NATICK, MASSACHUSETTS

STUDY OF FIRE DEPARTMENT RESOURCES AND DEPLOYMENT

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CONTENTS

I. EXECUTIVE SUMMARY

This *Study of Fire Department Resources and Deployment* was conducted by MMA Consulting Group, Inc. The study examines the management, operations, structure, service delivery and planning capability of the Natick Fire Department. This report, while critical at some points, is intended to develop a plan to improve the organization, operations, deployment and management of the Department. The primary focus of this report is the future of service delivery.

Many of the weaknesses and shortcomings identified by the consultants are not the product of one person or group of persons, but have developed over a long period of time. Many of the key recommendations in this report relate to the development of stronger management, supervision and leadership. Some recommendations may be controversial, but all recommendations are concerned with building the management and planning capability of the Fire Department.

During the course of field work and interviews, it was apparent that most members of the Department have talent and enthusiasm. However, the Department has failed to develop the leadership and management skills of both its company and chief level officers and has not established a direction or vision for the future. While many personnel desire organizational, operational and management changes, changes will only be achieved with a new management philosophy within the Department. Some of the major findings of the study include:

- There is a need to strengthen the management functions of the Fire Department and develop systems to ensure that command personnel are accountable for activities within the Fire Department.

- There is a need to improve internal communication, management direction, and leadership.

- The Department lacks a systematic professional development strategy which builds the supervisory and management capability of company and chief officers.

- ➢ The Department does not have a comprehensive set of standard operating guidelines or procedures (SOGs or SOPs).

- ➢ The Department lacks a systematic process to develop and use management information to evaluate administrative and operational activities.

- ➢ The current organization structure results in the development of four independent shifts, or groups, of personnel rather than one unified department.

- ➢ There is a need to consider a new deployment strategy for emergency medical services.

Recommendations in this report cover a wide range of topics and relate to organization, management, human resources, deployment, emergency communications, and emergency medical services. Some of the primary recommendations resulting from this analysis are summarized below.

FIRE DEPARTMENT REORGANIZATION RECOMMENDATIONS

The Natick Fire Department should be reorganized.

- ➢ The Fire Department should be composed of two operating divisions:
  - ▸ Operations Division
  - ▸ Support and Staff Services Division

- ➢ The Operations Division should be commanded by an Assistant Chief of Operations. The Division should be responsible for:
  - ▸ Delivery of fire suppression services
  - ▸ Delivery of emergency medical services
  - ▸ Special operations
  - ▸ Training

- ➢ The Support and Staff Services Division should be commanded by an Assistant Chief of Support and Staff Services. The Support and Staff Services Division's responsibilities should include:
  - ▸ Fire prevention and inspection services
  - ▸ Fire communications
  - ▸ Facilities management
  - ▸ Apparatus and equipment maintenance

- Emergency medical services quality assurance efforts
- Research and planning
- Financial management

➢ The Assistant Chief positions should not be represented by the bargaining unit. They should be management positions.

➢ The Assistant Chief positions should come from a reallocation of the officer ranks within the Fire Department. No new personnel are required to create these two positions.

FIRE DEPARTMENT MANAGEMENT RECOMMENDATIONS

The Natick Fire Department should improve management practices and accountability.

➢ The Fire Chief and the Town Administrator should negotiate a series of goals and objectives to clearly identify important tasks to be completed and the time line for achieving goals and objectives.

➢ The Fire Chief should immediately implement a process to improve internal organizational communication, by using staff meetings, e-mail, periodic shift meetings, and other techniques.

➢ The Fire Chief should develop a process to develop and/or revise all standard operating guidelines, and Department rules and regulations.

➢ The Fire Chief should negotiate specific goals and objectives for the Assistant Chiefs who will command the two divisions within the Department.

➢ The Department should establish a series of standing committees for Standard Operating Procedures, Rules and Regulations, Safety, Training, Special Operations, Equipment/Apparatus, EMS, and Incident Management.

➢ The Department should develop management information reports and collect important operational and administrative data to assist in decision-making.

- ➢ The Fire Department should develop a routine staff inspection process to identify facility, equipment, and other problems.

HUMAN RESOURCES MANAGEMENT RECOMMENDATIONS

The Town and the Fire Department should develop a stronger system of human resources management.

- ➢ The position of Fire Chief should be removed from Civil Service.

- ➢ The proposed Assistant Chief positions should not be represented by the bargaining unit. Ideally, these positions should be removed from Civil Service.

- ➢ The Town should conduct a national search to recruit its next Fire Chief.

- ➢ The Fire Chief should be employed on a contractual basis. The contract should contain performance measures, as well as security arrangements for the person selected as Fire Chief.

- ➢ The Fire Department should establish specific training and education requirements for each supervisory and management rank in the Department.

- ➢ The Fire Department should establish a new promotional process for the selection of chief and company officers.

- ➢ The Fire Chief should develop a performance appraisal process for evaluating the performance of chief officers and, eventually, company officers.

EMERGENCY MEDICAL SERVICES RECOMMENDATIONS

- ➢ The Town should implement an emergency medical dispatch system.

- ➢ The Town should immediately develop a plan to have all dispatchers trained and certified in Emergency Medical Dispatch (EMD) procedures and re-certified according to national standards.

- The Town should establish a communication quality assurance committee, composed of Police, Fire, and EMS responders.

- The Town and the Fire Department should develop a five to seven-year plan to ensure that the Department has 35 to 40 EMT-Ps in its employ to allow for the implementation of a new ALS response plan.

- The Department should develop a paramedic engine deployment strategy. Under this approach, the Department would implement an ALS first responder system, in which each engine company, ladder company, and ambulance would be staffed with one FF/EMT-P on duty at all times.

- The Fire Department should revise EMS deployment strategies, including:
  - Discontinue the current practice of deploying an ALS-staffed ambulance to a confirmed EMD BLS response.
  - Discontinue the deployment of first responder engine and ladder companies to confirmed EMD BLS responses.
  - Discontinue the practice of deploying Ladder 1 to EMS responses when Engine 1 is available to respond.
  - Maintain the capability to staff one BLS ambulance and one ALS ambulance at all times. The ALS ambulance should be staffed with at least one FF/EMT-P at all times.

- The Fire Department should implement an interim response approach to allow gradual implementation of the new EMS deployment plan.

- The Fire Department should plan to establish a new staff position of EMS Lieutenant. The new position should report to the Assistant Chief of Support and Staff Services.

- The Department should enhance its training effort by developing specific training goals.

RECOMMENDATIONS RELATING TO LONG-TERM STRATEGIC INITIATIVES

- ➢ The Natick Fire Department should continue to operate four fire stations at this time, but develop a plan to consolidate stations and develop a three fire station response model.

- ➢ The Department should work with the State's Division of Human Resources (the state agency responsible for administration of Civil Service examinations) to establish long-term training and education standards for each supervisory rank within the Fire Department.

- ➢ The Natick Fire Department and the Natick Police Department should work with Town officials and other public safety agencies to develop a regional emergency communication system.

The following exhibits illustrate the current organization of the Natick Fire Department, the proposed organization of the Natick Fire Department, and the proposed staff officer complement of Fire Department.

EXHIBIT I-1
CURRENT FIRE DEPARTMENT ORGANIZATION

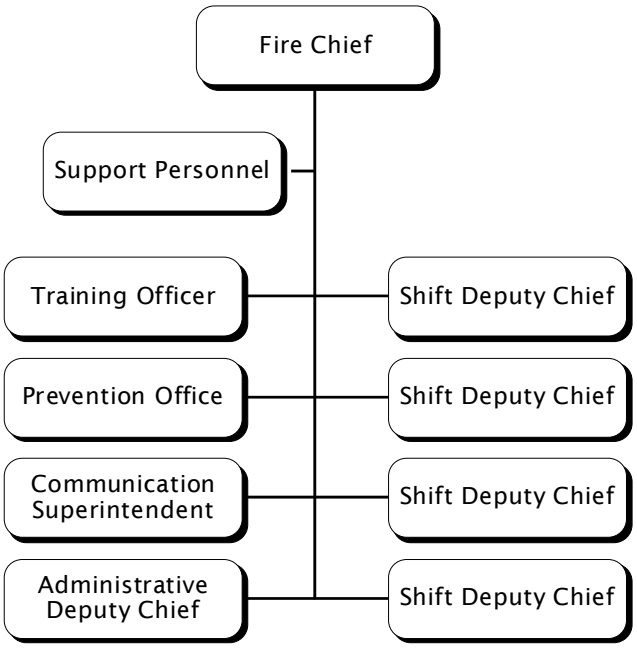
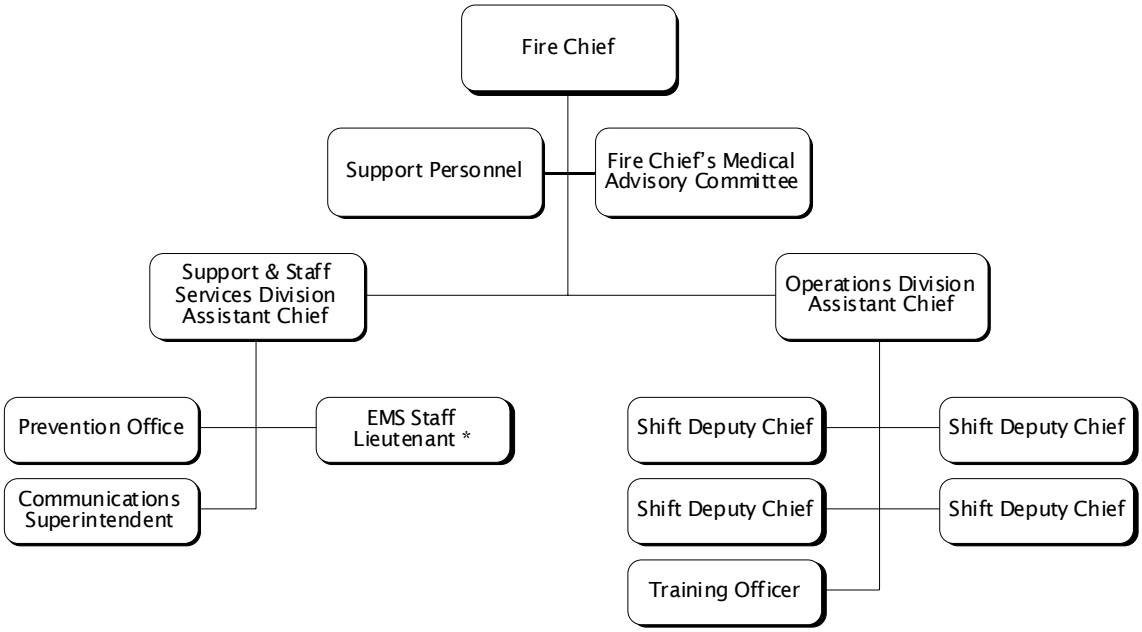


EXHIBIT I-2
PROPOSED FIRE DEPARTMENT ORGANIZATION



** Future position*

EXHIBIT I-3
CURRENT AND PROPOSED CHIEF AND STAFF OFFICER COMPLEMENT

POSITION TITLE	CURRENT	PROPOSED
Fire Chief	1	1
Assistant Chief of Operations	0	1
Assistant Chief of Support Services	0	1
Deputy Fire Chief	5	4
Captain (Training)	1	1
Captain (Prevention)	1	0
Lieutenant (EMS) *	0	1
Total	8	9

** To be established in the future.*

On the following pages, the major recommendations are listed in the order they are presented in this report, along with assigned priorities. The recommendations have been categorized as follows:

Priority 1: Recommendations which directly affect the safety of personnel or the public, or establish the framework for other recommendations. These recommendations should be addressed immediately.

Priority 2: Recommendations which should be implemented without delay, since they may bear directly on safety, productivity, cost and efficient operation of fire, rescue or emergency medical services in Natick.

Priority 3: Recommendations which are important to the efficient provision of fire, rescue or emergency medical services in Natick. These recommendations should be implemented as soon as reasonable and practical.

Priority 4: Recommendations which can contribute to the continued improvement of fire, rescue or emergency medical services in Natick These recommendations should be implemented as soon as resources and operating conditions permit.

EXHIBIT I-4
LIST OF RECOMMENDATIONS

	RECOMMENDATION	PRIORITY
III-1	The Fire Department should be reorganized.	1
III-2	The Fire Department should be composed of two operating divisions: an Operations Division and a Support and Staff Services Division.	2
III-3	The Operations Division and the Support and Staff Services Division should be commanded by Assistant Fire Chiefs.	2
III-4	The Assistant Chief positions should come from the existing staff complement and should be management, non-union, positions.	2
III-5	The Town and the Fire Department should develop defined qualifications for the Assistant Chief positions.	2
II-6	The Fire Chief must develop a process for implementing the proposed organizational changes.	2
IV-1	The Fire Chief should establish a budget development process which requires the participation of chief officers and staff officers.	1
IV-2	The Department should develop an annual apparatus and equipment replacement plan.	3
IV-3	The Department should develop standard operating guidelines (SOGs) and Department rules and regulations. The development of the guidelines should be a priority of the Fire Department.	1

IV-4	The operating guidelines (SOGs) should be developed and promulgated within the next 12 to 15 months.	2
IV-5	The Department should establish a series of standing committees. The committees should represent all ranks in the Department.	1
IV-6	The role of each committee should be defined by the Fire Chief and an officer should be assigned to coordinate the work of each committee.	2
IV-7	The chief officers of the Department should continue to hold staff meetings. Meeting minutes should be circulated to officers within the Department.	1
IV-8	Each Deputy Fire Chief should be directed by the Fire Chief to hold staff meetings with company officers at least monthly.	1
IV-9	The Fire Chief should schedule and preside over semi-annual meetings of all officers and an annual meeting of all members of the Department.	2
IV-10	Each chief officer and company officer should be provided with e-mail capability.	3
IV-11	The Fire Chief and Assistant Fire Chiefs should periodically visit each fire station.	2
IV-12	The Fire Chief, with the assistance of staff, should develop regular management information reports. The reports should be circulated to Town Administration and within the Department.	2
IV-13	The Town of Natick should remove the position of Fire Chief from Civil Service.	1
IV-14	The next Fire Chief should be selected by conducting a regional and national search.	3
IV-15	The next Fire Chief should be employed on a contractual basis.	3
IV-16	The Town should exempt the proposed Assistant Fire Chief positions from Civil Service.	2
IV-17	The Town should seek special Civil Service lists which contain EMT-Ps when filling any future entry level firefighter positions.	1
IV-18	The Town should use the State's delegated examination process for future promotions in the Fire Department.	4
IV-19	The Fire Department should use Assessment Centers as part of the promotional process for all company and chief officer positions.	4
IV-20	The Fire Department should develop education and training standards for officers. The Department should seek approval from the State to allow implementation of these standards.	3
IV-21	The Fire Department should develop a performance appraisal process for fire officers.	4
V-1	The Town should consider developing a long-term plan to consolidate Fire Stations 3 and 4.	4
V-2	Deploy EMT-Ps at each fire station.	1
VI-1	The management of the Fire Department should systematically monitor the staffing factor of the Fire Department, as one measure of productivity and accountability.	2

VI-2	Policy leaders of the Town should adopt a Fire Department staffing policy which encourages continuous improvement, in a cost effective manner, while ensuring the safety of personnel.	1
VI-3	Policy leaders of the Town should consider the viability of developing a plan to consolidate two fire stations.	4
VI-4	Policy leaders of the Town should explore the development of a long-term plan to encourage operational consolidation.	4
VI-5	Policy leaders of the Town should explore a long-term plan to consolidate emergency communications.	4
VII-1	The Town of Natick should continue to operate a consolidated police and fire communication center.	1
VII-2	The Town of Natick should establish a fully operating Emergency Medical Dispatch (EMD) system.	1
VII-3	Communication center dispatchers should be trained and certified in EMD procedures. Personnel should be re-certified according to national standards.	1
VII-4	The Town should establish a quality assurance review process for the EMS dispatch process.	2
VII-5	A quality assurance committee should be established, composed of police, fire and medical personnel.	2
VII-6	The quality assurance committee should meet quarterly to review a random selection of EMS dispatches.	2
VII-7	Programs to familiarize dispatch personnel with EMS and fire operations practices, such as “ride along” programs, should be developed and implemented as part of a dispatch personnel continuing education process.	2
VII-8	Develop and implement a new EMS response system, based on the paramedic engine concept.	1/2
VII-9	Assign one EMT-P to each engine and the ladder, and two to Ambulance 1.	3
VII-10	Maintain the capability to staff one ALS ambulance and one BLS ambulance.	1
VII-11	Deploy the BLS Ambulance only to EMD confirmed BLS calls for service.	2
VII-12	Deploy the ALS Ambulance and ALS engines to confirmed EMD ALS calls for service.	2
VII-13	Discontinue the deployment of first responder engine and ladder companies to confirmed EMD BLS responses.	2
VII-14	Develop a five to seven year plan to increase the number of EMT-Ps to between 35 and 40.	1
VII-15	The proposed EMS deployment model should be implemented on a gradual basis as the number of paramedics increases.	2
VII-16	The location of the proposed ALS units should be based on the assessment of data regarding the need for services.	3
VII-17	The Fire Department should develop and implement a plan to increase the number of EMT-Ps. The plan should contain annual goals.	2
VII-18	Plan to establish a new EMS staff position to coordinate activities.	4

VII-19	Develop an interim EMS response deployment plan as a transition to the proposed fully developed EMT-P deployment plan.	2
VII-20	The Fire Chief should develop a Fire Chief's Emergency Medical Advisory Committee.	1
VIII-1	The Fire Department should develop a training plan with specific training objectives.	1
VIII-2	The Training Officer should develop a written daily company training schedule.	2
VIII-3	Shift Deputy Chiefs should attend and monitor at least one company training program per shift.	1
VIII-4	The Department should establish a training committee charged with making recommendations to the Training Officer.	1
VIII-5	The Department should develop a training program for newly promoted officers.	3
VIII-6	The Department should train and prepare all Fire Captains to assume the role of acting Deputy Chief.	2
VIII-7	The Training Officer should annually develop one large-scale incident for each shift.	2
VIII-8	The Department should develop an Incident Management Team.	2
VIII-9	The Department should establish a safety committee.	1
VIII-10	The Department should integrate a minimum of eight hours of training on safe emergency operations in its annual training program.	1
VIII-11	The Department should establish a safe driver program in accordance with the emergency vehicle operator course (EVOC) provided by the State of Massachusetts.	2
VIII-12	The Department should establish an accident review committee.	2
VIII-13	The Department should adopt an apparatus replacement plan.	3
VIII-14	The Department should consider a quint apparatus to replace the current aerial.	2

The report is organized into several chapters. This *Executive Summary* presents the major findings and recommendations. Chapter II, *Introduction*, provides a description of the project's scope of services and a brief description of the Natick Fire Department. Chapter III, *Organization of the Fire Department,* describes the current organization and recommends a new organization for the Fire Department. Chapter IV, *Fire Department Management and Human Resources,* provides a range of recommendations relating to internal communication, management and human resources. Chapter V, *Fire Station Location and Response Evaluation,* presents computer mapping, analyzes the response capability of the Town's fire and rescue services and recommends a new station configuration. Chapter VI, *Deployment of Personnel and Resources,*

focuses on the Department staffing factor and links station location with deployment. Chapter VII, *Emergency Medical Services,* reviews the current deployment and response system and proposes a new response system. Chapter VIII, *Support Services*, discusses training and related matters. Chapter IX, *Fire Department Attitude Survey*, presents the results of a survey of firefighters. Chapter X, *Normative Data Comparisons,* presents data from other fire departments in Massachusetts and compares Natick to these cities and towns. *Chapter XI, Plan of Implementation*, lists each recommendation with an assigned priority and presents an approach to implementing recommendations. Four appendices are also included in this report.

II. INTRODUCTION

SCOPE OF STUDY

This *Study of Fire Department Resources and Deployment* was conducted by MMA Consulting Group, Inc., in accordance with the Town's request for proposals. The study required consultants to evaluate the use of resources, to identify strengths and weaknesses within the Department, and develop recommendations and implementation strategies for those recommendations. A number of specific areas were examined, including the current deployment of personnel and apparatus, the level of Department services in relation to state and national standards, management, organizational structure, staffing, scheduling, response capability, productivity of units, the utilization of the department's resources, equipment and technology, and training.

To conduct this assignment, three consultants conducted field work and site investigation. Two additional consultants conducted computer mapping, analyzed data, and gathered comparable information. Consultants visited fire stations, interviewed command and supervisory personnel, examined equipment and discussed operational and administrative procedures. Consultants interviewed selected Town officials, the emergency medical services medical director, and union officials. More than 50 Fire Department employees were interviewed during the course of the study. Employees were also provided with a written survey which was returned directly to our office.

NATICK FIRE DEPARTMENT

The Natick Fire Department provides a full array of fire, emergency medical, inspection, and other rescue services. At the time of this study, the Department employed a Chief of Department, five Deputy Fire Chiefs, seven Fire Captains, 15 Fire Lieutenants and 57 firefighters. The Department employs three civilian personnel, including two office support personnel and a Communications Superintendent. The following exhibit displays the current number of uniformed positions in the Fire Department.

EXHIBIT II-1
UNIFORMED PERSONNEL

POSITION TITLE	CURRENT
Fire Chief	1
Deputy Fire Chief	5
Captain (Training)	1
Captain Prevention	1
Captain (Shift Personnel)	5
Lieutenant (Shift Personnel)	15
Firefighter	57
Total	85

The Department deploys four engines, one ladder and two ambulances. Emergency response services are provided from four fire stations:

- Station 1 at 22 East Central Street (Headquarters Station)
- Station 2 at 45 Eliot Street
- Station 3 at 2 Rhode Island Avenue
- Station 4 at 268 Speen Street

The Fire Department responds to approximately 4,300 calls for service annually. On the following pages, several exhibits are presented. Exhibit II-2, *Calls for Service*, shows the total number of calls for service for five years.

Exhibit II-3 shows responses by different Fire Department response units for the years 1999 through 2003. It should be noted that Ambulance 2 was activated in 2001; prior to 2001, calls reported under Ambulance 2 were mutual aid responses.

EXHIBIT II-2
CALLS FOR SERVICE: 1999 THROUGH 2003

YEAR	CALLS FOR SERVICE
1999	4,378
2000	4,217
2001	4,978
2002	4,390
2003	4,336
Median	4,378
Mean (Average)	4,460

EXHIBIT II-3
FIRE DEPARTMENT UNIT RESPONSES: 1999 THROUGH 2003

	1999	2000	2001 *	2002	2003	Average	Median
Engine 1	2,013	1,936	1,997	1,506	1,422	1,775	1,936
Engine 2	712	649	765	557	627	662	649
Engine 3	1,287	1,268	1,383	1,271	1,242	1,290	1,271
Engine 4	1,825	1,771	1,814	1,731	1,708	1,770	1,771
Ladder 1	961	1,009	1,311	1,529	1,540	1,270	1,311
Deputy Chief	1,026	1,018	1,046	895	940	985	1,018
Ambulance 1	2,650	2,553	2,627	2,602	2,544	2,595	2,602
Ambulance 2	233	234	225	475	429	319	234

**Ambulance 2 activated. Prior to 2001, Ambulance 2 responses were mutual aid responses.*

The following two exhibits depict total calls for service and unit responses in graphic form.

EXHIBIT II-4
CALLS FOR SERVICE: 1999 THROUGH 2003

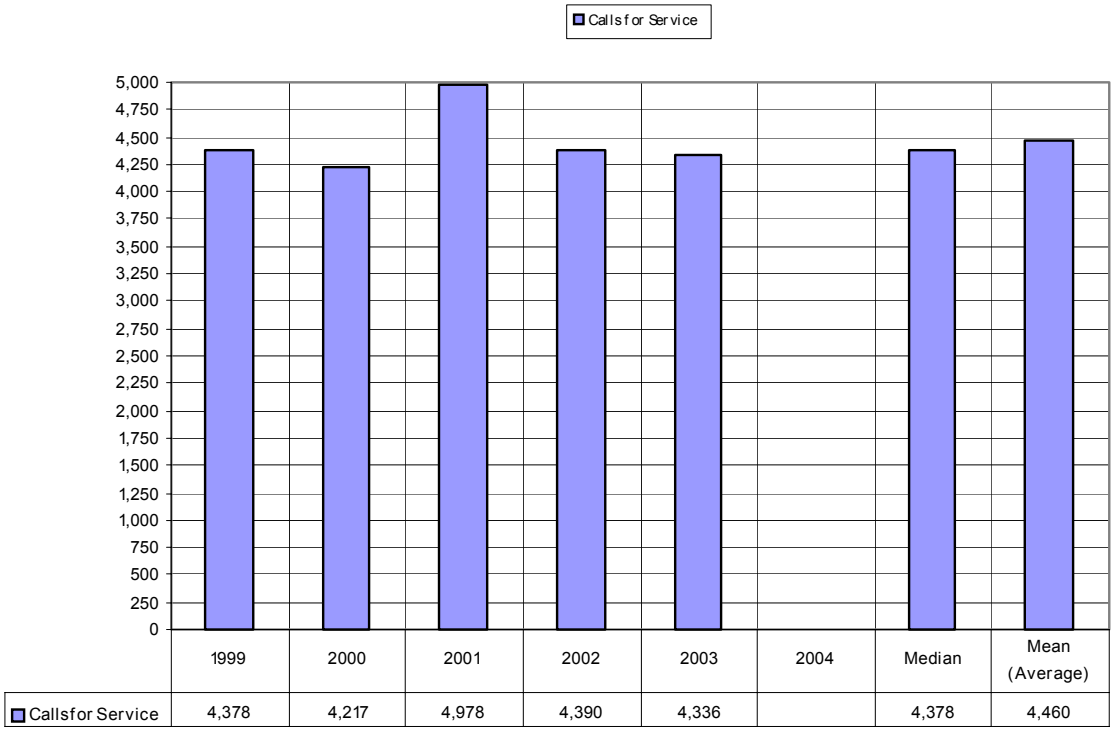
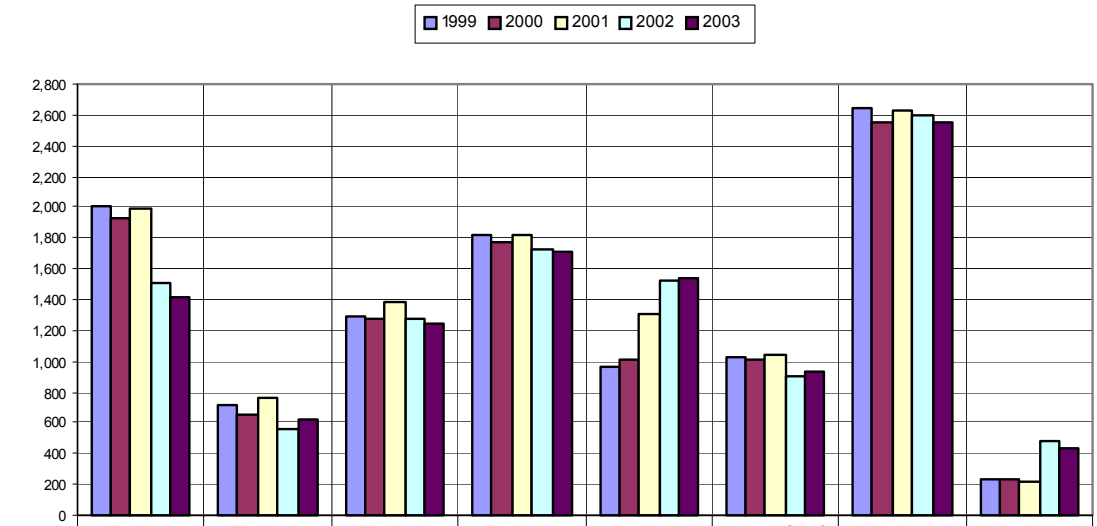


EXHIBIT II-5
FIRE DEPARTMENT UNIT RESPONSES 1999 THROUGH 2003



	Engine 1	Engine 2	Engine 3	Engine 4	Ladder 1	Deputy Chief	Ambulance 1	Ambulance 2
1999	2,013	712	1,287	1,825	961	1,026	2,650	233
2000	1,936	649	1,268	1,771	1,009	1,018	2,553	234
2001	1,997	765	1,383	1,814	1,311	1,046	2,627	225
2002	1,506	557	1,271	1,731	1,529	895	2,602	475
2003	1,422	627	1,242	1,708	1,540	940	2,544	429

III. ORGANIZATION OF THE FIRE DEPARTMENT

CURRENT ORGANIZATION OF THE NATICK FIRE DEPARTMENT

The current organization and staffing of the Fire Department provides for a Chief of Department, five Deputy Fire Chiefs, seven Fire Captains, 15 Fire Lieutenants and 57 firefighters. One Deputy Chief acts as an administrative Deputy Chief, and two Captains are assigned to staff functions. One Captain is assigned to manage prevention activities and one Captain is assigned to act as the Training Captain. One firefighter is assigned to fire inspection duties. In addition, the Department employs three civilian personnel. The following exhibit displays the current number of uniformed positions in the Fire Department.

EXHIBIT III-1

UNIFORMED PERSONNEL

POSITION TITLE	CURRENT
Fire Chief	1
Deputy Fire Chief	5
Captain (Training)	1
Captain (Prevention)	1
Captain (Shift Personnel)	5
Lieutenant (Shift Personnel)	15
Firefighter	57
Total	85

The Fire Department administrative staff is shown in Exhibit III-2.

EXHIBIT III-2
DEPARTMENT STAFF POSITIONS

POSITION	NUMBER
Fire Chief	1
Deputy Chief (administrative)	1
Training Captain	1
Prevention Captain	1
Fire Inspector	1
Communications Superintendent	1
Executive Secretary	2
Total	8

The performance of administrative duties is generally the responsibility of staff positions. Deputy Chiefs perform some limited administrative work.

STAFF DEPUTY CHIEF (ADMINISTRATIVE DEPUTY)

The Deputy Chief, as the Administrative Deputy, has several functional responsibilities. The Deputy Chief's primary duty is to serve as the director of emergency medical services for the Department. The Deputy Chief is assigned other limited administrative duties, such as apparatus maintenance and purchasing supplies and equipment. One firefighter/EMT-P is assigned as the paramedic coordinator to assist the Deputy Chief on a part-time basis. This firefighter receives a stipend to assist the Deputy Chief in the performance of his EMS duties. This is not a full-time staff position. When a Deputy Chief assigned to field operations (supervisor of a platoon) is on leave time, the Administrative Deputy Chief fills in for the absent Deputy Chief. The administrative Deputy Chief reports directly to the Fire Chief.

TRAINING CAPTAIN

The Training Captain is a relatively new position which is assigned a myriad of training duties. The position is also designated as the Department Safety Officer. The Training Captain reports directly to the Fire Chief.

FIRE PREVENTION CAPTAIN

The Fire Prevention Bureau is staffed with one Fire Captain and one Fire Inspector. The Prevention Bureau is responsible for quarterly inspections of all

schools, nursing homes and hotels, according to Commonwealth of Massachusetts guidelines. The Bureau performs plans review for all new building construction and all building renovations in conjunction with the Town building department and inspects these occupancies, as required. The Bureau also issues all permits for fire-related issues, such as open burning, oil burner and propane installations, etc. In addition, the Bureau inspects all three-family or greater occupancies. Fire companies assist in inspecting one and two-family occupancies, as required. The Bureau also coordinates the SAFE program for all schools in the Town. The Bureau has no office staff and lacks a technologically advanced record keeping system. The Bureau Captain reports directly to the Fire Chief.

OFFICE STAFF

Two secretaries are assigned to the Fire Chief as executive and department assistants. The secretarial staff also performs the third-party billing function for the Department.

FIELD DEPUTY CHIEFS

The four Deputy Chiefs assigned to command platoons or groups (shifts) have performed limited administrative duties. These administrative duties were narrow in scope and related to their assigned shifts. Each Deputy Chief has recently been assigned additional Department-wide administrative duties. The Fire Department has implemented a committee structure to assist the Fire Chief in administering the Department and to promote more participatory management. Each Deputy Chief has been assigned responsibility for oversight of a specific committee with a defined mission.

The current organization structure of the Department has a number of weaknesses:

- A large number of staff and operations personnel report directly to the Fire Chief. The Administrative Deputy Chief, the two staff Captains, platoon Deputy Chiefs and other support personnel report to the Fire Chief.

- The Administrative Deputy provides some staff support, but the position's frequent assignment to fill in for shift or group Deputy Chiefs detracts from the administrative role of the Deputy.

- The current organization results in four platoons which operate independently.

- The current organization requires the Fire Chief to assume too many responsibilities. While the Fire Chief is ultimately accountable for all Department activities, the current structure does not encourage delegation of responsibilities.

FIRE DEPARTMENT REORGANIZATION

To improve accountability and effectiveness, the Natick Fire Department should be reorganized. The new organization structure should clearly identify the roles of chief officers. The Fire Department should be composed of two operating divisions:

- *Operations Division* - The Division should be responsible for:
  - Delivery of fire suppression services
  - Delivery of emergency medical services
  - Special operations
  - Training

- *Support and Staff Services Division* - The Division's responsibilities should include:
  - Fire prevention and inspection services
  - Fire communications
  - Emergency medical services quality assurance efforts
  - Facilities management
  - Apparatus and equipment maintenance
  - Research and planning
  - Financial management

The Operations Division Assistant Chief should directly supervise all Deputy Fire Chiefs commanding shifts or groups. The Support and Staff Services Division Assistant Chief should supervise the Fire Inspector and the Fire Communications Superintendent. It should be noted that the Operations Division Assistant Chief should supervise field or operational personnel for both fire and emergency medical services. The Support and Staff Services Division Assistant Chief should be responsible for coordinating the emergency

medical quality assurance programs, emergency medical dispatch and related emergency medical services activities.

Each of these divisions should be commanded by an Assistant Chief. No new personnel are required to create these two positions. These positions should be created by reallocating the officer positions within the Fire Department: one Deputy Fire Chief position should be abolished and redefined as an Assistant Chief position. The second Assistant Chief should be established by upgrading one of the staff Captain positions, such as the Prevention Captain.

Currently, all employees, excluding the Fire Chief, are represented by unions. The Assistant Chief positions should be non-union, management positions. The positions should also be salaried positions and work regular office hours.

In another section of this report, the consultants have suggested that the Fire Chief and Assistant Chief positions should not be subject to Civil Service coverage. However, we recognize that the Town may decide not to remove the Assistant Chief positions from Civil Service. If the positions are removed from Civil Service, they should be filled by the Fire Chief and should serve at the Chief's pleasure.

RECOMMENDATION III-1: *The Fire Department should be reorganized.*

RECOMMENDATION III-2: *The Fire Department should be composed of two operating divisions: an Operations Division and a Support and Staff Services Division.*

RECOMMENDATION III-3: *The Operations Division and the Support and Staff Services Division should be commanded by Assistant Fire Chiefs.*

RECOMMENDATION III-4: *The Assistant Chief positions should come from the existing staff complement and should be management, non-union, positions.*

The following exhibit presents the current and proposed officer complement of the Natick Fire Department.

EXHIBIT III-3
CURRENT AND PROPOSED CHIEF AND STAFF OFFICER COMPLEMENT

POSITION TITLE	CURRENT	PROPOSED
Fire Chief	1	1
Assistant Chief of Operations	0	1
Assistant Chief of Support Services	0	1
Deputy Fire Chief	5	4
Captain (Training)	1	1
Captain (Prevention)	1	0
Lieutenant (EMS) *	0	1
Total	8	9

** To be established in the future. (See Chapter VII.)*

The Assistant Chiefs should have strong management qualifications. Ideally, both Assistant Chiefs should be sufficiently qualified so that the Fire Chief can move or reassign the incumbent Assistant Fire Chiefs between the two positions from time to time (every several years). Qualifications for the Assistant Fire Chief should include:

- Substantial supervisory and management experience in a fire department should be required. Both operational and administrative experience are essential.

- Substantial education and professional training relating to the management and operations of a Fire Department should be required. A Bachelor's Degree, or its equivalent, and successful completion of the National Fire Academy's Executive Fire Officer Program, or its equivalent, should be required.

- The Assistant Chief positions require strong communication skills and writing and presentation skills.

RECOMMENDATION III-4: *The Town and the Fire Department should develop defined qualifications for the Assistant Chief positions.*

The following exhibits illustrate the current organization of the Natick Fire Department and the proposed organization of the Natick Fire Department.

EXHIBIT III-4
CURRENT FIRE DEPARTMENT ORGANIZATION

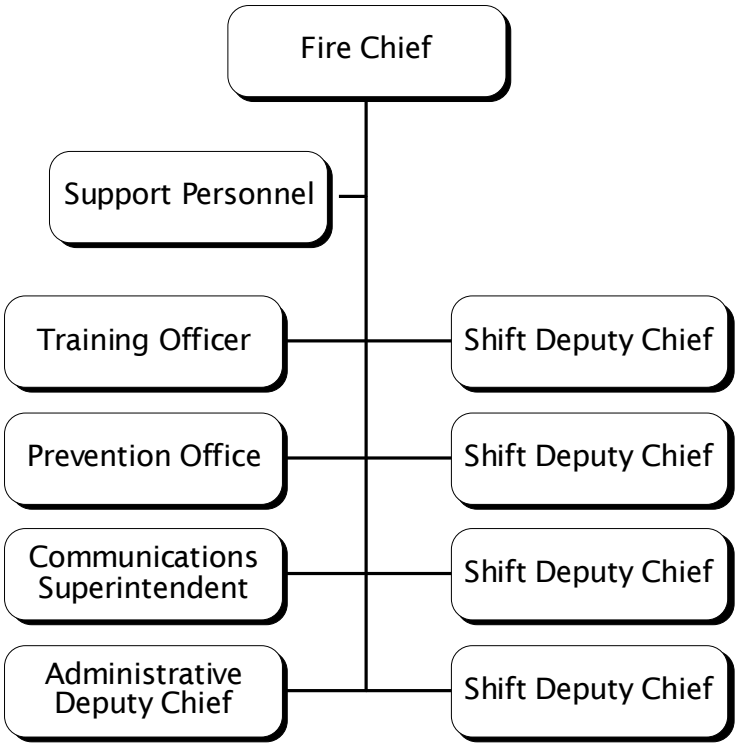
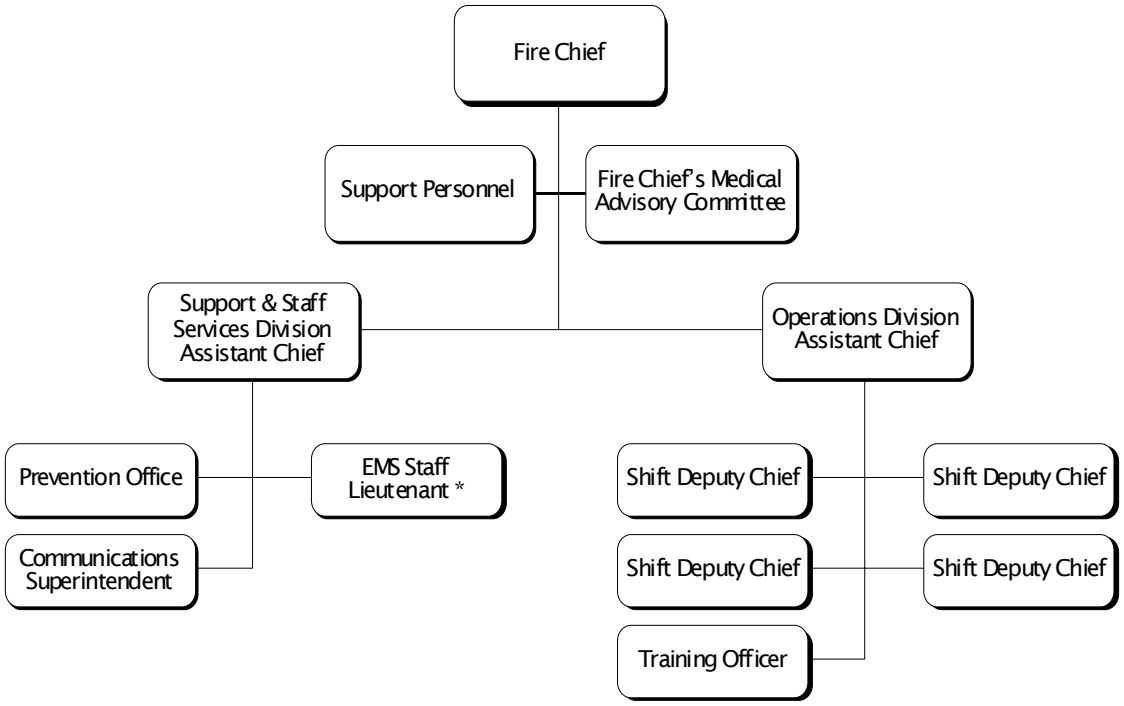


EXHIBIT III-5
PROPOSED FIRE DEPARTMENT ORGANIZATION



** Future position*

OFFICE OF THE FIRE CHIEF

Organizational recommendations made in this chapter will have the effect of changing the role of Fire Chief. Currently, the Fire Chief is the center of administrative activity and all decision-making flows from the office of the Chief. Most staff, and all chief officers, currently report to the Fire Chief. The proposed organization assigns a great deal of daily administrative and decision-making activities to the Assistant Chiefs, leaving the Fire Chief with more opportunity to evaluate activities of the Department, plan for the future, and evaluate the use of resources.

The proposed organization structure can only be implemented with the active participation and commitment of the Fire Chief. The Fire Chief has several critical tasks to accomplish to facilitate a new organizational structure. The Chief must:

- Clearly define the role of each Assistant Chief, in writing.
- Develop qualifications for the Assistant Chief positions.
- Develop a process for selecting the Assistant Chiefs.
- Communicate to all personnel within the Department the role and responsibility of the Assistant Chiefs, the qualifications for the positions, and the methods by which the positions will be filled.

RECOMMENDATION III-5: *The Fire Chief must develop a process for implementing the proposed organizational changes.*

IV. FIRE DEPARTMENT MANAGEMENT AND HUMAN RESOURCES

In the Natick Fire Department, managers typically spend most of their time reacting to events that have occurred and little time planning for the future. This is due, in part, to the unpredictable nature of the work of a Fire Department. As a result, the Department does not have a long-term vision of its future or how to assess the conditions which will have an impact on the Department.

MANAGEMENT AND INTERNAL COMMUNICATION

BUDGET AND FINANCIAL PLANNING

One of the most important planning tools for any manager is the budget. In Natick, the Fire Department needs to use the budget process for planning purposes. The Fire Chief should develop a budget process which requires the participation of each Deputy Chief and staff officer. Each Deputy Chief, the Training Captain, and the Prevention Captain should participate in the budget development process. While it is likely that those responsible for overseeing a platoon may not be in a position to participate fully in the budget development process, they should have an opportunity to participate and provide input. It is also important that the Fire Chief, in times of limited resources, clearly define the limitations of the budget process and work with personnel to develop reasonable budgets, and have personnel participate in the priority setting process.

> ***RECOMMENDATION IV-1:*** *The Fire Chief should establish a budget development process which requires the participation of chief officers and staff officers.*

In addition to the budget process, the Department must develop multi-year equipment and apparatus replacement plans. These plans should clearly define the need for each apparatus and major piece of equipment, and present an estimated cost and the life expectancy of the proposed replacement equipment or apparatus. The consultants have recommended a specific equipment replacement plan in Chapter VIII.

In this chapter, we have recommended the redefinition of the Department's committee structure. One recommended committee is an

Equipment/Apparatus Committee. This committee should be coordinated by a chief officer and should be responsible for the development of a replacement plan and its annual revision.

RECOMMENDATION IV-2: *The Department should develop an annual apparatus and equipment replacement plan.*

INTERNAL COMMUNICATIONS

Internal communication is concerned with the methods by which information is shared within the organization, up and down the chain of command. Sharing of information in a department that functions 24 hours a day, 365 days a year can be difficult, but such communication is a principal obligation of the Fire Chief and other chief officers. Communication can be formal and informal but, for an agency such as a fire department, a formal communication system is essential. During the course of our field work, it became apparent that there was a lack of communication upward and downward within the organization. There are several methods by which communication and the sharing of expectations can be accomplished.

One method to improve communications is to develop a comprehensive set of standard operation procedures (SOPs) or standard operating guidelines (SOGs) and department rules and regulations. SOPS or SOGs are intended to clearly define how operations should be conducted. These guidelines should cover emergency and non-emergency operations. Rules and regulations should describe expected behavior and standards of conduct within the Department.

The lack of written comprehensive standard operating guidelines and procedures has plagued the Department for several years. Some steps have recently been taken to address this issue, but the Department has not made their development and the implementation a priority. It is essential that the Department develop a core set of well-developed, written operational procedures and directives that will provide clear guidance and direction for senior and junior officers in the performance of their daily administrative and operational duties.

The development of these guidelines is extremely important. The Fire Chief should ensure that the key SOGs are developed, distributed throughout

the Department and fully understood by all parties. It is critical that the process of developing the SOGs be a participatory process, including all ranks within the Department. The Standard Operating Guidelines Committee of the Fire Department, recommended below, should be assigned the task of preparing the guidelines. The guidelines should be developed, circulated, and revised. A final set of Standard Operating Guidelines should be promulgated within the next 12 to 15 months.

> ***RECOMMENDATION IV-3:*** *The Department should develop standard operating guidelines (SOGs) and Department rules and regulations. The development of the guidelines should be a priority of the Fire Department.*

> ***RECOMMENDATION IV-4:*** *The operating guidelines (SOGs) should be developed and promulgated within the next 12 to 15 months.*

One of the most effective approaches to encourage communication within a public safety organization is to develop a series of standing committees and *ad hoc* committees to solve department problems and plan for future activities. The Fire Department has recently assigned, as ancillary duties, an area of responsibility to each Deputy Fire Chief, including:

- Deputy Chief - Communication Center Liaison
- Deputy Chief - Information and Technology
- Deputy Chief - Hose Testing and Hose Inventory
- Deputy Chief - Department Facilities

While we feel that this assignment of functions to each Deputy Chief is a good practice, we suggest that the Department consider developing a number of committees to help address several areas requiring work. The following committees are recommended:

- Standard Operating Guidelines or Procedures Committee
- Rules and Regulations Committee
- Safety Committee
- Training Committee
- Special Operations Committee

- Equipment/Apparatus Committee
- EMS Committee
- Incident Management Team Committee

When establishing each of the committees identified above, the Fire Chief should define the role of each committee and assign an officer to coordinate the committee and its work. It is recommended that the Department, if it is reorganized, should assign the Assistant Chief for Support and Staff Services the role of ensuring that the committees are active and accomplishing assigned tasks.

Generally, company officers in Natick do not participate in the development of Department policy. Captains and Lieutenants assigned to operations should be more involved in the development of Department policies and programs. For example, company Captains need to take a more active role in administering the training activities and drills for their respective companies, along with assisting in Department administration issues.

> ***RECOMMENDATION IV-5:*** *The Department should establish a series of standing committees. The committees should represent all ranks in the Department.*

> ***RECOMMENDATION IV-6:*** *The role of each committee should be defined by the Fire Chief and an officer should be assigned to coordinate the work of each committee.*

The Fire Department recently began holding staff meetings which include the Deputy Chiefs, the Fire Chief and representatives from the Town Administrator's office. This practice of holding staff meetings should be continued and expanded. Each Deputy Chief should periodically meet with officers in his or her command and conduct meetings to discuss Department matters. Company officers should meet with their companies to discuss Department activities. It is important that minutes of chief officer staff meetings be prepared and circulated to all officers in the Department.

The Fire Chief should be responsible for organizing regularly scheduled staff meetings and should prepare an agenda for each meeting. In addition to staff meetings, the Fire Chief should also establish a set of conditions which

encourage communication within the Fire Department. At least twice a year, the Fire Chief should schedule a meeting of all officers to discuss Department concerns. The Fire Chief should meet at least annually with all personnel for the purpose of answering questions and soliciting their ideas and suggestions on all pertinent topics.

> ***RECOMMENDATION IV-7:*** *The chief officers of the Department should continue to hold staff meetings. Meeting minutes should be circulated to officers within the Department.*

> ***RECOMMENDATION IV-8:*** *Each Deputy Fire Chief should be directed by the Fire Chief to hold staff meetings with company officers at least monthly.*

> ***RECOMMENDATION IV-9:*** *The Fire Chief should schedule and preside over semi-annual meetings of all officers and an annual meeting of all members of the Department.*

The Fire Department should work with the information technology staff of the Town and ensure that all chief officers and all company officers have access to e-mail for work related purposes. E-mail is an effective and efficient method to circulate information, schedule meetings, and provide data to personnel. Eventually, all Department personnel should have access to e-mail. Officers should be required to check e-mail at least twice during each shift to review messages.

> ***RECOMMENDATION IV-10:*** *Each chief officer and company officer should be provided with e-mail capability.*

The Fire Chief and the Assistant Chiefs, when the positions are established, should make an effort to periodically visit each fire station to talk with personnel and inspect facilities. This process can be accomplished informally, but offers an opportunity for chief officers to personally identify problems and hear the concerns of personnel.

> ***RECOMMENDATION IV-11:*** *The Fire Chief and Assistant Fire Chiefs should periodically visit each fire station.*

MANAGEMENT INFORMATION

The Fire Department does not generate and use information which could assist in planning and management efforts. Until recently, personnel were not fully aware of the capability of the computer system used by the Department and have not taken advantage of the system's capabilities. Personnel are currently being trained in the use of the current computer system. The Department should develop a range of management reports, including:

- Financial reports detailing expenditures, available monies and overtime usage.

- Operational reports summarizing calls for service and response information. Reports should display trends, such as type of calls, time of day and day of week of calls for service, and other information. In addition, the Department should develop routine reports on response time which identify average response times by categories, and also response time in time increments.

- Weekly management reports describing the activities of the Department. These reports should be distributed to the Town Administrator and the Board of Selectmen.

Reports should be designed to be circulated throughout the organization, so that officers will be fully aware of events within the Department.

RECOMMENDATION IV-12: *The Fire Chief, with the assistance of staff, should develop regular management information reports. The reports should be circulated to Town Administration and within the Department.*

HUMAN RESOURCES MANAGEMENT

POSITION OF FIRE CHIEF

Human resources management is concerned with the selection, promotion, and development of employees. In Natick, many of these processes are governed by the Massachusetts Civil Service system. Both the Fire Chief and members of the Department are subject to Civil Service coverage. While the Civil Service system has provided some obvious benefits, there are also some

limitations. For example, the system relies on multiple-choice written examinations as the means by which promotion is achieved. The successful completion of a multiple-choice examination is not the most effective way to assess the ability to perform the duties associated with supervisory or command ranks in a fire department. A written examination, for example, cannot measure such important management characteristics as human relations skills, oral communication skills, decision-making ability, and leadership.

The Fire Chief is the manager of a large multi-million dollar organization with a large number of employees and an important organizational mission. The current Civil Service process in Massachusetts seriously limits the pool of candidates for the position of fire chief, and thus, the position of fire chief should be removed from Civil Service coverage. It is our view that the current appointment process does not ensure that the most effective manager and leader will be selected as the fire chief.

The Fire Chief should be appointed only after an extensive search process in which applicants are thoroughly evaluated. Moreover, with the position removed from Civil Service, it is necessary for the Town to provide certain guarantees, in the form of an employment agreement, to ensure that the Fire Chief has sufficient protection from inappropriate interference.

The Town should also consider making the proposed positions of Assistant Fire Chief exempt from Civil Service coverage. Ideally, the Assistant Chief positions should be selected by the Fire Chief and serve at the pleasure of the Fire Chief. Unless specifically exempted from Civil Service coverage, the Assistant Chief rank will be subject to Civil Service. We assume that the positions of Assistant Fire Chief would be filled from within the Department, but if the positions are not subject to Civil Service, it is possible to recruit widely and select the most qualified candidates for the positions.

The employment agreement for the Fire Chief is likely to cover a range of matters relating to compensation and job security. It is likely that a contract would cover:

Scope of authority. An understanding of the scope of the position and the decision-making authority of the Fire Chief would be defined.

- *Contract term.* The term of the contract would be defined, probably between three and five years.

- *Termination and severance.* A method of termination or notice of termination would be included. A specific payment or schedule of payments may be negotiated. Non-renewal of a contract would also be covered.

- *Residency requirement.* Towns often require residency for top executives.

- *Compensation.* Provisions defining annual salary and the method of increasing the salary based on performance, or other measures, are included.

- *Fringe benefits.* Provisions relating to health, life, dental, long-term disability and other insurances would be included. Vacation and other leave would be specified.

- *Deferred compensation.* Executives often seek deferred compensation based on a percent of income.

- *Direct expenses.* Use of a vehicle, automobile allowance, and other expense items are often included in contracts.

- *Professional development.* Typically, funds are provided for a national convention and other local meetings. Costs of professional memberships and other professional development materials may also be included.

- *Other provisions.* Since Natick may have unique situations, other contract provisions may be necessary. For example, if housing is expensive, a housing allowance, or housing subsidy, may be sought by a candidate for the position of Fire Chief.

RECOMMENDATION IV-13: *The Town of Natick should remove the position of Fire Chief from Civil Service.*

The removal of the position from Civil Service requires the Town to petition the General Court to enact special legislation to remove the position from Civil Service coverage.

RECOMMENDATION IV-14: *The next Fire Chief should be selected by conducting a regional and national search.*

RECOMMENDATION IV-15: *The next Fire Chief should be employed on a contractual basis.*

RECOMMENDATION IV-16: *The Town should exempt the proposed Assistant Fire Chief positions from Civil Service.*

SELECTIVE CIVIL SERVICE LISTS

In this report, we have suggested that the Fire Department expand its complement of EMT-Ps. One method to do this is by using existing Civil Service processes which allow the Town to seek special employment lists, as long as those lists are for *bona fide* reasons. We recommend that the Town seek special employment lists which contain persons already trained as EMT-Ps. It is less costly to employ personnel who are already trained. Moreover, this will help increase the number of EMT-Ps more rapidly than training personnel already employed by the Department.

RECOMMENDATION IV-17: *The Town should seek special Civil Service lists which contain EMT-Ps when filling any future entry level firefighter positions.*

CIVIL SERVICE PROMOTIONAL PROCESSES

Since the Natick Fire Department is covered by Civil Service, the Town relies on written tests to promote personnel. The Massachusetts Human Resources Division, the State agency which administers municipal Civil Service examinations, has a process through which they will delegate the examination process to a town. This process allows a town to employ a consultant to develop job-related examination processes.

For all future promotions to fire lieutenant, fire captain and deputy chief, the Town should take advantage of the delegated examination process. There are two basic delegation approaches; one is called a weighted-graded examination, and another is called a fully delegated process. In the weighted-graded approach, candidates for promotion take the State's written examination and then participate in a locally designed examination process; each element of the examination is weighted to establish a score. The written examination would count as a certain percent of the examination and the local process would count for the balance of the grade. In addition, a percent of the grade is also based on an "education and experience" evaluation.

In the second approach, the full delegation process, the entire examination process is delegated to the Town. Typically, the full delegation agreements are used for chief officer positions. Under this approach, a written examination need not be given.

> ***RECOMMENDATION IV-18:*** *The Town should use the State's delegated examination process for future promotions in the Fire Department.*

The delegated examination processes should consist of Assessment Centers. An Assessment Center is a process to test and evaluate the leadership, administrative, and management skills of executives and managers, such as a fire chief. In an Assessment Center, candidates participate in a series of job-related exercises and are then evaluated on their *performance* in each exercise. A number of jurisdictions who have Civil Service use Assessment Centers for the selection of fire officers, including the towns of Franklin and Westwood.

> ***RECOMMENDATION IV-19:*** *The Fire Department should use Assessment Centers as part of the promotional process for all company and chief officer positions.*

TRAINING AND EDUCATION

The job requirements for positions in the Fire Department are established through the Civil Service process. The Human Resources Division has established general requirements for all officers within a fire department.

The consultants recommend that the Town work with the Human Resources Division to develop specific education and training requirements for company and chief officers. These requirements should be realistic, but reflect the need of the Department to employ personnel who have the required technical and medical skills. We recommend that the Town consider the following scale of education and training.

EXHIBIT IV-I
RECOMMENDED TRAINING AND EDUCATION LEVELS FOR NATICK FIRE OFFICERS

POSITION	RECOMMENDED MINIMUM QUALIFICATIONS	DESIRABLE TRAINING
Fire Chief	Bachelor's Degree and other advanced education desirable	Executive Fire Officer Program EMT-B or EMT-P Fire Officer III
Assistant Chief	Bachelor's Degree	Fire Officer III EMT-B or EMT-P
Deputy Chief	Associate's Degree	Fire Officer II EMT-B or EMT-P
Captain	Associate's Degree	Fire Officer II EMT-B or EMT-P
Lieutenant	High School and demonstrated advanced academic training (15 credits)	Fire Officer I EMT-B or EMT-P

RECOMMENDATION IV-20: *The Fire Department should develop education and training standards for officers. The Department should seek approval from the State to allow implementation of these standards.*

PERFORMANCE APPRAISAL

Currently, there is no systematic method for evaluating the performance of officers and other personnel in the Fire Department. Working with Town administrative officials, the Fire Chief should develop a performance appraisal process for evaluating the performance of chief officers and, eventually, company officers. The appraisal process should be job related.

RECOMMENDATION IV-21: *The Fire Department should develop a performance appraisal process for fire officers.*

V. FIRE STATION LOCATION AND RESPONSE EVALUATION

Fire station location, staffing and the ability to respond rapidly are interrelated. Exhibit V-1, *Current Deployment of Personnel and Units,* shows the station number, number of responders typically working at each station, and apparatus responding from each station.

EXHIBIT V-1
CURRENT DEPLOYMENT OF PERSONNEL AND UNITS

STATION	NUMBER OF PERSONNEL	APPARATUS
Station 1 22 East Central St.	8	Engine Ladder Ambulance Command Vehicle (Deputy Chief)
Station 2 45 Eliot St.	3	Engine
Station 3 2 Rhode Island Ave.	3	Engine
Station 4 268 Speen St.	3	Engine
Total	17 (minimum)	

To assess the deployment of personnel, it is necessary to evaluate fire station location. To conduct this assessment, the consultants reviewed maps of the Town, examined transportation networks, conducted site visits to each station, reviewed data and conducted computer mapping. The computer mapping allows a review of alternative strategies and approaches to service delivery. The computer mapping also allows us to evaluate the current emergency medical services deployment plan and consider alternative approaches.

For purposes of our analysis, we have adopted the benchmarks presented in NFPA 1710 as measures of performance. (See Appendix A for a detailed description of the standard.) The standard presents response time measures

and staffing goals and also stipulates that these response time performance objectives should be achieved in at least 90 percent of the incidents. In summary, the response time standards are:

Fire Suppression Incident - Four minutes (240 seconds) or less for the arrival of the first arriving engine company at a fire suppression incident and/or eight minutes (480 seconds) or less for the deployment of a full first-alarm assignment at a fire suppression incident. * **

Emergency Medical Incident - Four minutes (240 seconds) or less for the arrival of a unit with first responder (or higher) level capability at an emergency medical incident. 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. * **

** These response time performance objectives should be achieved not less than 90 percent of the time.*

*** These NFPA Standard 1710 time lines do not include dispatch and turn-out time. One additional minute is allowed for dispatch and one minute is added for turn-out time, for a total of two minutes.*

MAPPING METHODOLOGY

Response coverage provided by the existing fire stations in Natick was analyzed using the consultant's computer mapping capabilities. The model analyzes the travel distances that can be attained by apparatus from each fire station responding to its surrounding area within a given time, assuming defined average response speeds. Color coded maps are designed to illustrate the parts of the Town that can be reached within defined time ranges: zero to 60 seconds (one minute or less), 61 to 120 seconds (two minutes), 121 to 180 seconds (three minutes), 181 to 240 seconds (four minutes), 241 to 300 seconds (five minutes), 301 to 360 seconds (six minutes), and more than six minutes travel time from a fire station.

The mapping methodology consists of the following steps:

- ➢ Prepare a digitized base map representation of the Natick street and highway network.
- ➢ Locate the fire stations to be analyzed with respect to that network.
- ➢ Assign an average speed of 22 miles per hour to reflect reasonable response expectations.
- ➢ Generate color-coded maps indicating travel times from the fire stations in one-minute intervals to the borders of the community.

The street network is based on TIGER files from the United States Census Bureau. The resulting digitized street network was used in the computer mapping analysis to determine travel times to various points in the Town from the fire stations. In order to do this, the longitude and latitude of the fire station locations were established and inserted on the digitized street network and speed assignments were made.

On all streets, a conservative average speed of 22 miles per hour was used in order to take into account many limiting factors, such as time of day, season of the year, weather, traffic, etc. It is quite possible that speeds higher than these could occur, under favorable traffic and road conditions. However, our experience with suburban Massachusetts and New England towns suggests that, given the road configuration, stop lights and other features in Natick, an average speed of 22 miles per hour is reasonable.

The following six maps are presented in this chapter.

EXHIBIT V-2
LIST OF MAPS

The maps only depict over-the-road travel, or running, times. Two minutes for notification, dispatch, and turn-out time should be added to these times for an estimate of total response time. This will provide for a conservative estimate of response capability. Benchmarks and standards generally allow for one minute or less for dispatching and one minute or less for turn-out time. Thus, for example, a four-minute travel time response represents only part of the response time to an incident. It is necessary to add two minutes to the travel time to establish the total response time.

COMPUTER MAPS

The following exhibit describes the color key depicted on the maps.

EXHIBIT IV-3
MAP COLOR KEY

COLOR	TRAVEL TIME
Blue	One minute or less (zero to 60 seconds)
Light green	More than one minute, but less than two minutes (61 to 120 seconds)
Blue-green	More than two minutes, but less than three minutes (121 to 180 seconds)
Yellow	More than three minutes, but less than four minutes (181 to 240 seconds)
Tan	More than four minutes, but less than five minutes (241 to 300 seconds)
Pink	More than five minutes, but less than six minutes (301 to 360 seconds)
White	More than six minutes (more than 360 seconds)

Map 1, Travel Time from Station 1 (Central Street), shows the travel times from the Department's Central Station to various parts of the Town. It is interesting to note that within six minutes travel time, or eight minutes total response time, from this central station a responding unit can travel over 58.7 percent of the road network and serve 53.1 percent of the residential population. While this is a strong coverage pattern for one fire station, it also suggests that if more ALS capability were available, and if the additional ALS capability was deployed from other stations, as well as the central station, a significantly greater percent of the population would receive ALS within a shorter time frame.

Stations 2, 3 and 4 are generally positioned at the edges or borders of the Town. This deployment strategy was once commonly used by cities and towns. If the Town was reconfiguring all fire stations at one time, it is likely that stations would not be situated close to the borders, but in locations which would allow 360 degrees of effective response throughout the Town.

Map 2, Travel Time from Station 2 (Eliot Street), displays the South Natick Station and presents the same type of travel time information shown for Station 1. The South Natick station is near the border of the Town. Mapping indicates that, within six minutes travel time, a unit could reach Natick center. The station covers the southeastern part of the Town, which is generally less populated.

Map 3, Travel Time from Station 3 (Rhode Island Avenue), shows a fire station close to Route 9 in the eastern quadrant of the Town.

Map 4, Travel Time from Station 4 (Speen Street), provides coverage in the western part of the Town.

Map 5, Travel Time from Four Existing Stations, combines the response from each fire station and consolidates results on one map. The map depicts broad coverage within six minutes travel time. The computer maps indicate that in general, the Natick Fire Department can reach every area and street in the Town with its first due unit within six minutes travel, or eight minutes total, response time.

Exhibits IV-4 and IV-5 convert the mapping into statistical measures. These exhibits present three measures:

- *Area covered* (square miles) by the first-due responding units in one-minute time increments.
- *Street miles covered* by first-due responding units in one-minute time increments.
- *Residential population covered* by first-due responding units in one-minute time increments.

It should be noted that our mapping information displays 155.97 miles of streets in the Town of Natick; this includes public roadways, private roadways and, in some cases, long driveways. In addition, the population data is derived from the 2000 U.S. Census, which estimated a population of 31,946. The 2002 state population estimate is 32,384. The road milage and population data are derived from the TIGER mapping files, allowing us to link mapping information with population and road milage data.

Exhibit V-4, *Response Capability from Four Existing Fire Stations - Area, Street Miles and Population Covered (within each time segment)*, presents the travel time data associated with Map 5 and displays the coverage provided with a response from each station at the same time. The data presented show area covered, street miles covered and population reached in one-minute time increments. The data show the coverage achieved within each one-minute time increment. For example, 6.0 percent of road miles are covered within one minute, but within two minutes, an additional 17.4 percent of road miles are covered.

Exhibit V-5, *Response Capability from Four Existing Fire Stations - Area, Street Miles and Population Covered (cumulative response),* displays the cumulative area, street miles and population covered in each time increment. For example, the Fire Department can respond to 33.7 percent of the road miles in the Town within two minutes; within six minutes travel time, fire units cover 97.8 percent of roads.

EXHIBIT V-4
RESPONSE CAPABILITY FROM FOUR EXISTING FIRE STATIONS
AREA, STREET MILES AND POPULATION COVERED (WITHIN EACH TIME SEGMENT)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.95	6.0%	19.13	12.3%	1,926	6.0%
1 to 2 minutes	2.76	17.4%	33.41	21.4%	5,570	17.4%
2 to 3 minutes	3.76	23.8%	31.76	20.4%	7,503	23.5%
3 to 4 minutes	3.52	22.2%	28.4	18.2%	7,104	22.2%
4 to 5 minutes	2.55	16.1%	25.56	16.4%	5,148	16.1%
5 to 6 minutes	1.73	10.9%	14.33	9.2%	3,491	10.9%
More than 6 minutes	0.56	3.5%	3.38	2.2%	1,204	3.8%
Total	15.83	100.0%	155.97	100.0%	31,946	100.0%

EXHIBIT V-5
RESPONSE CAPABILITY FROM FOUR EXISTING FIRE STATIONS
AREA, STREET MILES AND POPULATION COVERED (CUMULATIVE RESPONSE)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.95	6.0%	19.13	12.3%	1,926	6.0%
1 to 2 minutes	3.71	23.4%	52.54	33.7%	7,496	23.5%
2 to 3 minutes	7.47	47.2%	84.3	54.0%	14,999	47.0%
3 to 4 minutes	10.99	69.4%	112.7	72.3%	22,103	69.2%
4 to 5 minutes	13.54	85.5%	138.26	88.6%	27,251	85.3%
5 to 6 minutes	15.27	96.5%	152.59	97.8%	30,742	96.2%
More than 6 minutes	0.56	3.5%	3.38	2.2%	1,204	3.8%
Total	15.83	100.0%	155.97	100.0%	31,946	100.0%

In the exhibit below, we have compared the four fire station response system (within six minutes travel time) to a six-minute travel time response from Station 1 only. The data strongly suggest that deploying EMT-Ps from all locations increases the area and the population of the Town covered within reasonably rapid response times. Thus, computer mapping indicates that an ALS unit responding from Station 1 within six minutes travel time (eight minutes total response time) reaches 53.8 percent of the area of the Town, 58.7 percent of the road miles in the Town and 53.1 percent of the population. If the Fire Department had the capability to deploy ALS units from each station, an ALS responding unit should be able to reach 96.5 percent of the area of the Town, 97.8 percent of the road miles in the Town and 96.2 percent of the population within six minutes travel time (eight minutes total response time).

EXHIBIT V-6
RESPONSE CAPABILITY FROM FOUR EXISTING FIRE STATIONS COMPARED TO RESPONSE CAPABILITY FROM STATION 1 ONLY (CUMULATIVE RESPONSE)

COMPARISON FACTOR	FOUR STATION RESPONSE WITHIN SIX MINUTES TRAVEL TIME		STATION 1 RESPONSE ONLY WITHIN SIX MINUTES TRAVEL TIME	
	Actual	*Percent*	*Actual*	*Percent*
Area (Sq. Miles)	15.27	96.5%	8.51	53.8%
Street Miles	152.59	97.8%	91.62	58.7%
Population	30,742	96.2%	16,955	53.1%

Mapping analysis of the existing fire station configuration system suggests several conclusions:

- ➢ The Town's first-due response capability is good.
- ➢ Stations 2, 3, and 4 are located near the borders of the Town, which does not allow for full 360 degree response, suggesting the need to consider some reconfiguration of fire stations.
- ➢ Deployment of EMT-Ps on engine companies distributed throughout the Town provides substantially better ALS coverage than deployment of ambulances from one central location.

ALTERNATIVE FIRE STATION LOCATIONS

An analysis of current station locations indicates that the Town should consider the consolidation of fire stations. After considering several potential fire configuration models, the consultants constructed a three fire station configuration model, which essentially consolidates Station 3 and Station 4 in a more central location.

For illustration purposes only, we selected a fire station location near the intersection of Route 9 and North Main Street, Route 27, to test our consolidation theory. Other fire station location sites are possible, and we do not envision this as a final location for any future station. The location enables consultants to provide a general analysis of the impact of a consolidated fire station. The model is intended to represent a theoretical approach. It should be noted that placement of a consolidated station in a number of locations near Route 9 results in the same general outcome as discussed below.

Map 6, Theoretical Three Fire Station Configuration, displays a response model for a theoretical consolidation of Stations 3 and 4 into one relocated station. The response data which is generated from a potential relocation is comparable to the results from the current four-station configuration. (See Map 5.) The following exhibits display the area, street miles and population covered with the three-station configuration. The exhibits are displayed in the same manner as Exhibits V-4 and V-5.

Exhibit V-7, *Response Capability from Theoretical Three Fire Station Configuration - Area, Street Miles and Population Covered (within each time segment),* should be compared with Exhibit V-4; Exhibit V-8, *Response Capability from a Theoretical Three Fire Station Configuration - Area, Street Miles and Population Covered (cumulative response),* should be compared with Exhibit V-5.

EXHIBIT V-7

RESPONSE CAPABILITY FROM THEORETICAL THREE FIRE STATION CONFIGURATION

AREA, STREET MILES AND POPULATION COVERED (WITHIN EACH TIME SEGMENT)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.67	4.2%	13.63	8.7%	1,090	3.4%
1 to 2 minutes	2.19	13.8%	29.21	18.7%	3,845	12.0%
2 to 3 minutes	3.36	21.2%	31.94	20.5%	5,472	17.1%
3 to 4 minutes	3.3	20.8%	22.3	14.3%	6,257	19.6%
4 to 5 minutes	2.4	15.2%	19.21	12.3%	5,081	15.9%
5 to 6 minutes	2.15	13.6%	20.27	13.0%	4,867	15.2%
More than 6 minutes	1.76	11.1%	19.41	12.4%	5,334	16.7%
Total	15.83	100.0%	155.97	100.0%	31,946	100.0%

EXHIBIT V-8

RESPONSE CAPABILITY FROM A THEORETICAL THREE FIRE STATION CONFIGURATION

AREA, STREET MILES AND POPULATION COVERED (CUMULATIVE RESPONSE)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.67	4.2%	13.63	8.7%	1,090	3.4%
1 to 2 minutes	2.86	18.1%	42.84	27.5%	6,861	21.5%
2 to 3 minutes	6.22	39.3%	74.78	47.9%	12,333	38.6%
3 to 4 minutes	9.52	60.1%	97.08	62.2%	18,590	58.2%
4 to 5 minutes	11.92	75.3%	116.27	74.5%	23,671	74.1%
5 to 6 minutes	14.07	88.9%	136.56	87.6%	28,538	89.3%
More than 6 minutes	1.76	11.1%	19.41	12.4%	3,408	10.7%
Total	15.83	100.0%	155.97	100.0%	31,946	100.0%

The following exhibit compares the response capability of the current four station configuration to the theoretical three-station configuration.

EXHIBIT V-9
FOUR EXISTING FIRE STATION CONFIGURATION COMPARED TO A THEORETICAL THREE FIRE STATION CONFIGURATION

COMPARISON FACTOR	FOUR STATION RESPONSE SIX MINUTES TRAVEL TIME		THREE STATION THEORETICAL RESPONSE SIX MINUTES TRAVEL TIME	
	Actual	*Percent*	*Actual*	*Percent*
Area (Sq. Miles)	15.27	96.5%	14.07	88.9%
Street Miles	152.59	97.8%	136,56	87.6%
Population	30,742	96.2%	28,538	89.3%

The comparison of the current configuration and the theoretical fire station model strongly suggests several conclusions:

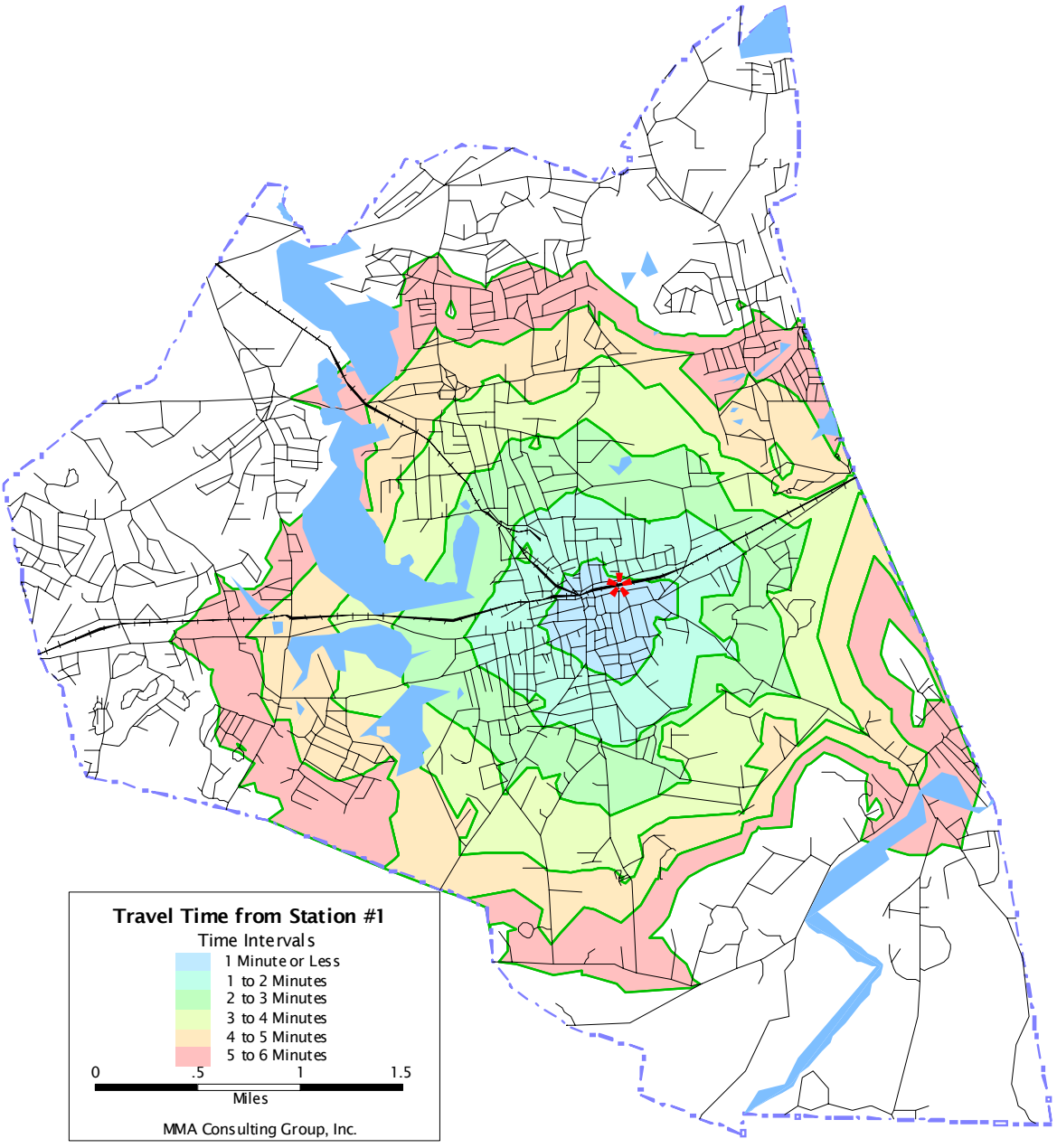
- ➢ The Town is generally able to receive the same level of fire and EMS coverage from a three-station configuration as from the current four-station configuration.
- ➢ Consolidation of these fire stations would allow reallocation of personnel among other fire companies, strengthening other companies.
- ➢ Deployment of EMT-Ps on engine companies distributed in a three fire station configuration is far more effective than the current system.

RECOMMENDATION V-1: *The Town should consider developing a long-term plan to consolidate Fire Stations 3 and 4.*

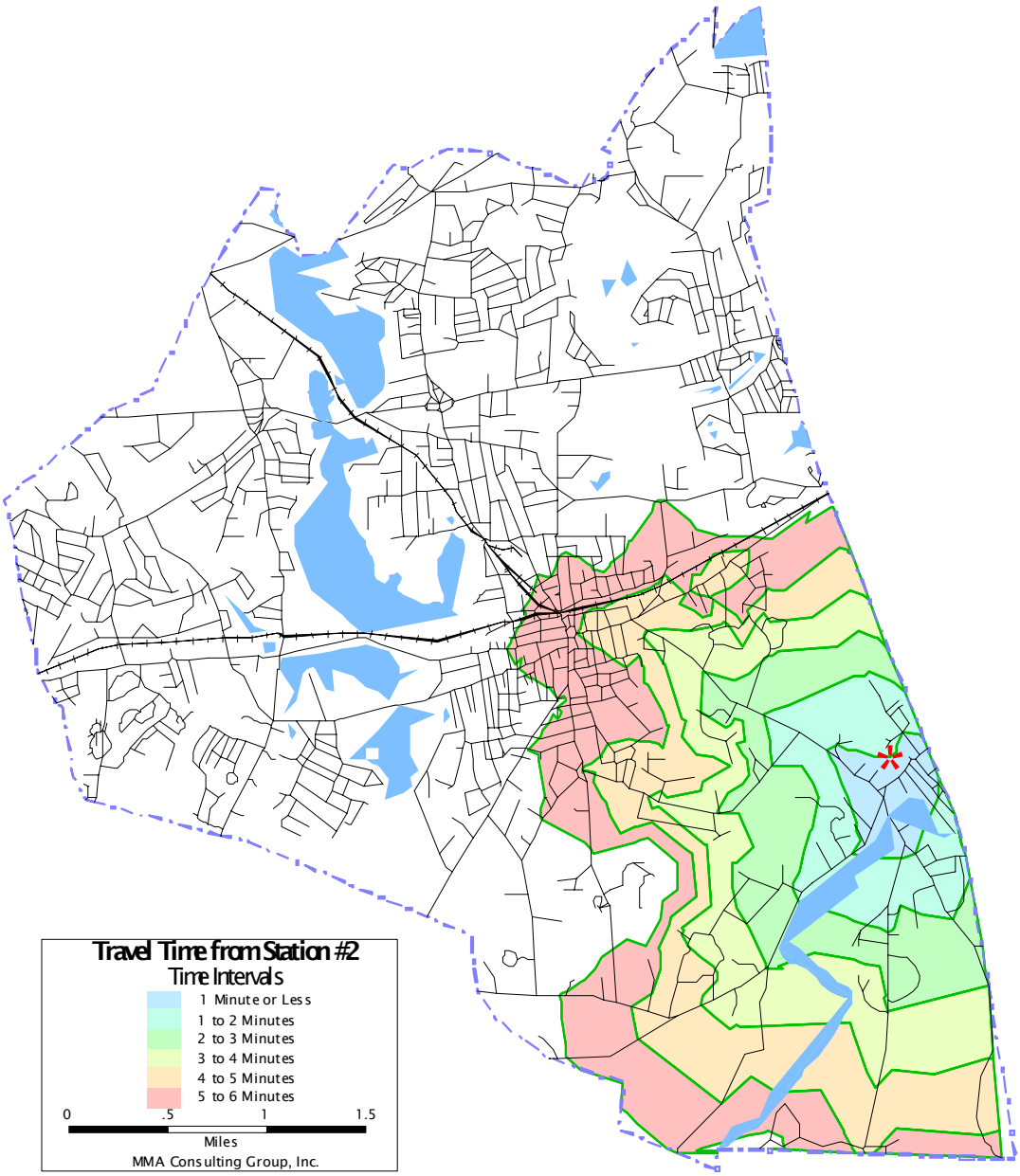
While we understand the difficulty and costs associated with the consolidation of fire stations in Natick, the long-term response benefits should be carefully considered. The Town would be able to dispose of two older inadequate facilities, reduce the number of front-line engines from four to three, and redeploy fire and rescue crews, creating more efficient response crews.

RECOMMENDATION V-2: *Deploy EMT-Ps at each fire station.*

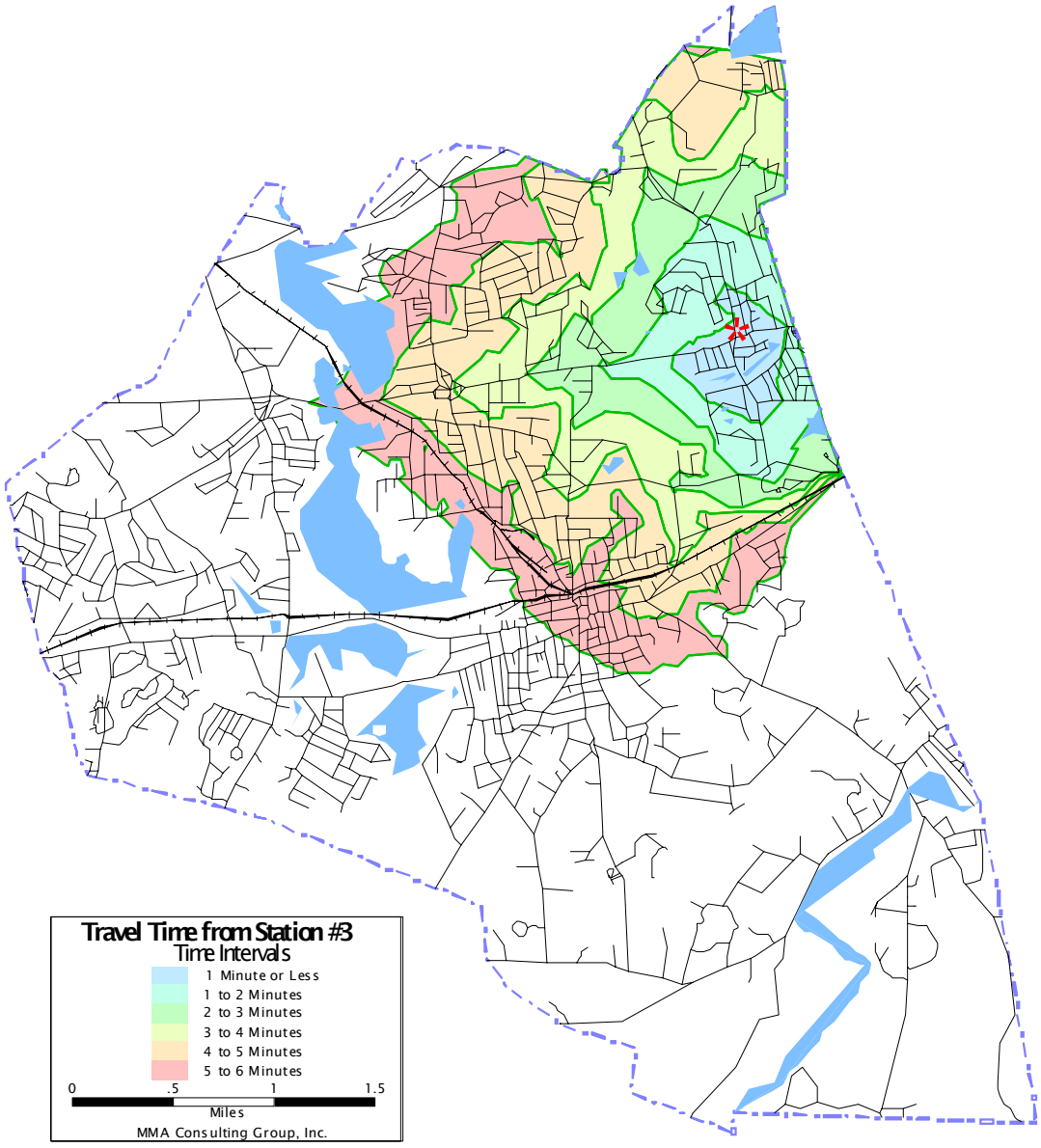
MAP 1


Travel Time from Station #1
Time Intervals
1 Minute or Less
1 to 2 Minutes
2 to 3 Minutes
3 to 4 Minutes
4 to 5 Minutes
5 to 6 Minutes
0
.5
1
1.5
Miles
MMA Consulting Group, Inc.

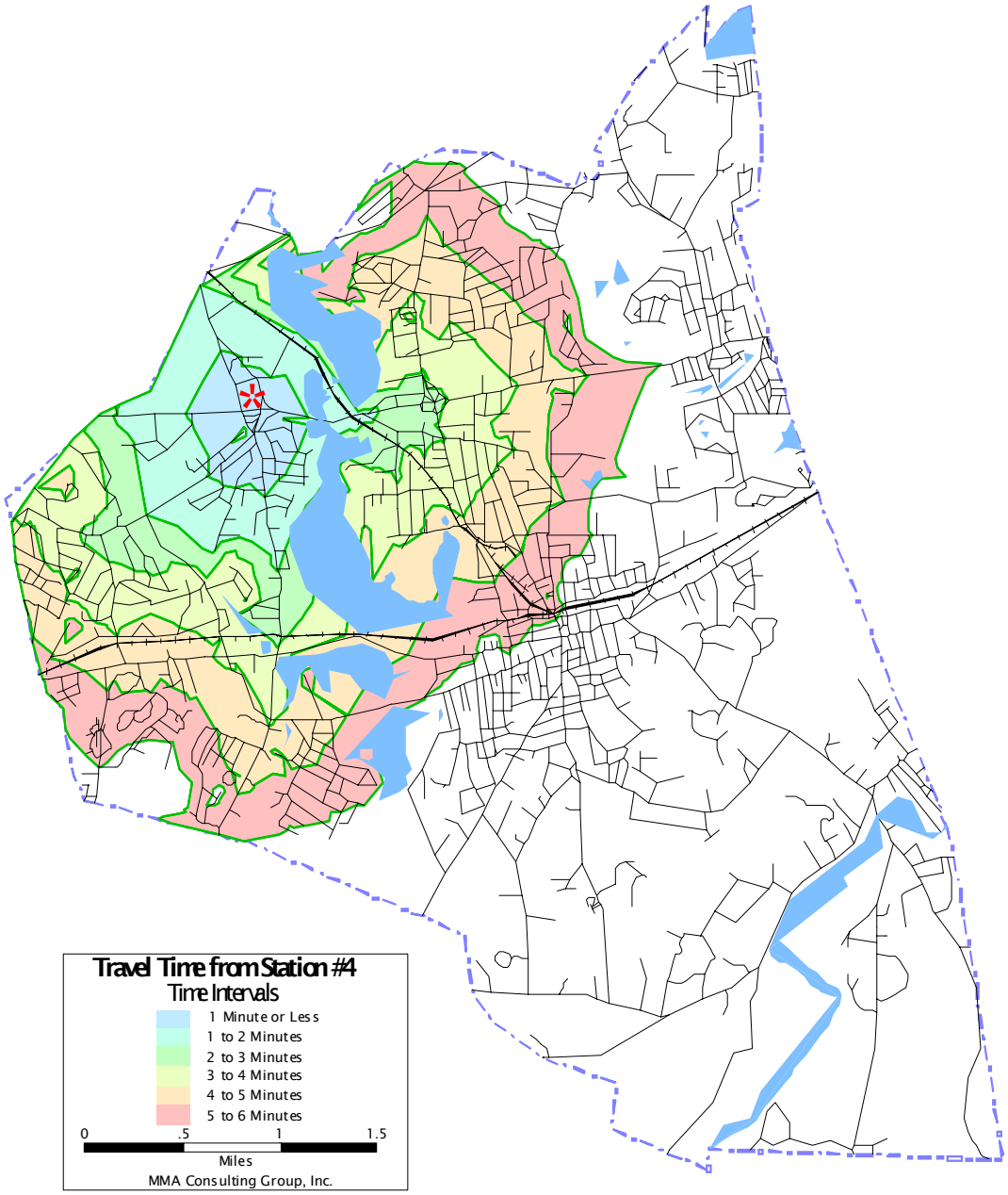
MAP 2


Travel Time from Station #2
Time Intervals
1 Minute or Less
1 to 2 Minutes
2 to 3 Minutes
3 to 4 Minutes
4 to 5 Minutes
5 to 6 Minutes
0
.5
1
1.5
Miles
MMA Consulting Group, Inc.

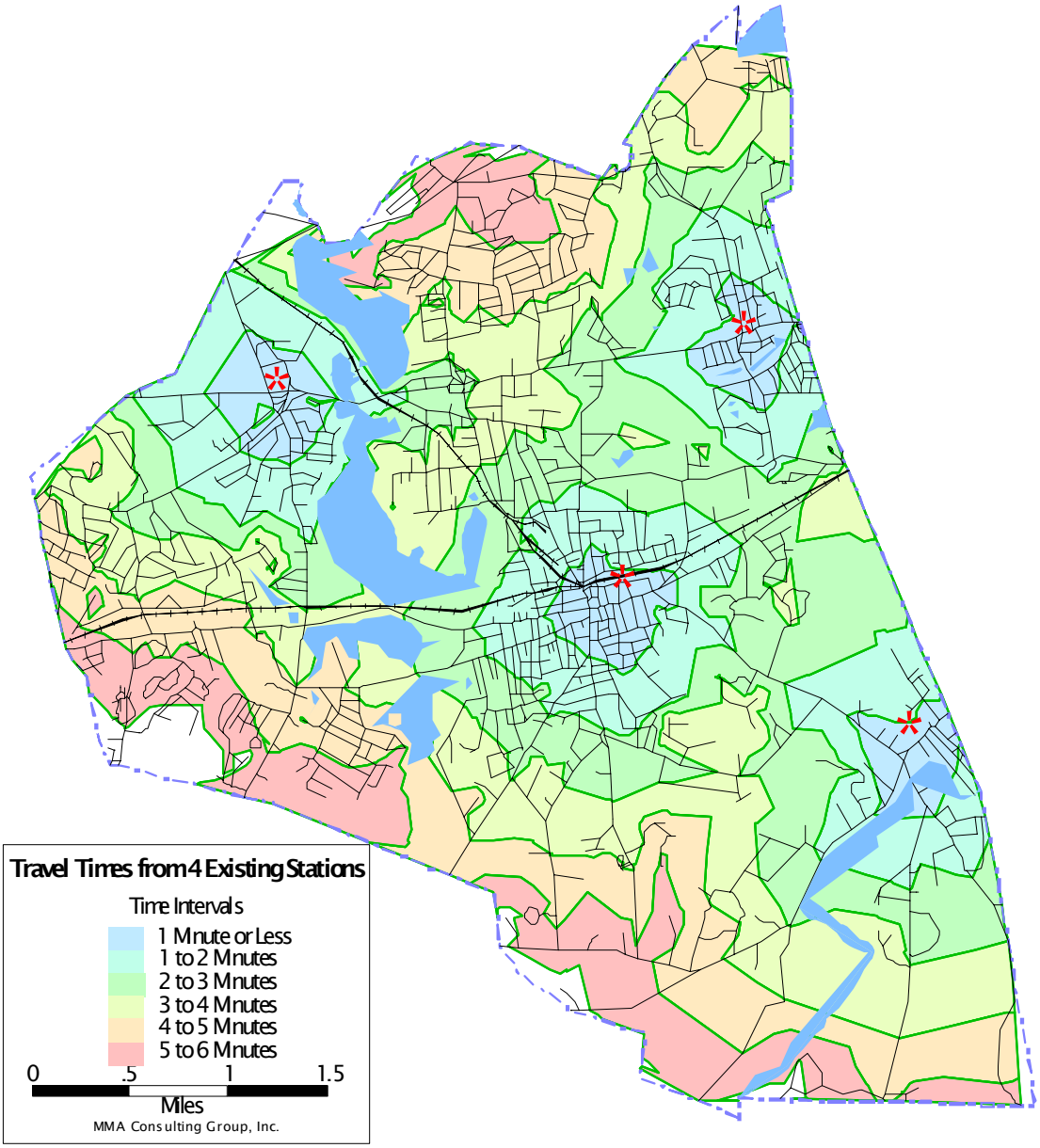
MAP 3


Travel Time from Station #3
Time Intervals
1 Minute or Less
1 to 2 Minutes
2 to 3 Minutes
3 to 4 Minutes
4 to 5 Minutes
5 to 6 Minutes
0
.5
1
1.5
Miles
MMA Consulting Group, Inc.

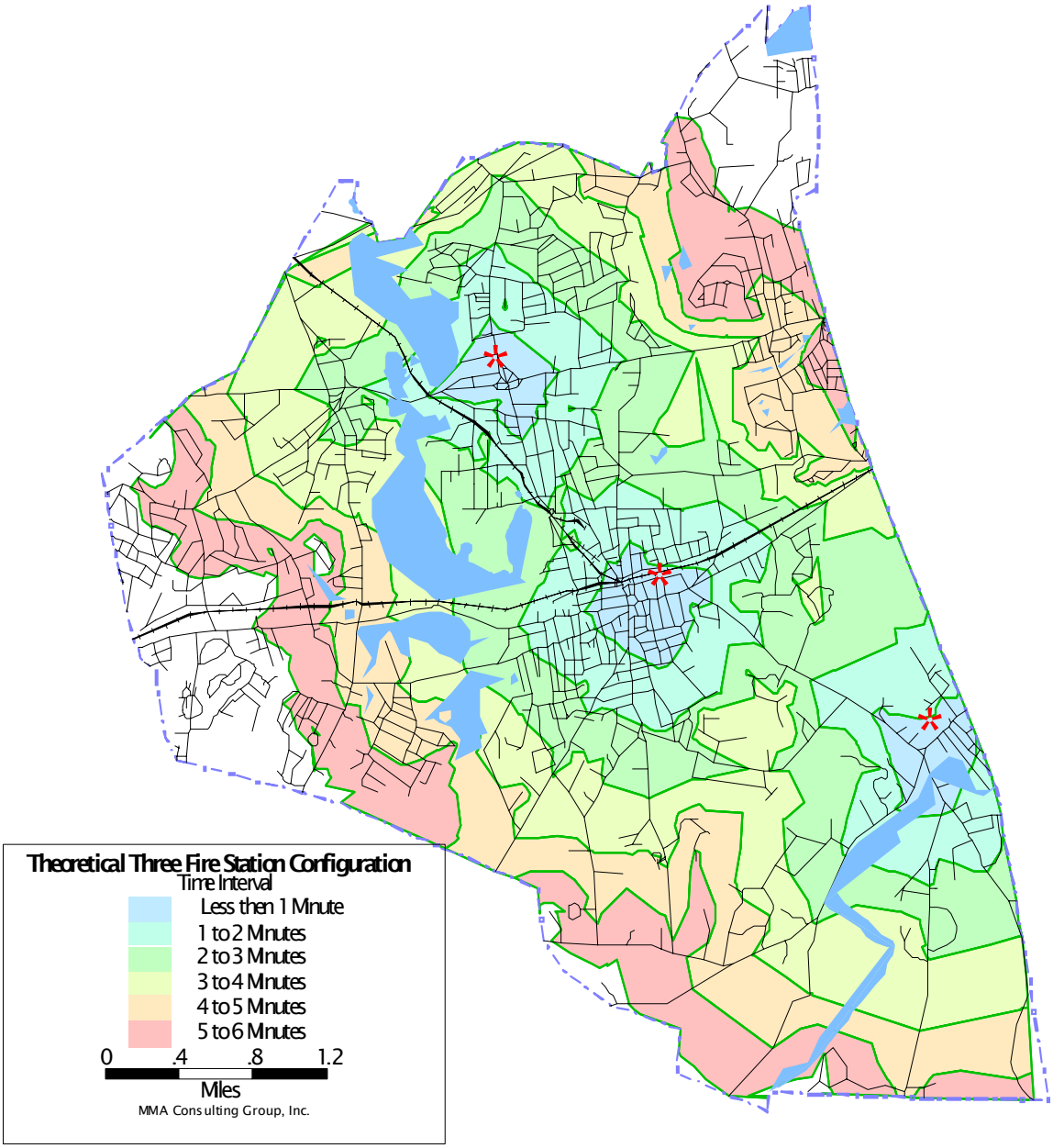
MAP 4


Travel Time from Station #4
Time Intervals
1 Minute or Less
1 to 2 Minutes
2 to 3 Minutes
3 to 4 Minutes
4 to 5 Minutes
5 to 6 Minutes
0
.5
1
1.5
Miles
MMA Consulting Group, Inc.

MAP 5


Travel Times from 4 Existing Stations
Time Intervals
1 Mnute or Less
1 to 2 Mnutes
2 to 3 Mnutes
3 to 4 Mnutes
4 to 5 Mnutes
5 to 6 Mnutes
0
.5
1
1.5
Miles
MMA Consulting Group, Inc.

MAP 6


Theoretical Three Fire Station Configuration
Time Interval
Less then 1 Mnute
1 to 2 Mnutes
2 to 3 Mnutes
3 to 4 Mnutes
4 to 5 Mnutes
5 to 6 Mnutes
0
.4
.8
1.2
Miles
MMA Consulting Group, Inc.

VI. DEPLOYMENT OF PERSONNEL AND RESOURCES

DEPLOYMENT OF PERSONNEL

The Department deploys personnel from four fire stations, and staffs five front-line fire units, or companies (four engine companies and one ladder company), and two ambulances. Most Department personnel are assigned to the direct delivery of services. The Fire Department uses a four-platoon/group or shift system. Each platoon works a 24-hour duty tour, followed by 72-hours off duty. Firefighters are assigned to one of four groups. The Department has an authorized strength of 20 positions assigned to each of the four groups, or platoons, but there are several vacancies, which results in platoons of various sizes.

Each platoon is authorized to have one Deputy Chief, one Captain, four Lieutenants and 15 firefighters/EMTs. One platoon has two Captains and three Lieutenants. The exhibit below shows authorized platoon staffing levels.

EXHIBIT VI-1
AUTHORIZED PLATOON STAFFING

POSITION	NUMBER
Deputy Chief	1
Company Officer (Captain or Lieutenant)	5
Firefighters/EMTs	14
Total Personnel	20

Exhibit IV-2, *Deployment of Personnel (Minimum of 17)*, shows the response model operating in Natick. The exhibit displays the emergency response units, including four engines, one ladder, and two ambulances. Ambulance 1 is staffed; Ambulance 2 is staffed from other units, when needed.

EXHIBIT VI-2
DEPLOYMENT OF PERSONNEL
(MINIMUM OF 17)

	STATION 1 22 EAST CENTRAL ST.	STATION 2 45 ELIOT ST.	STATION 3 2 RHODE ISLAND AVE.	STATION 4 268 SPEEN ST.
UNIT/PERSONNEL	STAFFING	STAFFING	STAFFING	STAFFING
Engine	3	3	3	3
Ladder	2			
Ambulance	2			
Ambulance	0			
Deputy Chief	1			
Total	8	3	3	3

Under the minimum shift staffing model, 17 firefighters/EMTs are assigned to units. Each engine company is staffed with one officer and two firefighters/EMTs; the ladder company is staffed with one officer and one firefighter/EMT; one ambulance is staffed with two firefighters/EMT-Ps. If a second ambulance is required, one firefighter/EMT-I, who is assigned to Engine 1, is reassigned to staff the second ambulance. In this case, the second ambulance responds with one firefighter/EMT to the second medical emergency. A first responder fire company (engine or ladder company) is deployed to all medical emergencies.

Each platoon is commanded by a Deputy Chief. When there is no Deputy Chief assigned to work, due to authorized leave, the administrative Deputy Fire Chief fills in for the absent Deputy Chief. As we understand this practice, Fire Captains do not serve in an Acting Deputy Chief capacity.

STAFFING FACTOR

The number of personnel needed for fire and EMS operations purposes depends on the number of personnel assigned on a daily basis to meet response objectives and risks, and the "staffing factor," often called a multiplier, which defines how many personnel it requires to keep one full-time firefighter on-duty around the clock, 24 hours per day, 365 days per year. The current work schedule results in personnel working an average of 42 hours per week. The

staffing factor or multiplier is one management measure of productivity, since it measures the number of hours worked in relation to the hours scheduled to work and the availability of personnel. The staffing factor can be significantly affected by negotiated labor agreements which establish vacation and other leave practices.

Determining the staffing factor requires several calculations:

- There are 8,760 hours in a year (365 *x* 24 hours = 8,760)
- A work week of 42 hours = 2,184 hours per year (42 *x* 52)

In Natick, leave time is granted in 10 or 14 hour increments. This practice reflects an earlier shift schedule in which personnel worked two 10-hour day shifts, followed by two 14-hour night shifts. Under the 24-hour schedule, or the original 10/14 schedule, personnel work the same number of hours per year.

To assess the Department's staffing factor, we examined records of authorized leaves, such as vacation leave, sick leave, personal health leave, bereavement leave, injury leave and union leave. The staffing factor is determined by the following calculation:

Total leave divided by number of incumbents - The total amount of leave for all categories (vacation, sick, personal, bereavement, union, and injury) is divided by the number of incumbents. This results in the total average leave taken, which reflects leave in 10 or 14 hour increments (12 hours is one-half of a tour of duty).

Total average leave taken divided by 2 - The total average leave taken is divided by two (since leave is granted in increments reflecting one-half of a tour of duty, which results in the number of off-duty tours of duty.

Authorized leave x 24 hours - The number of authorized off-duty tours of duty is multiplied by 24 hours, which results in the total number of off-duty hours.

Total hours scheduled to be worked minus total hours off duty - The total number of hours off-duty is subtracted from the total number of hours

scheduled to be worked each year, which results in the actual hours worked.

Total hours scheduled to be worked divided by actual hours worked - The total hours scheduled to be worked is divided by the actual hours worked. The result is a staffing factor, such as 1.2, which indicates the number of personnel it takes to fill one position on one shift 24 hours a day, 365 days a year.

In the exhibit below, we have displayed the Department's staffing factor. The staffing factor is based on information from 83 uniformed personnel.

EXHIBIT VI-3

NATICK STAFFING FACTOR *

TYPE OF LEAVE	SHIFTS OFF-DUTY	AVERAGE
Vacation	1,159	13.97
Sick	644	7.75
Personal Health	246	2.97
Bereavement	19	0.23
Union	5	0.06
Injury or Limited Duty	68	0.83
Total Shifts Off-duty	2,141	
2,141 periods off-duty/83 (number of firefighters) = 25.8/2 (see above) = 12.9 X 24 hours = 309.5 (rounded to 310) 2,184 (hours scheduled to work) - 310 = 1,874 2,184 (hours scheduled to work)/1,874 (hours worked) = 1.17 staffing factor		

** Includes 83 uniformed personnel*

The Department staffing factor is 1.17. Typically, consultants encounter staffing factors greater than 1.20, and often as high as 1.25. Thus, the staffing factor in Natick compares favorably to typical fire department staffing factors. The lower the staffing factor, the fewer number of personnel required to fill a position 24 hours per day, 365 days per year. As part of the staffing factor analysis we reviewed the staffing factor of each rank of the Department. The staffing factor is less significant for each rank than for the entire Department, but the staffing factor for each rank in the Department is as follows: Deputy

Fire Chief - 1.20; Fire Captain - 1.24; Fire Lieutenant - 1.21; and Firefighter - 1.14. The consultants' review of the staffing factor suggests that, over the next four of five years, the staffing factor is likely to range from the current level of 1.17 to an estimated high of 1.21.

In Natick, daily minimum staffing is 17 firefighters/EMTs. This includes the Deputy Chief. The number of chief officers required in a department is determined by a defined command structure. Normally when there is a need to fill a chief officer position, a lower ranking officer is assigned to the acting role. Thus, the staffing factor is applied to 16 company officers and firefighters to determine needed staffing. The following exhibit compares the Department's staffing factor of 1.17 to a 1.22 staffing factor (typically found by consultants) on a shift when 16 company officers and firefighters are required.

EXHIBIT VI-5
STAFFING FACTOR COMPARISON

NUMBER OF FIREFIGHTERS WORKING PER SHIFT OR GROUP	STAFFING FACTOR	NUMBER OF FIREFIGHTERS REQUIRED TO FILL 16 POSITIONS 24 HOURS PER DAY 365 DAYS PER YEAR
16	1.17	18.7 (rounded to 19)
16	1.22	19.5 (rounded to 20)

We can conclude from this analysis of personnel resources that:

- The average number of shifts or hours worked by Natick firefighters is within acceptable norms.

- The Department should strive to maintain this staffing factor, by monitoring leave time carefully.

RECOMMENDATION VI-1: *The management of the Fire Department should systematically monitor the staffing factor of the Fire Department, as one measure of productivity and accountability.*

STAFFING AND EMERGING STANDARDS

There has been a national debate about staffing and response time standards for municipal fire departments. The debate has resulted in the

development of National Fire Protection Standard 1710, which is applicable to full-time, career fire departments. (See Appendix A for a detailed description of the standard.) Chapter V (computer mapping) discusses the response time standards. This chapter will discuss the staffing standards presented in NFPA Standard 1710. In summary, NFPA Standard 1710 provides that:

- Each fire company must have an officer. (Natick has adopted this practice.)

- Engine companies must be staffed with a minimum of four firefighters. (Natick staffs engine companies with three personnel.)

- Ladder companies must be staffed with a minimum of four firefighters. (Natick staffs the ladder with two or three personnel.)

- A minimum of 15 firefighters, including an incident commander, must be present for a low-hazard structure fire, as well as two pumpers and a ladder truck, or similar vehicle. (Natick has the capability to deliver these resources.)

NFPA Standards do not have the force of law; however, the standard has framed the fire department staffing issue and the response time issue. As a practical matter, few communities in Massachusetts the size of Natick can achieve these measures. In the comparative data section of this report, we have presented data from similar size communities and fire department staffing levels. Obviously, the cost of increasing staffing and the comparative risk have been considered by each community.

In the planning, evaluation and design of a fire or emergency medical service system, a major consideration is the initial and subsequent response level capability to which the fire and emergency medical service responders should subscribe. As a policy matter, response capability objectives should be established by the Town, with due consideration of practical constraints and financial resources. While containing costs is an important objective, response capabilities and the safety of emergency response personnel must receive every consideration in the equation. Below are listed the four emerging standards, or benchmarks, which affect crew size, response times, firefighter safety and response time.

1. *OSHA requirements* for a minimum of four equipped personnel to be present before entry in a structure fire incident

2. *OSHA requirements* for a rapid intervention team (RIT) to be present for safety reasons at working structure fires

3. *OSHA and NFPA requirements* for a qualified incident commander and a qualified safety officer to be present at working incidents

4. *NFPA 1710 and industry standards* to have a minimum of 15 firefighters, including an incident commander, present for a low-hazard structure fire, and at least two pumpers and a ladder truck, or similar vehicle

Since it is difficult for a Town such as Natick to achieve the emerging standards and benchmarks, Town officials should establish operating objectives for the delivery of fire and emergency medical services to guide decision-making. The three primary operating objectives should be:

1. To maintain, and make every effort to continually improve, the current level of fire suppression, rescue, emergency medical and other capabilities of the Fire Department within the Town.

2. To administer and operate the Department in a cost-effective manner.

3. To provide these services while ensuring the welfare and safety of firefighter personnel.

RECOMMENDATION VI-2: *Policy leaders of the Town should adopt a Fire Department staffing policy which encourages continuous improvement, in a cost effective manner, while ensuring the safety of personnel.*

While it may be difficult for any one suburban town, such as Natick, to meet the developing fire and rescue standards, there are two approaches which will likely help the Town to achieve these standards. These approaches are cost effective, and will improve services in the long term:

Consolidate Fire Stations and Redeploy Personnel - Under this approach, Natick would consolidate Fire Stations 3 and 4 into a new relocated fire station. This station consolidation would allow the deactivation of one engine company, at which time personnel would be reassigned. One firefighter/EMT would be assigned to each of the remaining three engine companies, increasing the crew size of each engine company to four personnel, one officer and three firefighters. The reduction in the number of fire stations and engine companies means that one less apparatus must be replaced, and the number of company officers in the Fire Department would be reduced by four (one officer and three firefighters). While the total number of personnel would not be decreased, the number of company officers would be decreased.

Operational Consolidation (Field Operations Consolidation) - Under this approach, several fire departments in the region would establish a new response system. Emergency communications would be centralized in one regional dispatch center. In this system, fire and EMS response would be unified, and the closest units available would be deployed to an emergency. Departments continue to maintain separate identities, but all operational protocols are integrated. The operational consolidation approach increases the likelihood that sufficient resources are available in an emergency.

RECOMMENDATION VI-3: *Policy leaders of the Town should consider the viability of developing a plan to consolidate two fire stations.*

When considering fire station locations, it is important to recognize that there are several basic siting factors to consider. Whenever possible, fire station location and design should incorporate the basic features listed below. It should be noted that if the Town evaluated Fire Stations 3 and 4 according to the factors listed below, the stations would not measure up to the expectations set forth in these criteria:

- A fire station should be situated in or near areas of need.
- A fire station should be located on or near good multi-directional response routes.
- A fire station should be situated to allow for the exit of safety apparatus onto streets.

- ➢ A fire station should be appropriate for the neighborhood.

- ➢ A fire station should be large enough for all anticipated uses and have sufficient space to accommodate future space needs.

- ➢ A fire station should be sited on a lot which allows for building expansion, a ramp of sufficient length, off-street parking, and room to maneuver apparatus.

- ➢ A fire station should have drive-through bays.

- ➢ A fire station should have adequate office space, crew living quarters, classroom, study and resource space, storage, utility, work room, and exercise facilities.

Any new fire station should comply with the safety provisions of Chapter 9 of NFPA Standard 1500, *Standard on Occupational Safety and Health Program*, and Chapter 3 of NFPA 1581, *Standard on Fire Department Infection Control Program*. Fire stations should also comply with the appropriate sections of these firefighter safety standards. The basic requirements of these standards are listed below:

- ➢ Smoke and carbon monoxide detectors are required.

- ➢ Living areas are required to be separated from apparatus storage areas to prevent exposure to diesel exhaust emissions.

- ➢ Facilities must be provided for cleaning, disinfection, and disposal of protective clothing, protective equipment, and medical supplies.

- ➢ Standards are set for the size and equipment needed for fire department kitchens, sleeping areas, and bathrooms.

RECOMMENDATION VI-4: *Policy leaders of the Town should explore the development of a long-term plan to encourage operational consolidation.*

A key element of operational consolidation would be the development of a regional communication center. Historically, New England and Massachusetts have decentralized emergency communication systems with multiple agencies maintaining independent dispatch centers. Discussions with Town officials indicated that previous efforts by Natick officials to consolidate emergency communications with other towns have not been received positively.

An integrated communications system serving several fire or rescue agencies would automatically dispatch units based on predetermined protocols and availability. The effect of joint communications is to integrate the operations of each agency. This also allows the use of a variety of management deployment strategies, such as "moving up" units to "cover" for other units that are committed to incidents and less need to make call-backs. Practices such as "status system management" can be used for EMS units. Under status system management, ambulance units are deployed based on demand for service, which allows for varying the number of units, based on demand (time of day, day of week) and the location of units. This allows for more effective staffing, cost control and system efficiency.

RECOMMENDATION VI-5: *Policy leaders of the Town should explore a long-term plan to consolidate emergency communications.*

VII. EMERGENCY MEDICAL SERVICES

The Natick Fire Department responds to approximately 3,000 emergency medical service calls annually. Currently, the Fire Department delivers services through a two-tiered EMS delivery system which is composed of:

- Basic life support (BLS) services, delivered by a first responder fire company

- Advanced life support (ALS) services, delivered by ambulance

In addition, members of the Natick Police Department (NPD) are also trained to provide emergency first aid and all police vehicles are equipped with automatic external defibrillators (AEDs). Police vehicles respond to EMS requests for service to support the EMS response system.

EMERGENCY DISPATCH

The Town of Natick operates a consolidated communication center for all police, fire and emergency medical calls for service. When the communication center receives an EMS call, the communication center dispatches a Natick Fire Department first responder company (usually an engine company) along with a transporting ambulance. There is no formal call screening system (emergency medical dispatch system). Thus, no distinction is made between an advanced life support (ALS), or life-threatening response, and a basic life support (BLS) call, or non-life threatening call for service. All EMS requests are dispatched as full ALS responses.

Some communication center dispatchers received emergency medical dispatch (EMD) training several years ago, but an EMD system was never implemented, nor have personnel been re-certified in EMD procedures. In addition, no quality assurances measures are currently in place to review EMS dispatch procedures.

Some Fire Department personnel have expressed the desire to operate their own communication system, and expressed to consultants a concern about the quality of dispatch services. However, it does not appear that the Fire

Department has systematically evaluated the weaknesses in the dispatch function from the perspective of the Fire Department. The Fire Department should carefully review system weaknesses. This review should include an examination of any specific calls for service which were not appropriately dispatched, the training of personnel, and the clarity of protocols. The Fire Department should work with the Police Department to resolve dispatch problems**.** In our view, the Town should continue to operate a consolidated dispatch system. Better communication among participants in the dispatch system, clearly defined response protocols, training of personnel, and systematic quality review of dispatch performance will solve most problems. Data presented in Appendix D suggests that call processing time, from receipt of a call to dispatch of a call, is relatively slow. The Department should have a goal of dispatching 90 percent of calls within one minute of receipt of the call.

> ***RECOMMENDATION VII-1:*** *The Town of Natick should continue to operate a consolidated police and fire communication center.*

> ***RECOMMENDATION VII-2:*** *The Town of Natick should establish a fully operating Emergency Medical Dispatch (EMD) system.*

An emergency medical dispatch system is a medically approved system, used by a dispatch center to dispatch appropriate aid to medical emergencies. Emergency medical dispatch consists of a process of caller interrogation, pre-arrival instructions, and procedures to match an assessment of the need for service with an appropriate response. As a general rule, 60 percent of EMS requests are determined to be non-life-threatening requests that require a BLS response, while 40 percent of EMS requests are determined to be life-threatening requests, requiring an ALS response.

> ***RECOMMENDATION VII-3:*** *Communication center dispatchers should be trained and certified in EMD procedures. Personnel should be re-certified according to national standards.*

Medical supervision for the Natick EMS system is provided by the NFD Medical Director. To ensure appropriate medical supervision, the Medical Director has instituted several ALS quality assurance procedures, along with a continuing medical education (CME) program to ensure that a high quality of

advanced life support is provided and maintained by EMS responders. In addition, regular morbidity and mortality (M&M) conferences are conducted by the Medical Director. Specific ALS responses are selected and reviewed by the Medical Director. If, during the review process, an EMS response procedure is determined to be inappropriate, steps are taken to improve the procedure. Moreover, when exceptional performance is identified, the ALS providers are duly recognized for their work. Quality assurance medical review systems, such as M&M conferences and case reviews, are consistent with the strongly recommended EMS national medical standards for medical supervision and quality improvement systems.

Several quality assurance improvements should be instituted to ensure that the Fire Department continues to provide high quality emergency medical services. First, it is important for dispatchers to recognize that continuous evaluation of EMS dispatching is an essential part of the pre-hospital care system. The purpose of this quality assurance process is to continuously improve performance.

A quality assurance dispatch committee should be established to monitor EMS dispatch performance. The committee should be composed of police, fire- and emergency medical personnel. The purpose of the committee is to review performance, discuss weaknesses in system performance, suggest training and identify other improvements. The committee should meet quarterly to review a random selection of EMS dispatches to evaluate procedure and response.

> ***RECOMMENDATION VII-4:*** *The Town should establish a quality assurance review process for the EMS dispatch process.*
>
> ***RECOMMENDATION VII-5:*** *A quality assurance committee should be established, composed of police, fire and medical personnel.*
>
> ***RECOMMENDATION VII-6:*** *The quality assurance committee should meet quarterly to review a random selection of EMS dispatches.*

It is essential that dispatchers have the opportunity to fully understand the emergency medical response system. In addition to EMD training, dispatch personnel should have exposure to actual fire and EMS operations. Dispatchers

should have the opportunity to observe first-hand the operations of the fire and emergency medical system. Training should include the assignment of dispatch personnel to "ride along" with response crews.

> ***RECOMMENDATION VII-7:*** *Programs to familiarize dispatch personnel with EMS and fire operations practices, such as "ride along" programs, should be developed and implemented as part of a dispatch personnel continuing education process.*

The implementation of an emergency medical dispatch system can be difficult since it dramatically changes the way in which dispatchers perform their work. Each dispatch action is subject to review and evaluation, which can be stressful to employees. However, an EMD system is an essential part of an emergency medical response system, without which resources and needed care cannot be effectively delivered.

FIRE DEPARTMENT EMS RESPONSE CAPABILITY

The Natick Fire Department has 78 firefighters/EMTs trained to the State of Massachusetts Emergency Medical Technician-Basic (EMT-B) level. Seventeen of these firefighters/EMTs have raised their medical training to EMT-Intermediate (EMT-I) level, and thus, are capable of providing limited advanced life support measures. Fourteen firefighters/EMTs have elevated their training to the EMT-Paramedic (EMT-P) level. A firefighter/EMT-P is capable of providing invasive advanced life support measures during life-threatening emergencies.

An additional six firefighters have received the State of Massachusetts 40-hour first responder training. The level of EMS training in the Fire Department is relatively high. However, the number of trained EMT-Paramedic (EMT-P) personnel should be increased.

Primary EMS delivery in Natick is provided by one of four first responder engine companies and/or one first responder ladder company, along with one ALS ambulance. Thus, BLS EMS response is available from each fire station. Current ambulance staffing practices ensure that Ambulance 1 is staffed with two firefighters/EMT-Ps at all times. Ambulance 1 responds from fire headquarters.

When Ambulance 1 is deployed, and if a second simultaneous EMS request for service is received, the second ambulance, Ambulance 2, responds from headquarters. Ambulance 2 has ALS Intermediate capability only. Ambulance 2 is usually deployed with one firefighter/EMT-I. If, upon patient assessment at the EMS scene, the response requires ALS intervention, a mutual aid ALS ambulance is requested. Generally, mutual aid ALS ambulance support is provided by AMR, or from another surrounding community with ALS capability.

Currently, the staffing procedures for deploying the second ambulance, Ambulance 2, depend on the daily staffing of a shift:

Daily staffing @ 17 personnel - When the daily shift staffing is at 17 firefighters/EMTs on duty, the responsibility for staffing Ambulance 2 becomes the responsibility of Engine 1. In this case, Engine 1 staffing is reduced from three to two firefighters/EMTs, with one firefighter/EMT-I staffing Ambulance 2. The one firefighter/EMT-I responds to the EMS request alone. A second EMT comes from the responding engine.

Daily staffing @ 18 or 19 personnel - If 18 or19 firefighters/EMTs are on duty, the procedure for staffing Ambulance 2 changes. With this staffing level, it becomes the responsibility of Ladder 1 to staff Ambulance 2. The second ambulance response is at the ALS Intermediate level.

The current emergency medical response system should be reconfigured. The consultants propose the development of a paramedic engine deployment concept. The proposed EMS deployment for the Natick Fire Department has a number of features, listed in Exhibit VII-1.

EXHIBIT VII-1
FEATURES OF A RECONFIGURED EMS RESPONSE SYSTEM

1. Assign, at all times, one Firefighter/EMT- P (paramedic) to each engine company and the ladder company.
2. Maintain the capability to staff one BLS ambulance and one ALS ambulance at all times.
3. Assign, at all times, one firefighter/EMT-P on Ambulance 1. A long-term objective is to have two EMT-Ps on Ambulance 1.
4. Fully implement the Emergency Medical Dispatch (EMD) system.
5. Deploy the BLS Ambulance only to EMD confirmed BLS calls for service.
6. Discontinue the current practice of deploying an ALS staffed ambulance to a confirmed EMD BLS response.
7. Discontinue the deployment of first responder engine and ladder companies to confirmed EMD BLS responses.
8. Deploy ALS Engines and the ALS Ambulance to EMD confirmed ALS calls for service.
9. Discontinue the practice of deploying Ladder 1 to EMS responses when Engine 1 is available to respond.

One of the primary reasons for recommending this redeployment model is to provide for the distribution of EMS capacity. The effect of this distribution approach is demonstrated by examining the computer mapping in Chapter V. If ALS services are only delivered from the central station, 53 percent of the residents of the Town can be served within six minutes travel time, but if there is the capability to provide ALS service from each of the Town's current fire stations, it is possible to serve approximately 96 percent of the residential population of the Town within six minutes travel time, or eight minutes total response time.

There are a number of important advantages to the proposed reconfiguration of the EMS response system, including:

- Paramedics are distributed through out the Town, allowing for availability of personnel more rapidly in life-threatening situations.

- Multiple fire units need not be deployed to BLS calls for service. Systems using EMD generally dispatch 40 percent of calls as ALS and 60 percent of calls as BLS.

- ➢ EMD reduces the need to respond with lights and sirens, which reduces the risk of harm to firefighters and citizens.

- ➢ ALS resources are available for true ALS responses and are not committed unnecessarily.

- ➢ ALS is available more rapidly in a larger portion of the Town.

To fully implement this proposed deployment plan, it will be necessary to have seven EMT-Ps on each group/shift, one assigned to each fire company and two assigned to Ambulance 1. This will require the employment of approximately 33 EMT-Ps. However, given the potential promotions, retirements and special assignments, the Fire Department should attempt to maintain 35 to 40 paramedics within the Fire Department. In the following exhibit, the number of EMT-Ps required is presented. In developing this exhibit, the consultants have assumed that it requires approximately 1.17 persons to fill each position, 24 hours each day, 365 days per year. In addition, we have assumed in this exhibit that there will be one EMT-P assigned to each engine and the ladder, and one to Ambulance 1 at all times. Thus, for each shift, it is necessary to have six EMT-Ps.

It should be noted that one of the objectives of this process is to eventually provide one EMT-P in each fire company, and ultimately two EMT-Ps on the Ambulance. Recommended practice calls for assigning two EMT-Ps to an ALS ambulance.

EXHIBIT VII-2
REQUIRED NUMBER OF EMT-PARAMEDICS

STATION	UNIT
Station 1	Engine 1 (1 EMT-P) Ambulance 1 (2 EMT-Ps) Ladder 1 (1 EMT-P)
Station 2	Engine 2 (1 EMT-P)
Station 3	Engine 3 (1 EMT-P)
Station 4	Engine 4 (1 EMT-P)
Total EMT-Ps per shift	7 EMT-Ps
4 shifts x 7 EMT-Ps = 28 EMT-Ps x 1.17 (staffing factor) = 33 (rounded)	

The exhibit above indicates that, at a minimum, it will require 33 EMT-Ps to fully implement the proposed deployment model. However, due to promotions, staff assignments, and to ensure a sufficient number of personnel, the Fire Department should increase the complement of firefighters/EMT-Ps to 35 to 40. With 16 firefighters/EMT-Ps currently in the Department, it will be necessary for the Department to increase the number of EMT-Ps by 19.

There are several potential sources of EMT-Ps. There are currently 17 EMT-Intermediates (EMT-Is) in the Fire Department and it may be possible to convince some personnel to increase their training level. In addition, the Fire Department should consider requesting specialized lists containing paramedics from the Massachusetts Human Resources Division when filling firefighter/EMT-P vacancies in the future. (See the discussion of these matters in other sections of this report.) New employees hired as paramedics should be required to maintain the required level of certification as a condition of employment. To achieve the number of EMT-Ps required, the Department should develop a five-year plan to increase the number in the Department by approximately three annually.

Available data does not indicate that the Department should staff a second ambulance on a full-time basis. The Department must establish a system to monitor the in-service ratio of the ALS ambulance and determine how much time the unit is committed to responses. Information such as the number of calls for service, length of each incident, time of day of incidents, day of week and other data must be gathered and evaluated.

For purposes of the new EMT-P deployment plan, it is recommended that the BLS ambulance, when activated, should be staffed in a manner similar to the current practice. One EMT would be redeployed from Engine 1 or Ladder 1 to respond with the ambulance. With the reduction in fire company staffing caused by this practice, Engine 1 and Ladder 1 should respond to other incidents as a task force, with units responding as a team. This results in a four-person team at the scene of an incident.

RECOMMENDATION VII-8: *Develop and implement a new EMS response system, based on the paramedic engine concept.*

RECOMMENDATION VII-9: *Assign one EMT-P to each engine and the ladder, and two to Ambulance 1.*

RECOMMENDATION VII-10: *Maintain the capability to staff one ALS ambulance and one BLS ambulance.*

RECOMMENDATION VII-11: *Deploy the BLS Ambulance only to EMD confirmed BLS calls for service.*

RECOMMENDATION VII-12: *Deploy the ALS Ambulance and ALS engines to confirmed EMD ALS calls for service.*

RECOMMENDATION VII-13: *Discontinue the deployment of first responder engine and ladder companies to confirmed EMD BLS responses.*

RECOMMENDATION VII-14: *Develop a five to seven year plan to increase the number of EMT-Ps to between 35 and 40.*

The EMS redeployment plan should be implemented gradually as the number of EMT-Ps is increased. With 14 EMT-Ps, it is difficult to implement the plan fully, but it could be partially implemented and expanded as more EMT-Ps become available. We estimate that it will require five to seven years to fully implement the plan. As sufficiently trained personnel become available, the Department could begin to implement paramedic engine companies one at a time. The actual implementation process should consider the needs of different areas of the Town and base the implementation of the program on the evaluation of data. The following is an illustration of an implementation plan.

EXHIBIT VII-3
ILLUSTRATION OF IMPLEMENTATION OF NEW EMS DEPLOYMENT MODEL

UNIT	CURRENT (2005)	2006	2007	2008	2009	2010	2011
Station 1 22 East Central St.	ALS Ambulance					Engine	Ladder
Station 2 45 Eliot St.				Engine			
Station 3 2 Rhode Island Ave.		Engine					
Station 4 268 Speen St.					Engine		

To implement the proposal above, it is necessary to increase the number of EMT-Ps in a systematic manner. The following exhibit is designed to parallel the exhibit above, and presents a plan to increase the number of EMT-Ps annually. The plan presented below is a relatively conservative plan and results in a total of 33 EMT-Ps. Once authorized to proceed on the redeployment model, the Fire Department should develop a specific plan for increasing the number of EMT PS. The plan should have specific annual goals.

EXHIBIT VII-4
PLAN TO ANNUALLY INCREASE THE NUMBER OF EMT-PS

	CURRENT (2005)	2006	2007	2008	2009	2010	2011
Annual Increase		4	4	4	3	2	2
Total Number	14	18	22	26	29	31	33

RECOMMENDATION VII-15: *The proposed EMS deployment model should be implemented on a gradual basis as the number of paramedics increases.*

RECOMMENDATION VII-16: *The location of the proposed ALS units should be based on the assessment of data regarding the need for services.*

RECOMMENDATION VII-17: *The Fire Department should develop and implement a plan to increase the number of EMT-Ps. The plan should contain annual goals.*

Since emergency medical response is such a large part of the services provided by the Fire Department, and since the provision of pre-hospital care is such a critical process, the Department should plan to establish an EMS staff position. The position should be assigned the rank of Lieutenant. This staff Lieutenant should be responsible for coordination of all department EMS activities, participating in quality assurance programs, and assessing program effectiveness. The new position should report to the Assistant Chief of Staff and Support Services.

RECOMMENDATION VII-18: *Plan to establish a new EMS staff position to coordinate activities.*

INTERIM EMS AMBULANCE DEPLOYMENT PLAN

To implement the advanced ALS response system that is proposed, it is necessary for the Fire Department to develop an interim emergency medical service ambulance response and deployment plan. Under this interim plan, all ambulance personnel will be assigned to Ladder 1 and response strategies should be built around the responsibilities of Ladder 1.

The type of ambulance staffing will be determined by:

- the type of EMS call dispatched
- the level of EMS capability (ALS or BLS) of the first responder company

Under this response plan, Ladder 1 will have flexible staffing. When both ambulances are committed, as a result of simultaneous EMS responses, Ladder 1 will temporarily respond with Engine 1 for fire emergencies. In this situation, Engine 1 and Ladder 1 become a task force and operate as one unit/company.

In the following two exhibits, we have described this interim response plan. One exhibit assumes a minimum of 17 personnel on-duty; and one plan assumes a minimum of 18 personnel on-duty. The exhibits are intended to display the flexible status required until the Department attains the desired ALS capability in all first responder companies. On most days, with minimum staffing, at least one first responder company (FRC) will be staffed.

Note that under this flexible plan, the ladder company should be staffed as follows:

- One officer
- Two Firefighters/EMT-Ps
- One Firefighter/EMT-B

The exhibits display initial staffing on the left, levels of ambulance staffing, the level of first responder response, first responder engine company, and the status of the ladder after each type of response.

EXHIBIT VII-5

INTERIM FLEXIBLE RESPONSE PLAN - 17 PERSONNEL ON-DUTY

Ladder 1 Staffing 1 Officer 2 FFs/EMT-Ps 1 FF/EMT-B/I	Ambulance Staffing	First Responder Response (FRC) ALS/BLS	Ladder 1 Staffing Status
Initial BLS Response			
1st Response BLS Response (Anywhere)	1 FF/EMT-P 1 FF/EMT-B/I	None	1 Officer 1 FF/EMT-P
2nd Response BLS Response (Anywhere)	1 FF/EMT-P	BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1
2nd Response ALS Response (Anywhere)	1 FF/EMT-P	ALS or BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1
3rd Response ALS or BLS Response (Anywhere)	Mutual Aid Ambulance (ALS or BLS)	ALS or BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1
Initial ALS Response - First Responder Company ALS Capability			
1st Response ALS Response (FRC ALS capability)	1 FF/EMT-P	ALS FRC	1 Officer 1 FF/EMT-P 1 FF/EMT-B/I
2nd Response ALS Response (Anywhere)	1 FF/EMT-P	ALS or BLS FRC	1 Officer 1 FF/EMT-B/I
2nd Response BLS Response (Anywhere)	1 FF/EMT-P 1 FF/EMT-B/I	None	1 Officer Assigned with Engine 1 as Task Force 1
3rd Response ALS or BLS Response (Anywhere)	Mutual Aid Ambulance (ALS or BLS)	ALS or BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1
Initial ALS Response - First Responder Company BLS Capability			
1st Response ALS Response (FRC BLS capability)	2 FFs/EMT-Ps	BLS FRC	1 Officer 1 FF/EMT-B
2nd Response ALS Response (Anywhere)	1 FF/EMT-B/I Mutual Aid ALS Ambulance	ALS or BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1
2nd Response BLS Response (Anywhere)	1 FF/EMT-B/I	ALS or BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1
3rd Response ALS or BLS Response (Anywhere)	Mutual Aid Ambulance (ALS or BLS)	ALS or BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1

EXHIBIT VII-6

INTERIM FLEXIBLE RESPONSE PLAN - 18 PERSONNEL ON-DUTY

Ladder 1 Staffing 1 Officer 2 FFs/EMT-Ps 2 FFs/EMT-B/Is	Ambulance Staffing	First Responder Response (FRC) ALS/BLS	Ladder 1 Staffing Status
Initial BLS Response			
1st Response BLS Response (Anywhere)	2 FFs/EMT-B/Is	None	1 Officer 2 FFs/EMT-Ps
2nd Response BLS Response (Anywhere)	2 FFs/EMT-Ps	None	1 Officer Assigned with Engine 1 as Task Force 1
2nd Response ALS Response (Anywhere)	1 FF/EMT-P 2 FF/EMT-P	ALS FRC BLS FRC	1 Officer 1FF/EMT-P 1 Officer Assigned with Engine 1 as Task Force 1
3rd Response ALS or BLS Response (Anywhere)	Mutual Aid Ambulance (ALS or BLS)	ALS or BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1
Initial ALS Response - First Responder Company ALS Capability			
1st Response ALS Response (FRC ALS capability)	1 FF/EMT-P	ALS FRC	1 Officer 1 FF/EMT-P 2 FFs/EMT-B/Is
2nd Response ALS Response (Anywhere)	1 FF/EMT-P	ALS or BLS FRC	1 Officer 2 FFs/EMT-B/Is
2nd Response BLS Response (Anywhere)	2 FF/EMT-B/I	None	1 Officer 1 FF/EMT-P
3rd Response ALS or BLS Response (Anywhere)	Mutual Aid Ambulance (ALS or BLS)	ALS or BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1
Initial ALS Response - First Responder Company BLS Capability			
1st Response ALS Response (FRC BLS capability)	2 FFs/EMT-Ps	BLS FRC	1 Officer 2 FFs/EMT-B/Is
2nd Response ALS Response (Anywhere)	1 FF/EMT-B Mutual Aid ALS Ambulance	ALS or BLS FRC	1 Officer 1 EMT/FF-B/I
2nd Response BLS Response (Anywhere)	2 FFs/EMT-B/Is	None	1 Officer Assigned with Engine 1 as Task Force 1
3rd Response ALS or BLS Response (Anywhere)	Mutual Aid Ambulance (ALS or BLS)	ALS or BLS FRC	1 Officer Assigned with Engine 1 as Task Force 1

RECOMMENDATION VII-19: *Develop an interim EMS response deployment plan as a transition to the proposed fully developed EMT-P deployment plan.*

RECOMMENDATION VII-20: *The Fire Chief should develop a Fire Chief's Emergency Medical Advisory Committee.*

It is important that the Fire Department make a strong commitment to high quality care. The Fire Chief should establish a committee which includes key local officials and members of the medical community to periodically discuss and review the emergency medical response system. The committee should meet quarterly.

During the course of the study, the consultants explored a range of emergency medical service delivery approaches, including the concept of staffing two ambulances on a full-time basis. While staffing two ambulances on a full-time basis may be a desirable goal, a more effective service delivery approach, given available resources and service demand, would be to strategically deploy paramedic-staffed units at the various fire stations. This approach, coupled with an improved dispatching process, would provide better service delivery to citizens.

VIII. TRAINING AND APPARATUS REPLACEMENT

TRAINING IN THE NATICK FIRE DEPARTMENT

The Fire Department Training Officer position was established three years ago. A Fire Captain is designated as the Training Officer and is also designated as Department Safety Officer. The incumbent Training Captain is a State certified fire instructor.

The effectiveness of the training program is somewhat limited by the additional administrative duties that have been assigned to the incumbent Training Officer. These duties often consume substantial periods of time and detract from the development and delivery of training programs. Despite the administrative role of the Training Officer, there has been a reasonable level of progress achieved during the last several years. One recent achievement is development and the implementation of a Rapid Intervention Team concept within the Department. A Rapid Intervention Team is a safety measure which establishes a process in which a fire company is placed on dedicated stand-by at an emergency incident to provide immediate support to firefighters who may become endangered during firefighting operations.

All Natick firefighters have been trained in, or certified to State of Massachusetts Firefighter 1 and 2 standards, OSHA Hazardous Material Operational Level standard, OSHA Blood Borne Pathogens, Rapid Intervention Team (RIT), and the Incident Command System (ICS). In addition, the Department conducts a re-certification program of emergency medical personnel every two-years.

Special operations training is not complete; training in confined space, trench collapse, technical rescue, and mid-rise high rise operations have not been provided. In addition, while there is a one-day driver safety familiarization program provided annually, there is no driver certification program for Department members. Currently, drivers are selected by seniority.

Chief officers receive an annual stipend to attend fire related training courses. Chief officers are required to attend 32-hours of training programs or courses through a contract agreement. Chief officers are required to validate

attendance by submitting a certificate of attendance. There are no specific fire management courses required by the Department to qualify for the stipend. Chief officers select their own courses and programs to attend. There is no requirement that chief officers attend National Fire Academy training courses.

There is no certification, education, or training required to attain the rank of officer or chief officer within the Department. The only requirement to be promoted to a company officer position is the Civil Service requirement of having served one year at the rank of firefighter to be eligible for the written examination.

While it is apparent that the Fire Department's training program has achieved much in the last several years, the consultants have identified a number of areas where training is necessary. More importantly, the Department does not have a training plan with realistic objectives, which is linked to established state and national standards for safe emergency scene operations.

RECOMMENDATION VIII-1: *The Fire Department should develop a training plan with specific training objectives.*

The Training Officer should develop daily company training schedules. The company officers should be required to deliver the predetermined training programs for their shift.

RECOMMENDATION VIII-2: *The Training Officer should develop a written daily company training schedule.*

RECOMMENDATION VIII-3: *Shift Deputy Chiefs should attend and monitor at least one company training program per shift.*

The Department should establish a training committee. The training committee should be composed of all ranks and chaired by a Deputy Chief. The training committee should meet every two months and submit recommendations to the Training Officer.

RECOMMENDATION VIII-4: *The Department should establish a training committee charged with making recommendations to the Training Officer.*

RECOMMENDATION VIII-5: *The Department should develop a training program for newly promoted officers.*

The administrative Deputy Fire Chief fills in for any shift Deputy who is on authorized leave. Captains are not authorized to serve in the role of acting Deputy Chief. An essential element of an officer's training is to have the opportunity to serve in a more challenging role. Fire Captains should be authorized to serve as acting Deputy Chiefs. Thus, all Captains should be trained and prepared to assume the role of Deputy Chief.

RECOMMENDATION VIII-6: *The Department should train and prepare all Fire Captains to assume the role of acting Deputy Chief.*

The Training Officer should annually develop at least one large-scale training exercise for each shift. The type of exercises conducted should be a result of a risk assessment process and reflect the type of large-scale emergencies that may be possible in the Town of Natick.

The Department should develop an Incident Management Team in accordance with the Incident Command System (ICS) and National Incident Management System (NIMS) capable of being implemented during emergency operations.

RECOMMENDATION VIII-7: *The Training Officer should annually develop one large-scale incident for each shift.*

Recommendation VIII-8: *The Department should develop an Incident Management Team.*

It is essential that a fire department's practices at an emergency be safe and that any weaknesses in procedure are corrected immediately. The Natick Fire Department has designated the Training Officer as the Safety Officer. However, the Department does not have a safety committee which is charged with responsibility to make recommendations to improve the safety of fire Department operations.

The Fire Department should establish a safety committee chaired by a Deputy Fire Chief and composed of members from all ranks in the Fire Department. The committee should meet every two months to review operations and make recommendations to the Safety Officer of the Department. Since the Safety Officer is also the Training Officer in Natick, new safety measures can be integrated in the Department's training program relatively rapidly. Moreover, all personnel should annually receive a minimum of eight hours of safe emergency scene operations training.

RECOMMENDATION VIII-9: *The Department should establish a safety committee.*

RECOMMENDATION VIII-10: *The Department should integrate a minimum of eight hours of training on safe emergency operations in its annual training program.*

An important part of a safety program in a Fire Department is a safe driver program. In addition, any accidents or mishaps should be carefully evaluated. Two essential parts of the driver safety program are to institute an emergency vehicle operator course and create an accident review committee for the Department. The accident review committee should be chaired by a Deputy Chief and should review all Department accidents and submit findings and conclusions to the Fire Chief.

RECOMMENDATION VIII-11: *The Department should establish a safe driver program in accordance with the emergency vehicle operator course (EVOC) provided by the State of Massachusetts.*

RECOMMENDATION VIII-12: *The Department should establish an accident review committee.*

FIRE APPARATUS REPLACEMENT

Fire apparatus are used to transport firefighters from fire stations to the scene of emergencies. The apparatus serves both as a personnel carrier and a firefighting tool when on the scene of a fire. Engine apparatus carry firefighters who are primarily responsible for extinguishing the fire. Ladder or truck apparatus carry firefighters that specialize in locating and removing trapped

building occupants, disconnecting utilities, and ventilating smoke and deadly fire gasses from a building that is on fire.

Fire apparatus must be maintained in extremely reliable condition. The failure of an apparatus to start when dispatched to an emergency or the failure of a pump or aerial ladder to work at the scene of an emergency will have serious consequences. Reserve apparatus are maintained by the Fire Department to allow companies to remain in service when their regular piece of apparatus is out of service for maintenance or repairs.

There are no precise standards for determining how long a fire apparatus will last, but we estimate that an engine will last, given the level of usage (light to moderate use) in Natick approximately 15 to 20 years (15 years as a front-line apparatus and five years as a reserve apparatus). Aerial ladders usually last approximately 15 to 20 years (15 years as a front-line apparatus and five years as a reserve apparatus). Ambulances will last eight to ten years. There are several factors which affect the life of an apparatus:

- Maintenance history
- Maintenance history and aerial testing records (for aerial apparatus)
- Galvanized steel or aluminum body
- Level of use and vehicle rotation policies
- Development of new technology
- New safety standards
- Changes in community characteristics requiring new or different apparatus
- Changes in response policies and protocols

In the following exhibit we have listed major apparatus and, assuming a 20-year life cycle, we have suggested a replacement program.

EXHIBIT VIII-1
APPARATUS FLEET REPLACEMENT PLAN

APPARATUS	TYPE	MANUFACTURER	MODEL	YEAR	GALLONS PER MINUTE (GPM)	AERIAL (IN FEET)	RECOMMENDED REPLACEMENT YEAR
Engine 1	Pumper	Emergency-1		2001	1250 GPM		2021
Engine 2	Pumper	Emergency-1		1986	1250 GPM		2006
Engine 3	Pumper	Emergency-1		1985	1250 GPM		2005
Engine 4	Pumper	Emergency-1		1995	1250 GPM		2015
Engine 5 Reserve Stored at E-1	Pumper	Emergency-1		1985	1250 GPM		2005
Ladder 1	Aerial Ladder	Emergency-1	Rear Mount	1984		110' Aerial	2004 *
Ambulance 1	Transport Ambulance	Horton/Ford	E-450	1999			2009
Ambulance 2	Transport Ambulance	Horton/Ford	E-450	1995			2005
Rescue Boat Stored at E-1	Boat	Henry O	150	1989		15' Length	2009
Boat Trailer Stored at E-1	Trailer	Load/Rite	1997	1997			2017
Haz Mat Unit Stored at E-1	Trailer	Unknown	Military Surplus	Unknown			2008
Incident Support Unit Stored at E-1	Trailer	Southwest Express		2003			2023
Mass Decon Unit Stored at E-1	Trailer	Southwest Express		2003			2023
Boat Stored at E.4					15 HP	14' Length	
Car 2	Command Vehicle	Ford	Expedition	2002			2012

** Replacement overdue*

In Natick, there are several front-line apparatus in need of relatively rapid replacement. Since there are several major apparatus in need of replacement, it may be difficult for the Town to replace several units at the same time. Thus, we suggest that the Town consider the following order of replacement:

EXHIBIT VIII-2
ORDER OF REPLACEMENT

APPARATUS	ESTIMATED COST	COMMENT
Ladder 1	$600,000 to $700,000	Older apparatus
Ambulance 2	$80,000 to $120,000	EMS is a large part of the workload
Engine 3 or Engine 2	$350,000 to $400,000	Replace appropriate unit based on evaluation of condition
Engine	$350,000 to $400,000	Replace a second engine

RECOMMENDATION VIII-13: *The Department should adopt an apparatus replacement plan.*

While consultants are aware of the recent problems with a quint apparatus, it is our view that a quint apparatus is an appropriate apparatus for a Town such as Natick. The flexibility of such a unit makes it desirable and the failure of one apparatus does not imply the that the quint concept is inappropriate for Natick.

RECOMMENDATION VIII-14: *The Department should consider a quint apparatus to replace the current aerial.*

IX. FIRE DEPARTMENT ATTITUDE SURVEY

During the course of this study, more than 50 members of the Fire Department presented their views, suggestions, and opinions at interviews and meetings with the consultants. Fire Department employees were also given the opportunity to anonymously respond to an attitude survey. In this chapter, the results of the survey are presented.

FIREFIGHTER ATTITUDES

The purpose of the survey of Fire Department employees was to gather information concerning firefighters' views of the work they perform, the services they provide and the support they receive. It is important to recognize the attitudes and opinions of employees as one indicator of the health of an organization.

In the survey, respondents were asked to identify their length of service with the Department. Twenty-five members answered this question; of these, 20 indicated their service to be seven or more years; of these 20 respondents, ten respondents indicated a service length of 20 or more years. Thus, most responses are from experienced members who have a great interest in the Department.

SURVEY DESIGN

The Fire Department survey form is composed of several parts. Sections I through IV ask respondents to evaluate each of a series of statements, or items, using a five point scale. The fifth section asks respondents about their future plans with the organization. At the end of the survey, respondents are given the opportunity to give short narrative answers to four general questions.

The consultants provided the Fire Department with 80 survey forms and self-addressed stamped envelopes. The surveys were distributed to firefighters on each shift. The consultants received, by return mail, 30 responses, a 37.5 percent response.

COMPILATION OF SURVEY RESULTS

The following charts provide a compilation of all of the questionnaires received. In the compilation of survey results, every effort has been made to be accurate. In some instances, e.g., when individual questions were not answered, two responses were given to a question, or a response was not legible, responses had to be excluded from the compilation.

Questions 1 through 15 (Section I) ask members for opinions on practices and procedures, as well as their degree of personal satisfaction as a member of the Department. Exhibit IX-1 presents each of the statements in Section I and summarizes the responses. The results shown are based on the following instructions:

Please indicate in the box before each statement the response that best describes your opinion on each of the following statements. Use the following scale:

5=Strongly Agree 4=Agree 3=No Opinion 2=Disagree 1=Strongly Disagree

EXHIBIT IX-1
RESPONSES TO QUESTIONS 1 THROUGH 15

		5	*4*	*3*	*2*	*1*
1	I receive adequate direction and support from my supervisor.	6.9%	48.3%	3.4%	31.0%	10.3%
2	I receive adequate training for my job.	6.7%	6.7%	10.0%	50.0%	26.7%
3	My work is goal oriented.	6.7%	50.0%	20.0%	13.3%	10.0%
4	The Fire Chief is clearly concerned about the needs of employees.	0.0%	3.4%	6.9%	24.1%	65.5%
5	In my job, I feel like a member of a team, not just an individual employee	3.3%	46.7%	13.3%	23.3%	13.3%
6	Discipline in the Fire Department is handled in a fair and consistent manner.	3.3%	3.3%	13.3%	40.0%	40.0%
7	We have a good working relationship with other Town departments.	3.3%	43.3%	30.0%	10.0%	13.3%
8	The citizens of Natick appreciate the work of our department on their behalf.	23.3%	56.7%	13.3%	3.3%	3.3%
9	Fire prevention is an important part of my job.	10.0%	30.0%	33.3%	20.0%	6.7%
10	Promotions in this Department are based on merit and qualifications, rather than on favoritism and personal influence.	0.0%	17.2%	24.1%	24.1%	34.5%
11	The Natick Fire Department is a progressive agency.	0.0%	10.0%	16.7%	33.3%	40.0%
12	Good performance is recognized and rewarded in this Department.	0.0%	12.0%	8.0%	32.0%	48.0%

		5	4	3	2	1
13	My work is governed by clear standards of performance.	0.0%	10.3%	20.7%	44.8%	24.1%
14	Safety is emphasized and enforced.	0.0%	41.9%	19.4%	19.4%	19.4%
15	I enjoy my work.	40.0%	36.7%	3.3%	10.0%	10.0%

The following summarizes many of the responses from *Questions 1 through 15:*

- 77% of respondents enjoy their work.
- 80% believe that the citizens of the Town appreciate their work.
- 50% feel they are members of a team.
- 40% believe that prevention is part of their job.
- 90% do not believe that the Fire Chief is clearly concerned about the needs of employees.
- 59% do not believe that promotions are based on merit.
- 80% do not believe that discipline is fairly and consistently administered.
- 77% of personnel do not believe that they receive adequate training.
- 73% do not believe the Department is a progressive organization.
- 80% do not believe that performance is recognized or rewarded.
- 69% do not agree that there are clear standards governing their work.

Exhibit IX-2 presents the responses to *Questions 16 through 29* (Section II). Section II solicits opinions on a variety of services provided by the Department.

Please rate your department on each item listed below, using the following scale.

5=Excellent 4=Very Good 3=Good 2=Fair 1=Poor

EXHIBIT IX-2
RESPONSES TO QUESTIONS 16 THROUGH 29

		5	*4*	*3*	*2*	*1*
16	Incident command	0.0%	16.7%	50.0%	20.0%	13.3%
17	Prevention & public education	0.0%	6.7%	36.7%	36.7%	20.0%
18	Customer service attitude	0.0%	46.7%	20.0%	23.3%	10.0%
19	Pre-planning	0.0%	3.3%	23.3%	36.7%	36.7%
20	Technical rescue	0.0%	0.0%	10.3%	31.0%	58.7%
21	Haz Mat response	0.0%	6.7%	20.0%	40.0%	6.4%
22	Public service calls	6.7%	46.7%	30.0%	16.7%	0.0%
23	Emergency Medical Services	43.3%	36.7%	10.0%	6.7%	3.3%
24	Rapid Intervention Team	0.0%	3.3%	30.0%	50.0%	16.7%
25	Dispatch & emergency communications	0.0%	3.3%	6.7%	10.0%	80.0%
26	Fire ground operations	3.3%	26.7%	40.0%	10.0%	20.0%
27	Natural disaster response	0.0%	10.3%	34.5%	17.2%	37.9%
28	Multiple-casualty incidents	0.0%	11.1%	25.9%	29.6%	33.3%
29	Bio-chem incidents	0.0%	0.0%	22.2%	29.6%	48.2%

The exhibit indicates that, generally, only Department performance in Emergency Medical Services was considered excellent or very good by most members (80 percent of respondents). Rated next best in performance were customer service attitude, incident command, fire ground operations and public service calls. (These were considered good to very good in two-thirds or more of responses.) Significant numbers rated the Department's performance only fair to poor in the predominantly technical areas of prevention and public education, pre-planning, technical rescue, rapid intervention, multiple casualty, bio-chemical and natural disasters. Dispatching and emergency communications were evaluated as fair or poor by 90 percent of respondents:

- 80% of respondents rated Emergency Medical Services as excellent or very good (43.3% excellent and 36.7% very good).
- 67% evaluated incident command as good to very good (50% good and 16.7% very good).
- 67 % rated the Department's customer service attitude as good to very good (20.0% good and 46.7% very good).
- 77% rated the Department's responses to public service calls as very good to good (46.7% very good and 20.0% good).
- 67% of respondents evaluated fire ground operations as good or very good (26.7% very good and 40% good).
- 74% of respondents evaluated prevention and education as good to fair.
- 55% of respondents believe the Department's capability in a natural disaster response would be fair to poor, but 34.5% thought it should be rated as good.
- 63% of respondents rate the Department's capability in multiple-casualty incidents as fair to poor, but 25.9% rate it good.

In the remaining areas, Department members had a fairly negative opinion (fair to poor) on the level of services that the Department provides in these areas, for example:

- 73% of respondents rated the Department's pre-planning as fair to poor.
- 90% of respondents rated technical rescue as fair to poor.
- 73% rated haz-mat response as fair to poor.
- 67% rated the rapid intervention effort as fair to poor.
- 78% of respondents believe that the Department's capability in a bio-chemical incident is fair to poor.

Exhibit IX-3, *Responses to Questions 30 through 49,* presents responses to Section III of the survey. The questions generally seek information on the degree of employee satisfaction with various support items and functions generally thought to contribute significantly to the morale of members.

Please indicate your opinion about each item listed below. Use the following scale.

5=Very Satisfied 4=Satisfied 3=No Opinion 2=Dissatisfied 1=Very Dissatisfied

EXHIBIT IX-3
RESPONSES TO QUESTIONS 30 THROUGH 49

		5	*4*	*3*	*2*	*1*
30	Town support	0.0%	13.8%	24.1%	37.9%	24.1%
31	Equipment	3.3%	30.0%	26.7%	23.3%	16.7%
32	Vehicle types	0.0%	36.7%	23.3%	36.7%	3.3%
33	Vehicle maintenance	0.0%	13.3%	3.3%	36.7%	46.7%
34	Rules and regulations	0.0%	20.0%	6.7%	43.3%	30.0%
35	Discipline	0.0%	13.3%	20.0%	33.3%	33.3%
36	Internal communications	0.0%	0.0%	6.9%	37.9%	55.2%
37	Provisions for health & safety	0.0%	33.3%	20.0%	26.7%	20.0%
38	Staff support services	0.0%	3.6%	39.3%	14.3%	42.8%
39	Encouragement to be innovative	0.0%	7.1%	28.6%	32.1%	32.1%
40	Fringe benefits	3.7%	48.1%	25.9%	11.1%	11.1%
41	Stations and facilities	0.0%	14.3%	7.1%	53.6%	25.0%
42	Training programs	0.0%	23.3%	6.7%	40.0%	30.0%
43	Training facilities	7.1%	39.3%	7.1%	42.9%	3.6%
44	Safety at incidents	0.0%	43.3%	10.0%	26.7%	20.0%
45	Promotional procedures	3.6%	7.1%	25.0%	42.9%	21.4%
46	Standard Operating Guidelines	0.0%	20.0%	13.3%	26.7%	40.0%
47	Supervision & management	0.0%	16.7%	33.3%	23.3%	26.7%
48	Training & educational opportunities	0.0%	21.4%	21.4%	39.3%	17.9%
49	Mutual aid	3.6%	37.9%	37.9%	10.3%	10.3%

Survey *Questions 30 through 49* indicate that there are no areas where a clear majority of respondents are satisfied with support and related functions. There are significant minorities of respondents who are satisfied with

equipment, vehicle types, fringe benefits, training facilities, safety at incidents and mutual aid arrangements. However, many respondents are dissatisfied with town support, vehicle maintenance, rules and regulations, discipline, internal communications, staff support services, encouragement to be innovative, stations and facilities, training programs, promotional procedures, standard operating guidelines and supervision and management.

The first three sets of questions discussed above (1 through 15, 16 through 29, and 30 through 49) provide a view of how respondents regard the nature and quality of the work performed and their role in the fire and rescue system. While respondents appear to have a high satisfaction level with some elements of the Department, there are significant management, leadership and support concerns raised by respondents in the survey.

The consultants' experience with many fire departments indicates that there are three fairly distinct areas from which employees derive job and career satisfaction:

- *task orientation,* which relates directly to those survey items having to do with the preparation for and actual response to emergency incidents

- *interaction orientation*, which relates directly to those survey items having to do with management, supervision, fairness, respect, and team operations

- *self orientati*on, which relates directly to those survey items having to do with the individual's general satisfaction

Attention to these three areas and to the issues and concerns raised by the attitude survey is of vital importance in further improving performance of the Department, job satisfaction, retention of personnel and customer service.

Section IV of the survey (*Questions 50 through 57*) focuses on individuals' relationships with supervisors, peers and personnel in other Town departments. Members were asked to evaluate how satisfied they were with these relationships:

Please indicate below how you feel about your relationship with each of the following persons or groups. Use the following scale.

5=Very Satisfied 4=Satisfied 3=No Opinion 2=Dissatisfied 1=Very Dissatisfied

EXHIBIT IX-4
RESPONSES TO QUESTIONS 50 THROUGH 57

		5	*4*	*3*	*2*	*1*
50	Relationship with your immediate supervisor	23.3%	40.0%	16.7%	16.7%	3.3%
51	Relationship with your Deputy Chief	40.0%	43.3%	10.0%	3.3%	3.3%
52	Relationship with the Fire Chief	0.0%	13.3%	16.7%	23.3%	46.7%
53	Relationships with fellow firefighters	16.7%	70.0%	6.7%	6.7%	0.0%
54	Relationships with Town residents as you perform your job	13.3%	73.3%	6.7%	6.7%	0.0%
55	Fire Department support from Town Meeting	0.0%	48.3%	34.5%	13.8%	3.4%
56	Fire Department support from Town administration	0.0%	26.7%	23.3%	43.3%	6.7%
57	Relationships with other Town department personnel with whom you may need to work on projects or incidents	0.0%	50.0%	33.3%	13.3%	3.37%

Questions 50 through 57 present the views of respondents regarding relationships. The responses indicate that there is satisfaction with the relationships among members of the Department. However, personnel display dissatisfaction with their relationships with the Fire Chief and the Town's administration.

- 63% expressed satisfaction in their relationship with their immediate supervisor.
- 83% are satisfied with their relationship with their Deputy Chief.
- 87% believe their relationships with fellow firefighters are satisfactory (16.7% very satisfactory and 70% satisfactory).
- 87% of respondents are satisfied with their relationships with Town residents as they perform their jobs.
- 70% of respondents are dissatisfied with their relationships with the Fire Chief (23.3% dissatisfied and 46.7% very dissatisfied).

Part V asked each respondent to indicate their future plans for the next two or three years with respect to the fire department, by responding to the following statement: *Please indicate, as best you can at this time, what your future plans are for the next two or three years.* The responses of 28 members are summarized below:

EXHIBIT IX-5
FUTURE PLANS OF FIRE DEPARTMENT MEMBERS

STATEMENT	NUMBER OF RESPONSES	PERCENT OF RESPONSES
I plan to remain with the Department in my current capacity.	11	39.3%
I plan to remain with the Department in a position of higher rank than the one I now hold.	12	42.9%
I plan to retire in the next three years.	4	14.2%
I plan to leave the Department and take a similar position in another department.	1	3.6%
I plan to get out of the municipal fire department business.	0	0.0%
	28	100.0%

At least in the short term, responding members indicate overwhelmingly that they plan to stay with the Department, with 23 of 28 members, or 82 percent of respondents planning to remain with the Department. Retirements and plans to leave the department account for five members, or nearly 18 percent.

The remaining portion of the survey solicited narrative responses to four questions. While it is not the intent to quote all of them here, a general summary of the comments is included below.

VI. What management changes would you like to see in the Department?

The written responses are critical of overall management and administration of the Department. Comments address issues such as a lack of a clear chain of command, and a need for increased leadership, creativity, planning and communications.

VII. What operational changes would you like to see in the Department?

Several respondents called for an assistant chief position which would handle day-to-day operations, administration, and EMS supervision. Personnel

were critical of the dispatching operation. Personnel discussed the need for more paramedics to provide for a better distribution of work load. A number of comments were made relating to the staffing of apparatus, maintenance of apparatus and stations.

Many personnel commented on the need for well-designed and implemented SOPs/SOGs. The amount and type of training, its conduct and quality was criticized by many.

VIII. What do you like most about the Department?

Most responses cited good personal relationships with fellow firefighters as factors for liking the job. They also enjoy being of service to the public. A few indicated the work schedule as being a positive factor.

IX. What do you like least about the Department?

Many answers to this question reiterated what had been expressed before. Problems with management and planning were repeated in response to this question.

The survey provided a final section where additional comments could be made. Again, most comments were similar to earlier responses. Some expressed hope that the study would result in positive changes. A few pointed out that the union has great influence in the overall operations, administration and management of the Department.

X. NORMATIVE DATA COMPARISONS

APPROACH AND METHODOLOGY

This chapter compares the resources of the Natick Fire Department to fire departments in 15 Massachusetts cities and towns similar to Natick. Comparing similar communities provides managers with normative information about their department in relation to others, and provides a description of typical practices within the State.

The data presented in this chapter was gathered by contacting each fire department by telephone. Follow-up telephone calls were made to clarify information, as necessary.

COMPARABLE JURISDICTIONS

The consultants selected cities and towns located in eastern Massachusetts, that are considered similar to Natick in population size and density, and generally have the same types of growth and development factors as Natick.

The selected towns and cities are primarily mature suburban communities with approximately 30,000 persons and relatively low to moderate population density, according to the 2000 U.S. Census. The predominant construction type is wood frame, single-family residences. A majority of the communities have significant non-residential construction. The following exhibit lists the communities from which data was collected.

EXHIBIT X-1
COMPARATIVE JURISDICTIONS

CITY/TOWN	2000 POPULATION	SQUARE MILES
Andover	31,247	31.1
Beverly	39,862	15.4
Billerica	38,981	25.46
Chelmsford	33,858	22.54
Danvers	25,212	13.64
Franklin	29,560	26.8

CITY/TOWN	2000 POPULATION	SQUARE MILES
Lexington	30,355	16.48
Marlborough	36,255	20.99
Needham	28,911	12.5
North Andover	27,202	26.63
North Attleborough	27,143	19.05
Norwood	28,587	10.47
Shrewsbury	31,640	20.78
Watertown	32,986	4.06
Wellesley	26,613	10.05
Average	31,227	18.4
Natick	31,946	15.83

Exhibit X-2 compares Natick to 15 communities on a number of measures. The average population density of the 15 comparable communities is 2,195 persons per square mile, which is similar to Natick's 2,016 population density. The number of fire stations is often a function of geographic factors, physical development within the community, and historical development, as well as ISO guidelines. In Watertown, with a population density of 8,125 persons per square mile, there is a is a fire station for each 1.35 square miles. In less dense communities, such as Andover, the ratio is one station per ten square miles. In Natick, the ratio is one per four square miles. The exhibit below indicates an average of .21 stations per square mile.

EXHIBIT X-2
COMPARISON OF POPULATION DENSITY, FIREFIGHTERS AND FIRE COMPANIES PER 10,000 POPULATION AND NUMBER OF CALLS PER 1,000 POPULATION

CITY/TOWN	POPULATION PER SQ. MI.	NUMBER OF STATIONS PER SQ. MI.	FIREFIGHTERS PER 10,000 POPULATION	NUMBER OF FIRE COMPANIES PER 10,000 POPULATION	NUMBER OF TOTAL CALLS PER 1,000 POPULATION
Andover	1,005	0.10	22.1	1.28	176.02
Beverly	2,588	0.19	15.8	1.00	120.64
Billerica	1,531	0.20	19.5	1.95	169.36
Chelmsford	1,502	0.22	17.7	1.48	126.35
Danvers	1,848	0.15	19.8	1.19	255.03
Franklin	1,103	0.07	14.5	1.01	108.90
Lexington	1,842	0.12	17.8	0.99	114.02
Marlborough	1,727	0.52	21.0	1.38	131.48
Needham	2,313	0.16	22.1	1.38	109.61
N. Andover	1,021	0.08	22.4	1.00	153.33
N. Attleborough	1,425	0.16	21.0	1.47	123.63
Norwood	2,730	0.10	20.6	1.05	178.16
Shrewsbury	1,523	0.14	11.7	1.26	77.53
Watertown	8,125	0.74	27.9	1.52	127.57
Wellesley	2,648	0.20	20.7	1.50	162.78
Average	2,195	0.21	19.6	1.28	142.29
Median	1,727	0.16	21.0	1.38	131.48
Natick	2,018	0.25	26.6	1.56	135.5

EMERGENCY MEDICAL SERVICES

Emergency Medical Services (EMS) are provided in some form by all of the comparable communities. One town, Shrewsbury, provides first responder service only. Ten provide BLS service, and four offer ALS service. First responders offer important early intervention in medical emergencies and provide initial help, such as the control of bleeding, CPR, and assistance to persons who have stopped breathing or who are having difficulty breathing. The training requirements for first responders are lower than those for EMTs and the skills that first responders are trained to perform are fewer than those provided by EMTs.

Paramedic training is significantly greater than EMT-B or first responder training. Paramedics, acting under the supervision and direction of a medical doctor, are permitted to engage in invasive advanced life-saving procedures and administer drugs. Levels of emergency medical services provided by comparable towns is shown below.

EXHIBIT X-3
LEVELS OF EMS SERVICES

CITY/TOWN	FIRST RESPONDER	BLS	ALS	NUMBER OF AMBULANCES	DAILY STAFFED AMBULANCES	NUMBER OF FFS/EMTS	NUMBER OF EMT-PS
Andover		✓		3	2	50	
Beverly		✓		0		27	
Billerica		✓		0		40	
Chelmsford		✓		0		51	
Danvers		✓		0		47	
Franklin			✓	2	2	32	24
Lexington			✓	2	1	49	
Marlborough		✓		0		59	
Needham			✓	2	1	50	16
N. Andover		✓		2	2	44	
N. Attleborough			✓	1	1	22	22
Norwood		✓		2	1	24	
Shrewsbury	✓			0		6	
Watertown		✓		2	1	84	
Wellesley		✓		0		43	
Total	1	10	4	16	10	628	
Average				2	1.25	41.9	20.7
Natick		✓	✓	2	1	78	14

Exhibit X-4 indicates the level of emergency medical services provided, the average number of personnel by service type, and the average number of EMT and EMT-P personnel.

EXHIBIT X-4
15 COMPARABLE COMMUNITIES: EMERGENCY MEDICAL PERSONNEL

EMS SERVICE	NUMBER OF TOWNS/CITIES	AVG. NUMBER OF FIREFIGHTERS	AVG. NUMBER OF FFS/EMTS	AVG. NUMBER OF EMT-PS
First Responder Only	1	37	6	
BLS	10	66	47	
ALS	4	55	38	21

FIRE COMPANY STAFFING

The Natick Fire Department operates 1.56 fire companies per 10,000 residents. In Natick, there are four front-line engine companies and one ladder company. These are staffed with three firefighters on the engine companies and two crew members on the ladder company. In the communities surveyed, there was an average of 2.7 engine companies and 1.3 ladder companies per department. It is also important to remember that the number of front-line engine companies is driven by the number of fire stations in a community.

In the municipalities, the average minimum number of firefighters and officers working on each engine company was three; and for ladder companies it was 2.1. This average staffing level is typical of communities in the Northeast, but is not consistent with NFPA Standard 1710. (See Appendix A.)

EXHIBIT X-5
AVERAGE APPARATUS STAFFING

	AVERAGE NUMBER OF COMPANIES PER DEPARTMENT	AVERAGE NUMBER OF FIREFIGHTERS PER APPARATUS
Engine Companies	2.7	3.0
Ladder Companies	1.3	2.4

The following exhibit lists each comparable jurisdiction and the number of fire stations and front-line engines and ladders each operates. In addition, the typical crew size of engine and ladder companies is reported.

EXHIBIT X-6
NUMBER OF STATIONS, ENGINE AND LADDER COMPANIES AND TYPICAL CREW SIZE

CITY/TOWN	NUMBER OF STATIONS	FRONT-LINE ENGINE COMPANIES	TYPICAL ENGINE CREW SIZE	NUMBER OF LADDERS	TYPICAL LADDER CREW SIZE
Andover	3	3	3	1	2
Beverly	3	3	3	1	3
Billerica	5	5	3	1	2
Chelmsford	5	4	2	1 (quint)	3
Danvers	2	1	3	2 (quints)	5
Franklin	2	2	4	1	unstaffed
Lexington	2	2	3	1	3
Marlborough	3	3	3	2	2
Needham	2	2	4	2 (quints)	2
N. Andover	2	2	3	1 (quint)	1
N. Attleborough	3	3	2	1	2
Norwood	1	2	4&3	1	3
Shrewsbury	3	3	2	1	1
Watertown	3	3	3	2	3
Wellesley	2	3	3	1	2
Average	2.7	2.7	2.9	1.2	2.5
Natick	4	4	3	1	2

FIRE DEPARTMENT STAFF RESOURCES

Fire departments have varying staffing levels. The following exhibit displays staffing levels by rank in the jurisdictions from which data was collected. Watertown has the largest number of firefighters, 92; Shrewsbury has the smallest number of firefighters, 37.

EXHIBIT X-7
CAREER PERSONNEL

CITY/TOWN	CHIEF	ASST. CHIEF	DEPUTY CHIEF	CAPTAIN	LIEUTENANT	FF	FF/EMT	TOTAL
Andover	1		4		13	1	50	69
Beverly	1		5	5	12	13	27	63
Billerica	1		2	5	15	13	40	76
Chelmsford	1		2	5		1	51	60
Danvers	1		1	4	9	35		50
Franklin	1		1	5	4		32	43
Lexington	1	1		4	8		40	54
Marlborough	1		4	4	8		59	76
Needham	1	1	4	2	6		50	64
N. Andover	1		1		9	6	44	61
N. Attleborough	1		1	4	8	21	22	57
Norwood	1		1	4	5	24	24	59
Shrewsbury	1			4		26	6	37
Watertown	1		4	8	14		65	92
Wellesley	1	1		5	12	36		55
Average	1		2.5	4.5	9.5	17.6	39.2	61.1
Natick	1		5	7	15	57		85

Exhibit X-7 indicates that three communities, Lexington, Needham and Wellesley, have the position of Assistant Chief. The exhibit also indicates that there is considerable variation in how fire departments are staffed.

In its current configuration, the Natick Fire Department has assigned 19 to 20 firefighters to each of its four shifts. Typically, there are a minimum of 17 on duty at a given time. The ratio of on-duty personnel to the total number of personnel employed on a shift in Natick ranges from 1.12 to 1.23. In the 15 communities surveyed, there is an average of 14.4 firefighters assigned per shift and there is an average of 12.1 on-duty personnel at any given time. In those communities, the ratio of on-duty personnel to the total number of personnel employed on a shift was 1.20.

EXHIBIT X-8
PERSONNEL PER GROUP

CITY/TOWN	NUMBER OF PERSONNEL ASSIGNED PER GROUP	TYPICAL NUMBER OF PERSONNEL ON DUTY	RATIO OF ON-DUTY PERSONNEL TO SHIFT OR GROUP SIZE
Andover	17	16	1.06
Beverly	15	13	1.15
Billerica	18	14	1.29
Chelmsford	13	11	1.18
Danvers	12	10	1.20
Franklin	10	8	1.25
Lexington	13	12	1.08
Marlborough	19	13	1.46
Needham	16	12	1.33
N. Andover	13	12	1.08
N. Attleborough	12	10	1.20
Norwood	14	12	1.17
Shrewsbury	9	7	1.29
Watertown	22	19	1.16
Wellesley	13	12	1.08
Average	14.4	12.1	1.20
Natick	20	17	1.12-1.23

Appendix C contains additional comparative information on the activity level, staffing, and composition of fire departments in the United States. The data is drawn from the *Firehouse* annual run survey.

XI. PLAN OF IMPLEMENTATION

The recommendations in this report cover a range of matters; however, the primary recommendations relate to the organization, management, and deployment of emergency medical services resources. A number of the more important recommendations require a great deal of discussion and policy decisions before implementation. Other recommendations can be implemented by the Fire Department with little discussion.

PLAN OF ACTION

The Town of Natick should adopt a plan of action to implement the major recommendations in the next several years. An important element of this plan of action is for the Town to establish an internal management committee composed of Town administrative officials and selected members of the Fire Department to review recommendations. The Town Administrator should play an important role in the study implementation process and should be responsible for working with the Fire Chief to develop a series of major implementation goals and objectives.

While there are a number of important policy and administrative decisions to consider, the three most important policy decisions which need to be discussed are:

- Reorganization of the Fire Department and the establishment of two Assistant Fire Chief positions

- Removal of the position of Fire Chief from Civil Service

- Revision of the Fire Department's EMS deployment practices

EXHIBIT XI-1
POLICY DECISIONS

POLICY DECISION	FACTS TO CONSIDER	RESPONSIBILITY
Reorganization of the Fire Department and the establishment of two Assistant Fire Chief positions	Effectiveness of the organization Accountability of personnel Internal communications Future of the Department	Selectmen Town Administrator Fire Chief
Removal of the position of Fire Chief from Civil Service	Anticipated retirement of chief officers Public response to proposal	Selectmen Town Administrator Fire Chief
Revision of the Fire Department's EMS deployment practices	Level of service Potential costs Supplement EMS/ALS response to ambulance transport EMD dispatching Redefine response protocols	Selectmen Town Administrator Fire Chief

TOWN ADMINISTRATION AND FIRE CHIEF ESTABLISH IMPLEMENTATION GOALS & OBJECTIVES

Once it is determined which recommendations should be implemented, the Town Administrator, with input from the Board of Selectmen, should negotiate specific goals and objectives with the Fire Chief. These goals and objectives should be reasonable, but should have definite time lines for achieving a particular objective.

ORGANIZATION OF THE FIRE DEPARTMENT

To reorganize the Fire Department, the Town must undertake several actions:

- *Remove the position of Fire Chief from Civil Service.* This requires Town Meeting action, and does not affect the incumbent Chief, but affects the selection of a Fire Chief in the future.

- *Establish the Assistant Fire Chief positions.* Reorganization of the Department is contingent upon establishing these positions.

- *Reorganize the Fire Department*. The Fire Chief should draft an administrative order restructuring the Fire Department. The administrative order should include several key features:

  - the organization structure of the Department
  - a written description of the authority and responsibilities of the Assistant Fire Chiefs
  - creation of a process for selecting the Assistant Fire Chiefs
  - establishment of a date for the reorganization to become effective

INTERNAL COMMUNICATION

The Fire Chief should implement several recommendations relating to internal communications during the next three months. The Fire Chief should:

- *Continue the staff meeting process*. The Fire Chief should continue the staff meeting process and see that staff meetings occur on each shift.

- *Schedule a full Department meeting.* The Chief should schedule and hold a full Department meeting within the next six months.

- *Establish a task force to review the Fire Department Study*. The Fire Chief should establish a task force to review the Fire Department study to establish what actions can be taken within a reasonable time.

- *Establish the recommended committee structure*. The Fire Department should create the standing Department committees recommended in the report.

- *Make the development of Standing Operating Guidelines a priority.* The Fire Chief should make the development of SOGs a priority of the Fire Department.

- *Make periodic visits to fire stations*. The Chief should develop a regular program to visit fire stations to speak with officers and personnel, as well as inspect operations.

EMERGENCY MEDICAL SERVICES

The Fire Chief should designate a chief officer to work with the Police Department to identify existing emergency communication problems. In addition, the Fire Chief should:

- *Work with the Police Chief to implement EMD.* The Fire Chief and the Police Chief should discuss the EMD process and determine a process to implement EMD as soon as possible.

- *Establish a Fire Chief's Medical Advisory Committee.* The Fire Chief should use this committee as a sounding board to begin developing the plan to alter current EMS response protocols and implement a new system.

PRIORITY OF RECOMMENDATIONS

While we consider all the recommendations contained in this report to be important, this section is intended to place the recommendations into a framework which provides a sequential methodology of implementation. The recommendations contained in this report have been assigned priorities. The party responsible for implementation of a recommendation is identified. The recommendations have been categorized as follows:

Priority 1: Recommendations which directly affect the safety of personnel or the public, or establish the framework for other recommendations. These recommendations should be addressed immediately.

Priority 2: Recommendations which should be implemented without delay, since they may bear directly on safety, productivity, cost and efficient operation of fire, rescue or emergency medical services in Natick.

Priority 3: Recommendations which are important to the efficient provision of fire, rescue or emergency medical services in Natick. These recommendations should be implemented as soon as reasonable and practical.

Priority 4: Recommendations which can contribute to the continued improvement of fire, rescue or emergency medical services in Natick These recommendations should be implemented as soon as resources and operating conditions permit.

For the purpose of this exhibit, we have organized recommendations by priorities. At the left of the exhibit, the priority of each recommendation is identified, followed by the number indicating the chapter in which the recommendation is found, the text of the recommendation, and the official/s responsible for implementing the recommendation.

PRIORITY	RECOMMENDATION		RESPONSIBLE OFFICIAL
1	VII-1	The Town of Natick should continue to operate a consolidated police and fire communication center.	Fire Chief Police Chief
1	III-1	The Fire Department should be reorganized.	Selectmen Town Administrator Fire Chief
1	VII-10	Maintain the capability to staff one ALS ambulance and one BLS ambulance.	Fire Chief
1	VII-3	Communication center dispatchers should be trained and certified in EMD procedures. Personnel should be re-certified according to national standards	Fire Chief Police Chief
1	VII-2	The Town of Natick should establish a fully operating Emergency Medical Dispatch (EMD) system.	Fire Chief Police Chief
1	VII-20	The Fire Chief should develop a Fire Chief's Emergency Medical Advisory Committee.	Fire Chief
1	IV-1	The Fire Chief should establish a budget development process which requires the participation of chief officers and staff officers.	Fire Chief
1	VIII-1	The Fire Department should develop a training plan with specific training objectives.	Training Officer Deputy Chiefs Training Committee
1	IV-3	The Department should develop standard operating guidelines (SOGs) and Department rules and regulations. The development of the guidelines should be a priority of the Fire Department.	Fire Chief Department Committee
1	VI-2	Policy leaders of the Town should adopt a Fire Department staffing policy which encourages continuous improvement, in a cost effective manner, while ensuring the safety of personnel.	Selectmen
1	IV-5	The Department should establish a series of standing committees. The committees should represent all ranks in the Department.	Fire Chief
1	V-2	Deploy EMT-Ps at each fire station.	Selectmen Town Administrator Fire Chief
1	IV-7	The chief officers of the Department should continue to hold staff meetings. Meeting minutes should be circulated to officers within the Department.	Fire Chief

1	IV-8	Each Deputy Fire Chief should be directed by the Fire Chief to hold staff meetings with company officers at least monthly.	Fire Chief Deputy Chiefs
1	VIII-3	Shift Deputy Chiefs should attend and monitor at least one company training program per shift.	Deputy Chiefs
1	VIII-4	The Department should establish a training committee charged with making recommendations to the Training Officer.	Fire Chief Training Officer
1	VII-14	Develop a five to seven year plan to increase the number of EMT-Ps to between 35 and 40.	Fire Chief Deputy Chiefs
1	IV-17	The Town should seek special Civil Service lists which contain EMT-Ps when filling any future entry level firefighter positions.	Town Administrator Fire Chief
1	IV-13	The Town of Natick should remove the position of Fire Chief from Civil Service.	Selectmen
1	VIII-10	The Department should integrate a minimum of eight hours of training on safe emergency operations in its annual training program.	Fire Chief Training Officer Safety Committee
1	VIII-9	The Department should establish a safety committee.	Fire Chief
1/2	VII-8	Develop and implement a new EMS response system, based on the paramedic engine concept.	Selectmen Town Administrator Fire Chief
2	IV-16	The Town should exempt the proposed Assistant Fire Chief positions from Civil Service.	Selectmen Town Meeting
2	IV-12	The Fire Chief, with the assistance of staff, should develop regular management information reports. The reports should be circulated to Town Administration and within the Department.	Fire Chief Deputy Chiefs Staff Officers
2	IV-11	The Fire Chief and Assistant Fire Chiefs should periodically visit each fire station.	Fire Chief Deputy Chiefs
2	VIII-7	The Training Officer should annually develop one large-scale incident for each shift.	Training Officer Deputy Chiefs
2	VIII-6	The Department should train and prepare all Fire Captains to assume the role of acting Deputy Chief.	Deputy Chiefs Training Officer
2	VIII-11	The Department should establish a safe driver program in accordance with the emergency vehicle operator course (EVOC) provided by the State of Massachusetts.	Training Officer Accident Review Committee
2	IV-9	The Fire Chief should schedule and preside over semi-annual meetings of all officers and an annual meeting of all members of the Department.	Fire Chief Deputy Chiefs
2	IV-6	The role of each committee should be defined by the Fire Chief and an officer should be assigned to coordinate the work of each committee.	Fire Chief
2	VI-1	The management of the Fire Department should systematically monitor the staffing factor of the Fire Department, as one measure of productivity and accountability.	Deputy Chiefs

2	IV-4	The operating guidelines (SOGs) should be developed and promulgated within the next 12 to 15 months.	Fire Chief
2	VIII-2	The Training Officer should develop a written daily company training schedule.	Training Officer
2	VIII-12	The Department should establish an accident review committee.	Fire Chief
2	VIII-14	The Department should consider a quint apparatus to replace the current aerial.	Fire Chief Town Administrator Selectmen
2	II-6	The Fire Chief must develop a process for implementing the proposed organizational changes.	Fire Chief
2	III-5	The Town and the Fire Department should develop defined qualifications for the Assistant Chief positions.	Fire Chief Town Administrator
2	III-4	The Assistant Chief positions should come from the existing staff complement and should be management, non-union, positions.	Selectmen Town Administrator Fire Chief
2	VII-4	The Town should establish a quality assurance review process for the EMS dispatch process.	Fire Chief
2	VII-5	A quality assurance committee should be established, composed of police, fire and medical personnel.	Fire Chief
2	VII-6	The quality assurance committee should meet quarterly to review a random selection of EMS dispatches.	Fire Chief Staff Officers
2	VII-7	Programs to familiarize dispatch personnel with EMS and fire operations practices, such as "ride along" programs, should be developed and implemented as part of a dispatch personnel continuing education process.	Fire Chief
2	III-3	The Operations Division and the Support and Staff Services Division should be commanded by Assistant Fire Chiefs.	Selectmen Town Administrator Fire Chief
2	VII-19	Develop an interim EMS response deployment plan as a transition to the proposed fully developed EMT-P deployment plan.	Fire Chief
2	III-2	The Fire Department should be composed of two operating divisions: an Operations Division and a Support and Staff Services Division.	Selectmen Town Administrator Fire Chief
2	VII-11	Deploy the BLS Ambulance only to EMD confirmed BLS calls for service.	Fire Chief
2	VII-12	Deploy the ALS Ambulance and ALS engines to confirmed EMD ALS calls for service.	Fire Chief
2	VII-13	Discontinue the deployment of first responder engine and ladder companies to confirmed EMD BLS responses.	Fire Chief
2	VIII-8	The Department should develop an Incident Management Team.	Fire Chief Deputy Chiefs Training Officer
2	VII-15	The proposed EMS deployment model should be implemented on a gradual basis as the number of paramedics increases.	Fire Chief Deputy Fire Chiefs

2	VII-17	The Fire Department should develop and implement a plan to increase the number of EMT-Ps. The plan should contain annual goals.	Deputy Fire Chiefs Fire Chief
3	VII-16	The location of the proposed ALS units should be based on the assessment of data regarding the need for services.	Deputy Fire Chiefs Fire Chief
3	VIII-13	The Department should adopt an apparatus replacement plan.	Fire Chief
3	VII-9	Assign one EMT-P to each engine and the ladder, and two to Ambulance 1.	Fire Chief
3	IV-2	The Department should develop an annual apparatus and equipment replacement plan.	Fire Chief
3	IV-10	Each chief officer and company officer should be provided with e-mail capability.	Fire Chief Town Officials
3	IV-14	The next Fire Chief should be selected by conducting a regional and national search.	Selectmen Town Administrator
3	IV-15	The next Fire Chief should be employed on a contractual basis.	Selectmen Town Administrator
3	IV-20	The Fire Department should develop education and training standards for officers. The Department should seek approval from the State to allow implementation of these standards.	Town Administrator Fire Chief
3	VIII-5	The Department should develop a training program for newly promoted officers.	Training Officer Deputy Chiefs
4	IV-21	The Fire Department should develop a performance appraisal process for fire officers.	Fire Chief Town Administrator
4	IV-19	The Fire Department should use Assessment Centers as part of the promotional process for all company and chief officer positions.	Town Administrator Fire Chief
4	IV-18	The Town should use the State's delegated examination process for future promotions in the Fire Department.	Town Administrator Fire Chief
4	V-1	The Town should consider developing a long-term plan to consolidate Fire Stations 3 and 4.	Selectmen Town Administrator
4	VI-3	Policy leaders of the Town should consider the viability of developing a plan to consolidate two fire stations.	Selectmen
4	VI-4	Policy leaders of the Town should explore the development of a long-term plan to encourage operational consolidation.	Selectmen
4	VII-18	Plan to establish a new EMS staff position to coordinate activities.	Fire Chief Town Administrator
4	VI-5	Policy leaders of the Town should explore a long-term plan to consolidate emergency communications.	Selectmen

APPENDIX A
STANDARDS, BENCHMARKS AND RESPONSE PARAMETERS

This appendix describes the standards and benchmarks used to design fire or emergency medical service systems. Below are listed the four emerging standards, or benchmarks, which affect crew size, response times, firefighter safety and response time.

1. *OSHA requirements* for a minimum of four equipped personnel to be present before entry in a structure fire incident

2. *OSHA requirements* for a rapid intervention team (RIT) to be present for safety reasons at working structure fires

3. *OSHA and NFPA requirements* for a qualified incident commander and a qualified safety officer to be present at working incidents

4. *NFPA 1710 and industry standards* to have a minimum of 15 firefighters, including an incident commander, present for a low-hazard structure fire, and at least two pumpers and a ladder truck, or similar vehicle.

DEVELOPING RESPONSE CAPABILITY OBJECTIVES

Response capabilities should consider both rapid response and, in the case of fire emergencies, a sufficient number of firefighters to attack the fire. Response time policy, or objectives, must also accommodate variations in fire danger. It is important to consider subsequent responses occurring after the initial response and the possibility of simultaneous emergency events, such as fire, rescue, haz-mat and EMS incidents, occurring during or after the initial incident. A number of measures and standards are considered by fire and rescue agencies when developing response capability objectives. These major measures and standards are described in detail later in the text.

STANDARDS AND FACTORS USED TO DEVELOP RESPONSE CAPABILITY OBJECTIVES

Containment of a Fire/Flashover	Distribution of Capacity (fire station location)
Local Characteristics of the Town	AMA EMS Response Considerations & Standards
Sequence of Emergency Response	AHA Standards for Cardiac Response
Insurance Services Office (ISO) Measures/Standards	"Two In, Two Out" OSHA Safety Rule
NFPA Standard 1710	

The concepts summarized in the exhibit above provide a frame of reference for many of the recommendations in this report.

Containment. In structure fire instances, there are several important factors to weigh. First is the behavior of fire within a confined space. The risks associated with this can vary across the Town. In closely developed, built-up, areas it is imperative to consistently contain a fire within the compartment of origin (that area separated from the remainder of the structure by construction). This means that the fire department must interrupt the growth of fire before a condition called "flashover"occurs. At flashover, there is a rapid transition in fire behavior from localized burning of fuel, to involvement of all the combustibles in the enclosure. At that time, the fire typically expands in six different directions: vertically through the ceiling, horizontally through the four walls, and even through openings in the floor. By then, all barriers to fire growth beyond the original compartment are under attack by extremely hot flame, smoke and gasses. These elements expand at approximately 50 times their volume per minute. At flashover, the probability of death or serious injury to occupants of the structure is significant. Obviously, life safety within the structure is a basic concern and, when nearby properties involved, the control of flashover becomes even more paramount as additional lives and property are jeopardized.

Comprehensive testing by the United States Institute of Standards and Technology has generally established that a fire within a typically furnished room will evolve into flashover within four to ten minutes of the event of open flame. At that time, temperatures at ceiling level will reach 1,500 degrees. United States fire department planning generally assumes approximately an eight-minute period before flashover.

Under these circumstances, and where lives and properties are in danger, in order to accomplish timely interruption of fire growth, contain the fire within the compartment of origin, and locate and remove threatened persons, rapid and effective response is essential. Fire companies must receive notification of the fire, don appropriate safety gear, mount the apparatus, travel to the scene of the fire, accomplish sufficient firefighting tasks to inhibit fire growth, and rescue occupants within approximately eight minutes of the event of flame. The tasks to be accomplished at the scene by the initial arriving units include search, rescue, ventilation, ladder placement, hose line deployment and other actions, all requiring immediate and simultaneous execution.

Local Characteristics. When designing response time and response capability objectives, it is important to consider fire risks, how they vary by neighborhood, and the level of service needed. Risks are greatest in wood-frame and non-resistant residential dwelling units, which are normally without automatic detection and reporting systems or suppression systems. In newer construction (particularly commercial, industrial and institutional structures), where buildings may be required to have automatic detection and suppression systems, the fire risk can be less. The latter usually have suppression systems which reduce the unmeasured time between the start of a fire and when the fire is detected and reported, and automatically retard fire development. It is important to recognize the significance of automatic suppression systems. In the following exhibit, data from the NFPA is reproduced indicating the effectiveness of sprinklers in residential occupancy structure fires.

SPRINKLER FIRE PROTECTION STATISTICS - RESIDENTIAL STRUCTURE FIRES 1994-1998 (ANNUAL AVERAGES)

	HOMES (APTS., 1 & 2 FAMILY)	ROOMING, BOARDING & LODGING HOUSES	HOTELS & MOTELS
Percent of fires in buildings with automatic suppression systems	2.1%	17.2%	34.5%
Deaths per 1,000 fires with no automatic suppression systems	9.5	13.4	8.5
Deaths per 1,000 fires with automatic suppression systems	2.2	0.0	0.0
Percent reduction in deaths per 1,000 fires when automatic suppression systems are present	76.6%	100%	100%

Source: *The U.S. Fire Problem Overview Report*, Marty Ahrens, NFPA, June 2001

The data indicates that there is a reduction in death when automatic suppression systems are present. While not shown above, NFPA data also demonstrate that there is a substantial reduction in the cost of fire damage when automatic suppression systems are in place.

Sequence of response. In bringing firefighters to the point of "fire interruption," required steps include:

Notification of the fire companies
Turnout of firefighters (donning safety gear, etc.) and dispatch
Travel time
Size-up and set-up at the scene

The time required to complete these procedures must be reduced to the shortest possible span through training, sound standard operating procedures, reasonable response times and other means. Assuming the shortest possible response time for these processes, in most structure fires, the first-due company has very limited time to travel to the incident location and accomplish

interruption of fire growth, perhaps no more than four to six minutes. Ideally, the locations of stations should ensure that response times of four to six minutes can be accomplished in most of the response area surrounding the station, so that the initial response can arrive in time to prevent flashover.

Insurance Services Office (ISO). The Insurance Services Office (ISO) has established some general station location standards, based on road travel distances. The ISO Fire Suppression Rating Schedule states in item #560, Distribution of Companies: *The built-upon area of the Town should have a first-due engine company within 1.5 miles and a ladder-service company within 2.5 miles.*

The *National Fire Protection Association (NFPA) Handbook* has indicated that first-due apparatus should be located within two miles of residential areas, within one and one-half miles of commercial areas and within one mile of locations where the required fire flow exceeds 5,000 gpm.

Distribution of Capacity. The basic principle for allocation of fire suppression forces is to distribute units throughout the service area, to allow approximately equal travel distances and response times to all locations. In Natick, the four active fire station locations, allow the dispatch of companies to effectively cover their individual response areas within reasonable time frames. However, factors other than distance will influence response. For instance, weather conditions, the configuration of the roadway network, or traffic patterns may delay response.

Taking into account these factors, therefore, each protection area must set its own realistic goal, such as reaching 90 percent of the incidents within an identified number of minutes.

EMS Response Considerations. The benchmark for fire interruption is also important for emergency medical response purposes. Survivability for a non-breathing person is a function of application of CPR, defibrillation, and advanced life support. Models exist to predict survivability. One commonly applied model is the Eisenberg Model, which estimates the probability of survival based on a system's ability to deliver the critical links in a timely manner. The functional equation is:

Survival rate = 67% minus 2.3% per minute without CPR
minus 1.1% without necessary defibrillation
minus 2.1% per minute without necessary Advanced Cardiac Life Support

This equation suggests that one-third of all non-breathing and/or cardiac arrest patients may die immediately, and that the remaining individuals' probability of survival decreases by up to 5.5 percent for each subsequent minute; however, the decrease can be slowed by the application of various procedures (CPR, defibrillation, ACLS).

American Heart Association. The American Heart Association, in its *Statement on Chain of Survival*, describes a particular sequence of events which must occur rapidly to allow for people to survive sudden cardiac arrest. The chain of survival includes recognition of early warning signs, activation of the emergency medical system, basic cardiopulmonary resuscitation, defibrillation, intubation and intravenous administration of medications. Early defibrillation is identified as a critical link in the chain of survival. The Association supports rapid response and advocates establishing public access defibrillation (PAD) programs. For every minute without defibrillation, the odds of survival drop seven to 10 percent. A sudden cardiac arrest victim who isn't defibrillated within 8 to 10 minutes has very limited chance of survival.

"Two in, two out" OSHA guideline. It is also important to consider the so-called "two in, two out" OSHA guideline that, except in extreme life-threatening situations to the occupants, four firefighters will be required at the scene of a structure fire before any two may enter.

NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS

For Natick, the establishment of response standards and objectives will be influenced by National Fire Protection Standards. For example, for a low hazard working structure fire, the minimum apparatus should be two engines, one ladder and 15 firefighters, including an incident commander. The 15-person requirement for a residential structure working fire is specified in the NFPA handbook and is also based on studies in Louisville, Phoenix and other areas, and is a commonly accepted, industry-wide standard. Moreover, the recently adopted NFPA 1710 has become a significant benchmark to which the Fire Department should measure its performance.

NFPA 1710, *Standard for the Organization and Deployment for Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (2001 edition), approved on August 2, 2001, sets forth requirements concerning the organization of fire suppression and fire-based EMS services, as well as staffing requirements and maximum response times to fire and EMS incidents. While NFPA standards do not have the weight of law unless imposed by the authority having jurisdiction (AHJ), or required by OSHA or the Code of Federal Regulations, standards typically are viewed by courts and other judgmental bodies as "industry standards."

NFPA 1710 contains *minimum* requirements relating to the organization and deployment of fire suppression operations, emergency medical operations, and special operations for all career fire departments. The standard also specifies *minimum* criteria for addressing the effectiveness and efficiency of fire suppression operations, emergency medical services, and special operations delivery in protecting the public, and the occupational safety and health of fire department employees.

NFPA 1710 describes response time objectives and staffing requirements. While the standard presents response time measures (described below), it also stipulates that these response time performance objectives should be achieved in at least 90 percent of the incidents. The response time objectives and staffing requirements are summarized below.

NFPA RESPONSE TIME OBJECTIVES AND STAFFING

FIRE DEPARTMENT RESPONSE TIME OBJECTIVES

STANDARD	NFPA 1710 SECTION	COMMENT
Turn-out time shall be one minute (60 seconds) maximum.	*Section 4.1.2.1.1 (1)*	Turn-out time includes time from notification of a fire company to departure from the fire station.
Four minutes (240 seconds) or less for the arrival of the first arriving engine company at a fire suppression incident and/or eight minutes (480 seconds) or less for the deployment of a full first-alarm assignment at a fire suppression incident. *	*Section 4.1.2.1.1 (2)*	The four-minute and eight-minute time lines are travel time from station to the incident. Both the four-minute goal and the eight-minute goal are to be achieved, if the standard is to be met, except under unusual circumstances, when only the eight-minute requirement is to be met.

STANDARD	NFPA 1710 SECTION	COMMENT
Four minutes (240 seconds) or less for the arrival of a unit with first responder, or higher, level capability at an emergency medical incident. *	*Section 4.1.2.1.1 (3)*	The four-minute and eight-minute time lines are travel times from a station to the incident.
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. *	*Section 4.1.2.1.1 (4)*	The four-minute and eight-minute time lines are travel times from a station to the incident.

* *These response time performance objectives should be achieved not less than 90 percent of the time.*

FIRE DEPARTMENT STAFFING REQUIREMENTS

STANDARD	NFPA 1710 SECTION	COMMENT
Each fire company must have an officer.	*Section 5.2.1.2.2*	Engine companies, ladder companies, and special service companies must be commanded by an officer. Natick assigns an officer to each company.
A chief level officer must respond to all full alarms.	*Section 5.2.1.2.3*	A chief level officer would be a Deputy Chief. Natick responds with a chief officer.
Engine companies must be staffed with a minimum of four firefighters.	*Section 5.2.2.1.1*	Natick staffs with three firefighters.
Ladder companies must be staffed with a minimum of four.	*Section 5.2.2.2.1*	Natick staffs generally staffs with two to three firefighters.
The initial full-alarm assignment shall consist of 14 individuals, or 15 if an aerial ladder has responded.	*Section 5.2.3.2.2*	Natick is able to provide 15 personnel on-scene for a full alarm assignment.

NFPA 1710 also states that the number of on-duty fire suppression personnel in excess of 14 or 15 shall be comprised of the numbers necessary for firefighting performance *relative to the expected firefighting conditions.* These numbers shall be determined through task analyses which take the following factors into consideration:

- life hazard to the population protected
- provision of safe and effective firefighting performance conditions for the firefighters
- potential property loss

- nature, configuration, hazards, and internal protection of the properties involved
- types of fireground tactics and evolutions employed as standard procedure, type of apparatus used, and results expected to be obtained at the fire scene

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

The explanatory text which accompanies NFPA 1710 provides insight regarding the basis for the response objectives of "... four minutes or less for the arrival of the first arriving engine company at a fire suppression incident and/or eight minutes or less for the deployment of a full first alarm assignment at a fire suppression incident."

The explanatory text states that: "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. At approximately 10 minutes into the fire sequence, the hypothetical room of origin flashes over. Extension outside the room begins at this point. 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 the super heating 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." *(Annex A, Section A.5.2.1.2.1)*

NFPA 1710 AND POSSIBLE EQUIVALENCIES

NFPA 1710 does allow for the development of equivalencies to achieve the results envisioned in the standard. However, NFPA 1710 is essentially an "input" standard and depends on historical data and generally accepted information concerning fire spread and life safety to emphasize the community benefits of compliance.

Sources of additional information for standards and guidelines include www.nfpa.org, www.americanheart.org, www.iafc.org, cfai@cfainet.org, and www.astm.org.

APPENDIX B
EMERGING TRENDS AND BEST PRACTICES

Many emerging fire and rescue trends, best practices and general local government trends will continue to affect fire and rescue services. Fire departments have traditionally been measured in relation to defined standards and recognized industry practices.

The text of the report defines principles associated with fire and EMS response. In addition, there are other conditions and developments that are changing the operations and administration of the fire and rescue services, including:

- legislative, regulatory and industry standards
- emergency communications/regional system development
- emergency medical services
- operational consolidation (field operations consolidation)
- human resources
- risk management
- increased customer service focus
- increase in service delivery specialties
- technology and equipment
- accreditation

LEGISLATIVE, REGULATORY AND INDUSTRY STANDARDS

There are a number of legislative, regulatory and industry standards which are causing changes in local fire service organizations. Some of these standards have long histories, and some reflect fairly new initiatives. Proposed guidelines and standards emerge from committee processes. These technical committees review data, research and actual experience of fire and rescue agencies when establishing these standards.

The two primary agencies involved with establishing fire-related standards are the Insurance Services Office (ISO) and the National Fire Protection Association (NFPA).

ISO/CRS. The Insurance Services Office is a national nonprofit organization providing services to the property and casualty insurance industry. ISO has a nonprofit subsidiary corporation, Commercial Risk Services (CRS), which provides public protection surveys. The ISO Fire Suppression Rating Schedule evaluates municipal fire suppression capability using three major criteria: the fire alarm process (how a fire is reported and how a fire department receives a report); the fire department (apparatus, equipment, staffing, training, mutual aid, automatic mutual aid, pre-fire planning, training, etc.); and the water system (supply, water main capacity to deliver fire flow, distribution of hydrants, etc.). These ISO criteria are very detailed and are assigned weights. For example, the schedule defines, in detail, the type of equipment an engine company should have. The outcome of an ISO evaluation is the assignment of a jurisdiction to one of ten Public Protection Classifications. (Class 1 is the highest possible rating and Class 10 is the lowest.) This classification system is used to establish rates associated with fire insurance coverage and has a significant impact on commercial and industrial insurance rates.

National Fire Protection Association. The NFPA develops many standards applicable to fire departments. Two of the more frequently discussed standards are NFPA 1500 (health and safety) and the controversial NFPA Standard 1710 (response time and staffing).

NFPA Standard 1500 *(Standard on Fire Department Occupational Safety and Health Program)* evolved to address the large number of fatalities and occupation related injuries in fire departments. NFPA 1500 covers a range of safety issues and has resulted in a number of other standards relating to fire department incident management, infectious disease control, medical requirements for firefighters, and creation of the fire department safety officer concept. (The safety officer has responsibilities related to incident management.)

NFPA Standard 1710, which as has been discussed in Appendix A of this report sets forth requirements concerning the organization of fire suppression and fire-based EMS services. The standard discusses staffing requirements and maximum response times to fire and EMS incidents.

NFPA Standard 1710 (applicable to career fire departments) was adopted along with Standard 1720 (applicable to volunteer departments) and Standard 1730 (applicable to combination departments, those departments operating with a combination of career and volunteer or call personnel).

There are many other NFPA standards which are used as guidelines by fire departments, for example: NFPA 1001, Standard on Fire Fighter Professional Qualifications, NFPA 1021, Standard for Fire Officer Professional Qualifications, and NFPA 1002, Standard for Fire Apparatus/Driver/Operator Professional Qualifications. There are also standards for protective clothing, breathing apparatus and other matters.

EMERGENCY COMMUNICATIONS/REGIONAL SYSTEM DEVELOPMENT

There are a number of developments within the area of emergency communication. The most obvious are technological. Emergency communications appear to have caused a significant change in fire and EMS operations.

On major communication development has been emergency medical dispatch (EMD). EMD systems establish a framework for screening EMS calls and classifying them by seriousness. As a result, EMD training programs have been developed. For example, Natick has trained some of its dispatchers in EMD. EMD provides for call screening and allows dispatchers to give pre-arrival instructions. While these systems provide high quality service, they have had a direct impact on dispatch staffing. A dispatcher can be committed to a call for a substantial period of time, which often requires an increase in the number of dispatchers. However, there has been some movement to create consolidated fire and EMS communications systems around the country, and in Massachusetts. For example, Barnstable County has developed a regional fire and EMS communication system used by five fire departments. A number of other fire departments have expressed an interest in joining the system. In addition, fire chiefs in several towns in Norfolk County are aggressively attempting to get support for a regional communications system.

MMA Consulting Group, Inc. recently reviewed data in one region in which nine fire and EMS departments, having a volume of approximately 25,000

calls per year, employed at least one dispatcher on duty at all times. Thus, there were nine to 12 dispatchers on-duty (communities employed about 50 dispatchers in total). If communications were provided by one agency, a system employing about 20 personnel could effectively manage the call load and provide EMD dispatching.

The development of emergency communications (911 and E-911) has resulted in substantial call volume to emergency numbers for non-emergency calls. A number of jurisdictions in the United States are experimenting with the non emergency service number 311. The objective of this effort is to reduce the number of non-emergency calls to 911.

EMERGENCY MEDICAL SERVICES

The provision of some level of emergency medical services by fire departments is a well-established practice. Services are provided in a number of ways. Some developments include:

EMD. Emergency medical dispatch procedures (see above) allow dispatchers to evaluate the seriousness of calls using a call screening process and to make differentiations between life-threatening and non-life-threatening calls. National data, as well as the consultants' experience, indicate that incoming calls can be categorized, in general, as follows: 40 percent of calls are advanced life support calls (ALS, life-threatening calls), 50 percent are basic life support calls (BLS, non-life-threatening calls), and 10 percent are trauma calls.

Response Protocol Revisions. The practice of many fire departments has been to design EMS response systems in which a first responder engine company is deployed to each emergency medical service call. However, as systems have evolved, fire departments have been more discriminating in response policies. This is particularly true when emergency medical dispatch procedures are implemented. Many fire departments do not automatically deploy fire units to BLS calls; however, they automatically deploy units to ALS calls (life-threatening situations). This policy has been adopted by many agencies for a variety of reasons. If units are committed to BLS incidents, they are not available for ALS

incidents. Committing fire companies excessively may not be a wise deployment choice.

Increasing EMS Training Level for Fire Companies. Some jurisdictions have established paramedic engine companies. These units may be strategically deployed to respond to fire and EMS (ALS) incidents in areas where ambulance response may be problematic, or to ALS calls prior to arrival of a more distant ambulance.

Use and Distribution of Defibrillators. The development of Automatic External Defibrilltors (AEDs), which require a modest level of training, are typically placed on most fire apparatus, and increasingly in police vehicles. The use of defibrillators is essential, since the survivability for a non-breathing person is a function of application of CPR, defibrillation and advanced life support.

OPERATIONAL CONSOLIDATION (FIELD OPERATIONS CONSOLIDATION)

Under operational consolidation, fire departments remain separate, but operate in a combined manner for response purposes. Operational consolidation often evolves as communications are integrated and detailed standard response protocols are developed. Typically, this model may develop and operate effectively when jurisdictions have similar service levels. For example, Natick, Framingham, Wellesley, Wayland, and other nearby towns have a similar level of service and staffing which lends viability to operational consolidation.

HUMAN RESOURCES

There are several evolving practices with respect to human resources management reflecting national and specific Massachusetts trends. These trends include increasing entry qualifications, mandatory entry qualifications or condition of employment qualifications, and diversification of the work force.

Entry Qualifications. Entry qualifications for firefighting personnel in Massachusetts are limited. In Massachusetts, the entry requirements do not include a high school diploma or equivalency. In other parts of the country, requirements are usually higher. Since much of the work of fire and rescue departments now requires more sophisticated training, not only for emergency medical services, but hazardous materials, bio-

hazards, etc., many jurisdictions are beginning to require more competencies as a condition of employment.

Mandatory Qualifications for Employment and Conditions of Employment. Many fire and rescue departments are requiring, as a condition of employment, that personnel be trained to the emergency medical technician basic level (EMT-B) before employment, or even to the paramedic level (EMT-P). Other departments are requiring that personnel reach certain levels of training within specified time parameters. In Massachusetts, the appointing authority may request a special Civil Service list seeking specific qualifications, such as paramedic training, as long there is a *bona fide* occupational reason for such a list.

Diversification of the Workforce. There has been a broad national effort to diversify the fire service to increase the number of women and minority firefighters and emergency medical personnel.

Promotional Examinations and Civil Service in Massachusetts. The Massachusetts Human Resources Division (HRD) has traditionally used written examinations for promotional processes. The HRD, however, will delegate to a municipality the responsibility for conducting a non-traditional examination process. These examination processes are under the general supervision of HRD and typically have consisted of oral panels or assessment centers. Assessment centers are processes in which candidates participate in a series of exercises evaluating leadership, supervisory, and management skills. These processes have been used for positions such as Fire Chief, Deputy Fire Chief, Fire Captain and Fire Lieutenant.

Advanced Academic and Professional Education and Training. Nationally, and in Massachusetts, there are increasing numbers of firefighters with college degrees and advanced degrees. Some union organizations have sought the introduction of educational incentive programs which provide for pay increases, or fixed annual payments, for attainment of college degrees. In addition, many command personnel within fire departments are participating in programs at the National Fire Academy. The Executive Fire Officer (EFO) program is one of the most well-known

programs and completion of the program is often regarded as a desirable qualification for promotion.

RISK MANAGEMENT

There are two types of risk management which are growing within fire and rescue organizations. Internal risk management is concerned with reducing accidents, injury and sickness on the job. As a result, there has been a rapid growth of health and wellness programs, including the development of specific health programs (e.g., requiring specific inoculations, or as in Massachusetts, prohibiting smoking). Risk management is also applied to the assessment of risk at an operations scene. For example, at a working fire, there should be a designated safety officer, who monitors operations and has authority (notwithstanding rank) to halt all operations if conditions warrant it.

CUSTOMER SERVICE FOCUS

Fire and rescue organizations are increasingly concerned with customer service. There are many examples, including the national program in which fire stations are identified as safe places for lost children and the provision of first aid. In addition to these traditional service functions, many fire departments are training personnel to identify other health, safety or social service related problems. Under these "connector services" programs, firefighters who come in contact with possible family situations or an aged person at risk report these observations to appropriate agencies.

INCREASE IN SERVICE DELIVERY SPECIALTIES

The development of technical rescue specialties within fire departments by means of regional resource sharing is growing. Particular areas of technical rescue include confined space, building collapse, trench rescue, industrial accidents, etc. The skills developed are generally a function of the characteristics of the community or the region.

TECHNOLOGY AND EQUIPMENT

Changes in technology, equipment and apparatus are having a significant impact on safety and operations. For example, use of thermal imaging devices, instruments measuring the stability of walls, improved protective clothing and uniforms, and breathing apparatus with radios built into masks are now

common. More extensive use of computers in apparatus designed to provide information on buildings and hazards are also more common.

Apparatus are changing in several ways. Some fire suppression apparatus are becoming smaller and more specialized. At the same time, there is the generalization of equipment rather than specialization of equipment. Rapid intervention vehicles, such as rescue-pumpers, flying squads with pumps, ambulance-pumpers, combined hazardous materials and command post vehicles, combined lighting and air trucks and modern tanker-pumpers are increasingly common. Some departments have two or more specialized vehicles available for immediate use by responders, depending on the type of call. For example, a pumper crew may be able to select a pumper or a medical aide car, depending on whether the call is a fire call or an EMS call.

ACCREDITATION

The International Association of Fire Chiefs and the International City/County Management Association have created a Commission on Fire Accreditation. The Commission has established guidelines and standards and specifies a process for fire departments to achieve accreditation.

APPENDIX C
NATIONAL COMPARATIVE DATA

	Population	Fire Calls	EMS Calls	False Calls	Total Calls	No. of Engines	No. of Ladders	No. of Ambulances	No. of Heavy Rescue	No. of Hazmat	Total Personnel	Work Hours	Engine Crew Size	Ladder Crew Size
Newport RI	24,750	160	3,948	1,098	5,799	3	2	2	0	0	98	42	3	3
Ellensburg WA	25,000	70	1,726	136	2,127	2	1	3	0	0	36	50	4	4
Hebron KY	25,000	823	801	284	1,658	3	1	2	1	1	46	56	3	3
Imperial MO	25,000	500	790	30	1,092	3	0	0	1	0	17	72	2	X
Plainfield IN	25,000	652	2,610	171	3,433	2	2	3	1	0	54	56	3	3
Watertown WI	25,000	242	1,349	184	1,876	3	1	2	1	1	45	56	3	3
Anderson City SC	26,380	179	0	326	878	3	1	0	0	1	54	53	4	3
Watertown NY	26,705	147	1,236	530	2,648	5	2	0	1	0	82	40	3	3
Englewood NJ	28,000	2,331	0	1,000	2,331	2	1	0	0	0	52	42	2.25	2.25
Poughkeepsie NY	30,000	382	1,659	605	4,587	3	2	0	1	0	72	42	2	2
Naples FL	31,000	219	2,759	812	4,548	3	1	0	0	1	51	52	3	1
Seaside CA	32,200	89	1,285	13	2,107	1	1	0	0	0	35	56	3	4
Wheeling WV	32,500	148	3,374	574	5,422	6	2	3	1	0	94	56	3	3
Falmouth MA	32,660	1,284	3,910	178	5,473	6	1	4	1	0	58	42	4	2
Mount Lebanon PA	33,000	77	0	483	1,893	4	1	0	1	0	61	42	3	3
Houma LA	34,000	161	86	142	630	5	2	0	0	0	60	53	3	3
Manitowoc WI	34,350	125	4,037	456	4,844	5	1	8	1	1	57	56	2	2
Hagerstown MD	35,000	165	529	324	1,888	5	2	0	0	0	62	56	1	2
Texarkana TX	35,000	261	472	291	1,613	5	1	0	1	0	75	56	3	1
Annapolis MD	35,838	1,956	7,352	821	10,129	3	2	0	1	1	98	56	3	2.5
Florence AL	36,264	229	2,715	413	3,725	5	1	0	1	0	90	56	4	4
Panama City FL	36,541	235	225	406	1,319	4	1	0	0	0	86	56	5	4
Hoboken NJ	38,577	388	136	1,553	3,443	3	2	0	1	1	125	42	3.5	3.5
Teaneck NJ	39,000	154	0	576	3,643	4	1	0	1	0	101	42	3	2
Spartanburg SC	39,673	352	572	675	2,096	6	1	0	1	0	70	56	3	2
Eastchester NY	40,000	1,503	546	148	2,197	4	2	0	0	0	73	42	2	2
Fitchburg MA	40,000	2,640	2,331	135	7,438	4	1	0	0	0	85	42	3	2
Muskegon MI	40,283	275	2,493	238	3,656	3	1	0	0	0	41	53	3	X
Titusville FL	41,000	270	4,761	268	5,325	2	2	1	0	0	62	56	3	3
York PA	42,000	317	480	764	2,530	4	1	0	0	0	73	42	2	2
Olympia WA	42,514	262	5,361	711	6,977	3	1	0	0	0	83	48.6	3	3
Hackensack NJ	42,677	1,850	5,144	1,161	8,155	4	1	2	1	0	99	42	3	3
Covington KY	43,370	2,080	7,454	X	9,548	5	2	3	1	0	117	48	3	3
Palm Springs CA	43,997	375	4,758	150	6,430	5	0	0	0	0	60	56	2	X
Sanford FL	45,550	255	4,411	707	8,091	3	1	2	0	0	69	53.5	3	4
Ocala FL	46,455	465	10,174	840	13,077	5	1	4	0	1	110	52	3.5	2.5
Elgin IL	47,634	2,534	6,394	1,284	8,928	5	2	4	0	0	107	50.15	3	3
Casper WY	49,664	169	3,106	138	4,298	5	1	0	1	1	73	56	3	2
Average	35,568	640	2,605	503	4,365	4	1	1	1	0	72	51	3	3
Median	35,419	266	2,029	413	3,650	4	1	0	1	0	71	53	3	3

APPENDIX D
AMBULANCE RESPONSE DATA FOR 2003

It was difficult to generate response time data for Natick Fire Department response units. With the assistance of Police Department personnel, the consultants were able to develop response time information for Ambulance 1 (A-1) and Ambulance 2 (A-2) for 2003. In the following four exhibits, response time data is provided for A-1 and A-2. Transport and non-transport response times are shown. Dispatch times often appear slower than they are, as a result of call processing procedures.

Exhibit D-1, *Receipt of Call to Dispatch* shows the time elapsed from receipt of a call for service to dispatch of an ambulance. The exhibit displays the number and percent of calls for service dispatched in 30-second time increments. For example, 26.2 percent of calls are dispatched within one minute. Dispatch times for calls requiring transport and calls not requiring transport are shown.

EXHIBIT D-1
RECEIPT OF CALL TO DISPATCH

	A-1 TRANSPORTS		A-1 NO TRANSPORTS		A-2 TRANSPORTS		A-2 NO TRANSPORTS	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Less than 1 minute	409	26.2%	189	20.0%	38	17.1%	15	9.3%
1:00 to 1:29	499	31.9%	250	26.4%	58	26.1%	30	18.6%
1:30 to 1:59	345	22.1%	222	23.5%	45	20.3%	32	19.9%
2:00 to 2:29	137	8.8%	117	12.4%	40	18.0%	30	18.6%
2:30 to 2:59	79	5.1%	57	6.0%	23	10.4%	11	6.8%
3:00 to 3:29	35	2.2%	30	3.2%	6	2.7%	18	11.2%
3:30 to 3:59	18	1.2%	31	3.3%	5	2.3%	10	6.2%
4:00 to 4:29	14	0.9%	11	1.2%	4	1.8%	9	5.6%
4:30 to 4:59	3	0.2%	13	1.4%	1	0.5%	3	1.9%
More than 5 minutes	23	1.5%	26	2.7%	2	0.9%	3	1.9%
Total	1,562	100.0%	946	100.0%	222	100.0%	161	100.0%
Average (minutes & seconds)	1:34		1:50		1:48		2:16	
Maximum (minutes & seconds)	19:43		8:15		8:18		6:11	

Exhibit D-2 shows the amount of time from dispatch to arrival at the scene of an incident. This data includes turn-out time and travel time to the scene of an incident. As in Exhibit D-1, the number and percent of calls which are responded to are shown in 30-second time increments.

EXHIBIT D-2
CALL DISPATCHED TO ON LOCATION

	A-1 TRANSPORTS		A-1 NO TRANSPORTS		A-2 TRANSPORTS		A-2 NO TRANSPORTS	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Less than 1 minute	23	1.6%	33	4.5%	7	2.9%	21	18.1%
1:00 to 1:29	21	1.4%	20	2.8%	8	3.3%	3	2.6%
1:30 to 1:59	42	2.8%	33	4.5%	9	3.8%	3	2.6%
2:00 to 2:29	91	6.2%	38	5.2%	10	4.2%	10	8.6%
2:30 to 2:59	79	5.3%	45	6.2%	15	6.3%	3	2.6%
3:00 to 3:29	98	6.6%	63	8.7%	16	6.7%	7	6.0%
3:30 to 3:59	113	7.6%	60	8.3%	20	8.3%		0.0%
4:00 to 4:29	139	9.4%	81	11.1%	17	7.1%	11	9.5%
4:30 to 4:59	132	8.9%	62	8.5%	24	10.0%	7	6.0%
5:00 t0 5:29	134	9.1%	62	8.5%	15	6.3%	9	7.8%
5:30 to 5:59	155	10.5%	59	8.1%	20	8.3%	6	5.2%
6:00 to 6:29	115	7.8%	46	6.3%	12	5.0%	5	4.3%
6:30 to 6:59	87	5.9%	39	5.4%	14	5.8%	4	3.4%
7:00 to 7:29	61	4.1%	29	4.0%	4	1.7%	7	6.0%
7:30 to 7:59	51	3.5%	16	2.2%	5	2.1%	4	3.4%
More than 8:00 minutes	137	9.3%	41	5.6%	44	18.3%	16	13.8%
Total	1,478	100.0%	727	100.0%	240	100.0%	116	100.0%
Average (minutes & seconds	5:08 *		6:29		5:46		5:05	
Maximum (minutes & seconds)	18:24		16:56		28:29:00		20:51	

** Not including three calls which indicated three-hour response times.*

Exhibit D-3 shows the number and percent of calls in one-minute time increments. The exhibit shows the number of calls and percent of calls in cumulative time increments. For example, 94 percent of calls are dispatched within three minutes.

EXHIBIT D-3
RECEIPT OF CALL TO DISPATCH (CUMULATIVE INTERVALS)

	A-1 TRANSPORTS		A-1 NO TRANSPORTS		A-2 TRANSPORTS		A-2 NO TRANSPORTS	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Less than 1 minute	409	26.2%	189	20.0%	38	17.1%	15	9.3%
Less than 2 minutes	1,253	80.2%	661	69.9%	141	63.5%	77	47.8%
Less than 3 minutes	1,469	94.0%	835	88.3%	204	91.9%	118	73.3%
Less than 4 minutes	1,522	97.4%	896	94.7%	215	96.8%	146	90.7%
Less than 5 minutes	1,539	98.5%	920	97.3%	220	99.1%	158	98.1%
More than 5 minutes	23	1.5%	26	2.7%	2	0.9%	3	1.9%
Total	1,562	100.0%	946	100.0%	222	100.0%	161	100.0%

Exhibit D-4 shows cumulative response time (turn-out and travel time) in one-minute increments from the time a call was dispatched to the time it arrived on scene. For example, in 90.7 percent of incidents, Unit A-1 was on the scene within eight minutes of dispatch.

EXHIBIT D-4
TIME FROM DISPATCH TO ARRIVAL ON SCENE (CUMULATIVE INTERVALS)

	A-1 TRANSPORTS		A-1 NO TRANSPORTS		A-2 TRANSPORTS		A-2 NO TRANSPORTS	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Less than 1 minute	23	1.6%	33	4.5%	7	2.9%	21	18.1%
Less than 2 minutes	63	4.3%	86	11.8%	24	10.0%	27	23.3%
Less than 3 minutes	256	17.3%	169	23.2%	49	20.4%	40	34.5%
Less than 4 minutes	467	31.6%	292	40.2%	85	35.4%	47	40.5%
Less than 5 minutes	738	49.9%	435	59.8%	126	52.5%	65	56.0%
Less than 6 minutes	1,027	69.5%	556	76.5%	161	67.1%	80	69.0%
Less than 7 minutes	1,290	87.3%	641	88.2%	187	77.9%	89	76.7%
Less than 8 minutes	1,341	90.7%	686	94.4%	196	81.7%	100	86.2%
More than 8 minutes	137	9.3%	41	5.6%	44	18.3%	16	13.8%
Total	1,478	100.0%	727	100.0%	240	100.0%	116	100.0%

The data shown in these exhibits suggest several findings. First, dispatch processing time is relatively long. Ideally, most dispatches should be made within one minute. A goal of the Department should be to dispatch 90 percent

of incidents within one minute. The data also shows that the Department is able to deliver advanced life support services within eight minutes (travel time and dispatch time) in 90.7 percent of incidents, responding from Station 1 only. Implementation of a paramedic engine concept will improve these capabilities substantially. (See Chapter V.)