

ASHLAND, MASSACHUSETTS

FIRE AND POLICE STATION SPACE NEEDS
ASSESSMENT AND LOCATION STUDY

APRIL 2008

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I. EXECUTIVE SUMMARY

This *Fire and Police Station Space Needs Assessment and Location Study* was conducted by MMA Consulting Group, Inc. The primary purpose of the study was to assess the future needs and location of public safety facilities. To conduct this analysis it was necessary to assess the general operations of the Ashland Fire Department and the Ashland Police Department and develop an estimate of the possible growth of each department and the constraints on service delivery in the future. The primary focus of this report is to identify a future site for police and fire facilities and to estimate the scope of the need for these facilities over the next five to ten years and beyond.

This study required several consultants to conduct field work, interview personnel, tour the Town, review data and conduct computer mapping. Based on our analysis, a number of primary findings were made.

- The current public safety facilities are inadequate and obsolete.
- The Town has made a significant effort to maintain and replace building systems in the current fire stations and the police station.
- The location of fire and police facilities, assuming a new joint facility, will be influenced by the fire and emergency medical response needs of the Town.
- The two fire station configuration is not the most appropriate deployment framework for a smaller community, such as Ashland.
- The sites of the Central Fire Station at 151 Main Street and the Police station at 137 Main Street are too small to allow expansion. In addition, the railroad crossing and the increasing rail traffic make the sites less than desirable.
- The Town's road network, the number of railroad crossings, the low lying land area of the Town, and the limited availability of land for new facilities constrain the options available to the Town.

- The Police Departments generally has enough personnel resources to manage the current workload and absorb some increase in the workload.
- The Fire Department has limited resources available for a major incident and relies on the call-back of personnel and mutual to respond to major incidents.
- The Police Department and the Fire Department have separate communication operations which would benefit from consolidation.

The recommendations focus on issues or topics which will affect the scope of public safety facilities. The primary recommendations resulting from this analysis are summarized below.

- The Town should develop a long-term public safety facilities replacement strategy.
- The long-term plan should consolidate public safety facilities, including both fire stations at one location.
- The public safety facilities strategy should consider a planning horizon of 25 to 30 years.
- The Town should make the acquisition of a site for public safety facilities a priority of the Town.
- The site selected for the facility should consider the geography of the Town, the multiple railroad crossings, and the site size required to house fire and police operations. The security of the site in the event of a natural disaster should also be considered.
- A site for police and fire facilities should be a minimum of three to five acres. A larger site may be desirable to allow for future expansion and/or other facility development.

- The consolidated public safety facility should range in size from approximately 40,000 to 55,000 square feet.
- The Fire Department space needs include garage, office, living , kitchen, meeting/training, and storage spaces. The Fire Department will require approximately 20,000 to 25,000 square feet of space. Approximately 10,000 to 14,000 square feet will be devoted to apparatus bays.
- The Police Department space needs include office space, a garage space for four vehicles, interview rooms, meeting/training room, lunchroom facilities, locker rooms, a secure evidence area, a secure booking area, and a lock-up. Additional security should be built into the police facility. The police facility will require approximately 20,000 to 30,000 square feet of space.
- The consolidated public safety facility should include an emergency communication center with space for several dispatch consoles. Approximately 1,200 to 1,500 square feet of space will be required for the communication center.
- The consolidated public safety facility should be designed to allow the departments to share some facilities, such as training rooms, records room, some storage areas, and other facilities.
- The Town may wish to include a community room within the facility.
- The emergency communication functions of the Fire and Police Departments should be consolidated in the new facility.
- The Town should employ civilian communication personnel.
- The Fire Department should increase each shift by one firefighter. Over the next several years, the Department should consider the employment of one additional fire officer to perform a staff role.

- The Police Department should consider the employment of one additional Sergeant. The Police Department should plan for the addition of two to three police officers.

Exhibit 1 lists the major recommendations in the order they are presented in this report, along with assigned priorities. The recommendations have been categorized as follows:

- Priority 1:** Recommendations which should be implemented without delay and which bear directly on the ability of the public safety agencies to provide an acceptable level of service and operate in an efficient manner.
- Priority 2:** Recommendations which are important to the effective and efficient operation of the public safety agencies and should be implemented as soon as reasonable and practical.
- Priority 3:** Recommendations which can contribute to the continued improvement of the public safety agencies and should be implemented as soon as resources and operating conditions permit.

**EXHIBIT 1
LIST OF RECOMMENDATIONS**

	RECOMMENDATION	PRIORITY
1	The Police Station and Fire Stations should be replaced and relocated.	1
2	The Police Station and the Fire Stations should be consolidated into one public safety building.	1
3	The Town should increase the staffing of the Fire Department by two Firefighters/EMT-Bs or EMT-Ps on each shift.	1
4	The Town should employ one additional staff officer to serve as second-in-command of the Fire Department.	3
5	The Fire Department should maintain an equipment complement of an aerial apparatus (quint), two front-line pumpers (one with a smaller wheel base), two ambulances, a rescue truck, and a brush truck. The Department should maintain a reserve pumper.	Continue current practice.
6	The Police Department should continue to employ the current complement of patrol personnel.	1

	RECOMMENDATION	PRIORITY
7	The Police Department should employ one additional Sergeant.	2
8	The Police Department should plan to employ two to three additional police officers in the next five to 10 years.	3
9	The Police Department should enhance its data analysis capability.	2
10	The Town should consolidate police and fire emergency communication when a new police or fire facility is available. Planning for any new facility should consider the space and system needs of a consolidated emergency communication operation.	2/3
11	The Town should explore alternatives for management of the consolidated communication center: <ul style="list-style-type: none"> ▸ consolidation of the Police Department and Fire Department communication functions into a new department reporting to the Town Manager; ▸ consolidation of the Police Department and Fire Department communication functions under the direction of the Police Department or the Fire Department. 	3
12	The Town should staff the communication center with trained civilian personnel.	3
13	The Town should operate with one fire station.	1
14	The Town should construct a fire and police facility in the general area of Location X.	1
15	The Town should consider constructing a public safety facility which incorporates police, fire and emergency communication functions. The estimated size of the facility should be between 40,000 and 55,000 square feet.	1

The report is organized into several chapters. This *Executive Summary* presents the major findings and recommendations. Chapter II, *General Background and Condition of Current Facilities*, provides a description of the Town, the Police and Fire Departments, and the current level of activity. The chapter identifies the location of each facility and indicates some of the shortcomings of each facility. Chapter III, *Fire Department Organization and Services*, describes the Fire Department and discusses anticipated changes in the Department. Chapter IV, *Police Department Organization and Services*, describes the Police Department and discusses anticipated changes in the Department. Chapter V, *Emergency*

Communication, discusses the consolidation of emergency communication services. Chapter VI, *Response Evaluation, Response Capability, and Computer Mapping*, analyzes general site locations and presents recommendations. Chapter VII, *Chapter VII, Estimating the Size of a Consolidated Public Safety Facility*, addresses factors which influence the selection of a site for a public safety facility. Chapter VIII, *Implementation of Recommendations*, presents the priority for each recommendation and includes general estimates regarding the cost of public safety facilities.

II. GENERAL BACKGROUND AND CONDITION OF CURRENT FACILITIES

LOCAL CHARACTERISTICS AFFECTING PUBLIC SAFETY SERVICES

The Town of Ashland provides a full array of public safety services. The Town employs 23 full-time Fire Department personnel, including four civilian dispatchers and one administrative assistant, and approximately five call firefighters. The Police Department employs 31 full-time personnel, including five civilian personnel, and several special officers. The Town is 12.9 square miles in size and has a population of 15,678 (2006 population). The current population has increased approximately 6.8 percent since 2000, when the U.S. Census identified 14,674 residents. The Town's planning documents project that the Town will continue to grow over the next 20 years and could grow to approximately 20,000 to 22,000.

CONDITION OF THE EXISTING FIRE STATIONS AND THE POLICE STATION

The Fire Department operates from two fire stations. Fire Station 1, Central Station, is located at 151 Main Street, and Fire Station 2, Headquarters, is located at 70 Cedar Street. The Police Station is located at 137 Main Street. While the Central Fire Station is centrally located, the station building site is small with limited expansion potential. The Police Station is small with limited expansion potential. The Central Fire Station and the Police Station are located close to the commuter rail line in an area that is subject to flooding.

The Town has made an effort to maintain and replace building systems in each public safety facility. The condition of facilities, given the age and usage of the facilities indicates that the Town has not neglected facilities. However, the facilities are obsolete. Exhibit 2 presents basic information on each station.

EXHIBIT 2

FIRE APPARATUS, EQUIPMENT, AND PERSONNEL DEPLOYED AT EACH FIRE STATION

LOCATION	YEAR BUILT	CONDITION	NATURE OF FACILITY	COMMENTS
151 Main Street Fire Station 1 Central Station	1927	The building systems are in generally good condition.	The Fire Department deploys three firefighters at this station. Apparatus include an ambulance, a pumper, the mini-pumper and boat.	Small building site, narrow bays, low-lying area, prone to flooding, near rail tracks; approximately 7,500 square feet of space.
70 Cedar Street Fire Station 2 Headquarters	1988	The building systems are in generally good condition.	The Fire Department deploys the duty officer and dispatcher at this location. Apparatus include an aerial ladder (quint), an ambulance, two pumpers, the rescue truck and the brush truck.	Site is somewhat remote; approximately 7,600 square feet of space.
137 Main Street Police Station	1978	The building systems are in generally good condition.	The Police Station houses all police personnel and resources.	Small building site, narrow bays, low lying area, prone to flooding, near rail tracks; 4,662 square feet of space.

FIRE STATION 1, CENTRAL FIRE STATION (151 MAIN STREET)

SUMMARY

This station was built in 1927 and is in adequate condition. The Town has made an effort to maintain the facility. The facility is too small for a headquarters station.

The building site is not large enough to allow for expansion of the building. The three bays are small and the height and width of the apparatus bays are barely large enough for the existing trucks. New state of the art apparatus are likely to be larger than units in the current fleet; as equipment is replaced, it may be difficult to house apparatus at this location. It is not feasible to increase the size of the bays to accommodate new equipment. Renovation or extensive repair of the Central Fire Station is not recommended.

BUILDING EXTERIOR

The front concrete apron and the handicapped access ramp are in good condition. The paving of the parking area at the rear and the sides of the building is in fair to poor condition. The building has brick and mortar exterior walls which are in good condition and show signs of repointing in many areas. Windows have thermal glass and are wood framed with a vinyl cover. The windows are in good condition. The roof was replaced in 2006 with an EPDM rubber and is in excellent condition. The apparatus bay doors are metal thermal panel with thermal glass and are in good condition.

BUILDING INTERIOR

The apparatus garage is equipped with a PlymoVent system to eject truck engine gases from the building. The consultants were informed that the floor drains work well. The drains are connected to an oil and gas separator trap which drains into the Town sewer system. The apparatus bays are heated by two ceiling-hung gas-fired heating units. These units are self-contained forced hot air units.

The floor, wall and ceiling finishes are in fair to poor condition. The second story floor has a hardwood floor which is in good condition. The plumbing fixtures are in good to fair condition throughout the building. The building's hot water is provided by two 75-gallon gas fueled hot water heaters located in the basement. Heat is supplied to the basement and ground floor office and lavatory by a gas-fired hot-air furnace located in the basement. HVAC is provided to the second floor by a roof mounted gas/electric AC handling unit, which is in good condition. The electric distribution system panel and emergency transfer switch are located in the basement and are in good condition. A Kolher diesel emergency generator with a self-contained fuel tank is located outside the rear of the building. Many lighting fixtures have been replaced with efficient T-8 fluorescent fixtures.

FIRE STATION 2, HEADQUARTERS STATION (70 CEDAR STREET)

SUMMARY

This station was built in 1988 and is in fair to good condition and is located in a relatively remote residential location.

BUILDING EXTERIOR

The driveway paving is in poor condition and parking is limited. The parking areas should be enlarged to meet current needs. The building was constructed on a concrete slab. The first floor office and dispatch areas are wood framed. Apparatus bays have concrete block walls and a precast concrete ceiling. The second floor walls and roof structure are wood frame.

The exterior of the building has both vinyl siding and brick and concrete block walls. The exterior walls of the building are in good condition. The windows are thermal glass, wood frame/vinyl covered and are in good condition. The roof has asphalt shingles which are in fair condition. Roof shingles show evidence of ice back-up problems, which may be caused by poor ventilation or improperly installed insulation. The garage doors are metal panel with single pane glass in excellent condition. The Fire Chief's office, locker rooms and day room/training room are on the second floor over the apparatus bays. The second floor is not handicapped accessible.

BUILDING INTERIOR

The apparatus bay floor drains are connected to a gas/oil separator trap which drains into the septic system. The apparatus garage is equipped with a PlymoVent system to eject truck engine gases from the building. The interior finishes (floors, walls and ceilings) are generally in good condition. Plumbing fixtures are in good condition throughout the building. The building lobby has an accessible lavatory. Hot water is provided by 75-gallon self-contained gas-fired water heater.

The heat and air conditioning are supplied to the first floor office and dispatch area by a natural gas-fired hot furnace/electric A/C air handler. The second floor heat and air conditioning are provided by two gas fired/electric air handling units. These units are in good condition. The air conditioning is not adequate in the dispatch area and in the radio room/closet due to heat generated by the radio and computer equipment. Apparatus bays are heated by ceiling-hung gas-fired heating units. These units are self-contained forced hot air units.

The electric system is a 400-ampere system in good condition. Emergency power is provided by a diesel powered generator in excellent condition tied to a

400-ampere transfer switch capable of restoring full power to the building. The lighting fixtures are efficient T-8 fluorescent fixtures.

POLICE STATION (137 MAIN STREET)

SUMMARY

The building was built in 1978. The Town has made a great effort to maintain and replace building systems. However, the building does not meet the present or future needs of the Department. The site does not have enough land area to support building expansion and parking is inadequate. The facility is located in a low area that has flooded in the past and is also near the commuter railway.

BUILDING EXTERIOR

The paved driveways are in fair to poor condition with cracks and patched areas. The building has brick and block exterior walls and is built on a concrete slab. The exterior mortar joints are in good condition and there are only a few areas that have some deterioration of mortar. The roof is a standing seam copper roof which is in good condition. Roof flashings are also in good condition. The windows are non-opening and have thick bullet resistant glass. Windows are in good condition; however, they are very narrow and do not allow much natural light into the building. The overhead garage door is in fair condition. The facility has some access barriers that will need to be corrected should any major renovation or addition take place.

BUILDING INTERIOR

The consultants were told that the garage floor drain works well and is connected to an oil and gas separator trap draining to the Town's sewer system. The interior walls are painted cement masonry block. The floor covering is mainly vinyl tile that may contain asbestos. The ceilings are drop ceilings. The original drop ceiling has a concealed metal grid system. Most plumbing fixtures are original and in good to fair condition. Hot water is provided by the boiler through an indirect heat/storage tank that is in excellent condition.

The HVAC system has a new high efficiency hot water boiler and zone pumps located on the second floor loft. The system is in excellent condition. The heat is provided by a gas fueled boiler. Heat is distributed through a

multiple-zoned system which uses baseboards, fan coil units, radiant heat located in the concrete floors, and two small air handlers. Air conditioning is provided by two DX compressors located outside, feeding the two small air handlers. Although parts of the HVAC system are new, the air flow throughout the building is poor since areas of the building have been modified for different uses. Some of the original ceilings have been lowered.

The main electric panel was recently replaced with a 225-ampere, three-phase panel. There is a recently replaced Kolher, 40 KW emergency generator and a new transfer switch. The generator is located in the building above the dispatch area, which is not the most appropriate location for this equipment. The Station's main electric panel, transfer switch and generator are in excellent condition. Female employees have a separate trailer used as a locker room located at the rear of the building. The Police Chief's office opens onto a general access hallway. The role call room is small and is used for training and other meetings. There are four jail cells; three are used to hold prisoners; two cells are for male prisoners, and one cell is for female or juvenile prisoners; the fourth cell is used for storage. The booking area is small and unsafe. There is limited space to secure evidence. The roll call room is next to the male locker room and can only be entered through the roll call room. There is limited private space for officers to conduct interviews.

The facilities are no longer adequate for either the Police Department or the Fire Department. Some of our primary concerns include:

- The limited Fire Department resources are deployed in two locations.
- The building sites for the Central Fire Station (Station 1) and the Police Station are too small to allow for expansion or complete rehabilitation.
- The current locations of the Police Station and the Central Fire Station (Station 1) are prone to flooding.
- The response by the Fire Department and Police Department may be hampered by the proximity of a railroad crossing.
- The Police Department and Fire Department operate separate dispatch operations.

RECOMMENDATION 1: The Police Station and Fire Stations should be replaced and relocated.

A cost-effective solution to the replacement and relocation of the Police Station and the Fire Stations is to consolidate them in one location. The consolidation of facilities will enable sharing of selected resources.

RECOMMENDATION 2: The Police Station and the Fire Stations should be consolidated into one public safety building.

III. FIRE DEPARTMENT ORGANIZATION AND SERVICES

DESCRIPTION OF THE CURRENT ORGANIZATION

The Ashland Fire Department currently employs 23 career personnel: the Fire Chief, five Lieutenants, 12 firefighters, four civilian dispatchers, and one Administrative Assistant. The Department also has five or six call firefighters. The Department provides a full array of emergency and non-emergency services, including fire suppression, emergency medical services at the advanced life support (ALS) level, rescue, fire inspection, and fire prevention services. Exhibit 3 displays the staffing complement of the Ashland Fire Department.

**EXHIBIT 3
FIRE DEPARTMENT EMPLOYEE COMPLEMENT**

POSITION	NUMBER
Chief	1
Captain	1
Lieutenant	4
Firefighter	12
Dispatcher	4
Administrative Assistant	1
Total	23

On a typical day, the Fire Department deploys three firefighters at the Central Fire Station (Station 1) and one officer and dispatcher at Headquarters Station (Station 2). Exhibit 4 shows the typical deployment approach used by the Fire Department. The Fire Department has one officer, three firefighters, and one dispatcher assigned to each group, or shift, of personnel. Each group or shift has two EMT-Ps and two EMT-Bs. Seven firefighters, all four Lieutenants, and the Chief are paramedics (EMT-Ps). In addition to the seven paramedics, all Department personnel are certified as EMT-Bs or EMT-Is.

EXHIBIT 4
TYPICAL DAILY DEPLOYMENT AND STAFFING

STATION	UNITS	STAFFING
Station 1, Central Station	Ambulance, pumper, mini-pumper, and boat	Three firefighters are typically assigned to this station daily.
Station 2, Headquarters Station	Aerial ladder, ambulance, two pumpers, rescue truck, brush truck	The duty officer and dispatcher are assigned to this station.

Exhibit 5 lists the available emergency response vehicles which may be deployed by on-duty and call-back personnel.

EXHIBIT 5
FIRE DEPARTMENT APPARATUS

APPARATUS	COMMENT
Engine 1	Short wheelbase for very narrow streets at various condominium developments; only two seats
Engine 2	Commercial chassis with medium wheel base
Engine 3	Commercial chassis with long wheel base
Engine 4	Large pick-up truck with minimal pump
Brush Truck	“Breaker” type on large chassis with tandem axle
Aerial Tower	Quint vehicle; rear mount aerial platform with tandem axle
Heavy Rescue	Long wheel base with command section
Two Ambulances	Commercial chassis with ambulance “box”

In addition to the apparatus listed in Exhibit 5, the Department has two command vehicles, two boats, a pick-up truck, a dive truck, and two trailers.

CALLS FOR SERVICE

The Ashland Fire Department responds to approximately 2,000 incidents each year. Exhibit 6 shows six years of calls for service.

EXHIBIT 6
FIRE DEPARTMENT CALLS FOR SERVICE

YEAR	NO. OF CALLS
2006	1,986
2005	2,096
2004	1,902
2003	1,830
2002	1,698

During the three-year period from 2004 through 2006, the Department averaged 1,994 fire and medical calls for service, or approximately 5.5 calls for service per day. Approximately 50 percent of the Department's calls for service are emergency medical service calls. It appears that a typical call consumes 30 to 60 minutes. As a result, with four personnel on-duty, there may be several times each day when all personnel are committed to a call. It is our understanding that Ashland Fire Department personnel may be "out-of-town" to provide aid to another town approximately 15 to 20 times each month,

OPERATIONAL PRACTICES

Several factors affect the Ashland Fire Department operational practices.

- The four on-duty responders (one officer and three firefighters) respond to a medical call when it is received. If the ambulance transports a patient to a hospital (two personnel perform this duty), the remaining fire officer and one firefighter return to Headquarters Station, Station 2, from which they would respond. The Department houses the reserve ambulance, pumper, and ladder truck at Station 2.
- The Department estimates that there are approximately 100 simultaneous or near-simultaneous EMS calls annually.
- The Department's personnel estimate that all four on-duty personnel are committed to an EMS or fire call approximately 200 times annually.

- The number of call personnel available during the day is very limited. Few call firefighters currently work in the Town.
- The “all off-duty shifts” recall, which may be necessary in the case of a major incident, results in a mixed response from personnel. It is reported that the number of responding personnel has ranged from very few to as many as ten personnel.
- The Hopkinton Fire Department is the primary mutual aid provider to the Ashland Fire Department. The Hopkinton Department is a combination department and does not have an aerial ladder. Hopkinton typically sends a pumper with four responders within eight to 10 minutes of being dispatched.
- The Ashland aerial ladder truck is driven to fires from Headquarters Station by a recalled Ashland Fire Department firefighter.
- The Ashland Fire Department uses mutual aid approximately five to 10 times per month, depending on the recall policy in effect. In addition, the Department uses mutual aid when recall does not generate sufficient off-duty personnel or call personnel.

The Fire Department has defined response protocols. For a medical calls, the ambulance located at the Central Fire Station and the command vehicle located at the Headquarters Station respond. When the Department receives a fire alarm with no report of smoke or fire, a response is initiated by Engine 2 from the Central Station and the command vehicle located at the Headquarters Fire Station. When the Department receives a fire alarm with a report of smoke and fire showing, a response is initiated by Engine 2 from the Central Station and the command vehicle located at the Headquarters Fire Station. In addition, personnel are called back to staff fire units and the mutual aid system is activated. Exhibit 7 duplicates the actual standard alarm assignment determined by the Ashland Fire Department.

EXHIBIT 7
ASHLAND FIRE DEPARTMENT STANDARD ALARM ASSIGNMENTS*

TYPE OF CALL/ALARM	RESPONSE
Medical Call	Ambulance-1 (Main St) and C-2 (Cedar Street) respond, total response of 3 firefighters and OIC.
Fire/Alarm Call (Standard fire alarm/investigation response, no reported smoke or fire showing)	Engine-2 (Main Street) and C-2 (Cedar Street) respond, total response of 3 Firefighters and an OIC. If nothing found, situation called under control. If further units needed, last shift personnel recalled or box struck to call all personnel in to fill out alarm card.
Fire/Alarm Call (Report of smoke/fire showing)	Box 7 Struck, E-2, C-2 respond. Second due is Engine-1 or Engine-3, followed by Tower-1 and Rescue-1. Ambulance 1 or 2 responds to stand-by and provide additional personnel. If reported smoke or fire showing Town of Hopkinton requested automatically to respond mutual aid to cover Station-1, downtown. If situation warrants, Hopkinton diverted to scene, additional mutual responses follow the District 14 Mutual aid assignment running card

*Source: Ashland Fire Department Official Web-Site

In addition to the alarm assignments described above, the Ashland Fire Department dispatcher is responsible for implementing the mutual aid system and multiple alarm protocols. Incident commanders often request specific mutual aid assistance.

The Fire Department has a well-defined organization and deploys personnel and units in accordance with reasonable strategies, given the resources that are available. The Fire Department has several service limitations and will always be required to rely on automatic mutual aid and mutual aid. The number of calls for service and the limited number of firefighters available to respond to an incident indicate that modest staffing adjustments should be considered. One additional Firefighter/EMT on each group or shift would offer more flexibility for a response. For example, with five personnel on-duty, rather than four personnel, if two personnel are committed to an EMS incident, three personnel are available to respond to a fire or an EMS incident. Employing one additional Firefighter/EMT per shift would require the employment of five personnel.

To determine the actual number of personnel required in a fire department, it is necessary to establish a staffing factor. The staffing factor identifies the number of personnel required to fill one position 24 hours per day, 365 days per year. The staffing factor is a general measure of productivity, since it compares the number of hours worked to the hours scheduled to work. The staffing factor can be significantly affected by negotiated labor agreements which establish vacation and other leave practices.

In Ashland, it is difficult to calculate a true staffing factor because the Department is relatively small and an injury to one firefighter can have a significant effect on the Department. Based on our experience, assuming the current work schedule, it requires approximately 4.8 to 5.2 personnel to fill one position in a fire department 24 hours per day, 365 days per year. In other words, it requires approximately 1.2 to 1.3 persons to fill one on-duty shift position. As a general rule, it requires five firefighters to fill four positions.

To assess the Department's staffing factor, records of authorized leaves and time off are reviewed. The staffing factor is determined by the average leave time taken in the Department and the average time worked by personnel. To determine the average leave time, the total annual leave time for all personnel is divided by the number of incumbents assigned to fire operations. (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. The total hours scheduled to be worked divided by the actual hours worked results in the staffing factor, which can be used to calculate additional staff needs to make up for authorized leaves (time off).

RECOMMENDATION 3: The Town should increase the staffing of the Fire Department by two Firefighters/EMT-Bs-or EMT-Ps on each shift.

RECOMMENDATION 4: The Town should employ one additional staff officer to serve as second-in-command of the Fire Department.

RECOMMENDATION 5: The Fire Department should maintain an equipment complement of an aerial apparatus (quint), two front-line pumpers (one with a smaller wheel base), two ambulances, a rescue truck, and a brush truck. The Department should maintain a reserve pumper.

IV. POLICE DEPARTMENT ORGANIZATION AND SERVICES

To assess the facility needs for the Police Department, it is necessary to establish the potential number of personnel that will be employed by the Department during the next five to ten years and beyond. This chapter is designed to develop a plan for the organization and staffing of the Police Department. The review of the Police Department's organization and staffing required three consultants to make several visits to the Department to gather data, develop an understanding of the Department's level of service, and interview Department staff. The consultants reviewed information concerning workload, staffing and deployment policies, response strategies, command relationships and related functions.

DESCRIPTION OF THE CURRENT ORGANIZATION

A police department must be organized in an efficient manner to allow for effective use of available resources. Police departments are unique in several ways. For example, they operate 24 hours a day, 365 days a year; they rely on a paramilitary rank structure; a chain of command is used to ensure compliance with orders and directives; and officers at the lowest echelons of the organization operate with little direct supervision and exercise a high level of discretion.

The Ashland Police Department is organized in a traditional manner. All responsibility flows from the office of the Chief of Police. Personnel are deployed using a three-shift assignment system. Exhibit 8 lists the positions and number of personnel in each position.

EXHIBIT 8

POLICE DEPARTMENT EMPLOYEE COMPLEMENT

POSITION	NUMBER
Chief	1
Lieutenant	2
Sergeant	4
Detective Sergeant	1
Detective	2
Police Officer	17
Administrative Assistant	1
Records Administrative	1
Dispatcher	2
Total	31

The primary service element of a police department is the patrol function, which provides direct services to the public. A police department may also have specialized units, such as traffic enforcement and drug enforcement. In addition, there are numerous support functions. These include records, evidence and property control, and facility and fleet maintenance.

PATROL STAFFING

Patrol is a primary function of the Ashland Police Department; other functions are intended to supplement the patrol force. The number, type, and assignment of personnel within a police department is a matter of considerable importance. Because a police department is heavily labor-intensive, personnel costs typically represent up to 80 percent of a police department's operating budget. There is no universal formula to determine how many police officers and civilian employees are sufficient to provide a satisfactory level of services. While some authorities cite the Federal Bureau of Investigation's annual *Uniform Crime Report* as a source for staffing recommendations, this publication merely lists the average staffing levels for cities of different population ranges and does not purport to make recommendations on this subject.

There is no single satisfactory explanation to guide town officials when determining whether the staffing level of their police department is adequate.

Moreover, since each community is different and has unique problems requiring different kinds of police response, comparing one community to another is of limited value. Comparisons do provide information about how one community relates to another with regard to expenditures for police services, crime rates, or staffing levels; however, these comparisons should not be used to assess the adequacy of police staffing in any particular community.

The most reliable way of determining acceptable staffing levels for a police department is through an analysis of *workload* and the application of specific, generally accepted, principles concerning the distribution of police personnel. Any reliable analysis of workload depends on a reliable database that accurately reflects police activity as measured by calls for service, arrests, traffic accidents, and certain officer-initiated activity. The basic unit used in the analysis of police activity is the category referred to as “calls for service,” those calls received and logged by the police department that require the response of a uniformed police officer to a particular location for a particular purpose. Three primary pieces of information are needed to develop a sound staffing analysis: calls for service, the time it takes to respond to calls for service, and the average number of hours worked annually by officers.

For the purpose of this analysis, the consultants reviewed the total number of calls for service for 2003 through 2006. Exhibit 9 shows the number of calls for service for the four-year period.

EXHIBIT 9
CALLS FOR SERVICE 2003 THROUGH 2007

YEAR	NUMBER OF CALLS
2003	15,868
2004	15,121
2005	14,664*
2006	13,307*
2007	14,353*
Total	73,313
Average	14,663

* Dispatchers were laid-off. It appears that the reduced call volume is the result of Police Officers not properly recording calls for service. Officers were unfamiliar with dispatch computer operations.

To fully analyze the activity level, we analyzed the calls for service in detail. Exhibit 10 presents the calls for service data received for 2003 through 2006. The exhibit lists the major type of call and the number of calls in specific categories. The Department responded to an average of 14,666 calls for service from 2003 through 2007. A review of the record keeping system suggests that the Department may be underestimating calls for service.

EXHIBIT 10
CALLS FOR SERVICE BY CATEGORY – 2003 THROUGH 2006

TYPE	2003	2004	2005	2006*	AVERAGE
Arrest	280	325	412	428	361.3
Accident with Property Damage	519	478	490	466	488.3
Accident with Injuries	50	49	29		42.7
Assault	60	125	87	110	95.5
Alarm	803	750	700	687	735
Vandalism	138	105	74	147	116
Citation	1,586	1,189	1,992	1,639	1,601.5
Juvenile Complaint	45	54	114	82	73.8
Miscellaneous	12,387	12,046	10,866	9,813	11,278
Total	15,868	15,121	14,664	13,307	14,740

* The categories, accident with property damage and accident with injuries, were combined in 2006.

Exhibit 11 shows the number of traffic citations and traffic tickets issued from 2004 through 2007.

EXHIBIT 11
CITATIONS AND TRAFFIC TICKETS ISSUED 2004 THROUGH 2007*

YEAR	CITATIONS	TRAFFIC TICKETS
2004	1,189	311
2005	1,992	412
2006	1,639	369
2007*	1,500	270
Total	6,320	1,362

* The number of traffic citations and tickets for 2007 is estimated.

Exhibit 12 shows the average number of calls for service by category for 2003 through 2006.

EXHIBIT 12
MONTHLY AVERAGE OF CALLS FOR SERVICE BY CATEGORY – 2003 THROUGH 2006

TYPE	2003		2004		2005		2006	
	CALLS	MONTHLY AVG.	CALLS	MONTHLY AVG.	CALLS	MONTHLY AVG.	CALLS	MONTHLY AVG.
Arrest	280	23.3	325	27.1	412	34.3	428	35.7
Accident w/Property Damage	519	43.3	478	39.8	490	40.8	466	38.8
Accident with Injury	50	4.2	49	4.1	29	2.4		0.0
Assault	60	5.0	125	10.4	87	7.3	110	9.2
Alarm	803	66.9	750	62.5	700	58.3	687	57.3
Vandalism	138	11.5	105	8.8	74	6.2	147	12.3
Citation	1,586	132.2	1,189	99.1	1,992	166.0	1,639	136.6
Juvenile Complaint	45	3.8	54	4.5	114	9.5	82	6.8
Miscellaneous	12,387	1,032.3	12,046	1,03.8	10,866	905.5	9,813	817.8
Total	15,868		15,121		14,664		13,307	

Data are further evaluated by determining the average amount of time devoted to answering different types of calls for service. The average time to service a particular call is based on discussions with command staff and is reasonable, based on the consultants' experience. This average factors in the time used by one or more officers, by type of call. In the following three exhibits, we have estimated the number of hours committed to each incident, by type, for 2003, 2004, 2005, and 2006.

In Exhibit 13, the calls for service in 2003 are shown by category, followed by the average estimated time to handle a particular call, and the total time per type of call for service.

EXHIBIT 13**2003 CALLS FOR SERVICE****AVERAGE TIME PER TYPE OF INCIDENT AND TOTAL HOURS REQUIRED BY TYPE OF INCIDENT**

TYPE	TOTAL CALLS	AVG. TIME (HOURS)	TOTAL HOURS
Arrest	280	2.0	560
Accident with Property Damage	519	0.8	415.8
Accidents with Injuries	50	0.8	40
Assault	60	0.9	54
Alarm	803	0.3	321.2
Vandalism	138	0.2	27.6
Citations	1,586	0.3	475.8
Juvenile Complaint	45	0.3	13.5
Miscellaneous	12,387	0.4	4,954.8
Total	15,868		6,862.7

Exhibits 14, 15 and 16 show an analysis of calls for service in 2004, 2005, and 2006.

EXHIBIT 14**2004 CALLS FOR SERVICE****AVERAGE TIME PER TYPE OF INCIDENT AND TOTAL HOURS REQUIRED BY TYPE OF INCIDENT**

TYPE	TOTAL CALLS	AVG. TIME (HOURS)	TOTAL HOURS
Arrest	325	2.0	650
Accident with Property Damage	478	0.8	382.4
Accidents with Injuries	49	0.8	39.2
Assault	125	0.9	112.5
Alarm	750	0.3	225
Vandalism	105	0.2	21
Citations	1,189	0.3	356.7
Juvenile Complaint	54	0.3	16.2
Miscellaneous	12,046	0.4	4,825.6
Total	15,121		6,628.6

EXHIBIT 15
2005 CALLS FOR SERVICE

AVERAGE TIME PER TYPE OF INCIDENT AND TOTAL HOURS REQUIRED BY TYPE OF INCIDENT

TYPE	TOTAL CALLS	AVG. TIME (HOURS)	TOTAL HOURS
Arrest	412	2.0	824
Accident with property damage	490	0.8	392
Accidents with Injuries	29	0.8	23.2
Assault	87	0.9	78.3
Alarm	700	0.3	210
Vandalism	74	0.2	14.8
Citations	1,992	0.3	597.6
Juvenile Complaint	114	0.3	34.2
Miscellaneous	10,866	0.4	4,346.4
Total	14,664		6,525.5

EXHIBIT 16
2006 CALLS FOR SERVICE

AVERAGE TIME PER TYPE OF INCIDENT AND TOTAL HOURS REQUIRED BY TYPE OF INCIDENT

TYPE	TOTAL CALLS	AVG. TIME (HOURS)	TOTAL HOURS
Arrest	428	2.0	856
Accident with property damage	466	0.8	372.8
Accidents with Injuries		0.8	
Assault	110	0.9	99
Alarm	687	0.3	206.1
Vandalism	147	0.2	16.4
Citations	1,639	0.3	491.7
Juvenile Complaint	82	0.3	29.4
Miscellaneous	9,813	0.4	3,925.2
Total	13,307		5,996.6

Exhibit 17 indicates the time police officers devoted to responding to calls for service in 2003 through 2006. These data indicate that police officers devote an average of 6,502 hours to responding to calls for service. While there may be some calls for service that are not recorded, the Police Department should plan on using approximately 6,500 to 7,000 hours of patrol time responding to calls for service.

EXHIBIT 17
HOURS DEVOTED TO RESPONDING TO CALLS FOR SERVICE
(2003 THROUGH 2006)

<u>YEAR</u>	<u>HOURS</u>
2006	5,739.0
2005	6,234.1
2004	6,443.8
2003	6,712.3
Average	6,502.1

A police officer assigned to patrol duties must have sufficient time to perform routine preventive patrol, perform other administrative duties, such as meeting with his or her supervisor, and handle calls for service. The percent of time that should be devoted to each category of activity is open to discussion and will depend, to some extent, on the specific community and what it expects of its police department. In Ashland, 35 percent of an officer's time should be devoted to responding to calls for service; 35 percent should be devoted to directed or preventive patrol; and 30 percent should be devoted to administrative duties.

As we have suggested, approximately 6,500 to 7,000 hours would be required to respond to an estimated 15,000 to 16,000 calls for service annually. Based on the time required to respond to calls for service, a total of approximately 16,000 to 18,000 hours will be required to staff patrol operations. This time allotment allows time for preventive patrol and administrative duties. The allotment of time to various functions is displayed In Exhibit 18.

While calls for service have remained stable over the last several years, the Town should anticipate a growth of approximately 3,000 to 5,000 calls for service, assuming population growth during the next five to 10 years. Currently, the Town has approximately one call for service for each resident in the Town annually.

EXHIBIT 18
HOURS REQUIRED TO ANSWER CALLS FOR SERVICE

	PERCENT	2003	2004	2005	2006
Calls for Service	35%	6,862.5	6,628.6	6,525.5	5,996.6
Directed/Preventive Patrol	35%	6,862.7	6,628.6	6,525.5	5,996.6
Administrative Duties	30%	5,882.3	5,681.7	5,589	5,139.9
		19,607.5	18,938.9	18,640	17,133.1

The number of officers required to meet patrol staffing needs is established by determining the number of hours the average police officer works in a year. The consultants examined work records for 2003, 2004, 2005, and 2006 to review the actual hours patrol officers worked. Theoretically, each officer could work 2,920 hours a year (eight hours a day for 365 days); however, time off must be subtracted from this theoretical maximum. It is important to note that the current work schedule of police officers requires personnel to work approximately 1,950 hours. (There is a slight variation in the number of hours worked annually based on the number of days in a year.) It should be noted that we assume that the amount of time off will increase as the Department personnel gain more seniority and are entitled to more authorized leave time.

The time off per officer is shown in Exhibit 19.

EXHIBIT 19
TIME OFF IN 2003 THROUGH 2005 (IN HOURS)

YEAR	2003-04 (BASED ON 15 OFFICERS)*	2004-05 (BASED ON 17 OFFICERS)	2005-06 (BASED ON 16 OFFICERS)**
Regular Days Off	832	832	832
Sick Leave	55	62.1	58
Vacation Leave	101	78	103
Personal Leave	25	25	0
Compensatory Time Off	27	26	66
Excused Absences	2	1.5	10
Other Leave	17	12	10
Bereavement Leave	0	0.5	1
Suspended	0	47	14
Injury-on-Duty	0	0	0
Training	48	48	48
Total	1,107	1,133	1,142

* 2003 The leave time of 15 officers was used to establish the level of time off. Three officers were in the police academy during this time period and have no recorded leave.

** 2005 The leave time of 16 officers was used to establish the level of time off. Two officers were in the police academy during this time period and have no recorded leave.

The exhibit above shows the average number of “time off” hours. To establish the average hours worked by officers, the average time off is subtracted from the theoretical hours available to work. The average patrol officer worked 1,813 hours in FY ‘04, 1,787 hours in FY ‘05, and 1,778 hours in FY ‘06. To fill one position annually (24 hours per day, 365 days per year) requires 1.6 officers. (See detailed discussion below.) Note that in the calculations below, the consultants rounded upward. This practice is adopted because of the need to estimate data.

It is important to note that the Department records time off on a fiscal year basis, but calls for service are recorded on a calendar year basis. As a result, it was necessary to compare fiscal year time-off data with calendar year call for service data. To ensure that our comparisons were accurate, we examined three years of data.

FY '04

2,920 (theoretical hours available) divided by 1,813 hours (hours worked in 2003) = 1.6 (officers needed to fill one shift, eight hours per day, 365 days per year).

19,180 (total patrol hours required) divided by 2,920 (theoretical hours available) = 6.6 officers (officers needed to fill one shift eight hours per day, 365 days per year) = 12 officers (rounded up).

FY '05

2,920 (theoretical hours available) divided by 1,787 hours (hours worked in 2004) = 1.6 (officers needed to fill one shift, eight hours per day, 365 days per year).

18,412 (total patrol hours required) divided by 2,920 (theoretical hours available) = 6.3 officers (officers needed to fill one shift eight hours per day, 365 days per year) = 11 officers (rounded up).

FY '06

2,290 (theoretical hours available) divided by 1,778 hours (hours worked in 2005) = 1.6 (officers needed to fill one shift, eight hours per day, 365 days per year).

17,815 (total patrol hours required) divided by 2,920 (theoretical hours available) = 6.1 officers (officers needed to fill one shift eight hours per day, 365 days per year) = 10 officers (rounded up).

These data indicate that a minimum of 11 or 12 patrol officers are required to staff patrol services for the Police Department. The analysis does not account for any special programs provided by the Police Department. For example, the Department currently assigns one officer to the DARE Program at least 17 weeks annually.

It appears that not all calls for service were recorded. The failure to record calls for service appears to have occurred when the number of civilian dispatchers was reduced. It appears that police officers providing dispatch functions may not have been as skilled at the data recording techniques as the civilian dispatchers.

Notwithstanding any recording deficiencies, the data do suggest that the Police Department has some capability to absorb additional calls for service,

assuming dispatch positions are filled by civilians. However, as the population increases, the capability of the Police Department to absorb calls is diminished. We estimate that the Department should be able to absorb an additional 1,500 to 2,500 calls for service. The Police Department should develop the analytical capability to assess patrol staffing needs.

***RECOMMENDATION 6:** The Police Department should continue to employ the current complement of patrol personnel.*

***RECOMMENDATION 7:** The Police Department should employ one additional Police Sergeant.*

Assuming a modest population growth and the anticipated increase in authorized time off, we estimate that there will be a need for a modest increase in the size of the patrol force over the next five to 10 years. The Department will need an additional two to three patrol officers.

***RECOMMENDATION 8:** The Police Department should plan to employ two to three additional police officers in the next five to 10 years.*

***RECOMMENDATION 9:** The Police Department should enhance its data analysis capability.*

V. EMERGENCY COMMUNICATION

ORGANIZING EMERGENCY COMMUNICATION IN ASHLAND

Communication and information is critical to all police and fire emergency response agencies. Dispatchers, or telecommunicators, translate information into an emergency response, a call for service, or otherwise address a problem. Telecommunicators are trained civilian personnel. The type and level of training provided to personnel is a function of the services provided by the agency or agencies served.

The Fire Department provides training to allow for the dispatch of fire and emergency medical services. The Police Department requires dispatchers who assist in managing information requests and dispatching units in accordance with policies and protocols. Dispatch functions are more complex than is often acknowledged. Each call requires the dispatcher to apply a protocol to a specific situation and make an immediate judgement (usually without supervisory review) about the type of response required. A central dispatch function requires personnel to have considerable familiarity with the different types of calls for service and the resources and capabilities of each responding emergency department.

Thus, a central dispatch service requires comprehensive training relevant to the mission, capabilities and functions of each department. In order to run smoothly, well-defined and tested procedures and an effective quality control system that covers significant operational functions of each responding department are required.

Currently, the Fire Department and the Police Department maintain separate dispatch operations. The Police Department is the public service answering point (PSAP), and upon the receipt of a fire or EMS call for service the dispatcher transfers the call to the Fire Department. Each department is required to staff a dispatch position. The Fire Department staffs its dispatch functions with Firefighters/Dispatchers. The Police Department employs several civilian dispatchers, but is required to fill any vacant dispatch position with a police officer. Thus, there are two Town employees, often police officers or firefighters, assigned to dispatch functions. Under the current organizational arrangement, the Police Department is required to fill 8,760 hours of dispatch time each year (365

days x 24 hours) and the Fire Department must also fill 8,760 hours of dispatch time each year. Thus, there are 17,520 hours of dispatch services that must be scheduled.

Given the relatively small size of the Police and Fire Departments in Ashland, there are three possible approaches to organizing emergency communication functions:

- ▶ *Option 1 - Separate police and fire communication/dispatch operations* (current situation). Under this approach, there would be no changes in the current arrangement.
- ▶ *Option 2 - Consolidate the communication functions within the Fire Department or within the Police Department.* Under this model, a communication department would be established in either the Fire Department or the Police Department. The communication unit would have responsibility for dispatching both fire and police units.
- ▶ *Option 3 - Consolidate the communication functions in a separate department of communication.* The emergency communication Department could report to the Town Manager. This would entail establishing an oversight committee of fire and police command personnel to ensure that effective training and protocols are in place.

Option 1 (separate police and fire communication/dispatch operations) is the least desirable alternative. Under this option, both Police and Fire Department civilian or uniformed personnel would continue to provide dispatch services. Both departments would maintain and operate, to a certain extent, parallel communication centers. There is considerable duplication of facilities and personnel in this option. Under this approach, police officers and firefighters are utilized for functions that detract from the exercise of the primary public safety functions for which they are trained.

Option 2 and Option 3 (consolidate the communication functions within the Fire Department or the Police Department, or consolidate the communication functions in a separate Department of Communication reporting to the Town Manager) have some similarities. There should be a joint communication center which dispatches fire, police, and EMS personnel.

While Option 2 is a viable alternative, it presents the potential for some conflicts between the Fire Department and the Police Department regarding responsibilities and establishing policies and procedures. Currently, personnel report that there is a good working relationship between the departments.

Option 3 is fundamentally similar to Option 2, but proposes a separate communication department, or unit, reporting to the Town Manager, under the direction of a Communication Supervisor. There would be an oversight committee composed of command representatives of the Fire and Police Departments. It would be the responsibility of these officers to ensure that personnel are appropriately trained to meet the needs of both departments. It should be noted that an oversight committee could also be formed under Option 2. The Town Manager could chair this committee.

The consolidation of communication resources would require clearly defined response protocols, as well as emergency medical dispatch training for all personnel. There should also be a mechanism for quality review and improvement, ensuring that actual dispatch functions and response to calls are constantly evaluated. It is essential that dispatchers are familiar with field operations. One approach to achieving familiarity with fire and police field operations is to have an ongoing formal ride-along and familiarization program for new dispatchers. Under this type of program, dispatchers spend time responding to calls with fire, EMS, and police personnel to become familiar with each system's needs.

***RECOMMENDATION 10:** The Town should consolidate police and fire emergency communication when a new police or fire facility is available. Planning for any new facility should consider the space and system needs of a consolidated communication operation.*

***RECOMMENDATION 11:** The Town should explore alternatives for management of the consolidated communication center:*

- ▶ *consolidation of the Police Department and Fire Department communication units into one new department reporting to the Town Manager.*
- ▶ *consolidation of the Police Department and Fire Department communication functions under the direction of the Police Department or the Fire Department*

STAFFING THE COMMUNICATION CENTER

In any new consolidated communication center, dispatch personnel should be civilian personnel. Civilians would be employed and trained specifically as dispatchers and would not have additional emergency response duties. Employing civilian personnel is somewhat less expensive than employing sworn firefighters and police personnel.

For Ashland to staff a consolidated communication center at the basic level will require the employment of at least three full-time and six to eight part-time personnel. Ideally, it would be better to employ five full-time personnel and four to five part-time dispatchers.

It will be necessary for the communication center to operate 24 hours a day, 365 days a year. This means it is necessary to fill 8,760 hours of dispatch time ($365 \times 24 \text{ hours} = 8,760$). Assuming personnel work conventional shifts of eight hours and 40 hours per week (2,080 hours per year), more than four personnel (4.2 persons) are required to fill the 8,760 hours. However, it is also necessary to account for authorized time off for employees. In reality, a typical employee assigned to work 40 hours per week generally works 1,700 to 1,800 hours annually. In Exhibit 20, we have estimated the work hours for dispatch personnel:

**EXHIBIT 20
DISPATCHER WORK HOURS**

Total hours scheduled	2,080
Time off	
Holidays (12 days x 8.0 hours)	96
Vacation (10 days x 8.0 hours)	80
Sick (5 days x 8.0 hours)	40
Personal (2 days x 8.0 hours)	16
Training (5 days x 8.0 hours)	40
Estimated hours off-duty	272
Estimated hours worked	1,808

Since there are 8,760 hours of dispatch time to be filled, we divided 8,760 by the number of hours an employee can be expected to work, ($8,760/1,808 = 4.85$). Thus, it requires five dispatchers (4.8 rounded to 5.0) to fill one position 24 hours a day, 365 days a year.

It should be noted that we have estimated the hours to fill one position 24 hours per day, 365 days per year. However, because of increased workload, it will be necessary to have two dispatchers on-duty during special events or on weekends. We estimate that an additional 1,500 to 2,000 hours of dispatch time will be required to provide coverage during these times. Exhibit 21 provides a conservative estimate of the number of dispatch hours that should be filled annually.

EXHIBIT 21
ESTIMATED TOTAL DISPATCH HOURS NEEDED

CATEGORY	NUMBER OF HOURS
Regular hours	8,760
Additional hours	1,000 to 2,000
Total	9,760 to 10,760

One dispatcher should be designated as Chief Dispatcher, for administrative purposes. The Chief Dispatcher would work a shift like all dispatchers, but would have additional responsibility for scheduling and coordinating training and selective administrative record keeping. A Chief Dispatcher should be compensated at approximately 10 percent above a dispatcher's pay. In summary, the proposed consolidated communication center should be staffed with one full-time Chief Dispatcher, four or five full-time dispatchers, and six to eight part-time dispatchers.

Currently, the Town assigns a police officer/or civilian dispatcher and a civilian fire dispatcher to provide dispatch services 24 hours per day, 365 days per year. Under the consolidated model, it will not be necessary to have two personnel on-duty at all times. We have estimated that it is necessary to budget for approximately 9,760 to 10,760 hours of dispatch service each year to meet the required minimum levels of services.

EXHIBIT 22
CURRENT NUMBER OF DISPATCH HOURS USED VS. ESTIMATED HOURS REQUIRED*

TYPE OF DISPATCH OPERATION	ESTIMATED DISPATCH HOURS REQUIRED
Independent Police Department & Fire Department dispatch functions	17,520
Consolidated center	9,760 - 10,760

EXHIBIT 23
COMMUNICATION CENTER STAFFING

POSITION	NUMBER OF PERSONNEL	
	ALTERNATIVE 1	ALTERNATIVE 2
Chief Dispatcher *	1	1
Full-time Dispatcher	3-4	4-5
Part-time Dispatcher	6-8	3-5

* The Chief Dispatcher would work a shift, in addition to having other administrative responsibilities, such as scheduling and administrative report generation.

RECOMMENDATION 12: *The Town should staff the communication center with trained civilian personnel.*

VI. RESPONSE EVALUATION, RESPONSE CAPABILITY, COMPUTER MAPPING AND DEPLOYMENT

The purpose of this chapter is to assess the current location of facilities and the ability of the departments to effectively respond from these locations. In addition, the analysis determines a possible location for future facilities, assuming a range of constraints.

The location of a fire station is more critical than the location of a police station. The response capability of a fire department is a function of station location and personnel available to respond. The personnel deployment methodology for a police department and a fire department are based on different response principles. Fire department personnel (fire and EMS) are deployed in fixed locations to provide reasonable response to all areas of a community within reasonable time lines. Fire and EMS response requires the deployment of a team of personnel. Police personnel are deployed as mobile units through a community.

The consultants examined a number of possible sites for fire stations and police stations in the Town. A variety of sites along Union Street, West Union Street, Waverly Street and Homer Street were reviewed.

There are a number of service benchmarks and factors which need to be considered when siting a fire station. The benchmarks present response time measures and staffing goals and also indicate that these response time performance objectives should be achieved in at least 90 percent of the incidents. The benchmarks presented below reflect National Fire Protection Standard 1710, and are designed for predominately career (full-time) fire departments. 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.*

The Ashland Fire Department must use a combination of resources to make progress in meeting NFPA 1710 response objectives. The Department should continue to rely on the call-back of off-duty personnel and the use of automatic mutual aid from adjacent communities for support during a major incident. However, for purpose of analysis, the response time benchmarks are used to allow us to measure the emergency response system in Ashland.

FIRE STATION LOCATION CONSIDERATIONS

When considering fire station locations, it is important to recognize that there are siting factors which influence the actual location of facilities. Whenever possible, fire station location and design should incorporate the basic features listed below. However, it is critical to note that there are many mitigating factors which affect the location of stations, such as available resources to pay for a facility and the availability of land. The location of a new fire station is often a result of compromises which reflect local circumstances.

Factors to consider when locating fire stations are listed below.

- ▶ 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 expansion.

- ▶ 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, work space, and exercise facilities.
- ▶ A fire station should be located to minimize risks from natural or manmade hazards.

A 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 safety standards.

- ▶ 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.
- ▶ Kitchens, sleeping areas, and bathrooms must be provided.

MAPPING METHODOLOGY

Response coverage provided by the two existing fire stations in Ashland 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 Fire Department response throughout the Town.

The mapping methodology consists of the following steps:

- ▶ Prepare a digitized base map representing the Ashland street and highway network.
- ▶ Locate the fire station to be analyzed with respect to that network.

- ▶ Assign appropriate road speeds to reflect reasonable response expectations.
- ▶ Generate eight maps and statistical exhibits indicating travel times from the fire stations in one-minute increments 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 two fire stations. In order to do this, the longitude and latitude of the fire station location were established and inserted on the digitized street network and speed assignments were made. The data indicating the population served within travel time increments is taken from the TIGER files (digitized maps prepared by the U. S. Census Department), which uses 2000 population.

COMPUTER-GENERATED MAPS

This report contains five maps designed to analyze the response capability from the current fire station locations, as well as from an alternative fire station location. The alternative station site is a theoretical representation developed for analysis purposes; no specific site has been selected. A station sited in the general area of the hypothetical *Location X* would result in essentially the same data displayed in this report. The travel time maps were developed using the following travel speed assumptions:

STREET CATEGORY	SPEED ASSUMPTIONS/MILES PER HOUR
Route 135 and Route 126	33 MPH
Collector streets	25 MPH
Local streets	20 MPH

These speed assumptions are based on a discussion with personnel and site visits by the consultants, which included an over-the-road survey of all existing stations and areas of the Town. The speeds are designed to take into account different conditions likely to be encountered, including the type of road, time of day, weather, traffic, and roadway conditions. The maps use a color coded format.

TRAVEL TIME MAPS

Exhibit 24 lists the maps presented in this chapter. Map 1 provides a general base map and Maps 2 through 5 display travel time in one-minute increments. Maps 2 through 4 also contain a numbering system which is associated with the time intervals. For example, number 1 identifies the color-coded map contours which reflect a one-minute time increment. Each map is accompanied by mapping data with three measures indicating area, street miles, and population covered in time increments.

EXHIBIT 24 LIST OF MAPS

Map 1	Location of Current Stations
Map 2	Travel Time from Station 1
Map 3	Travel Time from Station 2
Map 4	Travel Time from Station 1 and Station
Map 5	Travel Time from Location X

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 one minute or less for dispatching and one minute or less for turn-out time. 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.

Map 1 indicates the location of two existing stations. The locations are shown on a street map of Ashland. Station 1 is located at 151 Main Street; Station 2 is located at 70 Cedar Street.

Map 2 shows the response area within one-minute time increments from Station 1, Central Station (151 Main Street). More than 39.9 percent of street miles are covered from Station 1 within four minutes travel time (six minutes total response time). Within eight minutes travel time (10 minutes total response time), units responding from Station 1 cover 88.8 percent of the Town's area, 94.7 percent of the street miles, and 89.5 percent of the population.

Map 3 shows the response area within one-minute time increments from Station 2, Headquarters Station (70 Cedar Street). A fire or EMS unit responding from Station 2 is able to cover 25.7 percent of the total street miles in the Town within four minutes travel time; within eight minutes travel time, a response unit can cover 72.7 percent of the total street miles in the Town. The Department currently deploys its primary response personnel at Station 1 (three firefighters) and the officer in command of the shift is deployed at Station 2.

Map 4 shows the two existing stations operating together as a system. Coverage data derived from the maps show that the two stations working in an integrated manner provide somewhat better coverage than either Station 1 or Station 2 responding separately. However, the Department currently deploys its primary response crew from Station 1. Thus, Map 4 displays a theoretical response capability which assumes that there is a response team located at both Station 1 and Station 2. Map 4 indicates that approximately 59.3 percent of street miles are covered from both Station 1 and Station 2 within four minutes travel time. Within eight minutes travel time (ten minutes total response time) units responding from Station 1 and Station 2 would cover approximately 97.5 percent of the street miles in the Town.

Map 5 illustrates coverage from a hypothetical fire station operating in the general area of Location X, a generalized location in the eastern sector of the Town, south of Route 135. Map 5 indicates that approximately 38.7 percent of street miles are covered from Location X within four minutes travel time. Within eight minutes travel time (ten minutes total response time) units responding from Location X would cover approximately 86.9 percent of the street miles in the Town.

MAPPING DATA

Data displayed in the following exhibits are derived from Maps 2, 3, 4 and 5. These data indicate the area (square miles), streets (miles), and estimated population served by the current system. The exhibits present data in one-minute time intervals (one to six minutes). In addition, cumulative summaries indicate the total coverage within specific time parameters.

Note: The maps and data displayed 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.

Exhibit 25, *Travel Time from Station 1 - Area, Street Miles, and Population Covered (within each time segment)*, presents the travel time data associated with Map 2 and displays the coverage provided with a response from Station 1. For example, 4.4 percent of road miles are covered within one minute; however, within two minutes, an additional 10.6 percent of road miles are covered.

Exhibit 26, *Travel Time from Station 1 - Area, Street Miles, and Population Covered (cumulative response)*, presents the travel time data associated with Map 2 and displays the cumulative area, street miles, and population covered in each time increment. For example, the data indicate that the Fire Department can cover 15.0 percent of the road miles in the Town within two minutes; within six minutes travel time, fire units could cover 69.5 percent of roads.

Exhibit 27, *Travel Time from Station 2 - Area, Street Miles, and Population Covered (within each time segment)*, presents the travel time data associated with Map 3 and displays the coverage provided with a response from Station 2.

Exhibit 28, *Travel Time from Station 2 - Area, Street Miles, and Population Covered (cumulative response)*, presents the travel time data associated with Map 3 and displays the cumulative area, street miles, and population covered in each time increment. For example, the data indicate that the Fire Department can cover 8.3 percent of the road miles in the Town within two minutes; within six minutes travel time, fire units could cover 57.4 percent of roads.

Exhibit 29, *Travel Time from Station 1 and Station 2 - Area, Street Miles, and Population Covered (within each time segment)*, presents the travel time data associated with Map 4 and displays the coverage provided with a response from each station at the same time.

Exhibit 30, *Travel Time from Station 1 and Station 2 - Area, Street Miles, and Population Covered (cumulative response)*, presents the travel time data associated with Map 4 and displays the coverage provided with a response from each station at the same time. For example, the Fire Department responding from Station 1 and Station 2 at the same time can cover 24.2 percent of the road miles in the Town within two minutes; within six minutes travel time, fire units can cover 82.7 percent of roads.

Exhibit 31, *Travel Time from Location X (Theoretical Location) - Area, Street Miles, and Population Covered (within each time segment)*, presents travel time data associated with Map 5, which represents the possible response from a station in the general area of Location X.

Exhibit 32, *Travel Time from Location X (Theoretical Location) - Area, Street Miles, and Population Covered (cumulative response)*, presents travel time data associated with Map 5. For example, data generated from the mapping indicate that the Fire Department could cover 8.3 percent of the road miles in the Town within two minutes; within six minutes travel time, fire units could cover 57.4 percent of roads.

The following definitions apply in Exhibits 25 through 32: one minute or less equals 59 seconds or less; one to two minutes equals 60 seconds to 119 seconds; two to three minute equals 120 seconds to 179 seconds, etc.

The following exhibits present the statistical representation of the computer maps as described above.

EXHIBIT 25
RESPONSE CAPABILITY FROM STATION 1
AREA, STREET MILES, AND POPULATION COVERED (WITHIN EACH TIME SEGMENT)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.23	1.8%	3.66	4.4%	206	1.4%
1 to 2 minutes	0.85	6.6%	8.84	10.6%	861	5.9%
2 to 3 minutes	1.38	10.7%	10.63	12.7%	1,460	9.9%
3 to 4 minutes	1.59	12.3%	10.2	12.2%	1,781	12.1%
4 to 5 minutes	1.8	14.0%	10.73	12.8%	2,247	15.3%
5 to 6 minutes	2.05	15.9%	14.01	16.8%	2,561	17.5%
6 to 7 minutes	2.36	18.3%	13.39	16.0%	2,622	17.9%
7 to 8 minutes	1.23	9.5%	7.69	9.2%	1,402	9.6%
8 to 9 minutes	0.45	3.5%	1.51	1.8%	548	3.7%
9 to 10 minutes	0.21	1.6%	1.4	1.7%	280	1.9%
10 to 11 minutes	0.75	5.8%	1.55	1.9%	706	4.8%
Total	12.9	100.0%	83.61	100.0%	14,674	100.0%

EXHIBIT 26
RESPONSE CAPABILITY FROM STATION 1
AREA, STREET MILES, AND POPULATION COVERED (CUMULATIVE)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.23	1.8%	3.66	4.4%	206	1.4%
1 to 2 minutes	1.08	8.4%	12.5	15.0%	1,067	7.3%
2 to 3 minutes	2.46	19.1%	23.13	27.7%	2,527	17.2%
3 to 4 minutes	4.05	31.4%	33.33	39.9%	4,308	29.4%
4 to 5 minutes	5.85	45.3%	44.06	52.7%	6,555	44.7%
5 to 6 minutes	7.9	61.2%	58.07	69.5%	9,166	62.5%
6 to 7 minutes	10.26	79.5%	71.46	85.5%	11,738	80.0%
7 to 8 minutes	11.45	88.8%	79.15	94.7%	13,140	89.5%
8 to 9 minutes	11.94	92.6%	80.66	96.5%	13,688	93.3%
9 to 10 minutes	12.15	94.2%	82.06	98.1%	13,968	95.2%
10 to 11 minutes	12.9	100.0%	83.61	100.0%	14,674	100.0%

EXHIBIT 27
RESPONSE CAPABILITY FROM STATION 2
AREA, STREET MILES, AND POPULATION COVERED (WITHIN EACH TIME SEGMENT)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.17	1.3%	2.3	2.8%	266	1.8%
1 to 2 minutes	0.47	3.6%	4.64	5.5%	729	5.0%
2 to 3 minutes	0.58	4.5%	4.66	5.6%	885	6.0%
3 to 4 minutes	1.02	7.9%	9.92	11.9%	1,484	10.1%
4 to 5 minutes	1.53	11.9%	15.4	18.4%	2,082	14.2%
5 to 6 minutes	1.64	12.7%	11.09	13.3%	2,122	14.5%
6 to 7 minutes	1.25	9.7%	7.44	8.9%	1,369	9.3%
7 to 8 minutes	1.3	10.1%	5.36	6.4%	1,464	10.0%
8 to 9 minutes	0.85	6.6%	4.97	5.9%	871	5.9%
9 to 10 minutes	0.85	6.6%	5.05	6.0%	735	5.0%
10 to 11 minutes	0.99	7.7%	5.98	7.2%	786	5.4%
11 to 12 minutes	0.99	7.7%	3.91	4.7%	784	5.3%
12 to 13 minutes	0.33	2.6%	1.1	1.3%	265	1.8%
13 to 14 minutes	0.16	1.2%	0.47	0.6%	129	0.9%
14 to 15 minutes	0.77	6.0%	1.32	1.6%	703	4.8%
Total	12.9	100.0%	83.61	100.0%	14,674	100.0%

EXHIBIT 28
RESPONSE CAPABILITY FROM STATION 2
AREA, STREET MILES, AND POPULATION COVERED (CUMULATIVE)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.17	1.3%	2.3	2.8%	266	1.8%
1 to 2 minutes	0.64	5.0%	6.94	8.3%	995	6.8%
2 to 3 minutes	1.22	9.5%	11.6	13.9%	1,880	12.8%
3 to 4 minutes	2.24	17.4%	21.52	25.7%	3,364	22.9%
4 to 5 minutes	3.77	29.2%	36.92	44.2%	5,446	37.1%
5 to 6 minutes	5.41	41.9%	48.01	57.4%	7,568	51.6%
6 to 7 minutes	6.66	51.6%	55.45	66.3%	8,937	60.9%
7 to 8 minutes	7.96	61.7%	60.81	72.7%	10,401	70.9%
8 to 9 minutes	8.81	68.3%	65.78	78.7%	11,272	76.8%
9 to 10 minutes	9.66	74.9%	70.83	84.7%	12,007	81.8%
10 to 11 minutes	10.65	82.6%	76.81	91.9%	12,793	87.2%
11 to 12 minutes	11.64	90.2%	80.72	96.5%	13,577	92.5%
12 to 13 minutes	11.97	92.8%	81.82	97.9%	13,842	94.3%
13 to 14 minutes	12.13	94.0%	82.29	98.4%	13,971	95.2%
14 to 15 minutes	12.9	100.0%	83.61	100.0%	14,674	100.0%

EXHIBIT 29
RESPONSE CAPABILITY FROM STATION 1 & STATION 2
AREA, STREET MILES, AND POPULATION COVERED (WITHIN EACH TIME SEGMENT)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.43	3.3%	6.73	8.0%	520	3.5%
1 to 2 minutes	1.51	11.7%	13.51	16.2%	1,903	13.0%
2 to 3 minutes	1.82	14.1%	14.2	17.0%	2,168	14.8%
3 to 4 minutes	2.17	16.8%	15.12	18.1%	2,640	18.0%
4 to 5 minutes	1.83	14.2%	9.89	11.8%	2,327	15.9%
5 to 6 minutes	1.6	12.4%	9.66	11.6%	1,907	13.0%
6 to 7 minutes	1.67	12.9%	8.5	10.2%	1,582	10.8%
7 to 8 minutes	0.86	6.7%	3.95	4.7%	709	4.8%
8 to 9 minutes	0.21	1.6%	0.52	0.6%	68	1.1%
9 to 10 minutes	0.8	6.2%	1.53	1.8%	750	5.1%
Total	12.9	100.0%	83.61	100.0%	14,674	100.0%

EXHIBIT 30
RESPONSE CAPABILITY FROM STATION 1 & STATION 2
AREA, STREET MILES, AND POPULATION COVERED (CUMULATIVE)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.43	3.3%	6.73	8.0%	520	3.5%
1 to 2 minutes	1.94	15.0%	20.24	24.2%	2,423	16.5%
2 to 3 minutes	3.76	29.1%	34.44	41.2%	4,591	31.3%
3 to 4 minutes	5.93	46.0%	49.56	59.3%	7,231	49.3%
4 to 5 minutes	7.76	60.2%	59.45	71.1%	9,558	65.1%
5 to 6 minutes	9.36	72.6%	69.11	82.7%	11,465	78.1%
6 to 7 minutes	11.03	85.5%	77.61	92.8%	13,047	88.9%
7 to 8 minutes	11.89	92.2%	81.56	97.5%	13,756	93.7%
8 to 9 minutes	12.1	93.8%	82.08	98.2%	13,924	94.9%
9 to 10 minutes	100.0%	83.61	100.0%	14,674	100.0%	100.0%

Exhibits 31 and 32 show the anticipated response from Location X.

EXHIBIT 31
RESPONSE CAPABILITY FROM LOCATION X
AREA, STREET MILES, AND POPULATION COVERED (WITHIN EACH TIME SEGMENT)

	AREA (SQ. MILES)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.16	1.2%	2.34	2.8%	222	1.5%
1 to 2 minutes	0.67	5.2%	7.76	9.3%	850	5.8%
2 to 3 minutes	1.26	9.8%	12.01	14.4%	1,576	10.7%
3 to 4 minutes	1.46	11.3%	10.33	12.4%	1,759	12.0%
4 to 5 minutes	1.97	15.3%	12.83	15.3%	2,469	16.8%
5 to 6 minutes	1.63	12.6%	9.17	11.0%	2,023	13.8%
6 to 7 minutes	1.56	12.1%	9.81	11.7%	1,916	13.1%
7 to 8 minutes	1.31	10.2%	8.5	10.2%	1,379	9.4%
8 to 9 minutes	1.3	10.1%	7.04	8.4%	1,136	7.7%
9 to 10 minutes	0.57	4.4%	1.97	2.4%	449	3.1%
10 to 11 minutes	0.21	1.6%	0.39	0.5%	164	1.1%
11 to 12 minutes	0.8	6.2%	1.46	1.7%	731	5.0%
Total	12.9	100.0%	83.61	100.0%	14,674	100.0%

EXHIBIT 32
RESPONSE CAPABILITY FROM LOCATION X
AREA, STREET MILES, AND POPULATION COVERED (CUMULATIVE)

	AREA (SQ.)	PERCENT	STREET MILES	PERCENT	2000 POPULATION	PERCENT
1 minute or less	0.16	1.2%	2.34	2.8%	222	1.5%
1 to 2 minutes	0.83	6.4%	10.01	12.0%	1,072	7.3%
2 to 3 minutes	2.09	16.2%	22.02	26.3%	2,648	18.0%
3 to 4 minutes	3.55	27.5%	32.35	38.7%	4,407	30.0%
4 to 5 minutes	5.52	42.8%	45.18	54.0%	6,876	46.9%
5 to 6 minutes	7.15	55.4%	54.35	65.0%	8,899	60.6%
6 to 7 minutes	8.71	67.5%	64.16	76.7%	10,815	73.7%
7 to 8 minutes	10.02	77.7%	72.66	86.9%	12,194	83.1%
8 to 9 minutes	11.32	87.8%	79.7	95.3%	13,330	90.8%
9 to 10 minutes	11.89	92.2%	81.67	97.7%	13,779	93.9%
10 to 11 minutes	12.1	93.8%	82.06	98.1%	13,943	95.0%
12 to 13 minutes	12.9	100.0%	83.61	100.0%	14,674	100.0%

Exhibit 33 compares response coverage in selected time segments from Stations 1 and 2, Station 1 (only), Station 2 (only), and a theoretical Location X. The exhibit shows area covered, road miles covered, and population served within four, six and eight minutes travel time.

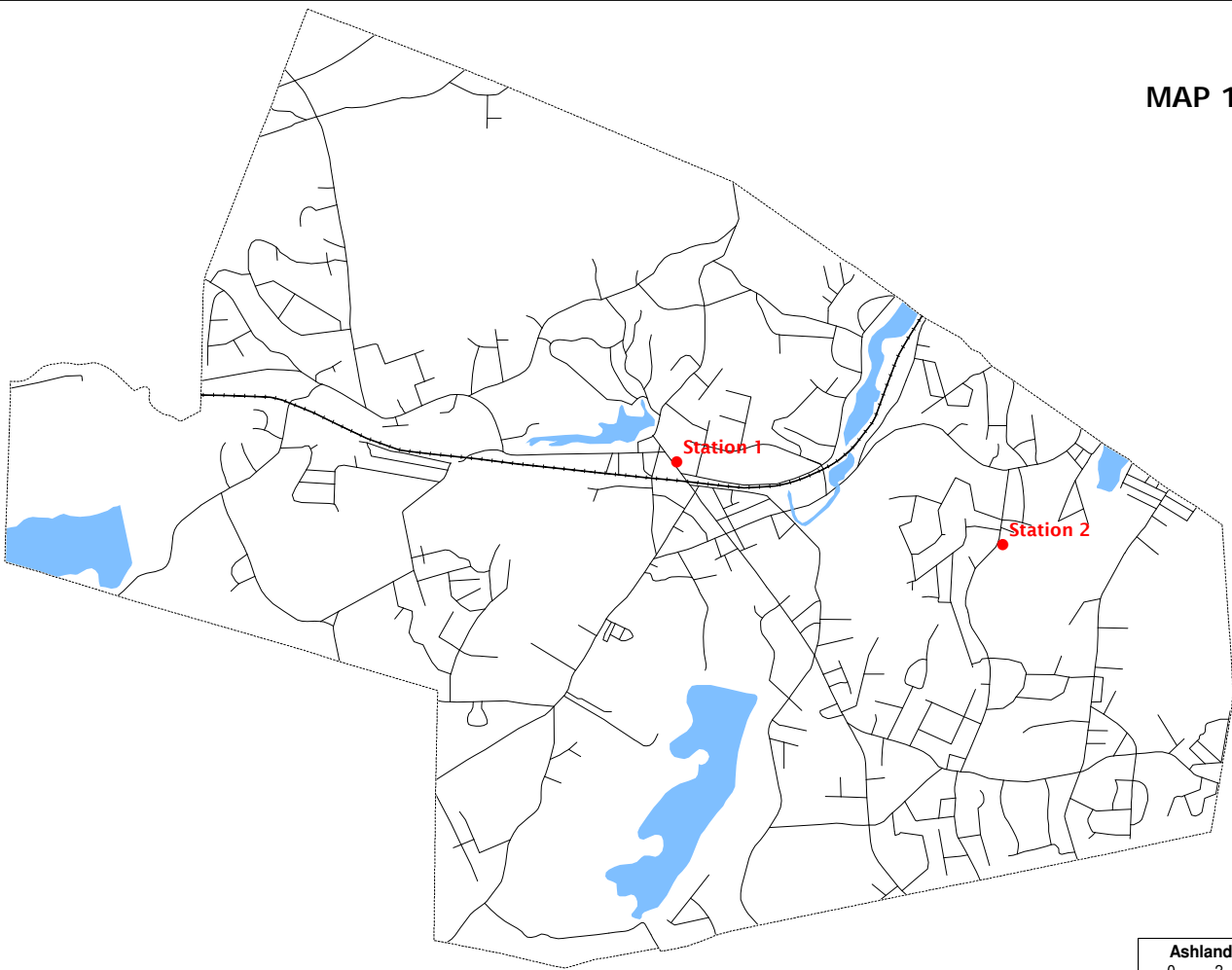
EXHIBIT 33

**CURRENT STATION CONFIGURATION (STATION 1 AND 2) COMPARED TO STATION 1 (ONLY),
STATION 2 (ONLY) AND THEORETICAL LOCATION X
(WITHIN FOUR, SIX AND EIGHT MINUTES TRAVEL TIME)**

	PERCENT OF SQUARE MILES	PERCENT OF STREET MILES	PERCENT OF POPULATION
FOUR MINUTES TRAVEL TIME			
Existing Two-Station Configuration	46.0	59.3	49.3
Station 1 Only	31.4	39.9	29.4
Station 2 Only	17.4	25.7	22.9
Theoretical Location X	27.5	38.7	30.0
SIX MINUTES TRAVEL TIME			
Existing Two-Station Configuration	72.6	82.7	78.1
Station 1 Only	61.2	69.5	62.5
Station 2 Only	41.9	57.4	51.6
Theoretical Location X	55.4	65.0	60.6
EIGHT MINUTES TRAVEL TIME			
Existing Two-Station Configuration	92.2	97.5	93.7
Station 1 Only	88.8	94.7	89.5
Station 2 Only	61.7	72.7	70.9
Theoretical Location X	77.7	86.9	83.1

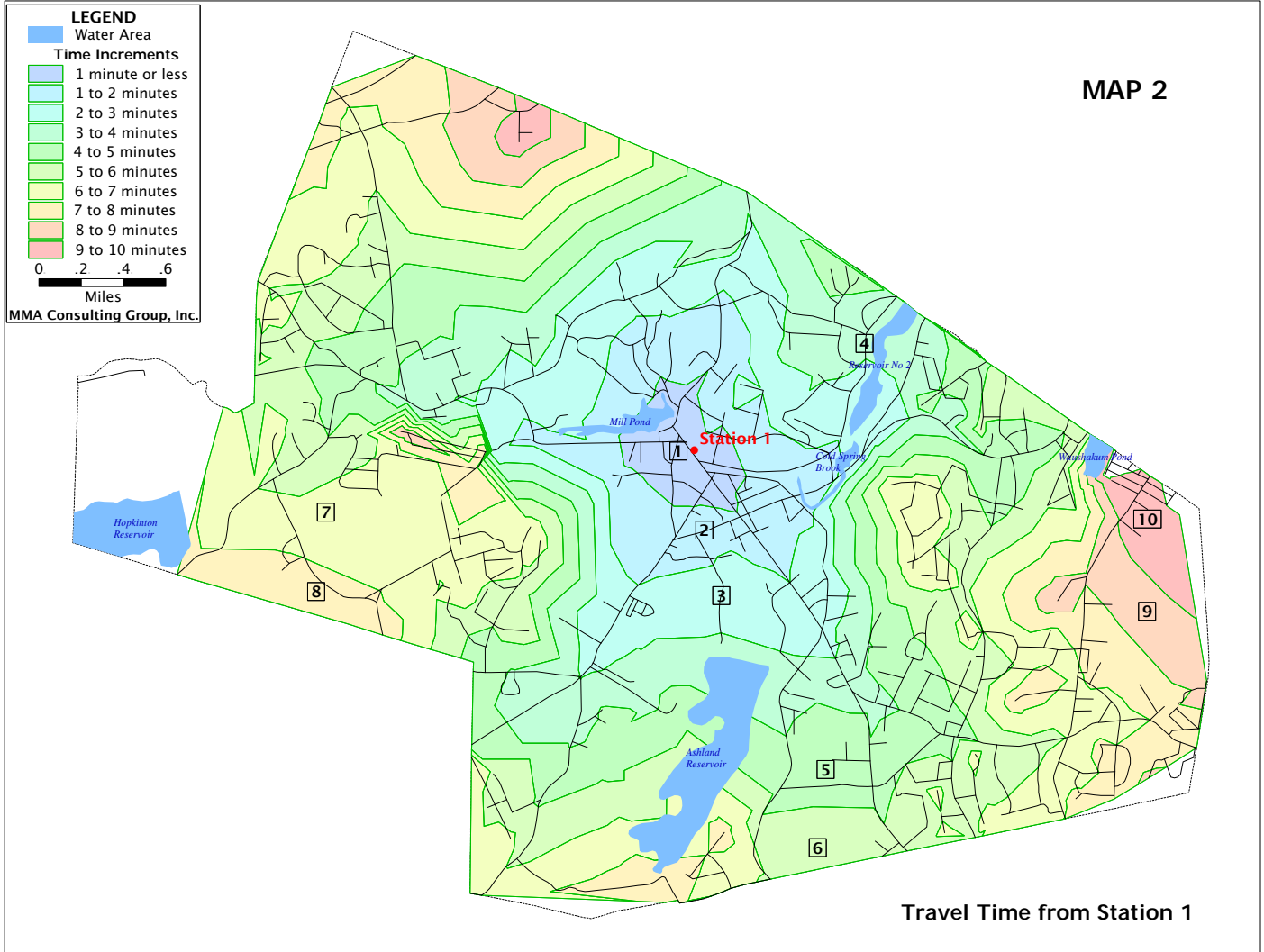
These data suggest that the theoretical Location X provides coverage similar to that provided from Station 1 within the four-minute and six-minute time parameters.

MAP 1

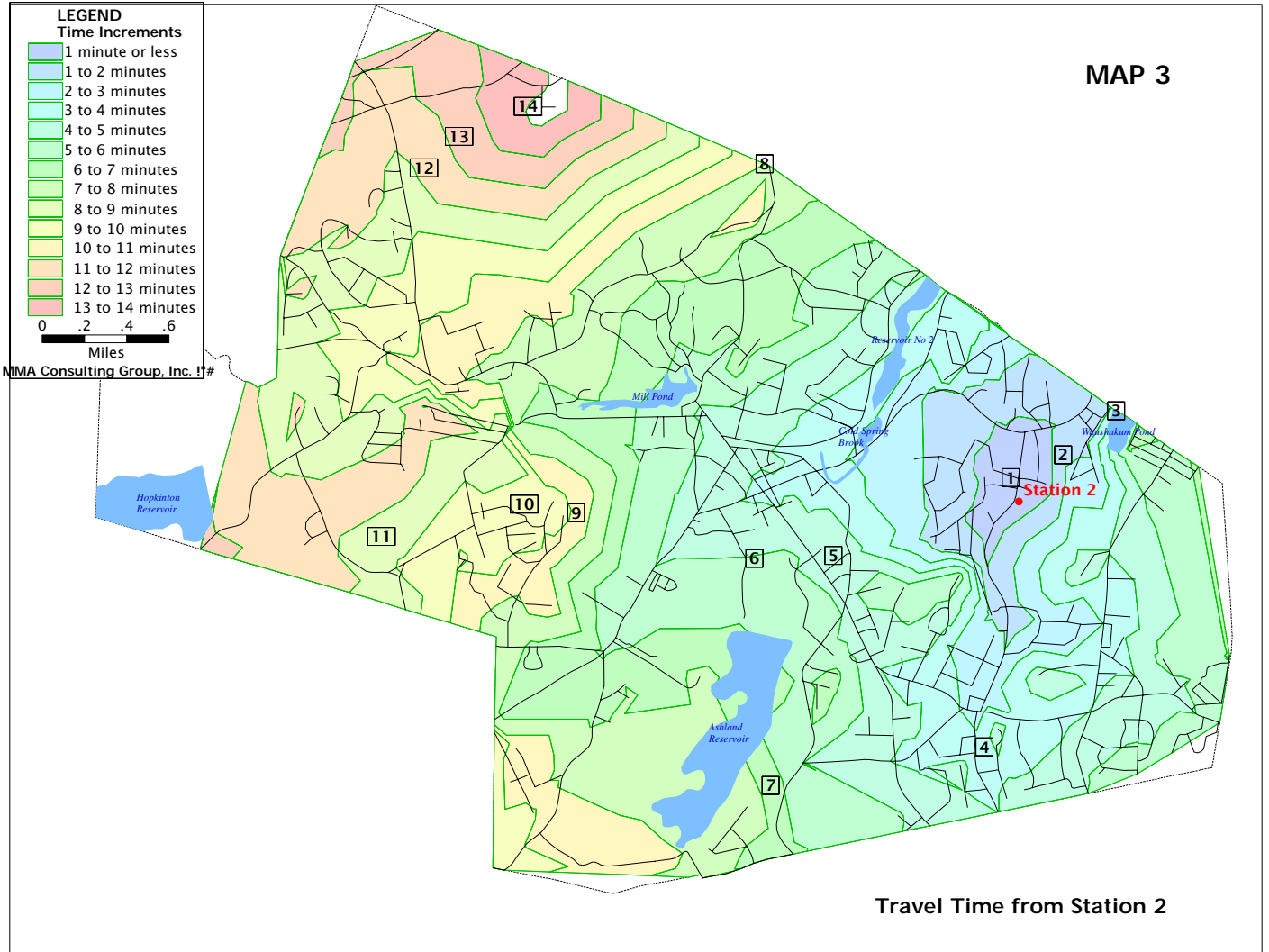


Ashland Base Map
0 2 4 6
Miles
MMA Consulting Group, Inc.

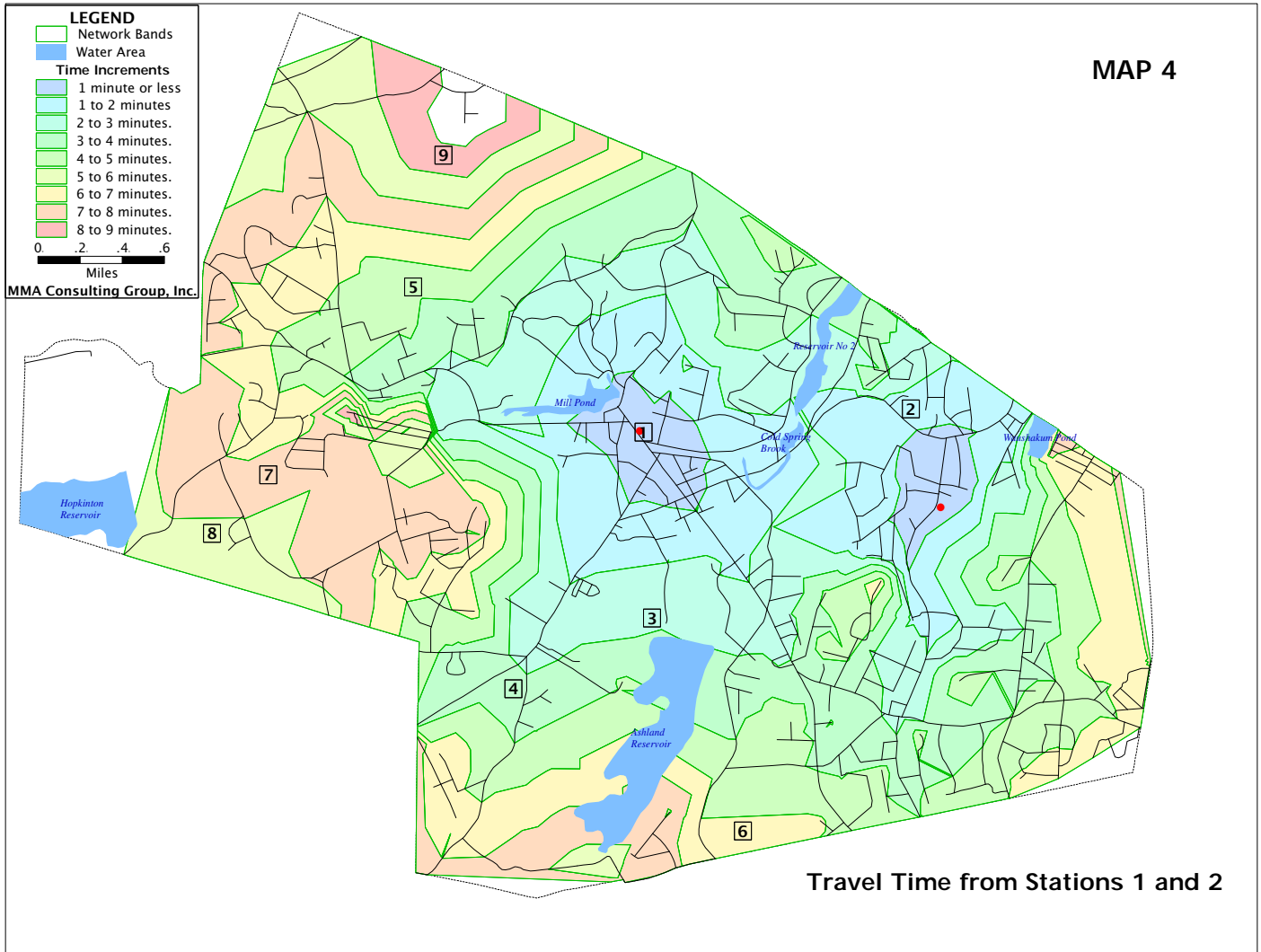
MAP 2



MAP 3



MAP 4

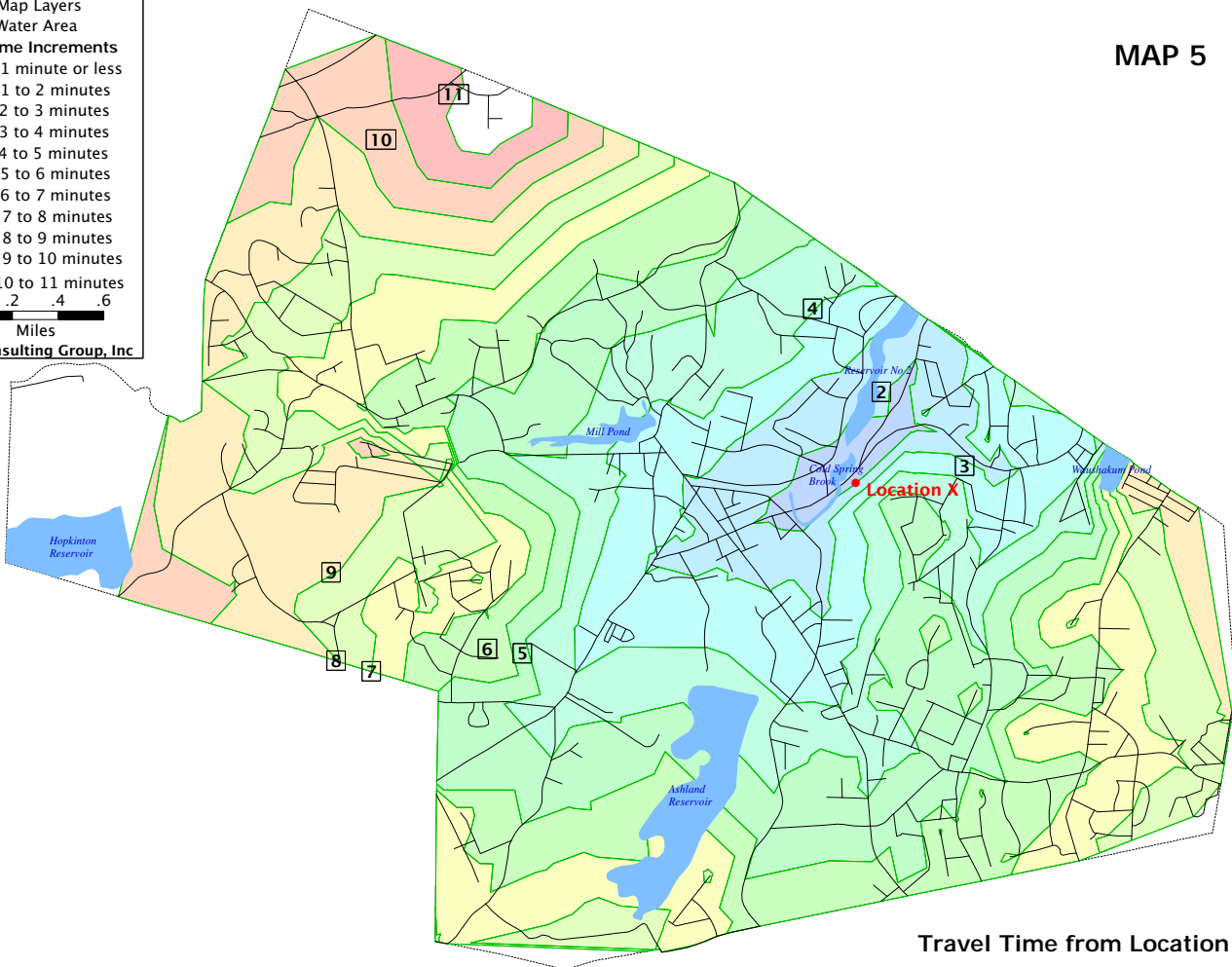


Travel Time from Stations 1 and 2

MAP 5

LEGEND
Map Layers
Water Area
Time Increments
1 minute or less
1 to 2 minutes
2 to 3 minutes
3 to 4 minutes
4 to 5 minutes
5 to 6 minutes
6 to 7 minutes
7 to 8 minutes
8 to 9 minutes
9 to 10 minutes
10 to 11 minutes
0 .2 .4 .6
Miles

MMA Consulting Group, Inc



Travel Time from Location X

The mapping analysis suggests a number of conclusions:

- The construction of a public safety facility near Location X is a viable option for the Town.
- The Station 1 site has several disadvantages, including a small site which does not allow for expansion.
- Location X (generalized location) is not hampered by a railroad crossing. There are a number of possible sites for a combined fire and police facility near Location X.

RECOMMENDATION 13: *The Town should operate with one fire station.*

RECOMMENDATION 14: *The Town should construct a fire and police facility in the general area of Location X.*

VII. ESTIMATING THE SIZE OF A CONSOLIDATED PUBLIC SAFETY FACILITY

There a number of factors which influence the selection of a site for a public safety facility, including the geography of the Town, the multiple railroad grade crossings, and the site size required to house fire and police operations. The actual size of a site for public safety facility will depend on a number of factors described earlier in the report. Assuming that a consolidated facility is constructed, a minimum size of three to five acres would be required; this would allow for a relatively large building footprint, parking, and expansion capability. Considering the current needs of the Fire and Police Departments, we estimate that a consolidated public safety facility would range in size from 40,000 to 55,000 square feet, depending on features. This range assumes that there will be some modest growth in the size of the Police and Fire Departments. We have presented relatively conservative estimates of building size.

The Fire Department space considerations include:

- *Current and future equipment needs* – The Department requires an aerial ladder, two front-line pumpers (one with a short wheel base) two ambulances, a brush truck, and a rescue truck. A reserve pumper should also be available. A four- or five-bay fire station should be considered.
- *Drive through bays* – The fire station segment of a building should include drive-through bays.
- *Expansion capability* – The Fire Department bays should be placed on one side of the facility to allow for an expansion of the number of bays.
- *Office and living space* – The Fire Department facility should provide for an office for the Fire Chief, a second office for a possible second-in-command, a fire prevention office, and a shift commander office. Living space should accommodate a reasonable number of personnel (eight to ten individuals). Kitchen space, meeting/training space, a decontamination facility, a laundry, and a conference room, and storage space are required.

- *Storage space* - The Fire Department facility should provide for storage space for supplies and equipment.
- *Maintenance bay/space* - The public safety facility should provide for a suitably equipped maintenance area to enable the Fire Department to maintain apparatus and vehicles.
- *Unheated garage/storage space* - The Fire Department requires space to park equipment that does not require heated storage, such as trailers, boats, and other equipment. This garage cold storage space could be in a small building located near the main facility. This space should be shared with the Police Department.
- *Fire Department training facilities* - The Fire Department maintains training facilities at Station 2. This training facility should be maintained at its present location.

The Police Department space considerations include:

- *Police Department administrative needs* - The Police Department requires an office for the Chief, offices for each Lieutenant, an office for the shift supervisor, an office for the Detective Sergeant, an area for detectives, a work area for officers, two or more interview rooms, a conference room, a meeting/training room, and lunchroom facilities.
- *Booking area evidence storage* - A secure booking area and a secure evidence space is required.
- *Locker rooms* - Space must be provided for male and female locker rooms.
- *Lock-up* - Currently four cells are maintained. A slightly larger cell area should be considered.
- *Garage and storage areas* - A garage space for several vehicles and ample storage is required.

- *Unheated garage/storage space* – The Police Department requires space to place equipment, such as motorcycles and off-road vehicles. This space should be shared with the Fire Department.
- *Safety and security features* – The public safety facility requires the integration of security measures into the building.

The Fire Department will require approximately 20,000 to 25,000 square feet of space. Approximately 10,000 to 14,000 square feet should be devoted to apparatus bays. The Police Department will require approximately 20,000 to 30,000 square feet of space.

The consolidated public safety facility must include sufficient space for an emergency communication center with four or more dispatch consoles. Approximately 1,200 to 1,500 square feet of space is required for the center. The communication center should be designed so that it may be expanded into an emergency operations center (EOC).

The consolidated facility should be designed to allow sharing of facilities, such as training rooms, computer rooms, records rooms, storage areas and other facilities. The Town may wish to include a community room within the facility. The public safety facility should be designed in a manner which recognizes the need for modern technologies.

RECOMMENDATION 15: *The Town should consider constructing a public safety facility which incorporates police, fire and emergency communication functions. The estimated size of the facility should be between 40,000 and 55,000 square feet.*

VIII. IMPLEMENTATION OF RECOMMENDATIONS

The primary recommendations in this report relate to the location of a new consolidated public safety facility which should incorporate the functions of the Police Department and the Fire Department. There are a number of secondary recommendations which are concerned with other needs of the Departments.

PLAN OF ACTION

The Town of Ashland should adopt a plan of action to implement the development of a consolidated public safety facility. The primary actions that must be taken are listed below.

Decision to construct new facilities – The first step in the process is to determine if new facilities will be constructed. Given the age and the location of facilities, the need is apparent.

Identification of a site for the facility – The Town should identify the appropriate sites which may be used for a consolidated facility.

Acquisition of a site for the facility – The Town should purchase the necessary land so that the Town will be able to develop the public safety facility when funds are available.

COSTS RELATED TO RECOMMENDATIONS

It is difficult to estimate costs for the construction of a public safety facility. Construction costs can vary greatly, but it is estimated that construction will cost approximately \$300 per square foot. This does not include land acquisition or the cost of furniture, fixtures, and equipment (FF & E). Exhibit 34 provides an estimate of the cost of a public safety facility.

EXHIBIT 34

ESTIMATED COST OF FACILITY (DESIGN AND CONSTRUCTION) *

<u>ESTIMATED SIZE</u>	<u>ESTIMATED COST @\$ 300 SQ. FT.</u>
40,000 sq. ft.	\$12,000,000
55,000 sq. ft.	\$16,500,000

* Does not include land related costs and FF & E.

This report proposes staffing increases. Exhibit 35 shows the current staffing complement of the Police and Fire Departments and recommended increases. These staffing recommendations would be implemented over a period of many years, depending on resources and growth in the demand for services.

**-EXHIBIT 35
CURRENT AND PROPOSED PUBLIC SAFETY STAFFING**

FIRE DEPARTMENT STAFFING

POSITION	CURRENT STAFFING	RECOMMENDED STAFFING INCREASES	TOTAL
Chief	1		1
Staff Officer		1	1
Lieutenant/Captain	5		5
Firefighter	12	9	21
Administrative Assistant	1		1
Dispatchers	4	-4	0
Total Fire Department Staffing	23	+6	29

POLICE DEPARTMENT STAFFING

POSITION	CURRENT STAFFING	RECOMMENDED STAFFING INCREASES	TOTAL
Chief	1		1
Lieutenant	2		2
Sergeant	4	1	5
Detective Sergeant	1		1
Detective	2		2
Police Officer	17	2 - 3	19 - 20
Administrative Assistant	1		
Administrative Assistant (Records)	1		1
Dispatchers	2	-2	0
Total Police Department Staffing	31	1 - 2	32 - 33

COMMUNICATION CENTER STAFFING

POSITION	CURRENT STAFFING	PROPOSED STAFFING	TOTAL
Dispatch Coordinator		1	1
Dispatcher (See above 2 police dispatchers & 4 fire dispatchers)	0	5	5
Dispatchers (part-time)		3 - 5	3 - 5
Total Communication Center Staffing	0	9 - 11	9 - 11
TOTAL - ALL PUBLIC SAFETY FUNCTIONS	54	16 - 19	70 - 73

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 for implementation. The recommendations have been assigned priorities. Additional comments have also been made. The recommendations have been categorized as follows:

- Priority 1:** Recommendations which should be implemented without delay and which bear directly on the ability of the public safety agencies to provide an acceptable level of service and operate in an efficient manner.
- Priority 2:** Recommendations which are important to the effective and efficient operation of the public safety agencies and should be implemented as soon as reasonable and practical.
- Priority 3:** Recommendations which can contribute to the continued improvement of the public safety agencies and should be implemented as soon as resources and operating conditions permit.

**EXHIBIT 36
LIST OF RECOMMENDATIONS**

	RECOMMENDATION	PRIORITY	COMMENT
1	The Police and Fire stations should be replaced and relocated.	1	Facilities are well maintained but do not meet needs.
2	The Police and Fire stations should be consolidated into one public safety building.	1	One facility will allow for cost savings in construction.
3	The Town should increase the staffing of the Fire Department by two Firefighters/EMT-Bs or EMT-Ps on each shift.	1	
4	The Town should consider the employment of one additional staff officer to serve as second-in-command of the Fire Department.	2	An additional staff officer is required to help manage the Department.

RECOMMENDATION	PRIORITY	COMMENT
5 The Fire Department should maintain an equipment complement of an aerial apparatus (quint), two front-line pumpers (one with a smaller wheel base), two ambulances, a rescue truck, and a brush truck. The Department should maintain a reserve pumper.		Continue current practice.
6 The Police Department should continue to employ the current complement of patrol personnel.	1	There are enough personnel to meet patrol staffing needs.
7 The Police Department should employ one additional Police Sergeant.	2	One additional sergeant position is desirable to ensure supervision on all shifts.
8 The Police Department should plan to employ two to three additional police officers in the next five to 10 years.	3	This assumes that demand for service increases.
9 The Police Department should enhance its data collection and analysis capability.	2	Requires enhanced information technology.
10 The Town should consolidate police and fire emergency communication functions when a new police or fire facility is available. Planning for any new facility should consider the space and system needs of a consolidated communication operation.	2/3	A new system should improve communication and information management.
11 The Town should explore alternatives for management of the consolidated communication center:	3	Each alternative should be explored.
<ul style="list-style-type: none"> ▸ Consolidation of the Police Department and Fire Department communication units into one new department reporting to the Town Manager. 		
<ul style="list-style-type: none"> ▸ Consolidation of the Police Department and Fire Department communication functions under the direction of the Police Department or the Fire Department 		
12 The Town should staff the communication center with trained civilian personnel.	3	All communication personnel should be civilians.

	RECOMMENDATION	PRIORITY	COMMENT
13	The Town should operate with one fire station.	1	
14	The Town should construct a fire and police facility in the general area of Location X.	1	Location X represents a generalized location.
15	The Town should consider constructing a public safety facility which incorporates police, fire and emergency communication functions. The estimated size of the facility should be between 40,000 and 55,000 square feet.	1	The size of the facility and the land area needed for the facility depend on the specific site selected.

APPENDIX STANDARDS, BENCHMARKS AND RESPONSE PARAMETERS

This Appendix describes the standards and benchmarks used to design fire or emergency medical service systems. Meeting benchmarks and standards is difficult for a small career fire department, such as Ashland. An approach toward making progress in achieving standards is to maximize the available regional resources. The four emerging standards, or benchmarks, which affect crew size, response times, firefighter safety and response time are listed below.

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 FIRE AND EMS 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 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, hazmat 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 this report.

STANDARDS AND FACTORS USED TO DEVELOP RESPONSE CAPABILITY OBJECTIVES

Containment of a Fire/Flashover	NFPA Standard 1710
Geographic Characteristics of the Town	DISTRIBUTION OF CAPACITY (FIRE STATION LOCATION)
Sequence of Emergency Response	AMA EMS RESPONSE CONSIDERATIONS & STANDARDS
“Two In, Two Out” OSHA Safety Rule	AHA STANDARDS FOR CARDIAC RESPONSE
Insurance Services Office (ISO) Measures/Standards	

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 are 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 indicate 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. 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 eight to 10 minutes has a 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 Ashland, 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
Turn-out time shall be one minute (60 seconds) maximum.	Section 4.1.2.1.1 (1)
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)
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)
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)

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

FIRE DEPARTMENT STAFFING REQUIREMENTS

STANDARD	NFPA 1710 SECTION
Each fire company must have an officer.	Section 5.2.1.2.2
A chief level officer must respond to all full alarms.	Section 5.2.1.2.3
Engine companies must be staffed with a minimum of four firefighters.	Section 5.2.2.1.1
Ladder companies must be staffed with a minimum of four.	Section 5.2.2.2.1
The initial full-alarm assignment shall consist of 14 individuals, or 15 if an aerial ladder has responded.	Section 5.2.3.2.2

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*)

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.