensive Fire Safety Effectiveness Model*.

The ability of adequate fire suppression forces to greatly influence the outcome of a structural fire is undeniable and predictable. Data generated by NFPA provides empirical data that rapid and aggressive interior attack can substantially reduce the human and property losses associated with structural fires (see Table A.5.2.1.2.1).

**Table A.5.2.1.2.1** Fire Extension in Residential Structures 1994-1998

Extension	Rate per 1000 Fires		
	Civilian Deaths	Civilian Injuries	Dollar Loss per Fire
Confined to the room of origin	2.32	35.19	3,185
Beyond the room but confined to the floor of origin	19.68	96.86	22,720
Beyond the floor of origin	26.54	63.48	31,912

Note: Residential structures include dwellings, duplexes, manufactured homes (also called mobile homes), apartments, row houses, townhouses, hotels and motels, dormitories, and barracks.

Source: *NFPA Annual Fire Experience Survey and National Fire Incident Reporting System*.

**A.5.2.1.2.3** The assignment of specific response districts to command officers should be based on the number of companies, workload, and response distances. Department administrative procedures should indicate clearly the jurisdiction of command officers.

**A.5.2.1.2.5** For further information on staff aides, see 3.3.37.

**A.5.2.3.1.2** NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*; 29 CFR 1910.134; and U.S. Department of Labor, Occupational Safety & Health Administration, *Memorandum for Regional Administration and State Designees; Response to IDLH or Potential IDLH Atmospheres*.

The initial rapid intervention crew (IRIC) and the rapid intervention crew (RIC) members are equipped with the fire fighters' protective ensemble, including protective clothing and equipment as required by NFPA 1500.

**A.5.2.3.2.1** For the purposes of this standard, the initial full alarm assignment capability is for a response to a structural fire in a typical 264 m<sup>2</sup> (2000 ft<sup>2</sup>), two-story, single-family occupancy without a basement and with no exposures (detached home). All communities respond to fire incidents in this type

of structure on a regular basis and therefore the hazards presented by this scenario are not unusual.

Other occupancies and structures in the community that present greater hazards should be addressed by additional fire fighter functions and additional responding personnel on the initial full alarm assignment. For further information on the classification of hazards, see NFPA *Fire Protection Handbook*, 18th edition.

**A.5.3** An EMS is defined as a comprehensive, coordinated arrangement of resources and functions that are organized to respond in a timely, staged manner to medical emergencies, regardless of their cause. The term *system* can be applied locally, at the state, province, or national level. The fundamental functions of an EMS system are the following:

- (1) System organization and management
- (2) Medical direction
- (3) Human resources and training
- (4) Communications
- (5) Emergency response
- (6) Transportation
- (7) Care facilities
- (8) Quality assurance
- (9) Public information and education
- (10) Disaster medical services
- (11) Research
- (12) Special populations

**A.5.3.2** The following four functions do not necessarily exist as separate elements in a particular system:

- (1) The first responding unit can be an ALS ambulance that can provide ALS treatment and ambulance transportation.
- (2) The first responding unit can be a fire suppression unit that can provide both initial and advanced level medical care.
- (3) ALS can be provided by the ambulance or by an additional fire suppression unit or a unit that is dedicated to ALS response only.
- (4) The system may not have ALS treatment capability — only a fire apparatus with fire fighters trained as first responder AED can respond.

**A.5.3.3.4.3** The American Heart Association recommends the minimum required personnel for an emergency cardiac care response. In those systems that have attained survival rates higher than 20 percent for patients with ventricular fibrillation, response teams include, as a minimum, two ALS providers and two BLS providers. See "Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiac Care," *JAMA*; "Basic Trauma Life Support for Paramedics and Other Providers," ACEP; "Pre-Hospital Trauma Life Support," ACS; "Pediatric Advanced Life Support," AHA; and "Emergency Care and Transportation of the Sick and Injured," AAOS.

**A.5.5.6.2** The U.S. Air Force has defined the areas involved in the emergency within 240 m (75 ft) of the aircraft as immediately dangerous to life and health (IDLH).

**A.5.6** For additional information on marine fire fighting, see NFPA 1405, *Guide for Land-Based Fire Fighters Who Respond to Marine Vessel Fires*.

**A.5.6.5.1** For additional information on marine rescue and fire-fighting vessels, see NFPA 1925, *Standard on Marine Fire-Fighting Vessels*.

**A.5.7.6.1.1** A system developed by Chief Paul Gleason of the United States Forest Service addresses specific mandatory fire orders in a system termed *LCES*, which stands for lookout(s), communication(s), escape route(s), and safety zone(s). These four items are to be implemented as an integrated system by a single resource unit, a strike team, or a full assignment. The implementation of LCES is a minimum safety requirement prior to the initiation of any wildland fire-fighting operations.

**A.6.2** Emergency incidents can involve operations that vary considerably in their complexity and scale. The control of these incidents depends on the planned, systematic implementation of an effective fireground organization to accomplish identified objectives. Every fire department, regardless of size, needs a proper system to regulate and direct emergency forces and equipment at both routine and major incidents. The incident management system forms the basic structure of operations, regardless of scale. An effective system is designed to manage incidents of different types, including structure fires, wildland fires, hazardous materials incidents, and medical and other emergencies.

**A.6.2.2** Unlike fire incidents where command is normally predicated by rank structure, EMS patient care is based upon statutory recognition of the individual with the highest level of medical certification. It is recommended that departments adopt protocols that define the degree of both member and nonmember involvement in direct patient care based upon local standards, medical control, and statutory requirements.

**A.6.5** For additional information, see NFPA 1620, *Recommended Practice for Pre-Incident Planning*.

## Annex B Informational References

**B.1 Referenced Publications.** The following documents or portions thereof are referenced within this standard for informational purposes only and are thus not part of the requirements of this document unless also listed in Chapter 2.

**B.1.1 NFPA Publications.** National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 1999 edition.

NFPA 1250, *Recommended Practice in Emergency Service Organization Risk Management*, 2000 edition.

NFPA 1405, *Guide for Land-Based Fire Fighters Who Respond to Marine Vessel Fires*, 2001 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 1997 edition.

NFPA 1620, *Recommended Practice for Pre-Incident Planning*, 1998 edition.

NFPA 1925, *Standard on Marine Fire-Fighting Vessels*, 1998 edition.

*NFPA Annual Fire Experience Survey and National Fire Incident Reporting System*.

*Fire Protection Handbook*, 18th edition, 1997.

*Fire Service Today*, Gerard, J.C. and A.T. Jacobsen, "Reduced Staffing: At What Cost," September 1981.

**B.1.2 Other Publications.**

**B.1.2.1 AMA Publication.** American Medical Association, 515 North State Street, Chicago, IL 60610.

"Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiac Care." 1992. *Journal of the American Medical Association*, 268(16) (October 28).

**B.1.2.2 CEAI Publication.** Commission on Fire Accreditation International, 4500 Southgate Place, Suite 100, Chantilly, VA 20151.

*Fire and Emergency Service Self Assessment Manuals*, National Fire Service Accreditation Program.

**B.1.2.3 FEMA Publication.** Federal Emergency Management Agency, Washington, DC 20002.

"Fire Risk Analysis: A Systems Approach," NFA-SM-FRAS, National Emergency Training Center, National Fire Academy, July 20, 1984.

**B.1.2.4 NIST Publication.** National Institute of Standards and Technology, Bldg. 820, Rm. 164, Gaithersburg, MD 20899.

"Hazard I Fire Hazard Assessment Method," U.S. Department of Commerce, June 1991.

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## Index

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# ***APPENDIX B***



## **OSHA Two in Two Out Overview**

In brief, the OSHA rule specifies that whenever fire fighters operate in an "immediately dangerous to life and health" (IDLH) environment, two fighters must go into the IDLH together and must maintain voice or visual communication, and two fire fighters must be outside the IDLH and be prepared to render emergency assistance to those inside. One of the two fire fighters outside the IDLH must remain in communication with those in the IDLH.

The OSHA rule provides an exception, however, which states that the rule does not apply in emergency rescue situations where a person is visible and in need of immediate rescue.

To comply with the 2-in / 2-out rule, a team of four fire fighters must be assembled before an interior fire attack can be made when the fire has progressed beyond the incipient stage, except in an imminent life-threatening situation when immediate action could prevent the loss of life or serious injury before the team of four fire fighters are assembled.

# ***APPENDIX C***



Municipal  
Resources  
Inc.



Fire Apparatus Manufacturer's Association

**Fire Apparatus Duty Cycle White Paper**

FAMA Technical Committee  
Chassis Subcommittee

Roger Lackore - Pierce Manufacturing

August 10, 2004

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## Purpose

This paper has been created by the Chassis Technical Committee of the Fire Apparatus Manufacturer's Association for the follow purpose:

- Provide guidance to fire apparatus manufacturers on the life expectancy and use profile for major types of fire apparatus.
- Estimate the average engine duty cycle in a fire apparatus.
- Provide a tool for engine manufacturers to use when estimating the impact of fire apparatus engine emissions.

## Methods

- Survey of Fire Chiefs
- Instrumentation of selected vehicles to log data on use profiles
- Engine Data Collection

## Definition of Terms

Urban	Area served by the fire department is obviously metropolitan and consists of high-density housing, industrial, or retail structures.
Suburban	Area served is mainly single family housing, light retail or light industry. Could be outskirts of metropolitan areas or smaller communities.
Rural	Area served is small towns and low density population regions that would include significant distances between the station and the structures being protected.

## PART I - Survey of Fire Chiefs

### Description

In January 2004, *Pierce Manufacturing* conducted an independent quantitative research survey through *Added Value Inc.* that was designed to provide information on the usage patterns for fire apparatus. Among the information sought through this survey were the following topics:

- Department demographics
- Number of apparatus by type
- Average number of runs per week
- Average length of run
- Average miles driven per year

The methodology for the research survey was as follows:

- A one-page questionnaire was developed consisting of 15 closed-end questions.
- A list of 1200 fire chiefs representing a cross-section of the U.S. was created.
- A code number was printed at the bottom of each questionnaire to allow *Added Value Inc.* to track responses.
- All Questionnaires were mailed with a postage-paid return envelope, and a cover letter from *Pierce Manufacturing*.
- The cutoff date for the survey receipt was February 23, 2004.

The response rate for the survey was 30%

### Respondent Profile

Respondents who were fire chiefs or assistant fire chiefs 69%

#### Type of Department

Career fire departments	30%
Volunteer departments	45%
Combination career/volunteer	25%

#### Population Served

50,000 or less	82%
50,000 to 100,000	11%
100,000 or more	7%

#### Demographics Served

Urban	25%
Suburban	46%
Rural	48%

Topography of Region Served

Relatively Flat	58%
Hilly	36%
Mountainous	14%

**Average Apparatus Per Department by Type**

Apparatus in service per department

Pumper	5.8
Aerial	1.5
Rescue	2.5

Chassis Type (newest apparatus)

	<u>Custom</u>	<u>Commercial</u>
Pumper	77%	23%
Aerial	93%	7%
Rescue	46%	53%

**Life Expectancy**

Years Expected in Active Service (Average)

Newest Pumper	17
Newest Aerial	19
Newest Rescue	15

Years Expected in Reserve Service (Average)

Newest Pumper	12
Newest Aerial	10
Newest Rescue	9

**Annual Apparatus Usage**

Total Miles Driven In Last 12 Months

Newest Pumper	4,501
Newest Aerial	3,663
Newest Rescue	4,898

Total Engine Hours (Average)

	<u>Last 12 Months</u>	<u>Hours per Week</u>
Newest Pumper	655	12.6
Newest Aerial	413	7.9
Newest Rescue	705	13.5

<u>Runs (Average)</u>	<u>Runs per Week</u>	<u>Runs per Year</u>
Newest Pumper	15	780
Newest Aerial	10	520
Newest Rescue	16	832

<u>Hours at Idle Per Week</u>	
Newest Rescue	10
Newest Pumper	9
Newest Aerial	7

## Life Expectancy by Demographics

<u>Years of Apparatus in active service (Average Expected)</u>	<u>Urban</u>	<u>Suburban</u>	<u>Rural</u>
Newest Pumper	15	16	18
Newest Aerial	18	19	21
Newest Rescue	13	15	16

<u>Years of Apparatus in reserve service on (Average Expected)</u>	<u>Urban</u>	<u>Suburban</u>	<u>Rural</u>
Newest Pumper	10	11	14
Newest Aerial	9	10	13
Newest Rescue	7	7	11

<u>Years of total service life (active plus reserve)</u>	<u>Urban</u>	<u>Suburban</u>	<u>Rural</u>
Newest Pumper	25	27	32
Newest Aerial	27	29	34
Newest Rescue	20	22	27

## Apparatus Use by Demographics

<u>Miles driven (last 12 months)</u>	<u>Urban</u>	<u>Suburban</u>	<u>Rural</u>
Newest Pumper	7,629	4,992	3,034
Newest Aerial	5,083	3,492	2,155
Newest Rescue	7,534	6,087	3,946

<u>Engine hours (last 12 months)</u>	<u>Urban</u>	<u>Suburban</u>	<u>Rural</u>
Newest Pumper	873	572	496
Newest Aerial	540	403	279
Newest Rescue	714	648	745

Runs per Week

	<u>Urban</u>	<u>Suburban</u>	<u>Rural</u>
Newest Pumper	29	16	8
Newest Aerial	13	11	5
Newest Rescue	31	16	11

Idle Time (hours per week)

	<u>Urban</u>	<u>Suburban</u>	<u>Rural</u>
Newest Pumper	11	10	6
Newest Aerial	8	7	5
Newest Rescue	13	9	8

Run Length (Round-Trip)

	<u>Miles</u>
Urban	4.9
Suburban	5.4
Rural	7.6

## PART II - Engine Duty Cycle Extraction

### **Description**

With the advent of electronically controlled diesels, engine manufacturers have incorporated data logging capability into the Electronic Control Modules (ECM) of the engines. Both Detroit Diesel and Cummins engines have the ability to log duty cycle activity and output the results in the form of percent of time spent at varying loads and engine speeds.

The accessibility of this logged data varies between engine models, dates of manufacture and the extent to which the customers may have extracted data already. Despite these issues, the researchers were able to access data on engines from a wide spectrum of apparatus types and department demographics. The resulting data provides good insight into the manner in which the average fire apparatus is used.

Because the format of data between engine manufacturers, engine models, and ECM versions is not identical, this paper condenses the results into six buckets. The percentage of time the engine operates at various speeds is reported as follows:

Low Speed	1000 rpm or less
Medium Speed	Between 1000 rpm and 1800 rpm
High Speed	1800 rpm and above

The percent of time the engine operates at varying loads is reported as a percentage of maximum load

Low Load	0 – 10%
Medium Load	Above 10% and below 90%
High Load	90 – 100%

Time spent at negative values of torque (engine braking) is included with the low load values.

## Results

### Population of Engine ECMs Interrogated

Apparatus Type	Number of Apparatus Sampled	Average Months of Service in Extraction Record
Pumper	51	26
Aerial	21	31
Rescue	4	14
<b>Grand Total</b>	<b>76</b>	<b>26</b>

### Average Apparatus Miles Per Year by Demographic

Demographic	Apparatus Type	Average of Miles Per Year
Rural	Pumper	2,352
	Aerial	1,866
	Rescue	2,756
<b>Rural Total</b>		<b>2,347</b>
Suburban	Pumper	6,068
	Aerial	3,479
	Rescue	4,992
<b>Suburban Total</b>		<b>5,403</b>
Urban	Pumper	6,126
	Aerial	6,514
	Rescue	9,222
<b>Urban Total</b>		<b>6,478</b>
<b>Grand Total</b>		<b>5,222</b>

### Average Engine Hours Per Year By Demographic

Demographic	Apparatus Type	Average of Eng Hrs
Rural	Pumper	301
	Aerial	204
	Rescue	301
<b>Rural Total</b>		<b>295</b>
Suburban	Pumper	1,364
	Aerial	1,133
	Rescue	367
<b>Suburban Total</b>		<b>1,272</b>
Urban	Pumper	1,107
	Aerial	2,379
	Rescue	1,686
<b>Urban Total</b>		<b>1,681</b>
<b>Grand Total</b>		<b>1,244</b>

### Average Pump Hours Per Year By Demographic

Demographic	Apparatus Type	Average of Pump Hrs
Rural	Pumper	70
<b>Rural Total</b>		<b>70</b>
Suburban	Pumper	168
	Aerial	59
<b>Suburban Total</b>		<b>135</b>
Urban	Pumper	93
	Aerial	141
<b>Urban Total</b>		<b>111</b>
<b>Grand Total</b>		<b>117</b>

## Average Aerial Hours Per Year By Demographic

Demographic	Apparatus Type	Average of Aerial Hours Per Year
Rural	Aerial	63
<b>Rural Total</b>		<b>63</b>
Suburban	Aerial	64
<b>Suburban Total</b>		<b>64</b>
Urban	Aerial	72
<b>Urban Total</b>		<b>72</b>
<b>Grand Total</b>		<b>69</b>

## Time Spent at Engine Speed by Demographic

Apparatus Type	Demographic	Average Time at Low RPM	Average Time at Medium RPM	Average Time at High RPM
Pumper	Rural	63%	27%	11%
	Suburban	71%	23%	6%
	Urban	62%	32%	5%
<b>Pumper Total</b>		<b>66%</b>	<b>27%</b>	<b>7%</b>
Aerial	Rural	73%	19%	9%
	Suburban	68%	27%	5%
	Urban	73%	22%	5%
<b>Aerial Total</b>		<b>71%</b>	<b>23%</b>	<b>5%</b>
Rescue	Rural	51%	42%	7%
	Suburban	77%	17%	7%
	Urban	57%	32%	11%
<b>Rescue Total</b>		<b>61%</b>	<b>30%</b>	<b>9%</b>
<b>Grand Total</b>		<b>67%</b>	<b>26%</b>	<b>7%</b>

## Time Spent at Engine Load by Demographic

Apparatus Type	Demographic	Average Time at Low Load	Average Time at Medium Load	Average Time at High Load
Pumper	Rural	61%	36%	3%
	Suburban	54%	44%	3%
	Urban	73%	24%	3%
<b>Pumper Total</b>		<b>62%</b>	<b>35%</b>	<b>3%</b>
Aerial	Rural	83%	11%	6%
	Suburban	37%	58%	5%
	Urban	53%	42%	5%
<b>Aerial Total</b>		<b>50%</b>	<b>45%</b>	<b>5%</b>
Rescue	Rural	59%	39%	2%
	Suburban	78%	22%	0%
	Urban	44%	51%	5%
<b>Rescue Total</b>		<b>56%</b>	<b>41%</b>	<b>3%</b>
<b>Grand Total</b>		<b>58%</b>	<b>38%</b>	<b>3%</b>

## Average Engine Load

The Average Engine Load was determined by multiplying the percent load, by the percent time at load, then by the total HP, and summing up the results. This gives an average power load for each sample apparatus. The following chart summarizes the average power by each power rating, and finally provides an average power load for the entire sample population.

<b>Apparatus Type</b>	<b>HP</b>	<b>Average Power Load (HP)</b>
Pumper	315	44
	330	49
	350	51
	365	51
	370	68
	400	51
	430	90
	435	106
	475	111
	500	118
<b>Pumper Total</b>		<b>73</b>
Aerial	330	42
	430	81
	470	124
	500	128
<b>Aerial Total</b>		<b>104</b>
Rescue	350	32
	430	107
	500	96
<b>Rescue Total</b>		<b>86</b>
<b>Grand Total</b>		<b>82</b>

## PART III - Vehicle Data-Logging

### **Description**

Operational data was gathered by installing GPS based data logging equipment on two sample apparatus. This recording equipment was installed for a span of three weeks on each vehicle and measured the time spent accelerating, decelerating, pumping, and at idle. Engine speed was also measured. The first apparatus was a pumper located at the busiest station of a major metropolitan department. The second apparatus was located at the station of a volunteer department in a rural bedroom community.

Most of the information obtained here is duplicated with a much larger population in the Engine Duty Cycle Extraction section. The unique information obtained in this portion of the study is the percentage of time the apparatus spends accelerating or decelerating while driving, and a more detailed view of the engine speeds during pumping.

The percent of time the apparatus operates at various conditions is defined as follows:

Acceleration	+1.5 mph per second or greater
Deceleration	-1.5 mph per second or less
Steady Speed	Between +1.5 and -1.5 mph per second

### **Results**

The result of this section of the study are provided for reference purposes only. The results are not statistically significant since only two trucks are involved and only three weeks of data was collected for each vehicle. The rural apparatus only operated for 15 hours over the three week time frame and of that was only actually driving for a total of three hours. It responded to one car fire which accounts for the pumping hours.

The urban pumper probably provides a more useful profile since it accumulated 64 hours of engine-on time over the three week period. The annualized data agrees fairly well with what we might expect of a busy metropolitan station.

### **Urban Career Department Apparatus Results**

#### **Urban Pumper Percent of Time**

Acceleration	7.2 %
Deceleration	6.8 %
Steady Speed	13.6 %
Stopped with Engine Running (Pump Off)	66.6 %
Pumping	5.8 %

**Urban Pumper Hours per Year**

Acceleration	80
Deceleration	77
Steady Speed	151
Stopped with Engine Running (Pump Off)	747
Pumping	64
Total	1123

**Rural Volunteer Department Apparatus Results****Rural Pumper Percent of Time**

Acceleration	1.5 %
Deceleration	2.0 %
Steady Speed	18.5 %
Stopped with Engine Running (Pump Off)	61.4 %
Pumping	16.4 %

**Rural Pumper Hours per Year**

Acceleration	4
Deceleration	5
Steady Speed	46
Stopped with Engine Running (Pump Off)	152
Pumping	41
Total	247

## National Cumulative Projections for Custom Apparatus

### Data Source

FAMA reports each year on the number of apparatus sold by apparatus type (Pumper, Aerial, Rescue). This data is sent by each fire apparatus OEM to a third-party organization that tallies the results and reports the total numbers without revealing the break-down by manufacturer. This eliminates any incentive for over or under reporting, and provides what we believe to be reasonably accurate data on the fire apparatus population. These numbers are inflated because they include export sales, but they are understated by the small number of OEMs who are not members of FAMA or do not report. We believe that these reporting errors balance fairly equally and that the values reported here can be used for gross estimates with a reasonable degree of confidence.

### Results

#### All Domestic Fire Apparatus

Year	Commercial Pumper	Custom Pumper	Aerial	Rescue	Specialty	Total
1997	1425	1570	605	408	735	4743
1998	1328	1535	590	520	805	4778
1999	1561	1561	657	513	900	5192
2000	1523	1865	712	446	1016	5562
2001	1416	1755	648	447	1028	5294
2002	1321	1977	584	588	1008	5478
2003	1277	1701	537	548	1028	5091

## Custom Fire Apparatus

The number of Custom Chassis Apparatus can be estimated as follows:

- 100% of Custom Pumpers (as reported by FAMA )
- 100% of Aerial Apparatus (Nearly every Aerial is built on a custom chassis)
- 20% of the Rescue Apparatus
- 10% of the Specialty Apparatus

Year	Custom Chassis Apparatus
1997	2330
1998	2310
1999	2411
2000	2768
2001	2595
2002	2779
2003	2450

## Acknowledgements

*I wish to thank all the fire service personnel who assisted in this project. Hundreds of Chiefs responded to our survey, or gave permission to inspect their apparatus. The gathering of this data involved many visits to fire stations where I was allowed to take their apparatus out of service while the data was collected. I have never visited a fire station where I was not welcomed and treated with courtesy. Perhaps a friendly attitude is a natural characteristic of those who put their life on the line to protect others. Whatever the reason, I find it a pleasure playing a small part in a profession filled with such kind people.*

– Roger Lackore, Pierce Manufacturing

Special thanks to the following departments for their help during the engine analysis phase of the project:

Anderson, Indiana	Lincolnshire, Illinois
Appleton, Wisconsin	Los Angeles, California
Big Bend Vernon, Big Bend, Wisconsin	Madison, Wisconsin
Black River Falls, Wisconsin	Marshall, Wisconsin
Central County Rescue, Missouri	Mesa, Arizona
Chicago, Illinois	Milwaukee, Wisconsin
Cleveland Township, Indiana	Mishawaka, Indiana
Countryside, Illinois	Monona, Wisconsin
Delefield, Wisconsin	Mount Pleasant, Wisconsin
Denver, Colorado	Mukwonago, Wisconsin
DePere, Wisconsin	North Shore, Wisconsin
Dover, Pennsylvania	Plymouth, Indiana
Eagle River FPD, Colorado	Portage Township, Indiana
East Troy, Wisconsin	Racine, Wisconsin
Fivepointville, Pennsylvania	Riverside County, California
Freedom, Wisconsin	Seymour, Wisconsin
Ft Atkinson, Wisconsin	Sheboygan, Wisconsin
Glenwood Springs, Colorado	South Milwaukee, Wisconsin
Greenville, Wisconsin	Sugarland, Texas
Hand In Hand, Pennsylvania	Tualitan Valley, Washington
Harris Township, Indiana	Union Township, Indiana
Howard, Wisconsin	Vail, Colorado
LaGrange, Wisconsin	Warran Township, Indiana
Lakeville, Indiana	West Grove, Pennsylvania
Liberty, Pennsylvania	Willowstreet, Pennsylvania
Lincoln, Pennsylvania	

# ***APPENDIX D***





# **Application Standards for the Accreditation of Ambulance Services**

**Version 3.0, October 2009**

Commission on Accreditation of Ambulance Services  
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## **Preamble**

The intent of the CAAS Standards is to define a "gold standard" for the medical transportation industry of a higher caliber than is typically required for state or local licensing. The revised CAAS Standards-- updated to reflect today's emergency medical services environment--are built upon this original intent. Clearly stated in the introduction to the original standards, "The applicant service desiring to become accredited should do so with the knowledge that it will fall into a class that has more to prove every day, rather than less. That is, the conferment of a Certificate of Accreditation is not justification to rest on that laurel, but to prove at all times that such recognition is warranted. Along with the certification that the agency has met these standards in the past must be the commitment to continue striving to meet new standards and excel in ways not yet adopted into standards."

## **A Brief History**

In March 1982, the American Ambulance Association (AAA) sponsored a Needs Assessment Workshop in Kansas City, Missouri, to analyze the status of the EMS industry. The participants compiled a list of the twenty most pressing issues facing emergency medical services, the first of which was the need for high quality industry standards. In May 1984, the AAA Board of Directors authorized the formation of its Ad Hoc Committee on Accreditation and Standards. The standards that grew out of this committee's work were consensus-based-- with input from professionals across the EMS industry. The development of the process by which an agency could become certified to these standards followed.

In 1990, an independent Commission on Accreditation of Ambulance Services (CAAS) was incorporated, bringing together a board of representatives from the American Ambulance Association, the Emergency Nurses Association, the International Association of Fire Chiefs, the National Association of Emergency Medical Technicians, the National Association of EMS Physicians, and the National Association of State EMS Directors. In 1993, the first agencies were accredited by the Commission.

## **The CAAS Standards Revision 2.0 (2000)**

In 1997, a Standards Revision Committee was formed, and work began on the 2000 Edition with a solicitation to all professional EMS organizations for

updates. Input for the revision was received from agencies, associations, and individuals from around the country, making the new standards truly a product of the entire ambulance industry.

The committee approached the standard revisions with several goals in mind. They determined that the end product should continue to serve the primary purpose of Quality Improvement for EMS agencies, thus adding a strong Quality Improvement focus throughout. The committee also sought to bring a higher degree of consistency to the format and language of the original application. New topics were addressed in such areas as compliance programs, information systems, insurance coverage, and customer satisfaction.

The process used by the committee was based upon a traditional Continuous Quality Improvement method. Each standard characteristic was reviewed for its level of importance to determine if it should be included and updated or replaced by another. The root intent was described within the structure of each revised standard characteristic. From there, the result (or outcome) of meeting the standard was also described and included. The process by which an agency is to meet each standard was defined where indicated, but was also left flexible in many cases-- encouraging agencies to determine the best methods for meeting their own needs.

## **Acknowledgments 2.0**

A debt of thanks is extended to Troy Hogue, Area Manager, Rural/Metro, Syracuse, who served as Project Manager and "author" for the new standards. Troy's quality expertise and personal commitment to the revision were essential to its successful completion.

At the inception of the revision process, requests for comments were solicited from EMS organizations and professionals across the country. The Commission would like to thank and acknowledge all those who provided initial input, including the American Ambulance Association's Professional Standards Committee; the Association of Air Medical Services; the National Academy of Emergency Medical Dispatchers; the National Association of Chiefs of Police; the National Association of EMS Physicians; the Society for Academic Emergency Medicine; Acadian Ambulance Services, Inc.; IMPACT Instrumentation, Inc.; Larry Anderson, Consultant; Pam Baker; Jonathan Best, NAEMT Board Representative to CAAS; Dean Cole, EMS

Program Director for the State of Nebraska; and CAAS site reviewers Dr. Bill Jermyn, George Johnson, Wilfred Chapleau, Dr. Patrick Lanzetta, and Dr. Vincent Verdile.

Many thanks are due to the members of the Standards Revision Committee, including: Kurt Krumperman, Chair, Rural/Metro Corporation, Syracuse, NY; Dale J. Berry, Huron Valley Ambulance, Ann Arbor, MI; Dr. Joseph Darin, Brookfield, WI; Dr. John W. "Bill" Jermyn, Moberly, MO; Chief Mary Beth Michos, Prince William County Department of Fire and Rescue, Prince William, VA; Mark Postma, MEDIC EMS, Davenport, IA; Lawson Stuart, AMR/NCTI, Sacramento, CA; and Susan D. McHenry, NHTSA, Washington DC.

A special thank you is also extended to the National Highway Traffic Safety Administration (NHTSA), for their generous financial contribution to the completion of this project.

## **The CAAS Standards Revision 2.5 (2004)**

In 2002, the CAAS Board of Directors responded to multiple requests for a mechanism to accredit ground Inter-Facility Transport (IFT) and Specialty Care Transport (SCT) agencies and directed the formation of a multidisciplinary task force to craft standards. Twenty-seven individuals from across the nation volunteered to work on six subcommittees. Work was completed in early 2004. During the process, multiple areas in the overall standards that required refinement were also identified, and these ideas were incorporated, as well as other minor revisions that had been recommended.

After considerable debate, CAAS elected to utilize both the IFT and SCT terms in its revision. Inter-Facility Transport (IFT) services are defined as those agencies that regularly accept or plan for scheduled transports between healthcare facilities. Specialty Care Transport (SCT) services are defined as those agencies that regularly accept or plan for transports between healthcare facilities that are outside of an EMS provider's normal scope of practice. There is a wide variation in IFT and SCT agencies that may be broad in scope or very limited (e.g., neonate transport services). The standards were written to be as inclusive of this diverse group as possible.

## **Using the IFT/SCT Standards**

Agencies performing IFT are required to meet all CAAS standards, unless specifically exempted in the IFT portion of the standard characteristic.

Agencies performing SCT are required to meet the additional standards marked by SCT. There is an assumption that a different standard of care is inherent in these services than in primary emergency response agencies, and the additional SCT standards address that difference.

The agency is asked to self-determine whether it needs to meet these additional requirements (see Application Document, page 3). It is important to note however, that for all application documentation received after June 1, 2005, site reviewers will have the obligation of applying the additional standards if they deem them relevant during their on-site review.

## **Acknowledgments 2.5**

CAAS wishes to thank Bill Jermyn, DO, FACEP, ACEP representative to the CAAS Board of Directors, for chairing the IFT/SCT Task Force. His commitment to the project has truly made the new standards a reality.

CAAS also wishes to thank the six sub-committee chairs who ably supported Dr. Jermyn and provided their expert advice in the development of the standards. They include: Jack Grandey, Program Director for FirstHealth of the Carolinas, Critical Care Transport, in Pinehurst, NC; Brian O'Neill, Vice-President, Emergency Systems, Center for Emergency Services-North Shore-Long Island and Jewish Health System, Syosset, NY; Heather Martin, Training Officer, West Des Moines EMS, West Des Moines, IA; Diane Baker, Nurse Manager, CARE Ambulance Service, Inc., Anaheim, CA; Patricia Peltier, AMR Project Manager Southwest Region, San Diego, CA; and Jon Krohmer, MD, FACEP, Medical Director, Kent County EMS, Grand Rapids, MI. The Commission also thanks C. T. Kearns, Executive Director, Pinellas Co. EMS Authority, Largo, FL; and Debbie Vass, Sunstar EMS, Largo, FL for their valuable insights.

As always, thanks are due to Troy Hogue, CAAS Standards Chair, and the revision committee for their dedication in keeping the CAAS standards current.

## **The CAAS Standards Revision 3.0 (2009)**

In the autumn of 2008 CAAS begin its third standards revision process. Twelve individuals from across the country volunteered their time and expertise to review the existing standards, using input from EMS experts, CAAS agencies and site reviewers to update and expand the CAAS standards. The standards review committee focused on the refinement of existing standards, and increased safety and compliance requirements. All changes and revisions in this 3.0 version of the CAAS standards are indicated with a *NEW* or *Rev.10/2009* notice.

### **Acknowledgements 3.0**

CAAS would like to extend a special thank you to Jon Howell, CEO, Huntsville EMS for chairing the CAAS standards revision committee. CAAS would also like to thank Chuck Kearns, MBA, EMT-P who served as Project Manager and "editor" for the revised standards.

This revision would not have been possible without the dedication and commitment of our committee members: Diane Baker, RN, RCP, Care Ambulance, Orange CA; Will Chapleau III, RN, TNS, EMT-P American College of Surgeons, Chicago, IL; James Cusick, MD, FACEP, Medical Director, Denver CO; Troy Hogue, Manager, Rural Metro, Syracuse NY; Kurt Krumperman; Patricia Peltier, RN, BA, Escondido, CA; and Kathy Rinnert, MD, FACEP, Associate Professor, University of Texas/ SW Medical Center, Dallas, TX. The Commission also thanks Mike Taigman, General Manager, AMR; Randy Howell, Boise Fire Department, Boise ID; Scott Vivier, Henderson Fire Department, Henderson, NV; Doug Wolfberg, Page, Wolfberg and Wirth; and Susan McHenry, National Highway Traffic Safety Administration for their valuable insights.

### **Dedication**

This edition of the CAAS standards is dedicated to Dr. William "Bill" Jermyn, who passed away suddenly in May of 2008. Dr. Jermyn was a passionate CAAS Board Member and advocate for emergency medical services. Bill was a well loved and highly respected emergency physician with the unique ability to bring a diverse group of passionate people together to solve EMS and acute health care issues. He brought his physician expertise to the CAAS Board of Directors along with his expert

knowledge of ambulance administration. He was a key contributor to the CAAS standards revision process in 2000 and served as the chair on the 2004 Specialty Care Transport standards revision committee responsible for the development of the version 2.5 CAAS standards. Additionally, Bill served as a mentor and role model for many of our site reviewers and staff members. Bill's compassion, tenacity, and dedication to quality in EMS will truly be missed by our organization. The CAAS standards are a tribute to Bill and all he has done for emergency medical services.

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---

**101  
ORGANIZATION**

**Purpose**

*The clear delineation of service ownership and organizational structure is necessary to assure accountability to customers, partners, medical oversight, and local/state/federal authorities. These standards are important for the organization to maximize its own effectiveness and to be responsive to the public.*

---

**101.01 Ownership**

Full disclosure of the agency ownership is required.

*Characteristics:*

**101.01.01 Legal Organization**

The agency shall maintain documents related to the legal organization of the agency, stating whether it is an individual proprietorship, partnership, corporation, or subsidiary of any other corporation, or a unit of government.

**101.01.02 Trade Names**

The agency shall disclose any fictitious or trade name(s) under which the organization operates, including but not limited to the name(s) by which said organization is known to the public.

**101.01.03 Parent Company**

The agency shall disclose any parent, subsidiary, or other relationships that involve ambulance or other health care business activities, shared overhead or resources, or that have interlocking directorates.

**101.01.04 Licensure**

The agency shall maintain documents certifying compliance with state and local licensure where such is applicable.

**101.02 Organizational Structure**

Documentation of the organizational structure is required so that lines of responsibility and authority can be clearly delineated.

*Characteristics:*

**101.02.01 Chain of Command**

The agency shall maintain a current, written document that clearly defines responsibility, authority, and chain of command for all necessary functions within the organization. Include, at a

minimum, identification of positions responsible for the following functions:

Executive Officer(s) (CEO, Chief, General Manager); Budgeting; Accounts Payable; Accounts Receivable; Purchasing; Human Resources; Operations; Supply/Materials Management; Fleet; Safety; Risk Management; Payroll; Communications; Quality Management/Improvement; Public Information; Marketing; Training/Education; Information Systems; Medical Direction. (Rev.10/2009)

**101.02.02 External Reporting**

The agency shall maintain a current, written document that clearly defines all lines of required reporting authority involving outside agencies.

**101.02.03 Job Descriptions**

The agency shall maintain current, written job descriptions for all positions. Each job description shall include, at minimum: title, general function, who the position reports to, duties/responsibilities, qualifications, physical requirements, and any Affirmative Action/EEOC/ADA/other legal requirements

---

**102  
INTER-AGENCY RELATIONS**

**Purpose**

*Positive inter-agency relations are necessary to provide high quality patient care services. A high quality EMS system depends on cooperation between various types of public safety agencies and all local EMS providers. The following standards are to emphasize these relationships.*

---

**102.01 Mutual Aid**

The agency shall develop and maintain relationships with other ambulance/EMS organizations in its immediate or neighboring service areas.

*Characteristics:*

**102.01.01 Mutual Aid Process**

The agency shall have a preplanned written process for dealing with mutual aid needs and requests, or shall demonstrate attempts to participate in the mutual aid process. *Applies to all levels of service provided (BLS, ALS, emergency, non-emergency, IFT, SCT)*

#### **102.01.02 Mutual Aid Policies**

Mutual aid agreements/policies shall address, at minimum, issues of liability, fees charged for services, communications, reciprocity, and mutuality of assistance offered.

#### **102.02 Disaster Coordination**

**The agency shall play an active role in the regional disaster plan and response.**

##### *Characteristics:*

##### **102.02.01 Disaster Plan**

The agency shall have a written plan describing its role(s) in a disaster. If a regional plan exists, the agency must participate in the plan. If no regional plan exists, the agency shall develop one internally. The plan must contain, at minimum, the following points as they relate to the specific agency: establishment of incident command; establishment of medical command; how triage will occur; how on-scene treatment will occur; how transportation and communication will occur in coordination with medical receiving facilities; how logistics planning will occur; how staging of vehicles will occur; how critical incident stress management will occur; how communications between agencies will occur; and how critiques are performed after the event. *(If the agency has crews/vehicles dedicated to IFT and/or SCT, the role of these crews/vehicles needs to be included in the disaster plan.)*

##### **102.02.02 Disaster Resources--Other**

The disaster plan shall include considerations for resources other than those internal to the agency, including at a minimum: how other resources (*e.g., Red Cross*) will be considered and used; responsibilities of various transportation services in the area; and when and how an EOC will be established.

##### **102.02.03 Disaster Simulations**

The agency will participate in simulations (tabletop or full-scale) to practice the content of the disaster plan. These simulations will be held, at minimum, once per year. All disaster simulations shall be critiqued. The critique must include, at a minimum: (a) the degree of success in implementing the plan, and (b) a review of tools, materials and supplies (*e.g., triage tags*) used to implement the plan. *(Rev.10/2009)*

#### **102.03 Conflict Resolution**

**The agency shall develop and maintain a means to resolve conflicts among personnel of all organizations directly or indirectly involved in patient care (e.g., other ambulance service providers, police and fire departments, medical personnel, etc.)**

##### *Characteristics:*

##### **102.03.01 Conflict Resolution**

The agency shall have a conflict resolution policy that describes what is done when a complaint is received from another agency or individual professional. This policy shall also describe what is done when a complaint is raised about another agency or individual professional.

The policy shall include, at minimum, a timely means to document the following: (a) reporting of the complaint; (b) investigation of the complaint; (c) resolution of the complaint, and (d) feedback to involved individuals.

The policy shall also describe how these complaints are tracked for any trends and what is done with this information. *(Rev.10/2009)*

#### **102.04 Inter-Agency Dialogue**

**The agency shall maintain on-going dialogue with area EMS agencies, public safety agencies, hospitals, and other healthcare and government officials to facilitate improved relationships and improved service coordination.**

##### **102.04.01 On-going Dialogue**

The agency shall maintain an on-going dialogue with area EMS agencies, public safety agencies, hospitals, and other healthcare and government officials.

---

**103  
MANAGEMENT**

**Purpose**

*The purpose of these standards is to establish general management policies and practices not specifically addressed in other sections.*

---

**103.01 Policies and Procedures**

The organization shall maintain written manuals of policies and procedures. These manuals shall include all aspects of the agency's operation.

*Characteristics:*

**103.01.01 Policies & Procedures**

- (a) The policies and procedures manuals shall include, at a minimum, the following: (a) Description of the Service; (b) Chain of Command; (c) Employment Policies (work rules); (d) Safety; (e) Accounts Receivable; (f) Communications; (g) Clinical Performance Standards; (h) Operational Performance Standards; (i) Unusual Events; (j) Vehicle Maintenance; (k) Equipment Maintenance; (l) Customer Service; (m) Performance Improvement; and (n) Training; (o) Mandatory Training/Compliance Programs including, but not limited to: Bloodborne Pathogens, Airborne Pathogens, Hazardous Materials, Patient Privacy, Health Care Fraud and Abuse, Anti-kickback, and current Federally Required Training; (p) *If the agency provides IFT and/or SCT, policies and procedures addressing specific aspects of these service levels must be included. At a minimum, these shall include: A general description of how this is accomplished within the structure of the agency if an EMS unit is used for IFT or SCT, and what to do if an IFT/SCT unit comes upon a motor vehicle crash or other EMS scene. (Rev.10/2009)*

**103.01.02 Policy Access**

The agency shall have a process in place to assure that employees have access to the policies and procedures.

**103.01.03 Policy Changes**

The agency shall have a process in place to assure that employees are informed of changes in policy/procedure.

**103.01.04 Legal Review**

All current policy/procedure manuals will be reviewed by legal counsel for compliance with federal, state, and local requirements, at least every three years. (Rev.10/2009)

**103.01.05 Clinical Review**

Current Clinical Performance Standards will be reviewed by the Medical Director for clinical appropriateness and compliance with federal, state, and local requirements.

**103.02 Strategic Planning**

The agency shall have a process in place for short- and long-range strategic planning.

*Characteristics:*

**103.02.01 Strategic Planning**

The agency shall demonstrate that it uses a defined process of goal-setting and follow-through in its strategic planning process.

**103.03 Management Development**

The agency shall demonstrate its commitment to the on-going development of its leadership.

*Characteristics:*

**103.03.01 Management Training**

The agency shall have a process to provide managers with initial and on-going management training.

**103.04 Information Management**

The agency shall have a process in place for managing written and electronic records.

*Characteristics:*

**103.04.01 Records Maintenance**

The agency shall have a records maintenance policy for essential documents. The policy shall include, at a minimum, how/where stored, length of retention, and destruction method. Policy section(s) on duration of records retention shall reference any applicable federal and state guidelines. The policy shall include, at minimum, the following types of records and how/where stored: Dispatch Records; Patient Care Records; Financial Records\*; Vehicle & Equipment Maintenance; Performance Improvement; Unusual Incidents; Safety (including vehicle crashes); Compliance Program Documentation; Employee Health; Customer Comments; Training; and Certification & Credentialing.

*\*Note: Financial records shall be kept in accordance with Generally Accepted Accounting Practices. (Rev.10/2009)*

#### **103.04.02 Data Back-up**

The agency shall have a written policy and process in place for the back-up of electronic data. The policy and processes must be HIPAA compliant. The policy and processes must also be NEMESIS compliant if the agency's state requires NEMESIS data submission.

If the agency uses electronic patient care reports (ePCR), there must be a written, HIPAA compliant policy and procedure in place that describes how patient information/records will be exchanged, transmitted, reproduced and securely stored. (Rev.10/2009)

#### **103.04.03 Power Back-up**

The agency shall have back-up power capability for all computer equipment essential to providing ambulance service. Back-up power shall be tested on a regularly scheduled basis.

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## 104 FINANCIAL MANAGEMENT

### Purpose

*Standards in this section relate to the general need for an emergency medical services provider to accurately track and plan for its fiscal resources while meeting its day-to-day management responsibilities.*

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#### **104.01 Financial Policy**

**The agency will make provisions and provide direction for the management of its fiscal affairs.**

##### ***Characteristics:***

##### **104.01.01 Financial Authority**

The individual identified as the primary leader of the organization shall have the ultimate responsibility and authority for management of the financial affairs of the agency. This responsibility and authority shall be clearly outlined in writing. *NOTE: In subsidiary agencies, this individual is identified as having responsibility and authority for the scope of service covered in the application.*

##### **104.01.02 Delegated Responsibility**

The agency shall identify all individuals that have financial responsibility and authority delegated to them.

#### **104.02 Budgeting and Financial Statements**

**The agency shall utilize a written budget and financial performance measurements.**

##### ***Characteristics:***

##### **104.02.01 Budgeting**

The agency shall demonstrate a clear relationship between its Strategic Plan and the development of its Budget.

##### **104.02.02 Monitoring Financials**

The agency shall have a procedure to monitor financial performance measurements (both revenues and expenses) during the budget period. The procedure shall include at a minimum: (a) a description of how the agency defines and identifies budget variances (b) how they are tracked for any trends, and (c) what is done with this information. (Rev.10/2009)

##### **104.02.03 Accountant Review**

The agency shall have an annual external, independent accountant review financial records, to verify that Generally Accepted Accounting Practices (GAAP) are being used. (Rev.10/2009)

#### **104.03 Accounts Receivable**

**If patient/billing collection is a function carried out by or on behalf of the agency, the agency shall have written accounts receivable policies.**

##### ***Characteristics:***

##### **104.03.01 AR Policies**

Accounts Receivable policies and procedures must include at a minimum sections on (a) Customer Service, (b) Collections, (c) Exceptions/Write-Offs, (d) Complaint Handling, and (e) Insurance Denials. (Rev.10/2009)

##### **104.03.02 Education and Training**

The agency shall maintain documentation of comprehensive training for all billing and coding personnel. This shall include training in all relevant ambulance billing and coding topics, including at a minimum, the role Call Intake and Dispatch play in compliant billing; interpretation of, and the billing requirements of proper Patient Care Documentation; proper coding and submission of ambulance claims; specific requirements of common payors, including Medicare, Medicaid and any other payors commonly found in the agency's patient population; proper follow-up of ambulance claims, including payment handling, over-payments, denials and appeals; and comprehensive training on billing compliance,

including false claims, the anti-kickback statute, HIPAA and general ambulance billing compliance. (NEW 10/2009)

#### **104.03.03 Continuing Education**

The agency shall maintain documentation of annual continuing education for all AR/Billing/Coding personnel, to assure the agency of ongoing compliance with regard to their billing practices. (NEW 10/2009)

#### **104.04 Insurance**

**The agency shall have insurance coverage to address financial risk issues.**

##### *Characteristics:*

##### **104.04.01 Insurance**

The service shall have insurance coverage based on a self-assessment of financial risk. At a minimum, the insurance coverage shall include: General Liability; Automobile Liability; Workers Compensation/Employers Liability; Medical Professional Malpractice; and Directors & Officers Insurance for Board of Directors.

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## 105 COMMUNITY RELATIONS AND PUBLIC AFFAIRS

### Purpose

*Due to the high visibility and unique expertise of EMS agencies, there exists a responsibility to keep the public well informed about out-of-hospital care and related health issues. These agencies must maintain a respected, high profile to enhance out-of-hospital care in their communities.*

---

#### **105.01 Community Education, Health Promotion, & Injury Prevention**

**The agency shall have established programs designed to inform the public of out-of-hospital care, health promotion, and injury prevention.**

##### **105.01.01 Telephone Directories**

The agency shall have clear listings in local directories indicating telephone numbers, including when to use 911 if applicable to the agency. When advertising exists, levels of service and response areas shall be delineated.

##### **105.01.02 Community Education**

Through community education initiatives, the agency shall be actively involved in informing the public of out-of-hospital care, health promotion, and injury prevention.

The agency must maintain summarized reports of all community education initiatives. The summary shall contain, at a minimum: (a) dates of programs; (b) brief descriptions of the programs; (c) goals of the programs, and (d) estimated number of participants. (Rev.10/2009)

##### **105.01.03 SCT Facility Education**

*NOTE: This standard only applies to agencies providing SCT level service.*

The agency shall have in place a program to educate the transferring and receiving facilities in their catchment areas about their SCT standards, capabilities, procedures, benefits to the patient, appropriateness of transfers, and guidelines.

#### **105.02 Community Relations**

**The agency shall have practices in place to strengthen its image within the community.**

##### *Characteristics:*

##### **105.02.01 Customer Feedback**

The agency shall have an established method for requesting feedback on the services it provides for the purpose of improving future service.

##### **105.02.02 Complaints**

The agency shall have a policy that describes what is done when a complaint is received from patients or other members of the community.

The policy shall include, at minimum, a timely means to document the following: (a) reporting of the complaint; (b) investigation of the complaint; (c) resolution of the complaint, and (d) feedback to involved individuals.

The policy shall also describe how these complaints are tracked for any trends and what is done with this information. (Rev.10/2009)

##### **105.02.03 Donation Policy**

The agency shall have a policy on handling requests for donations or contributions, whether in-kind or monetary.

**105.02.04 Community Service**

The agency shall be involved in supporting community service activities, other than providing ambulance service.

**105.02.05 Community Diversity**

The agency shall demonstrate efforts to assess and address cultural and language diversity within the community. *NOTE: Examples could include such things as printed materials supplied in different languages, training programs for field providers to understand cultural differences, etc.*

**105.03 Media Relations**

**The agency shall have established methods to promote positive media relations.**

*Characteristics:*

**105.03.01 Media Inquiries**

The agency shall have a policy on responding to media inquiries.

**105.03.02 Contacting Media**

The agency shall have an established method for contacting the media to generate positive coverage.

**105.03.03 Tracking Media Coverage**

The agency shall have an established method for tracking and logging media coverage related to the agency.

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**106  
HUMAN RESOURCES**

**Purpose**

*The process by which an EMS agency selects, trains, and maintains a working relationship with employees is critical to the success of the agency.*

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**106.01 Credentials**

**All operations level employees shall maintain current credentials by the applicable authorities to fulfill the requirements of their job descriptions.**

*Characteristics:*

**106.01.01 Credentials**

The agency shall maintain current credentialing documents as required by federal, state, local, or agency authorities. *(Rev.10/2009)*

**106.02 Compensation Package**

**The agency shall describe its compensation & benefits package for employees.**

*Characteristics:*

**106.02.01 Compensation Rules**

If the agency compensates its employees for work, the agency shall have a policy describing work rules related to pay, benefits, and other compensation. This policy shall include, at a minimum, description of time or duties to be compensated and paid time away from work.

**106.02.02 Compensation Description**

The agency shall provide employees with documentation describing the compensation and benefit programs available to them.

**106.03 Discipline/Corrective Action**

**Disciplinary consequences and the events that result in discipline must be clearly delineated.**

*Characteristics:*

**106.03.01 Corrective Action**

The agency will have a policy that addresses discipline/corrective action.

The policy shall contain, at minimum, the following: (a) examples of types of actions leading to levels of discipline; (b) description of who in the organization decides on use of disciplinary action; (c) process for employee grievance of corrective action; (d) conduct resulting in termination, and (e) progressive discipline. *(Rev.10/2009)*

**106.04 Problem Resolution**

**The agency shall have a clearly defined policy for handling employee grievances and concerns.**

*Characteristics:*

**106.04.01 Problem Resolution**

The agency shall have a procedure for employees to follow in reporting alleged unfair policy/procedure/actions of the agency.

The policy shall include, at minimum, the following: (a) process for reporting an issue; (b) investigation process; (c) decision making process, and (d) feedback to the employee. *(Rev.10/2009)*

### **106.05 Recruitment & Hiring**

**The agency shall have recruitment practices that consistently allow for hiring of qualified employees in accordance with Equal Employment Opportunity Act guidelines.**

#### *Characteristics:*

#### **106.05.01 Job Postings**

The agency shall have a policy describing how job openings are advertised, both internally and externally.

#### **106.05.02 Selection Process**

The agency shall have a selection process policy. At a minimum, the selection process shall include qualifications as related to the agency's job descriptions, a description of how EEOC guidelines are met, and a Medical Director review of any clinical standards used in hiring medical personnel.

#### **106.05.03 Affirmative Action/Diversity**

If required by law, the agency shall have an Affirmative Action plan. If no Affirmative Action Plan is required, the agency shall have a Diversity Plan to strive for hiring patterns reflective of the community.

Evidence shall demonstrate emphasis is placed upon local recruiting efforts. The agency will document the demographic/diversity makeup in their service area and compare it to the demographic/diversity of the workforce. The agency shall have a plan to strive to match community diversity in their hiring practices. (Rev.10/2009)

### **106.06 Employee Training & Development**

**The agency shall have established programs designed to appropriately train new employees and to provide ongoing training for all employees.**

#### *Characteristics:*

#### **106.06.01 Orientation Training**

The agency shall have an orientation program for all new employees specifically tailored to their job description. At a minimum, the orientation program shall include a review of all policies/procedures and standards relating to the employee and the position for which they were hired; a mechanism for evaluation and feedback on the employee's progress in orientation; and a mechanism to verify and document successful completion of all required orientation standards, including but not limited to current Bloodborne Pathogens, Airborne Pathogens, Hazardous Materials, Patient Privacy, Health Care

Fraud and Abuse, Anti-kickback & current Federally Required Training. (Rev.10/2009)

#### **106.06.02 Ongoing Training**

The agency shall have a policy describing the ongoing training requirements for employees specifically tailored to their job description. . At a minimum, the policy shall include Continuing Medical Education requirements (see also 106.06.03); all federal/state/local mandated education requirements including but not limited to current Bloodborne Pathogens, Airborne Pathogens, Hazardous Materials, Patient Privacy, Health Care Fraud and Abuse, Anti-kickback & current Federally Required Training. Optional education opportunities for employees: Optional Special Rescue Team(s) Training; Optional Specialty Care Transport Training and remedial training process. (Rev.10/2009)

#### **106.06.03 Continuing Medical Education**

With Medical Director input and approval, the agency shall have a Continuing Medical Education program that meets or exceeds local and state requirements. The Continuing Medical Education Program shall be clearly linked to the agency's Performance Improvement Program and shall address each level of service provided. Individual CME requirements may differ among different levels of providers. (Rev.10/2009)

### **106.07 Conduct**

**The agency shall have an established standard for professional conduct.**

#### *Characteristics:*

#### **106.07.01 Professional Conduct**

The agency shall have a policy describing standards for professional conduct. This policy shall include, at a minimum, patient confidentiality, customer service philosophy, nondiscrimination, and standards for dress & personal hygiene.

#### **106.08 Performance Evaluations**

**The agency shall have established standards for providing regular performance feedback to employees.**

#### *Characteristics:*

#### **106.08.01 Performance Evaluation**

The agency shall have a policy describing the method(s) used to evaluate employee performance. At a minimum, the policy shall include written evaluation(s), based on job descriptions and other standards of performance; written evaluation(s) made

available to employees so they are aware of what will be measured; a mechanism for ongoing feedback to employees, with a summary review done at least annually; a mechanism for the employee to provide written input on their evaluation(s); a mechanism for evaluations to be reviewed and signed by employees and their supervisors; and a mechanism for employees to review their past performance evaluations upon request.

#### **106.09 Subcontractor Personnel**

**If the agency utilizes subcontractor personnel, it must insure that they meet all CAAS standards for employees.**

##### **106.09.01 Subcontractor Personnel**

If an agency utilizes subcontractor personnel for staffing, it must insure that they meet all CAAS standards for employees.

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## **201 CLINICAL STANDARDS**

### **Purpose**

*Well-defined clinical standards are an essential foundation to the provision of quality out-of-hospital health care.*

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#### **201.01 Medical Oversight**

**Strong leadership from an agency's Medical Director is key to establishing current, appropriate clinical standards.**

##### *Characteristics:*

##### **201.01.01 Medical Direction**

The agency shall have a duly licensed physician, or physicians, responsible for medical oversight. Responsibilities shall include, at a minimum, development and authorization of clinical dispatch, patient care, and transport protocols; advisory and approval role in training/education of medical employees; advisory and approval role in clinical Performance Improvement initiatives; and advisory and approval role in EMS system design. (Rev.10/2009)

##### **201.01.02 SCT Medical Direction**

*NOTE: This standard only applies to agencies providing SCT level service.*

The need and use of specialty consultation shall be identified in areas of medicine where the Medical

Director lacks specific knowledge. The Medical Director, in conjunction with administration, shall have in place a policy/procedure that ensures continuous physician responsibility and availability for all phases of the transfer. This policy should specifically address the relationship of the patient care providers with the Medical Director, transferring physician, and accepting physician to clarify who is responsible for patient care during all parts of the transfer. On-line medical oversight physicians, including specialty consultants (if utilized), must be approved by the program Medical Director. They should be immediately available for consultation by the transferring crew throughout the transport.

#### **201.02 Clinical Protocols**

**Consistently following established medical protocols is necessary for the delivery of quality patient care.**

##### *Characteristics:*

##### **201.02.01 Protocol Existence**

The agency shall have a set of written protocols for medical employees. At a minimum, the protocols shall include a clear delineation of the scope of practice for each level of medical employee; be consistent with state and local statutory and regulatory protocols; include documentation of physician authorization; and be reviewed at least every three years and more often when there are widely accepted scientific changes to consider.

Protocol and Protocol changes shall be based upon current medical evidence, local practice standards, emerging technologies and national organization positions (e.g. American Heart Association guidelines.) (Rev.10/2009)

#### **201.03 Medical Records**

**Complete and accurate medical records are necessary to report and track patient care.**

##### *Characteristics:*

##### **201.03.01 Patient Care Records**

Medical records shall be kept on all patients contacted. At a minimum, the records shall contain incident location & location type; date, call times; patient name, gender, DOB; agency, vehicle & crew identification; assessment of patient, including vital signs; clinical impression; treatment, and response to treatment; disposition of patient, and the date and time the report was distributed\* to receiving facility. \*additional standards apply(Rev.10/2009)

### **201.03.02 Distributing Medical Records**

A copy of the medical record shall be left at the receiving healthcare facility at the time the patient is delivered.

If the local medical protocol allows the emergent departure of the crew prior to the written or electronic report being completed, then a verbal report or a short written form with essential medical information (see 201.03.01) must be presented at the time patient care is transferred. Essential medical information beyond that required in 201.03.01 shall be determined by local Medical Direction.

Agency personnel must use their best efforts to transfer complete medical documentation at the time the patient is delivered. The complete written record must be delivered to the healthcare facility consistent with local protocol but at a minimum before the agency's transporting, clinical personnel go off shift.

A copy of the medical record shall be maintained on file with the agency (see 103.04.01). If required, a copy of the medical record is to be filed with state/local authorities. (Rev.10/2009)

### **201.04 Staffing**

**Appropriate levels of trained staff will be assigned to requests for service.**

#### *Characteristics:*

#### **201.04.01 Staffing**

With input and approval from the Medical Director, the agency shall have established staffing certification and qualification standards for each level of service provided as indicated in Introduction Section XII, E., (BLS, ALS, SCT & Specialty Teams).

The minimum acceptable staffing standard for patient care is two Emergency Medical Technicians. All staffing standards shall be reviewed, at minimum, once per year.

If the agency operates specialty teams and/or services (water rescue, swiftwater rescue, high angle rescue, confined space rescue, bike team(s), technical rescue, etc.), the agency will have policies and procedures in place to guide personnel in the discharge of those duties with evidence of Medical Director input.

*The minimum acceptable staffing standard for patient care is two Emergency Medical Technicians. (Rev.10/2009)*

### **201.05 Response Plan**

**A comprehensive Response Plan is essential in providing timely, appropriate resources to requests for service.**

#### *Characteristics:*

#### **201.05.01 Triaging Service Requests**

With input and approval from the Medical Director, the agency shall have established protocols for triaging requests for service. At a minimum, these protocols shall include determining the level of urgency, determining and sending the closest appropriate resources (including when to request mutual aid), an ability to prioritize multiple requests for service made at one time, a listing of service levels that outlines which types of requests are appropriate for the agency to accept/decline (including SCT requests), and a procedure to help callers locate an appropriate alternative when the agency must decline a request for service (when declined for any reason—service level, resources not available, weather, etc.)

#### **201.05.02 Response Time Standards**

The agency shall have established standards for the following time intervals: total time to process a request prior to it being assigned to an ambulance; total time for an ambulance to start responding once notified of a request; total response time (defined as the difference in time from the point where the location of the patient, the call-back number, and the problem type are known--if possible--until the time when an appropriate responding crew advises that they have arrived at the scene.) These time intervals will be defined for life-threatening, emergency, and non-emergency requests. Differences in response time standards by geographic area will be described. In life-threatening requests, the default, total response time standard will be eight minutes and fifty-nine seconds, 90% of the time unless the Medical Director and the oversight agency have established a different system standard is appropriate due to system design.

*Note: If the agency provides IFT and/or SCT, response time standards for these levels of service shall be included. (Rev.10/2009)*

#### **201.05.03 Response Time Reporting**

Analysis Reports for all Response Time Standards, in all geographic areas, will be compiled on a weekly, monthly, and annual basis. Analysis of response times shall at a minimum use a fractile (reliability percentages) method and compare results to community and clinical standards set by the Medical Director. Response Time Analysis Reports shall be shared with employees and management. (Rev.10/2009)

#### **201.05.04 Response Time Monitoring**

Trends in response time exceptions will be identified from the Response Time Analysis Reports. Operational changes shall be implemented, and ongoing reassessment of the need for further operational changes will continue until the trend in response time exceptions is no longer present.

### **201.06 Clinical Standards Performance Improvement**

**The agency shall have a comprehensive Performance Improvement Program addressing clinical quality.**

#### ***Characteristics:***

#### **201.06.01 Performance Improvement Program**

The agency's Clinical Performance Improvement Program shall include prospective, concurrent, and retrospective initiatives designed to improve the care delivered by the agency's providers (whether ALS or BLS levels of care).

All aspects of the Clinical Performance Improvement Program shall be developed in conjunction with the Medical Director. (Rev.10/2009)

#### **201.06.02 Clinical Indicators**

The agency's Clinical Performance Improvement Program shall have measurable clinical indicators that are regularly assessed for compliance with established thresholds. These indicators shall include, at a minimum, the following: accurate patient assessment; medical interventions delivered in accordance with established protocols; success of skills; clinical documentation quality, and outcome data. *Note: If the agency provides SCT, the agency shall also conduct appropriate Utilization Review of these services which includes medical benefits to the patient and appropriateness of the transfer.* (Rev.10/2009)

#### **201.06.03 Indicator Exceptions**

The agency's Clinical Performance Improvement Program shall have a process for identifying and addressing instances where measurable indicators are not in compliance with established thresholds. This process shall include individual exceptions, as well as trends. (Rev.10/2009)

#### **201.06.04 Other Clinical Issues**

The agency's Clinical Performance Improvement Program shall have a process for investigating & addressing clinical issues raised by any means other than measured indicators. (Rev.10/2009)

#### **201.06.05 Reporting Performance Improvement Data**

The agency shall have a defined reporting process for Performance Improvement activities and issues. This shall include, at a minimum: documenting & reporting individual issues and individual clinical indicator results to the respective individuals, and documenting & reporting aggregate data of clinical indicators and other activities to employees, management, and the Medical Director. (Rev.10/2009)

#### **201.06.06 Assessing Performance Improvement Effectiveness**

The agency shall measure and report the effectiveness of its Clinical Performance Improvement initiatives to management, at least annually. Areas of the program determined to be in need of improvement will be identified, changed, reassessed, and reported on. (Rev.10/2009)

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## 202

### SAFE OPERATIONS & MANAGING RISK

#### **Purpose**

***Comprehensive safety standards are required to assure that patients, employees, and the agency are protected from unnecessary risk.***

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#### **202.01 Vehicle Safety**

**Programs shall be in place to address the safe operation of agency vehicles.**

**Characteristics:**

**202.01.01 Driving Standards**

The agency shall have a written policy/procedure addressing driving standards. At a minimum, this policy/procedure shall include sections on acceptable driving record criteria, including initial check, biennial check, and employee responsibility to report all changes to driving record; all requirements to achieve and maintain driving privileges; emergency and non-emergency vehicle operation standards including speed, lights/siren use, safety restraint use\*, crew responsibilities, all applicable laws; driver training program\*; and vehicle crashes\*.

*(Rev.10/2009)*

*\*additional standards apply to these items.*

**202.01.02 Safety Restraints**

The agency shall have a written policy/procedure addressing safety restraints. At a minimum, this policy/procedure shall include required use of seat belts for everyone in the front of moving vehicles; required use of seat belts for everyone in patient care compartment (including patients) unless impractical to provide patient care; use of child safety seats; securing of all equipment in moving vehicle; and safety restrictions for front seat passengers in vehicles equipped with passenger-side airbags. *Note: If the agency has dedicated vehicles for SCT, seating shall be designed so that the majority of patient care may be administered from a seat-belted position.*

**202.01.03 Driver Training**

The agency shall have a driver training program applicable to all personnel with driving privileges. At a minimum, this program shall include initial classroom training covering the safe operation of vehicles and all driving policies/procedures; initial hands-on training; initial evaluation process to authorize driving privileges; annual driver training review/update; and procedure for remedial driver training as needs are identified.

**202.01.04 Vehicle Crashes**

The agency shall have a written policy/procedure addressing vehicle crashes. At a minimum, the policy/procedure shall include procedures that employees are to follow in the event of a vehicle crash; required reporting process for vehicle crashes; process for investigation and follow-up of vehicle crashes, including but not limited to determining if preventable, any remediation and/or corrective action.

**202.02 Employee Safety**

**The agency shall have programs in place to protect the safety of employees.**

**Characteristics:**

**202.02.01 Employee Safety**

The agency shall have a policy/procedure addressing safety of its employees. At a minimum, this policy/procedure shall include Facility Safety, Exposure Control, Safety at Scenes (including protective vests or outer garments compliant with current federal standards), Safe Lifting, Hazardous Materials, Special Rescue Responses, Employee Wellness Programs, Safety Committee Structure and Duties, Employee duty and rest cycles, and any applicable local/state/federal requirements for employee safety.

*Note: If the agency provides SCT, policies and procedures must address the special requirements of infection control and employee safety inherent in such programs. Specific areas to be addressed are, at a minimum: durable medical equipment disinfection, personal protective equipment, and exposure risk management which shall include prospective attempts by triage to identify potential risk for caregivers. (Rev.10/2009)*

**202.03 Patient Safety**

**The agency shall have programs in place to protect the safety of patients.**

**Characteristics:**

**202.03.01 Patient Safety**

The agency shall have a policy/procedure addressing safety of patients. This policy/procedure shall include, at a minimum, patient lifting; patient movement/carrying devices; appropriate use of stretcher shoulder/torso/leg straps for patient safety; consideration for special needs or SCT patients such as: bariatric, LVAD, ECMO, ventilator dependent, etc.. *(Rev,10/2009)*

**202.04 Patient Personal Property**

**The agency shall have a method to properly care for patients' personal property.**

*Characteristics:*

**202.04.01 Patient Personal Property**

The agency shall have a written policy/procedure addressing handling of patients' personal property.

**202.05 Incident Reporting**

**The agency shall have a process for reporting, tracking, and resolving unplanned incidents.**

*Characteristics:*

**202.05.01 Incident Reporting**

The agency shall have a written policy/procedure addressing the process for employees to report incidents or unusual occurrences. At a minimum, this shall include the process and documentation of definition of incidents requiring reporting; investigation of incidents; resolution of incidents; feedback to involved individuals; and how incidents are tracked for any trends and what is done with this information.

**202.05.02 Critical Failures**

The agency shall have a written policy/procedure addressing the process for employees to report failures of equipment or vehicles that occurred during patient care delivery. At a minimum, this shall include the process and documentation of definition of failures requiring reporting; investigating the cause of the failure; reporting failures to any local/state/federal authorities as required; repair/replacement of failed equipment; feedback to involved individuals; and how failures are tracked for any trends and what is done with this information.

**202.05.03 Medical Error Reporting**

The agency shall have a written policy/procedure addressing the confidential process for employees to report medical errors. At a minimum, this shall include the process and documentation of: a definition of incidents requiring reporting; Medical Director involvement; investigation of incidents; resolution of incidents; feedback to involved individuals, and how incidents are tracked for any trends and what is done with this information. (NEW 10/2009)

**202.06 Loss Control**

**The agency shall take measures to protect itself and its employees from unnecessary loss.**

*Characteristics:*

**202.06.01 Loss Control**

The agency shall have an ongoing process to manage loss control and prevention. At a minimum, this process shall include reporting and review of the following: work-related injuries and infectious disease exposures; damage to company property; loss or theft of company property; potential clinical errors; and any suspected civil risk.

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203

**EQUIPMENT & FACILITIES**

**Purpose**

*All equipment and facilities must be maintained to a high standard to assure the delivery of quality patient care.*

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**203.01 Vehicles**

**Agency vehicles shall be in good working order, allowing for safe, reliable transportation.**

*Characteristics:*

**203.01.01 Vehicle Specifications**

All vehicles used by the agency in the delivery of patient care shall be designed and maintained in good working order, in accordance with applicable federal/state/local specifications. All vehicles must adhere to manufacturer's gross vehicle weight recommendations. The agency shall have documented guidelines for total weight restrictions for each vehicle. *If the agency provides SCT, all vehicles used for SCT shall have a minimum of one level of redundancy in each of the following: patient compartment lighting, communication system, and biomedical equipment power system.)*

**203.01.02 Vehicle Cleanliness**

The agency shall have a written policy/procedure addressing vehicle cleanliness. At a minimum, the policy/procedure shall include minimum vehicle cleanliness standards; cleaning required after each patient; detailed cleaning schedule (describe frequency); and additional cleaning required after transport of patients with communicable diseases.

### **203.02 Vehicle Maintenance**

**Programs shall be in place to provide comprehensive vehicle maintenance.**

#### ***Characteristics:***

#### **203.02.01 Preventive Maintenance**

The agency shall have a preventive maintenance program for all vehicles. At a minimum, this program shall include checks of fluid levels, lights, brakes, and tires each day the vehicle is to be used; scheduled preventive maintenance in accordance with vehicle manufacturer recommendations; and record-keeping.

#### **203.02.02 Vehicle Maintenance Records**

The agency shall have a program to document all vehicle maintenance, both scheduled & unscheduled. Summary reports of all vehicle maintenance records shall be provided to management at least quarterly.

### **203.03 Medical Equipment**

**Medical equipment shall be sufficiently stocked and maintained to allow for delivery of quality patient care.**

#### ***Characteristics:***

#### **203.03.01 Minimum Equipment**

The agency shall have criteria for portable medical equipment to be carried on each vehicle. These criteria shall be developed by administration, in conjunction with the Medical Director, and shall meet state/local requirements for level of service provided. Equipment shall include, at a minimum: oxygen, oxygen delivery equipment, and ventilation equipment; suction; stethoscope, BP cuffs; bandaging, splinting, and spinal immobilization equipment; defibrillator; OB delivery kit; hospital communications equipment; and infection control personal protective equipment. *Required equipment must be available for adult and pediatric patients.*

*NOTE: This standard applies to all levels of service provided (BLS, ALS, emergency, non-emergency, IFT, SCT) (Rev.10/2009)*

#### **203.03.02 Checking Equipment**

The agency shall have a policy/procedure for checking each vehicle's medical equipment each day it is to be used. At a minimum, this policy/procedure shall include proper function of durable medical equipment, adequate supply of all equipment, expiration dates on applicable items, and documentation of the check.

### **203.03.03 Locking Ambulances and ALS Supplies Security**

The agency shall have a policy/procedure requiring ambulances to be locked or otherwise secured when they are unattended.

The agency shall have a policy/procedure requiring medications, needles, and syringes to be locked when vehicles are unattended.

When locking medications and medication administration supplies, the agency shall incorporate the use of devices that will present obvious evidence of any tampering. *(Rev.10/2009)*

### **203.03.04 Temperature Extremes**

The agency shall have a policy/procedure for the storage of medications and IV fluids that allows for protection from extreme temperature changes. The policy shall also include a procedure for what to do if medications or IV fluids do get exposed to extreme temperatures.

### **203.04 Durable Medical Equipment Maintenance Programs shall be in place to provide comprehensive maintenance for medical equipment.**

#### ***Characteristics:***

#### **203.04.01 DME Maintenance**

The agency shall have a preventive maintenance program for durable medical equipment. At a minimum, this program shall include scheduled testing, calibration, and/or preventive maintenance based on manufacturer recommendations (if there are no manufacturer recommendations, schedule determined by the agency to be effective in preventing equipment failures); and planned replacement schedule, prior to projected equipment failure. *Equipment to be included in the DME maintenance program will include all equipment that is electrical and/or mechanical.*

### **203.05 Disposable Items**

**Programs shall be in place that cover the use, disposal, and restocking of disposable medical items.**

#### ***Characteristics:***

#### **203.05.01 Disposable Items**

The agency shall have a written policy/procedure identifying items that are single-use only. The policy/procedure shall also include the method for

restocking used disposable items, and storage, transportation, and disposal of disposable items/medical waste.

### **203.06 Facilities**

**The agency shall maintain facilities in good condition, creating an appropriate work environment.**

#### ***Characteristics:***

##### **203.06.01 Facility Space**

All agency facilities shall be adequately equipped and maintained for their typical use, including adequate sleeping space; showering facilities; food preparation & eating space; bathrooms; vehicle & equipment cleaning areas; building accessibility; safety equipment (fire extinguishers, smoke detectors, etc.); and any required federal/state/local facility requirements (this could include OSHA requirements, elevator inspections, local fire codes, etc.)

##### **203.06.02 Walk-in Care Requests**

For all facilities that are accessible to the public and with agency signage, there shall be clearly labeled instructions posted outside the facility for anyone seeking emergency medical care.

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## **204 COMMUNICATIONS CENTER**

### **Purpose**

***Efficient call taking, effective resource deployment, and continuous communications capabilities are required to maintain an effective EMS agency.***

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### **204.01 Policies and Procedures**

**The agency shall have comprehensive policies & procedures dealing with all aspects of its Communications Center.**

#### ***Characteristics:***

##### **204.01.01 Policies & Procedures**

The Communications Center shall have a written policy/procedure addressing requests for service. The agency Medical Director shall have input into the development of these policies/procedures.

If the agency contracts with an outside entity for dispatch, the dispatch entity must have all of the

policies and procedures required; and meet all applicable communications standards. (Rev.10/2009)

##### **204.01.02 Call-taking**

Communications Center procedures shall, at a minimum, include the following for each request for service: determining & documenting address of incident; determining & documenting call-back telephone number; determining & documenting the problem/nature of the request; determining & documenting emergency vs. non-emergency requests; providing pre-arrival instructions if indicated; determining & sending the closest appropriate vehicle to emergency requests for service; and determining any need for, and requesting assistance from, any other agencies as indicated.

If the agency does not regularly provide SCT services as defined by any government authority, the agency will have policies and procedures in place for Communications and Operations personnel to address handling requests for SCT services. (Rev.10/2009)

##### **204.01.03 SCT Call-taking**

***NOTE:*** This standard only applies to agencies providing SCT level service. The agency shall have a policy that addresses at a minimum: the appropriate triage of requests for service, data collected for each request, tracking of crew availability/status, medical oversight responsibilities, personnel and equipment requirements, infectious disease exposure potential, and communication requirements. The Performance Improvement process will evaluate the triage process. There shall be a resource to provide geographical directions for the crew in case they should become lost. There shall be a mechanism in place to assure that the transfer has been accepted by a receiving facility and appropriate documents are transferred. This confirmation does not have to occur before a crew is dispatched to the transferring facility, but must occur before the patient transport begins prior to departure from the transferring facility. (Rev.10/2009)

##### **204.01.04 Times**

The Communications Center shall have a mechanism in place to document time events for each request for service. At a minimum, these time events shall include: time of request, time vehicle was alerted, time vehicle began responding, time vehicle arrived at scene, time vehicle left scene, time vehicle arrived at destination, time vehicle returned to service.

#### **204.01.05 Communications Abilities**

The Communications Center and field personnel shall have communications capabilities allowing for immediate communications with one another at any time a vehicle is operating within the agency's service area. There shall be a minimum of two agency issued portable communications devices per vehicle. Each of the portable communications devices must be capable of instant/immediate, direct communication (push to talk) with the Communications Center. It is required that the agency shall have a demonstrable plan to address the means for field personnel to have consistent communication with each other and the Communications Center in the event of separation during an event.

If the agency provides SCT, there shall be effective communication mechanisms between the driver and patient compartments, ambulance to medical oversight, and ambulance to communication center systems.

Agency-issued wireless telephone communications may be used to meet the portable communication requirements for crews that are dedicated to IFT and/or SCT use. (Rev.10/2009)

#### **204.02 Contingency Plans**

**The agency shall have sufficient back-up means to continue operation in the event of equipment or power failure.**

##### *Characteristics:*

##### **204.02.01 Contingency Plan**

The Communications Center shall have a contingency plan to provide immediate back-up communications equipment and/or power source as may be necessary for its continued operation in the event of equipment or power failure. The contingency plan shall include: Telephone communications, radio communications, paging systems (if applicable), CAD Hardware & Software, back up power supply and off-site capabilities in the event of an incident with the Communications Center building. The contingency plan shall have, at a minimum, two levels of back-up. (Rev.10/2009)

##### **204.02.02 Practice Plan**

The contingency plan shall be implemented as a test, and critiqued a minimum of two times each year. Back-up equipment, such as power generators, shall be tested at a minimum, according to manufacturer recommendations.

In the event the agency experiences a communications center disaster, evidence of implementing the communications contingency plan, with a follow-up critique may serve as one of the required simulation exercises. (Rev.10/2009)

#### **204.03 Preventive Maintenance**

**Programs shall be in place to provide comprehensive communications equipment maintenance.**

##### *Characteristics:*

##### **204.03.01 Communications Maintenance**

The Communications Center shall have a preventive maintenance program for all communications equipment. At a minimum, this program shall include: scheduled testing, calibration, and/or preventive maintenance based on manufacturer recommendations (if there are no manufacturer recommendations, schedule determined by the agency to be effective in preventing equipment failures); service contracts for maintenance of all Communications Equipment, any planned component(s) replacement schedule, prior to projected equipment failure. (Rev.10/2009)

#### **204.04 Training**

**The agency shall have an established training program to assure that employees are trained to properly perform the Communications Center duties.**

##### *Characteristics:*

##### **204.04.01 Training**

All Communications Center employees shall have initial and on-going training (including evaluation of training results), on policies/procedures, standards, and equipment used.

The agency shall have a policy describing the initial and ongoing communications training requirements for employees.

At a minimum, the policy shall include: Continuing Dispatch Education requirements (see also 106.06.03), training performed as a result of Performance Improvement initiatives (204.07.01), All federal/state/local mandated education requirements including but not limited to Bloodborne Pathogens, Airborne Pathogens, Hazardous Materials, Patient Privacy, Health Care Fraud and Abuse, Anti-kickback & current Federally Required Training, Optional education opportunities for employees.

Optional Special Rescue Team(s) Training, Optional Specialty Care Transport Training and Remedial training process. (Rev.10/2009)

**204.05 Licensure**

**The agency shall maintain all necessary licenses for the operation of the communications frequencies and equipment.**

*Characteristics:*

**204.05.01 Licensure**

Licenses covering the operation of all radio/communications equipment and frequencies utilized by the agency shall be current and conspicuously displayed in the Communications Center.

**204.06 Communications Inter-Agency Dialogue**

**The agency shall maintain on-going dialogue with other area communications agencies to facilitate improved relationships and improved service coordination.**

*Characteristics:*

**204.06.01 Inter-Agency Dialogue**

The Communications Center shall maintain an on-going dialogue with other area communications agencies with which it relates (*for example, 911 Centers*).

**204.07 Communications Performance**

**Improvement Program**

**The agency shall have a comprehensive Performance Improvement program addressing Communications Center quality.**

*Characteristics:*

**204.07.01 Communications Performance**

**Improvement**

The Communications Center's Performance Improvement Program shall include prospective, concurrent, and retrospective initiatives designed to improve the service provided by the Communications Center. (Rev.10/2009)