

Report for

Regionalization Recommendations and Implementation

prepared for

The Towns of Sudbury, Wayland,
Weston, Concord, Acton,
Maynard, Lincoln and Boxborough,
Massachusetts

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EXECUTIVE SUMMARY

L.R. Kimball is pleased to provide the Towns of Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough (collectively, the Towns) with its Regionalization Recommendations and Implementation report. The Towns jointly commissioned L.R. Kimball to assess, inventory and analyze current conditions; and to provide recommendations regarding feasibility of a regional approach to emergency communications.

Through the course of this study, L.R. Kimball has determined that regionalization of all eight towns is practical and feasible from a political and financial perspective. Therefore, L.R. Kimball's recommendation is that the Towns begin following the Next Steps¹ to establish governance, identify a fair and equitable funding method, locate a site to house the regional center and hire a Director to facilitate the planning process and to develop the regional center's operational programs, such as eligibility/hiring, training, protocols (e.g., emergency medical dispatch [EMD]) and quality assurance (QA) programs.

To arrive at this determination and recommendation, L.R. Kimball collected a wide variety of data from the respective public safety answering points (PSAPs)/dispatch centers, agency heads and served agency personnel, including law enforcement and fire. L.R. Kimball utilized a survey tool to collect data from the dispatch centers on staffing, budgets, technology, pay scales, and operational methods. L.R. Kimball observed operations in the dispatch centers to gain an understanding of the work flow and call handling processes.

The dispatch centers receive 9-1-1 and non-emergency calls for the towns they serve. The dispatch centers receive automatic number identification/automatic location identification (ANI/ALI) information for all wireline 9-1-1 calls. Wireless 9-1-1 calls are transferred from one of three Massachusetts State Police communications centers.

The State 911 Department (911 Department) is charged with the coordination, administration, and implementation of Enhanced 9-1-1 (E9-1-1) services throughout the commonwealth of Massachusetts and provides customer premise equipment (CPE) to the dispatch centers. The 911 Department is charged by statute (M.G.L. c. 6A, § 18B) with establishing certification requirements for E9-1-1 telecommunicators, including EMD and QA of EMD programs in the Commonwealth.

There is no true separation of duties for call takers/dispatchers in the dispatch centers; each call taker/dispatcher answers calls for service and dispatches emergency service personnel. Answering incoming calls for service and dispatching emergency personnel are the primary responsibilities of a PSAP. Maintaining accurate information on these responsibilities assists in determining PSAP personnel needs. The call takers/dispatchers in the dispatch centers perform a myriad of additional duties, such as greeting the public at a walk-up window during business hours and after hours, monitoring holding cells via closed circuit television (CCTV), and record keeping, including payroll and administrative reports.

The Sudbury, Weston and Maynard Police Departments operate the primary dispatch center for their respective town, dispatching police personnel and transferring calls for fire and ambulance service to the respective fire department. With this configuration in place, the quality of service in handling police and fire/EMS emergency communications is not balanced. Law enforcement calls receive handling as soon as the 9-1-1 call is answered.

¹ Provided in Section 18

Fire and EMS calls are handled after transfer of the original call or the relay of information to the fire department. This creates a built-in delay for all fire and EMS emergency calls.

Wayland, Concord, Acton, Lincoln and Boxborough operate primary dispatch centers that dispatch police and fire/rescue/EMS personnel. Wayland's joint communications center is under the operational control of the police and fire departments, maintaining an equal balance of representation and service. In Concord, Acton, and Lincoln, the police chiefs have operational responsibility for their respective dispatch center, and proactively seek input from the fire chiefs, who maintains appropriate control over fire-related support services provided by communications center personnel. In Boxborough, while the police chief has operational responsibility for the dispatch center, the center is dual-run by the police and fire chiefs.

Each agency provided current operational costs to some extent.

Town/PSAP	Salaries	Benefits	Overtime	Other Operational Costs *	TOTAL
Sudbury	Police - \$174,113	\$45,000	\$50,786	** \$40,073	\$309,972
	Fire - \$107,000	\$30,000			\$137,000
Wayland	\$358,652	\$53,770	\$75,000	*** \$88,355	\$575,777
Weston	\$207,500		\$51,000	¥ \$93,960	\$352,460
Concord ¤	\$417,600			\$62,400	\$480,000
Acton	\$468,762			\$27,979	\$496,741
Maynard	\$225,000			\$27,690	\$252,690
Lincoln	\$214,915	\$63,922	\$21,700	\$27,094	\$327,631
Boxborough	\$163,674	\$62,683	\$35,875	\$39,093	\$301,325
TOTALS	\$2,337,216	\$255,375	\$234,361	\$406,644	\$3,233,596
* Includes building costs, system maintenance, connectivity, other equipment, training, etc. – when provided. ** Sudbury's facility costs for communications were estimated at 5% of total building costs provided. *** Wayland's facility costs for communications were estimated at 15% of total building costs provided. ¥ Weston's additional items for communications were estimated at 10% of total costs provided. ¤ Concord's figures were estimated.					

Sudbury, Wayland, Acton and Lincoln utilize a Pamet computer aided dispatch (CAD) system. Weston, Concord, Maynard and Boxborough utilize an IMC CAD system. Radio frequencies vary throughout the towns. Sudbury Police Department operates on an 800 MHz system, while all other police and fire departments operate on Very high frequency (VHF) and Ultra high frequency (UHF).

Regional interoperability with neighboring jurisdictions' voice and data systems can be improved by identifying infrastructure, network components and frequencies that can be shared, interfaced or reconfigured to provide ease of access and use for daily response and major incidents. Voice and data interoperability with neighboring towns and levels of government response will improve emergency services response and recovery efforts.

After reviewing the assessments of current operations and desiring to improve the quality of service to the citizens and interoperability, the regional consolidation committee opted to explore the following regionalization options:

- All eight towns
- Sudbury, Wayland, Weston and Lincoln
- Concord, Acton, Maynard and Boxborough

There are several common denominators that are applicable to any option, with only minimal modifications: funding, governance, organizational structure, operational methodology, and overall facility requirements.

The current funding for the dispatch centers is derived from each Town's general funds, which fully support all operating costs, including personnel, equipment, systems and networking, and the radio systems. The 911 Department funds and manages the 9-1-1 telephone system network and equipment.

Cost sharing options include a formula based on quantifiable factors such as population, use of system (call volume, incident volume) and/or real estate assessments, or some combination of these factors. Or, the Towns could elect to split costs evenly. L.R. Kimball recommends a formula based on a combination of population and real estate assessments. Use-based formulas have produced unsafe practices by user agencies if they attempt to save money by not reporting all activity. The different size and funding capacities of the Towns make the "split costs evenly" option an unfair and unbalanced funding method, particularly for the smaller participants.

A regionalization of emergency communications should be a collaborative effort between public safety response agencies and municipalities. A business model approach of service provider and customer agencies will result in equal and optimal service to all user agencies.

A balance of representation must be established between a supporting entity and the participating municipalities. Any governing agreement must clearly establish the authorities and responsibilities of all parties to avoid and/or address political and user agency control issues. L.R. Kimball recommends an Executive Board, with full decision-making authority in all matters, be established and comprised of term appointments of two police chiefs, two fire chiefs, two town managers and one at-large appointee to represent all participating towns. This configuration allows the served agencies and towns to have an appropriate level of control over how services are rendered.

A regional PSAP will require a backbone structure for administrative services and support services. L.R. Kimball recommends that one town be identified to provide these services, with compensation for same determined and agreed upon by the participating towns. Establishing pay and classification, preserving employee seniority, leave, retirement and other benefits are vital to the well-being of the transitioning employees. Decisions regarding these factors must be approached with the goal of keeping the employee whole.

All participating Towns should enter into an Intergovernmental Agreement (IGA), allowed under MASS GEN. LAWS Ch. 40 § 4a. The IGA should establish the Executive Board, including membership, authority and responsibilities.

An appropriate administrative infrastructure and delineation of duties must be created to direct and manage the operational staff toward the goals of the governing body, and a team approach will allow the center to transition into an efficient and effective regional operation. "Outer office" staff may a director, deputy director, administrative

assistant, training/QA coordinator, and technical staff. Operational staff includes supervisors and cross-trained call takers and dispatchers.

Staffing is dependent on the 9-1-1 and non-emergency call volume and police, fire and EMS incident volume, and will vary depending on the option(s) selected. A complete regionalization will require approximately 39 operational staff, including supervisors. Regionalization of Sudbury, Wayland, Weston and Lincoln will require 27 operational staff, including supervisors, while regionalization of Concord, Acton, Maynard and Boxborough will require 28 operational staff.

The number of workstations will vary. A regional center serving all towns would require seven consoles, plus at least two additional for training and future growth. The smaller regional centers would each require five consoles, plus two additional for training and future growth.

The recommended operational methodology in a regional PSAP is a combined duty floor operation staffed by multiple levels of cross-trained staff. A call processing flow is recommended that facilitates appropriate and free interaction and coordination among disciplines. Ideally, a regional PSAP will be configured operationally to have an area equipped and assigned for call taking, with a supervisor position centrally placed on the communications floor with equal vantage points and access to the dispatching areas. Law enforcement dispatching will be equipped and assigned to one side of this core and fire/EMS to the other.

Certified call takers would answer and document calls for service in a fully functional customized CAD system that routes calls to the appropriate dispatchers. The same call takers would provide EMD when needed, should the Towns elect to provide this service, and other information as appropriate. Based on pre-established priority assignments sourced to the nature of the event and response type, the receiving dispatcher(s) would notify and assign calls to the appropriate field unit/apparatus. The same dispatchers would monitor responding units/apparatus for status changes and requests for further information or services. L.R. Kimball recommends that the Towns in an eight town regional center implement an internal EMD and QA program.

One of the commonly voiced concerns from participating agencies is the desire to maintain the quality of service levels currently provided. In many of the public safety agencies, the emergency call taking and dispatching functions are a small percentage of their roles. Particularly in the smaller agencies, the dispatcher is the agency's initial point of contact and is usually the municipality's only after-hours contact. The dispatchers act as switchboard operators assisting callers with locating individuals and services within the respective agency and municipality served. The dispatchers also provide a myriad of municipal services unique to their locality and are able to direct or transfer callers to outside municipalities and/or services. In a regional environment, some of these services may continue without noticeable interruption, if the function is in direct support of 9-1-1. During the planning phase, all jurisdictions will need to evaluate and determine how best to handle non-emergency and administrative needs, both common and unique.

Training needs are a core focus of regionalization planning. The commitment to call taker and dispatcher training directly relates to the quality of service provided. An investment in a strong new-hire and on-going training program, and a continuing education program, will result in a high level of service provided to the public and public safety responders. A QA program will provide a tool to constantly monitor that level of service. A well-developed and defined QA program ensures consistency of operations, identifies problems, and identifies corrective actions to resolve the issues. A QA program is also a requirement of EMD.

To accommodate regionalization into one center or two smaller centers, a new facility or facilities will need to be consideration. To create autonomy, L.R. Kimball recommends construction/renovation of a separate facility to house a regional center – one that is not occupied by any of the served agencies. L.R. Kimball also recommends that the Towns pursue the creation of a single eight town regional center as the total cost is approximately \$4 million less than the total cost of two four town regional centers.

For a regional center serving all eight towns, a facility of approximately 8,500 square feet (SF) is needed to accommodate up to ten workstation consoles, associated administrative office space, equipment room needs and other associated space needs. The price is projected to be from \$3.1 to \$3.6 million. By comparison, a regional center serving four towns, a facility of approximately 6,500 SF is needed to accommodate up to seven workstation consoles per facility, associated administrative office space, equipment room needs and other associated space needs. The price range for one center is projected to be from \$2.4 to \$2.7 million.

Decisions will need to be made on technology, specifically the computer aided dispatch (CAD) systems, the radio system, and radio consoles. L.R. Kimball recommends participating Towns, regardless of the option(s) selected, develop a consensus on CAD system requirements and upgrade one of the existing CAD systems or develop a comprehensive RFP to procure a CAD system that meets the needs of all agencies. There are two primary options for radio system deployment: reuse of existing conventional systems or migration to a shared regional trunking system. Should existing conventional systems be reused, patching systems should be enhanced to provide more seamless unit-to-unit connectivity across frequency bands. The recommended system is a wide-area 700/800 MHz trunked system that would provide coverage and capacity necessary to meet the needs of all member agencies. A consolidated communications center will require a standardization of radio consoles. If a trunking system is implemented, a console solution that provides a direct interface to the trunking system is recommended to eliminate the need for individual control station radios for each channel.

The following table captures projected costs for an eight town regional center compared to projected costs for two four-town regional centers. For each regional option, costs were identified to plan and implement (transition costs), house and equip (capital costs) and staff and organize (operational).

Projected Costs Comparison			
Costs	Complete Regionalization	Sudbury, Wayland, Weston and Lincoln	Concord, Acton, Maynard and Boxborough
Capital Costs – Facility (One-time)	\$3,600,000	\$2,700,000	\$2,700,000
Capital Costs – Technology (One-time)	\$1,605,000	\$1,268,000	\$1,268,000
Transition Costs – Professional Services	\$250,000	\$250,000	\$250,000
Operational Costs – Salaries/Benefits (1 year)	\$3,100,000	\$1,980,000	\$2,030,000
Operational Costs – Other Expenses (1 year)	\$276,750	\$217,200	\$217,200
TOTALS	\$8,831,750	\$6,415,200	\$6,465,200

Cost efficiencies come from the elimination of multiple centers to maintain and equip, and from elimination of redundant and expensive technology such as CAD systems, 9-1-1 answering equipment, radio consoles, and logging recorders, as well as maintenance costs associated with these systems. The single set of technology and systems found in a consolidated environment reduces costs associated with procurement, connectivity and maintenance.

Where cost savings are achievable, the actual realization of savings may not occur for several years. The consolidation process can be expensive and can generate substantial one-time start-up and capital costs for facility and technology needs. These costs can delay the actual cost savings.

However, the benefits of improving service to citizens and first responders often outweigh cost factors. Benefits typically achieved include the following:

- Reduction or elimination of the transfer of 9-1-1 calls between PSAPs improves response times and lowers the potential for human or technology errors.
- Quicker call processing and dispatch times, which can result in faster on-scene times for field personnel.
- Sharing of physical space enables communications between call takers and law enforcement, fire, and EMS dispatchers to be virtually instantaneous. This improved communications enables field personnel to receive information more quickly and accurately, which is particularly important in multi-jurisdictional incidents. This communication is the least tangible or quantifiable benefit of regionalization/consolidation, but is one of the most key.
- If large enough, a consolidated PSAP can utilize a call taker/dispatcher organizational structure. This structure enables call takers to focus solely on the incoming call and obtain the best information possible. The dispatcher's ability to focus solely on field personnel improves responder safety.
- Standardized training of all emergency communications personnel increases consistency of service delivery regionally.
- A single regional communications center allows resource management during major incidents from a single point of control rather than fragmenting control among multiple dispatch centers.
- A consolidated environment will offer the opportunity to benefit from state-of-the-art technology, improved training, and expanded career opportunities that would not be otherwise financially or organizationally feasible.

Should the Towns decide to advance towards regionalization, the current momentum should be maintained by progressing directly into the planning and implementation phases.

1. OVERVIEW

The Towns of Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough jointly commissioned L.R. Kimball to complete the following:

- Assess, inventory and analyze current conditions
- Provide recommendations regarding feasibility of a regional approach to emergency communications

L.R. Kimball held an initial kick-off meeting with key stakeholders to establish a communications plan, review the scope of work, finalize the project schedule and methodology, and review a spreadsheet-based survey tool.

L.R. Kimball required the collection of a wide variety of data from the respective PSAPs/dispatch centers, agency heads and served agency personnel, including law enforcement and fire. Prior to being on-site, L.R. Kimball utilized the survey tool to collect data from the dispatch centers on staffing, budgets, technology, pay scales, and operational methods.

Between May 9 and 13, 2011, L.R. Kimball was on-site in Middlesex County and toured the respective facilities and met with Town Managers and Administrators, fire and police personnel, and dispatch staff.

L.R. Kimball observed operations in the dispatch centers to gain an understanding of the work flow and call handling processes. The dispatch centers receive 9-1-1 and non-emergency calls for the towns they serve. The dispatch centers receive ANI/ALI information for all wireline 9-1-1 calls. Wireless 9-1-1 calls are transferred from one of three Massachusetts State Police communications centers; the dispatch centers receive the caller's wireless number and location information from the respective wireless service provider.

There is no true separation of duties for call takers/dispatchers in the dispatch centers; each call taker/dispatcher answers calls for service and dispatches emergency service personnel. Answering incoming calls for service and dispatching emergency personnel are the primary responsibilities of a PSAP. Maintaining accurate information on these responsibilities assists in determining PSAP personnel needs. The call takers/dispatchers in the dispatch centers perform a myriad of additional duties, such as greeting the public at a walk-up window during business hours and after hours, monitoring holding cells via CCTV, and record keeping, including payroll and administrative reports.

L.R. Kimball assessed each dispatch center individually, making recommendations specific to the respective primary dispatch center. L.R. Kimball also made recommendations that are inclusive of all Towns in the assessment; these may be found in Section 2 *Regional Synopsis*.

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2. REGIONAL SYNOPSIS

The Towns of Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough are in Middlesex County and are participating in a regional assessment to determine the practicality of regionalizing (consolidating) all or some of the current dispatch operations or sharing some services.

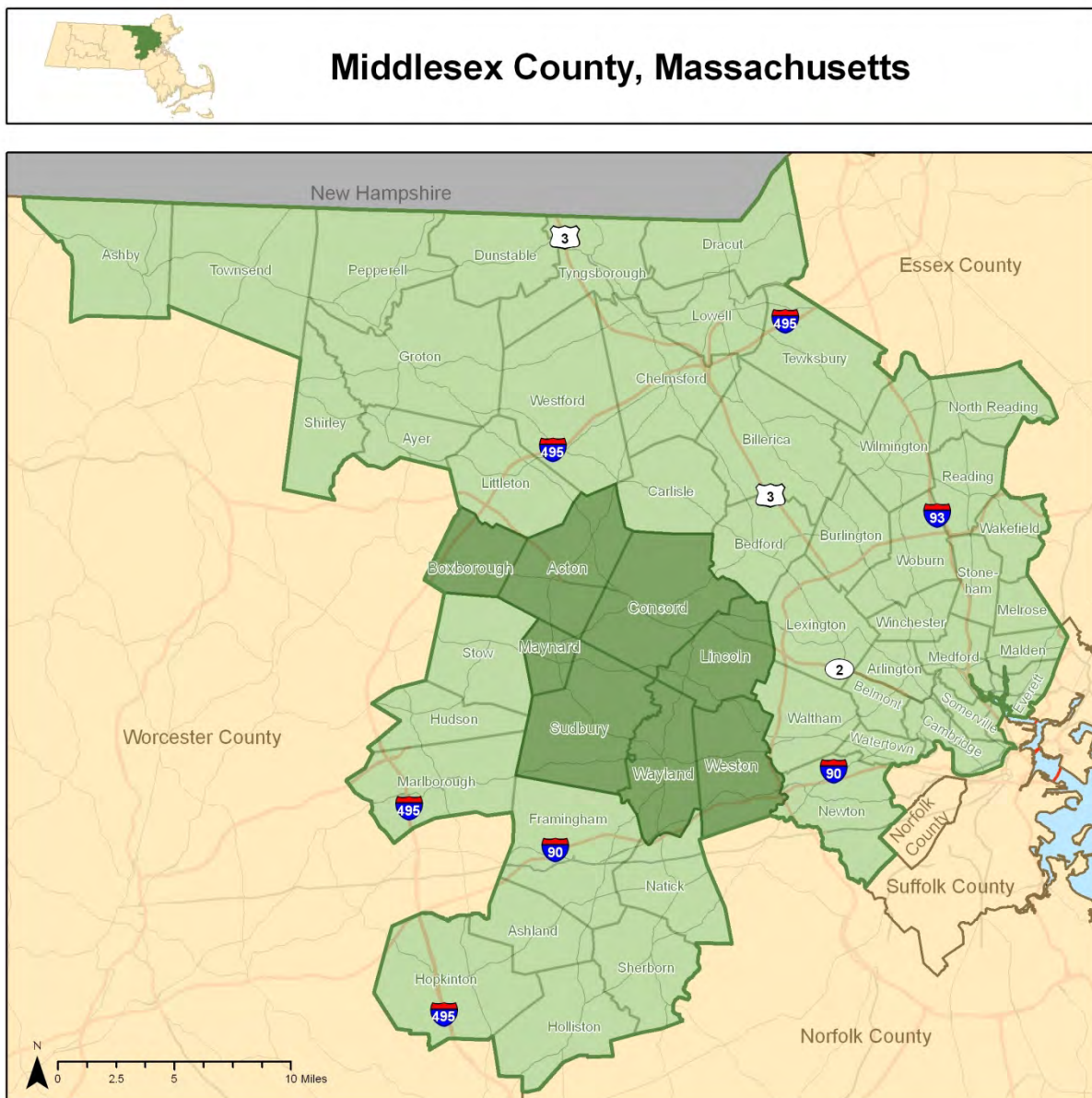


Figure 1 – Middlesex County – Participating Towns

2.1 Government

There are 50 cities and 301 towns in Massachusetts, and various local government structures. Cities generally have a small legislative body that meets frequently and either a Mayor or Manager. Towns generally have a large legislative body – Representative Town Meeting or Open Town Meeting – that meets at least annually, an elected Board of Selectmen and a Manager or Administrator.

Thirty-eight towns operate with a Representative Town Meeting and two hundred sixty-three operate with an Open Town Meeting. With Representative Town Meetings, representatives are elected to attend the town meeting and represent the community. With Open Town Meetings, all registered voters are eligible to attend, debate and vote on all matters brought before Town Meetings. Executive authority for both forms of Town government rests with the respective Board of Selectmen and the Manager or Administrator.² The Towns of Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough all operate with the Open Town Meeting form of government.

2.2 Massachusetts State 911 Department

The Towns are already in a fairly good position for sharing of services as the 911 Department provides CPE to the dispatch centers. The 911 Department is charged with the coordination, administration, and implementation of E9-1-1 services throughout the commonwealth of Massachusetts.

The 911 Department provides language interpretation services to all primary PSAPs in the Commonwealth through a contract with Qwest Communications. This language service is funded through wireline and wireless E9-1-1 revenues, paid directly by the Statewide Emergency Telecommunications Board (SETB).

The 911 Department also oversees the Massachusetts Equipment Distribution Program and the Telecommunications Relay Service. The 911 Department provides E9-1-1 equipment, database, network and technical support services to all primary PSAPs.³ Each PSAP is provided a Spectracom Master Clock, Orion MapStar mapping, Vesta Pallas Instant Recall Recorder, and a call detail record system. The 911 Department contracts with Verizon for the provision and maintenance of the 9-1-1 network and equipment.

The 911 Department is charged by statute (M.G.L. c. 6A, § 18B) with establishing certification requirements for E9-1-1 telecommunicators, including EMD and QA of EMD programs in the Commonwealth, and with establishing standards requiring PSAPs to have certified EMD personnel or to provide EMD through certified EMD personnel. Regulation 560 CMR 5.00 is summarized below:

- By 7/1/2012, PSAPs/RECCs⁴ must provide EMD either through certified EMD dispatchers at the PSAP/RECC or through a certified EMD resource.

² http://www.mma.org/component/docman/cat_view/146-municipal-government/166-forms-of-municipal-government

³ <http://www.mass.gov/?pageID=eopsagencylanding&L=3&L0=Home&L1=Public+Safety+Agencies&L2=State+911+Department&sid=Eeops>

⁴ Regional Emergency Communications Centers. RECC is a facility operated by or on behalf of 2 or more municipalities or governmental bodies, or combination thereof, as approved by the Department, that enter into an agreement for the establishment and provision of regional dispatch and coordination of emergency services for all such municipalities or governmental bodies including, but not limited to, a regional PSAP that provides enhanced 911 service and police, fire protection, and emergency

- The PSAP/RECC or certified EMD resource must use a single EMD Protocol Reference System (EMDPRS) on every request for medical assistance; have policies and procedures for use of EMDPRS, and establish a continuous QA program.
- In order to act as a certified EMD dispatcher for a PSAP/RECC, must be certified E9-1-1 telecommunicator; obtain and maintain CPR^[5] certification; and obtain and maintain EMD certification.
- In order to act as a certified EMD resource for a PSAP/RECC, must submit request for approval to the Department that includes the EMDPRS that will be used and documentation that each EMD dispatcher has met training and certification requirements.⁶

The 911 Department sponsors and conducts training programs and professional development courses for state and municipal telecommunicators. Every person who answers a 9-1-1 call in Massachusetts must attend a two-day training course provided by the SETB. The 911 Department is also providing training for EMD.

2.3 Wireline Calls

Delivery of wireline 9-1-1 calls to the dispatch centers is accomplished utilizing network facilities provided by the local exchange carrier (LEC), Verizon. Presently, legacy analog telecommunications technology comprises the 9-1-1 network. While generally a reliable network, the inherent limitations of analog networks restrict the amount of information sharing between PSAPs and other emergency service agencies.

Wireline 9-1-1 calls originate from a subscriber's telephone through the serving telephone central office. The serving central office routes the call through LEC's 9-1-1 tandem switch/selective router and completes the call to the appropriate primary PSAP based on the calling party's phone number and associated street address. Selective routing is a switch-based service that uses an emergency service number (ESN) provided by the phone company to route a 9-1-1 call to a PSAP using information obtained from a selective routing database (SRDB). The SRDB for all PSAPs is housed in that center's designated tandem switch.

Dedicated 9-1-1 centralized automatic message accounting (CAMA) trunks provide connectivity between the tandem switch and the dispatch centers. These 9-1-1 trunks are used to route wireline calls. (Massachusetts has separate 9-1-1 trunks for wireline and wireless calls.) The dispatch centers provide voice communications with the 9-1-1 caller. The phone number originating the 9-1-1 call and the caller's location are displayed at the respective dispatch center. The caller's originating phone number is used to retrieve the caller's location information from the LEC two 9-1-1 ALI databases. The dispatch centers receive ANI/ALI information for all wireline 9-1-1 calls.

medical services dispatch, including services provided by a private safety department. The regional PSAP portion of the center shall be equipped with automatic number identification and automatic location identification displays, as approved by the department, and is the first point of reception of a 911 call. M.G.L. c. 6A, § 18A.

⁵ Cardiopulmonary resuscitation

⁶ <http://www.mass.gov/Eeops/docs/setb/Summary%20of%20Proposed%20Regulations%20560%20CMR%205%2000.pdf>

2.4 Wireless Calls

There are 278 PSAPs in Massachusetts that are operated by the State Police and municipalities. The State Police operate three wireless PSAPs in Framingham, Middleboro and Northampton. All wireless calls that originate in the commonwealth are routed to one of these PSAPs and then transferred to the appropriate municipal PSAP, if necessary. In Massachusetts alone, there are 1.5 million wireline and 1.8 million wireless calls made annually.⁷

Delivery of wireless 9-1-1 to calls is accomplished utilizing network facilities provided by the different wireless service providers (WSPs) and Verizon. The routing of a wireless 9-1-1 call is more complicated than that of a wireline 9-1-1 call, as the subscriber is mobile and the technology in place today to route a wireless 9-1-1 call is still somewhat limited.

Wireless 9-1-1 calls originate from a subscriber handset and are sent via radio signal over the wireless carrier's network to an antenna base station/antenna located at one of the respective carrier's tower sites. The base station sends the 9-1-1 call to the WSP's mobile switching center (MSC) for proper call processing. The MSC uses a service control point database to assign an emergency service routing key (ESRK) number based on the tower's antenna site in which the call originated. Each ESRK in the database is also assigned a primary PSAP designation. From the MSC, the 9-1-1 call is connected to Verizon's tandem/selective router within the telephone network. The call is then routed from the tandem switch/selective router and passed to the appropriate State Police PSAP using dedicated wireless trunks.

All wireless calls for Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough route through the State Police in Framingham. The State Police filter duplicate calls as much as possible in order to control the volume of calls handled by the State Police and the individual local PSAPs. The calls are transferred via 9-1-1 trunks. Upon transfer, the ALI data is updated.

Should the Commonwealth decide to route all wireless calls to the appropriate PSAP initially, or when Next Generation 9-1-1 (NG9-1-1) technology is in place and wireless calls are routed based on location technology, the PSAPs would be easily overwhelmed in a matter of minutes. Staffing would not be sufficient in any dispatch center involved in this study.

2.5 Next Generation 9-1-1

One focus of NG9-1-1 will be to enable callers to transmit a variety of data types to PSAPs, including text, photos, streaming video and telematic information. While the technology to accomplish this is yet to be determined, it is certain that a mechanism will be needed to get these new data forms to primary and secondary PSAPs. This mechanism may take the form of updating existing answering equipment or, more than likely, will require PSAPs to replace existing equipment with new NG9-1-1 capable answering equipment.

⁷http://www.mass.gov/?pageID=eopsterminal&L=5&L0=Home&L1=Crime+Prevention+%26+Personal+Safety&L2=Report+an+Emergency&L3=Enhanced++911&L4=Training+and+Programs&sid=Eeops&b=terminalcontent&f=setb_public_education&csid=Eeops

NG9-1-1 solutions will be forthcoming, and will have additional requirements and/or legislation requiring PSAPs to be able to receive and process these calls. Important decisions will need to be made on the procurement and installation of this technology. The Towns will need to work with the 911 Department when implementing solutions.

The operational impact of NG9-1-1 will require changes to internal protocols and skill sets, and will require more intense oversight and coordination among applications and interconnected systems. As side effects of NG9-1-1 upgrades, funding, technology and human resources requirements may push local, small or individual PSAPs beyond their ability to support 9-1-1, both financially and operationally.

The Commonwealth is encouraging local government to consider consolidating emergency communications in an effort to reduce the cost of supporting existing PSAPs with network expansion/improvements, Internet Protocol (IP)-enabled 9-1-1 telephone systems, integrated mapping and logging recorders. These improvements are required to meet the current and future need to reach emergency services from any device, anytime and anywhere. The current 9-1-1 telephony systems are not able to accept and process IP-enabled communications in a reliable manner, nor are there standards for locating callers unless they are calling from a wireline or wireless phone. Current CAD systems are unable to accept and process data beyond the location, name, number and service provider. Logging systems will need to be able to store, search and retrieve data in conjunction with the typical captured voice feeds from radio and phones.

L.R. Kimball recommends each Town develop 5-year and 10-year plans to address the physical and technical needs of their respective centers, including end-of-life equipment issues and upgrades of equipment to National Emergency Number Association (NENA) i3⁸ standards, regardless of future decisions to regionalize or share services.

2.6 Interoperability

Regional interoperability with neighboring jurisdictions' voice and data systems can be improved by identifying infrastructure, network components and frequencies that can be shared, interfaced or reconfigured to provide ease of access and use for daily response and major incidents. Current interoperability efforts focus on wide area/large incident response. L.R. Kimball recommends the Towns focus on day-to-day/common regional response communications needs through coordination of systems, equipment and frequencies available for interoperability via an existing or the establishment of a more local regional radio committee/group.

Voice and data interoperability with neighboring towns and levels of government response will improve emergency services response and recovery efforts. Voice interoperability can be gained by more localized regional coordination. Data interoperability may be more difficult to achieve as it could require a common CAD system and/or a real-time interface among records systems or a records repository where regional agencies could feed commonly accessed files of specific shareable data to be accessed by other agencies and/or other levels of government response and recovery, as appropriate.

⁸ NG9-1-1 is the evolution of E9-1-1 to an all-IP-based emergency communications system. NENA's *Functional and Interface Standards for NG9-1-1 (i3)*, commonly referred to as i3, is the first version of the NG9-1-1 system design.
<http://www.nena.org/standards/technical/voip/functional-interface-NG911-i3>

3. PSAP ASSESSMENTS

3.1 Town of Sudbury

The town of Sudbury, located in southern Middlesex County, is approximately 24.6 square miles in area, with .3 square miles of water. Sudbury has a population exceeding 17,500.

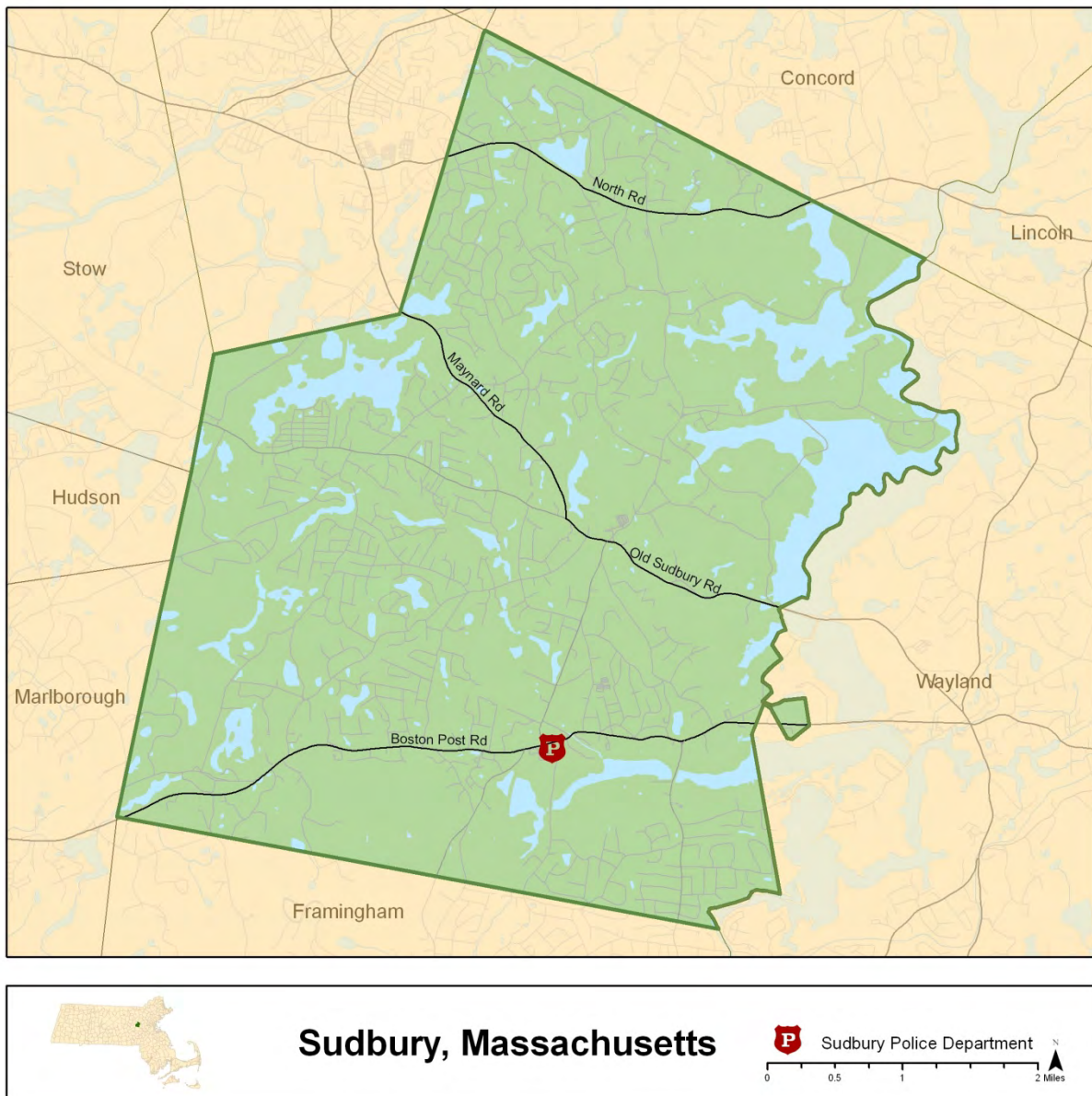


Figure 2 – Sudbury

A three-person Board of Selectmen and a Town Manager appointed by the Board oversee the Town of Sudbury. The Board of Selectmen is the primary policy-making body for the Town. The Town Manager is responsible for managing all Town departments.

Sudbury and Lincoln operate a shared high school, Lincoln-Sudbury Regional High School, which is located in Sudbury.

3.1.1 Existing Conditions

3.1.1.1 Operations

The Sudbury Police Department operates the primary dispatch center for the town, dispatching police personnel and transferring calls for fire and ambulance service to the Sudbury Fire Department.

Table 1 – Sudbury Operational Data

	Sudbury		
Staffing Levels			
Sworn or Civilian	Mix		
1 on duty	1 – Police / 1 – Fire		
2 on duty			
Console Positions	1 – Police		
Collective Bargaining	Teamsters		
Operating Procedures			
9-1-1 Call Transfers	All wireless calls are answered by the State Police and transferred to the appropriate PSAP. Fire and EMS ⁹ calls are transferred to the Sudbury Fire Department.		
10-codes			
Unit Recommendation for Police	Yes		
Police Status Method	CAD		
EMD Usage			
Fire Mutual Aid	Yes – Fire District 14		
Response Times (minutes)	1		
Call Volumes	2008	2009	2010
9-1-1 Wireline	1,853	1,788	1,809
9-1-1 Wireless	892	848	961
Non-emergency/Administrative	37,525	37,525	37,525
Incident Dispatch Data	2008	2009	2010
Police	18,158	15,813	15,223

⁹ Emergency medical services

	Sudbury		
Fire	877	882	1,131
EMS	1,066	1,161	1,214
Budget Costs			
Full-time	Police - \$174,113 (Salaries) - \$45,000 (Benefits) - \$50,786 (Overtime) Fire - \$107,000 (Salaries) - \$30,000 (Benefits)		
Part-time			

The police chief's administrative assistant is the dispatch supervisor and trainer, provides technical support, and performs QA on calls. The police department has three full-time and two part-time civilian dispatchers; shortages are covered by sworn officers. Minimum staffing is one, with dispatchers working eight-hour shifts. Wayland and Lincoln provide 9-1-1 call back-up for Sudbury.

The fire department has two full-time civilian dispatchers who work four on/four off from 0800 to 1800 hours. A third civilian dispatcher works two 14-hour shifts from 1800 hours to 0800 hours. For the remaining night shifts, overtime fire personnel or extra on-duty personnel cover the shift. Minimum staffing is one.

Sudbury does not provide EMD or pre-arrival instructions.

Ancillary duties of the dispatchers include:

- Entering warrants, citations and National Crime Information Center (NCIC) data
- Greeting the public
- Watching prisoners
- Answering calls for public works after hours
- Handling dog/animal calls
- Creating certified copies
- Tracking maintenance/cruiser issues
- Maintaining lost and found
- Issuing burning permits and collecting fees
- Monitoring mutual aid radios
- Updating contact listing and map books
- Answering all department phones
- Monitoring security system (CCTV)
- Providing fire hydrant locations (fire department)
- Maintaining daily fire log of all department activities (fire department)

Police personnel have UHF mutual aid channels with Lincoln, as well as 800 MHz with Marlboro and the Massachusetts State Police.

Sudbury is located in Fire District 14. Mutual aid is provided by other District 14 fire departments. Lincoln, Wayland, and Marlboro provide the first level of assistance during a serious fire. If the fire reaches a 3-alarm status, Ashland Control takes over all dispatch functions for the incident on the regional Fire District 14 frequency.

3.1.1.2 Technology

Sudbury's information technology (IT) department provides support to the police and fire departments.

Table 2 – Sudbury Technical Data

	Sudbury
Technology	
CAD	Pamet
RMS	Pamet
Additional Systems	Firehouse
Mapping/AVL/GIS	People GIS ¹⁰
Mobile Data	CJIS ¹¹
Radio	Police - 852.9215 and Fire - UHF 482.750
Paging	Zetron for fire still/box alarm tones
Logging Recorder	Nice DLR
Phone Systems, Servers and Connectivity	VESTA Pallas
Wireless Phase I and II Capabilities	Yes
Internet	Yes
Other Pertinent Technology	Pamet Law RMS ¹² , Firehouse Fire and Medical RMS

Sudbury's CAD system is Pamet, version 4.0.3.0, originally installed in 1989 and last updated in October 2010. The workstation uses a Windows XP Pro operating system and the server is Windows Server 2003. There is no redundant server. The Pamet CAD system is capable of supporting multiple jurisdictions and police, fire and EMS operations. The CAD system does not have an ANI/ALI interface.

The fire department has Firehouse CAD, which is used for records management and inspections. The fire department maintains a fire log book that requires written entries for all events.

The fire department has an automatic vehicle location (AVL) system that tracks regional assets.

The police department has mobile data terminals (MDTs) in patrol vehicles; however, the MDTs are only used for CJIS queries and are not interfaced with the CAD system. Air cards are used for connectivity.

The police department operates on frequency 852.9215 MHz and the fire department operates on UHF 482.750. Each system is Motorola and each department has a repeater site. The police dispatch console is a CENTRACOM

¹⁰ Geographic information system

¹¹ Criminal Justice Information Services Division

¹² Records management system

Series 2. Connectivity to the repeater is via two 4-wire lease lines. The fire dispatch console is a Zetron 4010R, connected to the repeater via a 4-wire lease line.

The fire department records the ring-down line from the police department and two administrative lines.

The police department dispatch center does not monitor outside alarms, but fire dispatch monitors municipal fire alarm boxes, which are not interfaced with the CAD system.

3.1.1.3 Facility

The Sudbury Police Department Dispatch Center is in poor condition. The communications area is not adequate for current needs. While there is no room for external expansion to the existing building, internal renovations would make the space more accommodating.

Table 3 – Sudbury Facility Data

	Sudbury
Facility	
Capacity	2 dispatch positions
Condition	Very small crowded space
Redundancy	Generator and UPS ¹³ back-up
Size	Dispatch – 8'x12'

3.1.2 Assessment

The Sudbury Police Department operates the primary dispatch center for the town, dispatching police personnel and transferring calls for fire and ambulance service to the Sudbury Fire Department.

L.R. Kimball recommends Sudbury strive to increase authorized civilian staff in preparation for EMD requirements. Currently, only one call taker/dispatcher is on-duty at a time. Becoming overwhelmed could happen in a matter of minutes. An additional position would also assist Sudbury in being able to develop and maintain a training and QA program in support of legislated EMD implementation and its on-going training requirements, should the Town elect to provide the service themselves. Sudbury should take advantage of funding from the 911 Department to meet EMD's legislated requirements as soon as possible. An additional position might also remove any dependency on sworn officers staffing the dispatch center. If sworn officers continue to cover shortages, L.R. Kimball recommends sworn personnel also receive EMD training and certification.

The quality of service in handling police and fire/EMS emergency communications is not balanced. Law enforcement calls receive handling as soon as the 9-1-1 call is answered. Fire and EMS calls are handled after transfer of the original call or the relay of information to the Sudbury Fire Department. This creates a built-in delay for all fire and EMS emergency calls.

¹³ Uninterrupted power supply

To eliminate the transfer of fire/EMS emergency calls, L.R. Kimball recommends Sudbury work towards merging/consolidating fire dispatch operations with current police dispatch operations. (This recommendation is dependent upon future decisions to participate in a regional initiative and/or shared services.) With a merger of this type, the fire chief should maintain operational control over how calls for service are dispatched and have appropriate control over other fire-related support services that may be handled by a merged operation. The community will benefit through the elimination of transferred fire or EMS emergency calls or relaying of information. Other benefits include improved situational awareness and coordination of resources during incidents where both agencies respond and/or when Sudbury agencies are part of a larger response.

L.R. Kimball recommends Sudbury improve ergonomics and the general environment for dispatch staff. Ergonomics and general environmental conditions can be improved by renovating the dispatch area to better accommodate two staffed positions. This is an opportunity to work toward maintaining two staffed positions in preparation for the impending EMD service requirements and a potential merge with fire/EMS dispatch services. (The recommendation for renovating the dispatch area is dependent upon future decisions to participate in a regional initiative as it would represent a financial and time investment.)

L.R. Kimball recommends the police department take advantage of resources that are available. For example, officers have the ability to run license, registration and wanted persons from their vehicles; however, this is not done consistently and tasks the dispatch staff unnecessarily. (L.R. Kimball acknowledges there are times when safety is a concern and dispatch staff should perform the tasks for field personnel.)

L.R. Kimball recommends the physical responsibility for checking on prisoners be removed from dispatch staff. L.R. Kimball acknowledges the need to have dispatch staff monitor prisoners via CCTV due to personnel and budgetary constraints; however, physical checks require dispatch staff to leave the phones and radio unattended.

Additional recommendations may be developed as further options are considered regarding any regionalization of services. Regardless of further decisions, Sudbury should take the above recommendations into consideration to improve services for their citizens, visitors and response agencies.

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3.2 Town of Wayland

The town of Wayland, located in southern Middlesex County, is approximately 15.9 square miles in area, with .7 square miles of water. Wayland has a population exceeding 12,900.

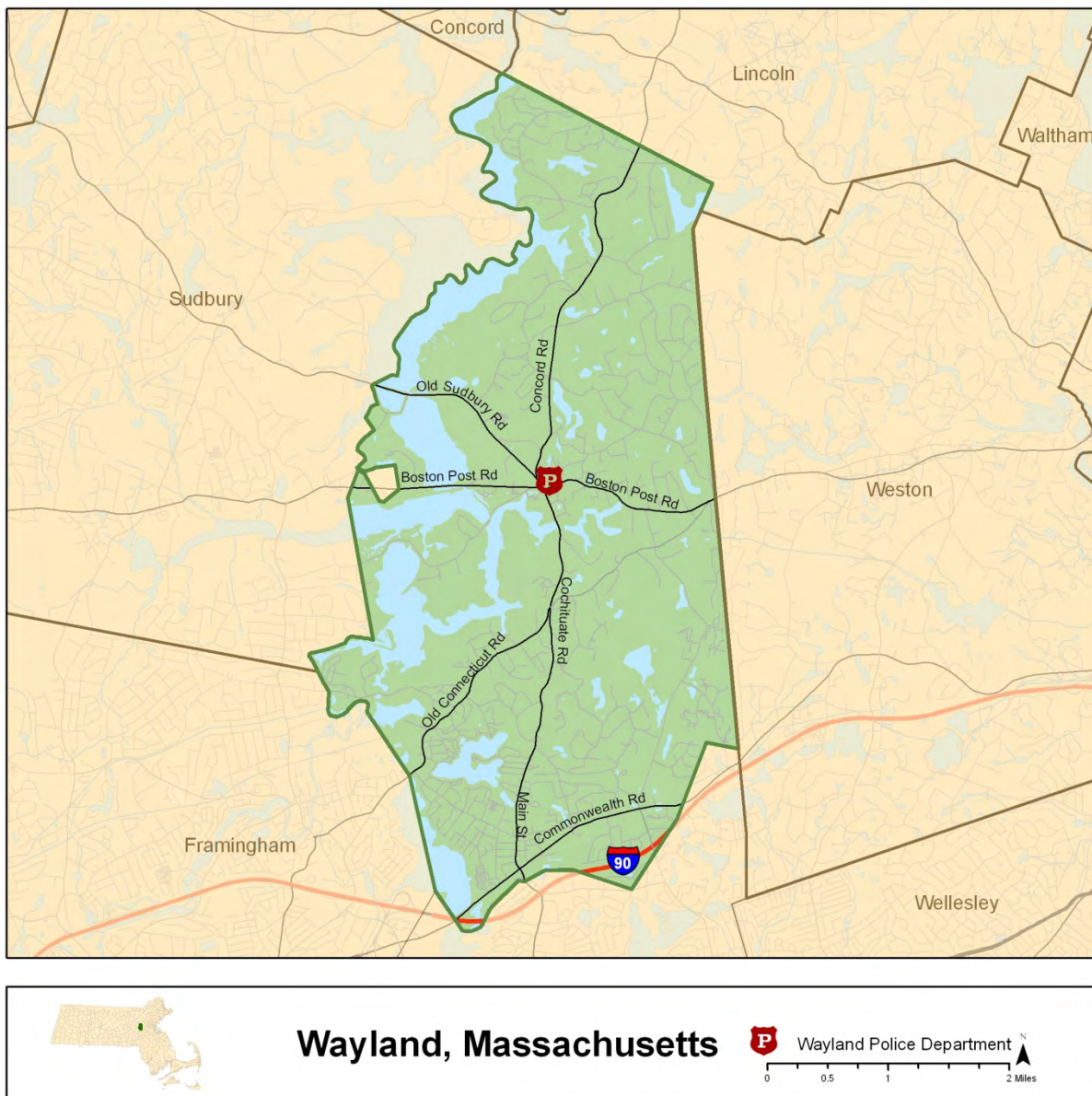


Figure 3 – Wayland

A five-person Board of Selectmen and a Town Administrator oversee the Town of Wayland. The Board of Selectmen, through the Town Administrator, is responsible for the operations of numerous departments, including police and fire. The Town Administrator oversees and administers the general business for the Town, "implementing policies to achieve the goals of the Board of Selectmen, and ensuring that available resources are being used in an efficient and effective manner."¹⁴

3.2.1 Existing Conditions

3.2.1.1 Operations

The Wayland Joint Communications Center is located in the Wayland Public Safety building and is the primary dispatch center for the town, dispatching police personnel and fire/rescue personnel.

Table 4 – Wayland Operational Data

	Wayland		
Staffing Levels			
Sworn or Civilian	Civilian		
1 on duty			
2 on duty	2		
Console Positions	2		
Collective Bargaining	Service Employees International Union (SEIU)		
Operating Procedures			
9-1-1 Call Transfers	All wireless calls are answered by the State Police and transferred to the appropriate PSAP.		
10-codes			
Unit Recommendation for Police	Yes		
Police Status Method	CAD		
EMD Usage			
Fire Mutual Aid	Yes – Fire District 14		
Response Times (minutes)	1		
Call Volumes	2008	2009	2010
9-1-1 Wireline	1,601	1,280	1,291
9-1-1 Wireless	815	698	782
Non-emergency/Administrative	10,000	10,000	10,000
Incident Dispatch Data	2008	2009	2010
Police	12,588	12,154	11,480
Fire	2,376	2,344	2,636
EMS	730	784	994

¹⁴ http://www.wayland.ma.us/Pages/WaylandMA_Admin/index

	Wayland
Budget Costs	
Full-time	\$351,152 (Salaries) - \$53,770 (Benefits) - \$75,000 (Overtime)
Part-time	

The police and fire chiefs jointly manage personnel and budget. The communications center has eight full-time and two part-time civilian dispatchers. Minimum staffing is two during the day and evening shifts and one during the midnight shift; each shift is eight hours. Communications staff is cross-trained in police and fire call taking, and dispatching. When the center is staffed by two dispatchers, police and fire dispatch responsibilities are separated, with each sharing the responsibility for answering incoming calls. Wayland does not provide EMD or pre-arrival instructions.

Ancillary duties of the dispatchers include:

- Greeting and directing walk-in customers
- Monitoring and coordinating with other Town departments (public works, water)
- Monitoring area police and fire frequencies
- Answering non-emergency and administrative calls for Town police and fire
- Entering records data and providing administrative support services for Town police and fire
- Maintaining burning permits
- Maintaining warrants
- Filing motor vehicle citations in RMS
- Faxing media releases
- Maintaining arrest logs
- Faxing all arrest documents to the court
- Monitoring prisoners and maintaining prisoner logs
- Sending/receiving involuntary commitment orders
- Completing requests for police traffic details, including billing information
- Maintaining and filing trespass, civil and restraining orders
- Monitoring ESP bank alarm
- Entering data for motor vehicle crash reports, business files, new residents and house checks

The joint center has mutual aid channels with area towns, as well as area-wide tactical channels and ICALL and ITAC for communications with the Massachusetts State Police on their 800 MHz system.

Wayland is located in Fire District 14. Mutual aid is provided by other District 14 fire departments. Lincoln, Sudbury, and Weston provide the first level of assistance during a serious fire. If the fire reaches a 3-alarm or 4-alarm status, Ashland Control takes over all dispatch functions for the incident on the regional Fire District 14 frequency.

3.2.1.2 Technology

Table 5 – Wayland Technical Data

	Wayland
Technology	
CAD	Pamet
RMS	Pamet
Additional Systems	Pamet
Mapping/AVL/GIS	People GIS
Mobile Data	Dell
Radio	Police - UHF - 484.4375 and Fire - UHF - 483.4125
Paging	Zetron for Fire/EMS
Logging Recorder	Nice DLR
Phone Systems, Servers and Connectivity	VESTA Pallas
Wireless Phase I and II Capabilities	Yes
Internet	Yes
Other Pertinent Technology	Pamet Law, Fire and Medical RMS, SigCom Vision 21 Alarm Box system

Wayland's CAD system is Pamet, version 4, originally installed in 1998 and last updated in 2011. The workstation uses a Windows 7/XP operating system and the server is Windows Server 2003. There is no redundant server. The CAD system is not capable of supporting multiple jurisdictions, but does support police, fire and EMS.

Pamet provides police, fire and EMS RMS, which are interfaced with the CAD system.

The mapping system is People GIS, installed in 2011, which includes ESRI and MapObjects for Wayland.

CJIS Web is installed in 20 officer-issued laptop computers that are taken in police vehicles with the officer. The MDTs are only used for queries and are not interfaced with the CAD system. Air cards are used for connectivity. The mobile server operating system is Windows Server 2003 and is located in the computer room at the Wayland Public Safety building.

The police department primarily operates on UHF 484.4375 and the fire department primarily operates on UHF 483.4125. The police and fire departments have two and three repeater sites, respectively. The police and fire dispatch consoles are Zetron 4115. Connectivity to the repeaters is via T1 and microwave.

The dispatch center monitors the municipal fire alarm system and Bank ESP tracker. The alarm receiver is a Signal Communications Vision 21, installed in 2003; however, it is not interfaced with the CAD system.

3.2.1.3 Facility

The Wayland Joint Communications Center has limited room for expansion.

Table 6 – Wayland Facility Data

	Wayland
Facility	
Capacity	2 dispatch positions
Condition	Good condition – limited space
Redundancy	Generator and UPS back-up
Size	Dispatch – 8'x20'

3.2.2 Assessment

The Wayland Joint Communications Center is the primary dispatch center for the town, dispatching police personnel and fire/rescue personnel.

Wayland has made investments in infrastructure. Wayland has completed narrowbanding and has upgraded their voters and repeaters. Wayland is working on microwave hops, and has upgraded their voters and repeaters.

The joint communications center is under the operational control of the police and fire departments, maintaining an equal balance of representation and service.

L.R. Kimball recommends Wayland strive to increase authorized civilian staff in preparation for EMD requirements, should the Town elect to provide the service themselves. An additional position would allow Wayland to develop and maintain a training and QA program in support of legislated EMD implementation and its on-going training requirements. Wayland should take advantage of State funding to meet EMD's legislated requirements as soon as possible.

L.R. Kimball recommends dispatch staff consistently record location changes in the CAD system. L.R. Kimball observed location changes noted on paper and not in the CAD system; dispatchers confirmed location changes were not always noted in the CAD system. This is a safety concern for police and fire personnel.

Additional recommendations may be developed as further options are considered regarding any regionalization of services. Regardless of further decisions, Wayland should take the above recommendations into consideration to improve services for their citizens, visitors and response agencies.

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3.3 Town of Weston

The town of Weston, located in southern Middlesex County, is a suburb of Boston and is approximately 17.3 square miles in area, with .3 square miles of water. Weston has a population exceeding 11,200.

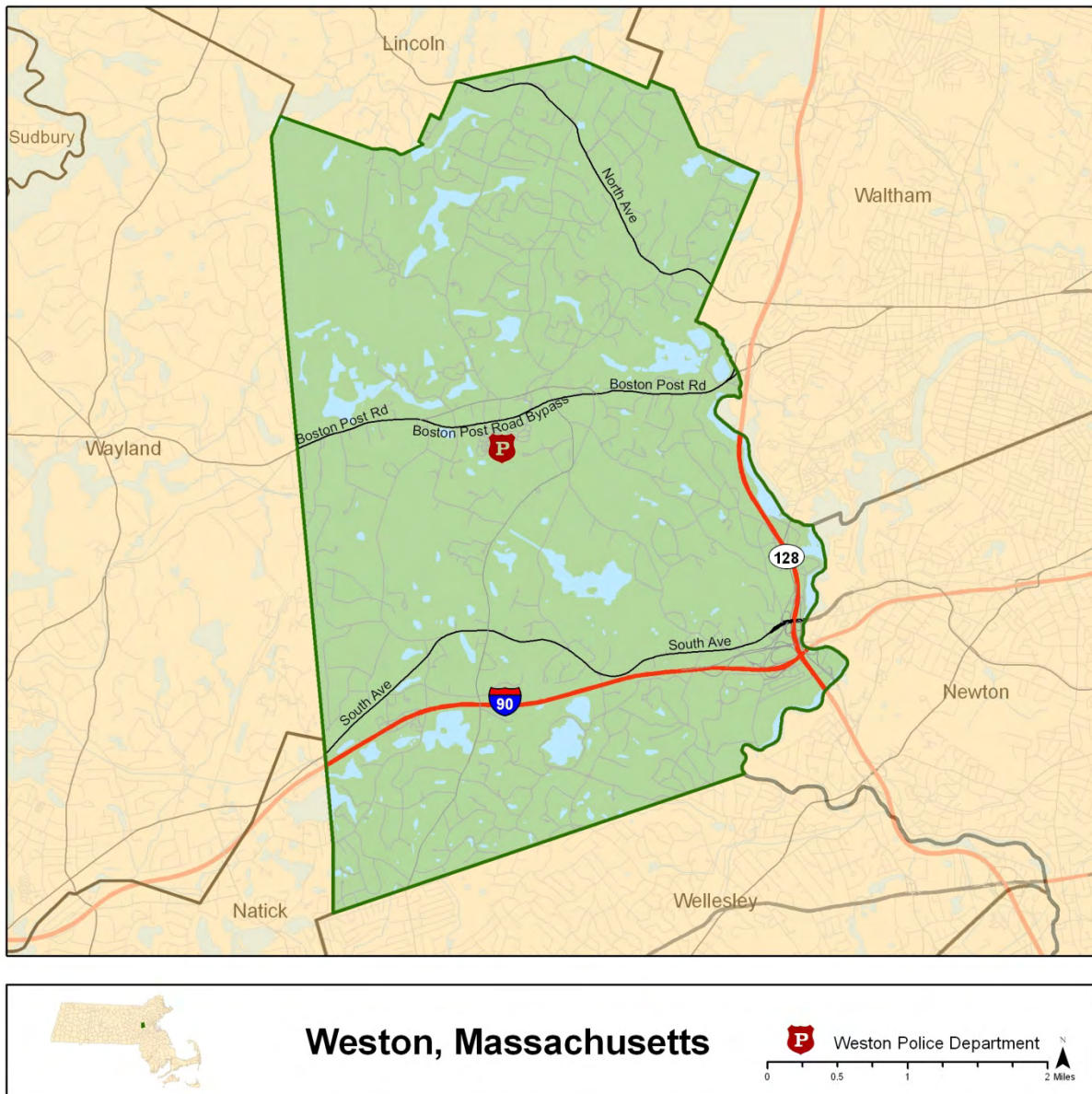


Figure 4 – Weston

A three-person Board of Selectmen and a Town Manager appointed by the Board oversee the Town of Weston. The Board of Selectmen is the primary policy-making body for the Town. The Town Manager supervises all Town departments under the jurisdiction of the Board.

Weston ranks as one of the most affluent towns in the United States and in 2009 had the number one public school system in Massachusetts.¹⁵

3.3.1 Existing Conditions

3.3.1.1 Operations

The Weston Police Department operates the primary dispatch center for the town, dispatching police personnel and transferring calls for fire and ambulance service to the Weston Fire Department. Weston has the lowest crime rate of the Metro-west Boston suburbs.

Table 7 – Weston Operational Data

	Weston		
Staffing Levels			
Sworn or Civilian	Civilian		
1 on duty	1		
2 on duty			
Console Positions	2		
Collective Bargaining	New England Police Benevolent Association (NEPBA) Local 177 I.U.P.A		
Operating Procedures			
9-1-1 Call Transfers	All wireless calls are answered by the State Police and transferred to the appropriate PSAP. Fire and EMS calls are transferred to the Weston Fire Department.		
10-codes			
Unit Recommendation for Police	Yes		
Police Status Method	CAD		
EMD Usage			
Fire Mutual Aid	Yes – Fire District 13		
Response Times (minutes)	2		
Call Volumes	2008	2009	2010
9-1-1 Wireline	1,630	1,459	1,723
9-1-1 Wireless	828	695	703
Non-emergency/Administrative			
Incident Dispatch Data	2008	2009	2010
Police	13,575	16,235	16,835

¹⁵ <http://www.bostonmagazine.com/boston/public2009>

	Weston		
Fire	2,152	2,009	2,453
EMS	996	983	1,134
Budget Costs			
Full-time	\$207,500 (Salaries) - \$61,000 (Overtime)		
Part-time			

The police lieutenant is the dispatch supervisor and trainer, and performs QA. The police department has four full-time civilian dispatchers. Minimum staffing is one, with dispatchers working eight-hour shifts.

The fire department has one dispatcher for each 12-hour day shift. Minimum staffing is one.

Weston does not provide EMD or pre-arrival instructions.

Ancillary duties of the dispatchers include:

- Monitoring the Boston Area Police Emergency Radio Network (BAPERN)
- Monitoring West District
- Watching prisoners via CCTV
- Entering data into CJIS
- Filing all reports
- Maintaining all supplies in dispatch area
- Faxing/receiving transmissions and forwarding same within department
- Permitting for solicitors and burials
- Assisting with animal control issues
- Monitoring fire radio
- Mailing citations
- Notifying public works for call outs
- Updating residents and corresponding information into system
- Changing and updating street information

Police personnel have VHF mutual aid channels with Carlisle and Lincoln, and ICALL and ITAC for communications with the Massachusetts State Police on their 800 MHz system. Weston also has radio communications with numerous agencies through a system called "Area Wide 3." In the system, Middlesex County is broken up into districts; Weston is in the West District. Area Wide 3 connects all agencies. Lincoln and Wayland are also in the West District and Concord is in the Northwest District. (See Appendix A for a list of districts and respective agencies.)

Weston is located in Metrofire District 13. Metrofire is an association of 34 metropolitan Boston fire departments that provide mutual aid to the others. A control center is incorporated into the operations of the Boston Fire Department. Fire alarm operators monitor departmental activity and coordinate regional response. Fire District 14 departments, such as Lincoln and Wayland, also provide the first level of assistance during a serious fire.

3.3.1.2 Technology

Weston's information systems department provides IT support to the police and fire departments.

Table 8 – Weston Technical Data

	Weston
Technology	
CAD	IMC/TriTech
RMS	IMC/TriTech
Additional Systems	IMC/TriTech
Mapping/AVL/GIS	IMC/TriTech
Mobile Data	IMC/Tri Tech
Radio	Police - UHF - 472.2375 and Fire - VHF - 154.16
Paging	Zetron for Police
Logging Recorder	Nice DLR
Phone Systems, Servers and Connectivity	VESTA Pallas
Wireless Phase I and II Capabilities	Yes
Internet	Yes
Other Pertinent Technology	IMC Law and Fire RMS

Weston's CAD system is IMC, version 4.6 build 17.79, installed in 2011. The server is Windows Server 2003. The CAD system is capable of supporting multiple jurisdictions and police, fire and EMS. The CAD system has an ANI/ALI interface.

The mobile mapping system is IMC CAD, with ESRI Shapefiles for Weston.

Weston uses IMC mobile data, with a Windows XP Mobile Switch as a mobile server. MDTs are installed in police and fire vehicles and interface with the CAD system; MDTs are used for status changes, queries and silent dispatch. There is mobile-to-server connectivity.

The police department operates on UHF 472.2375 and the fire department operates on VHF 154.16. Each department has a repeater at Regis College. The police dispatch console is a Zetron 4001R, originally installed in 2001; it has not been updated. The fire dispatch console is a Zetron. Connectivity to the both repeaters is through Town fiber. Each radio system has five remote receiver locations.

Municipal radio box alarms come into the fire department. The alarm receiver is a Digitize 3505. Forty-eight alarms are on old copper lines.

3.3.1.3 Facility

The Weston Police Department Dispatch Center area has limited room for expansion.

Table 9 – Weston Facility Data

	Weston
Facility	
Capacity	2 dispatch positions
Condition	Older building with limited space
Redundancy	Generator and UPS back-up
Size	Dispatch – 16'x16'

3.3.2 Assessment

The Weston Police Department operates the primary dispatch center for the town, dispatching police personnel and transferring calls for fire and ambulance service to the Weston Fire Department.

L.R. Kimball recommends Weston strive to increase authorized civilian staff in preparation for EMD requirements. Currently, only one call taker/dispatcher is on-duty at a time. Becoming overwhelmed could happen in a matter of minutes. An additional position would also assist Weston in being able to develop and maintain a training and QA program in support of legislated EMD implementation and its on-going training requirements, should the Town elect to provide the service themselves. Weston should take advantage of funding from the 911 Department to meet EMD's legislated requirements as soon as possible. An additional position might also remove any dependency on sworn officers staffing the dispatch center. If sworn officers continue to cover shortages, L.R. Kimball recommends sworn personnel also receive EMD training and certification.

For Weston Fire Department, the majority of their calls come in on business lines, which do not go through the dispatch center, but come directly to the fire department. Of the 2,400 to 2,500 calls annually, about 100 are transferred from the police department's dispatch center. While law enforcement calls receive handling as soon as the 9-1-1 call is answered, fire and EMS calls received on a 9-1-1 line are handled after transfer of the original call or relay of information. This creates a built-in delay for all transferred fire and EMS emergency calls. For calls received on business lines, the Weston Fire Department does not receive critical location information provided by 9-1-1. This creates disparity in how police and fire/EMS emergency calls are handled.

To eliminate the transfer of fire/EMS emergency calls, L.R. Kimball recommends Weston work towards merging/consolidating fire dispatch operations with current police dispatch operations. The fire department began hiring civilian dispatchers earlier in the year with the intent of a possible merger in the future. With a merger of this type, the fire chief should maintain operational control over how fire calls for service are dispatched and have appropriate control over other fire-related support services that may be handled by a merged operation. The community will benefit through the elimination of transferred fire or EMS emergency calls or relaying of information. Other benefits include improved situational awareness and coordination of resources during incidents where both agencies respond and/or when Weston agencies are part of a larger response.

L.R. Kimball recommends Weston improve ergonomics and the general environment for dispatch staff. Ergonomics and general environmental conditions can be improved by renovating the dispatch area to better accommodate two

full-time staffed positions. This is an opportunity to work toward maintaining two staffed positions in preparation for combining fire/EMS dispatch services and the impending EMD service requirements. (The recommendation for renovating the dispatch area is dependent upon future decisions to participate in a regional initiative as it would represent a financial and time investment.)

Additional recommendations may be developed as further options are considered regarding any regionalization of services. Regardless of further decisions, Weston should take the above recommendations into consideration to improve services for their citizens, visitors and response agencies.

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3.4 Town of Concord

The town of Concord, located in central Middlesex County, is approximately 25.9 square miles in area, with 1 square mile of water. Concord has a population exceeding 17,600.

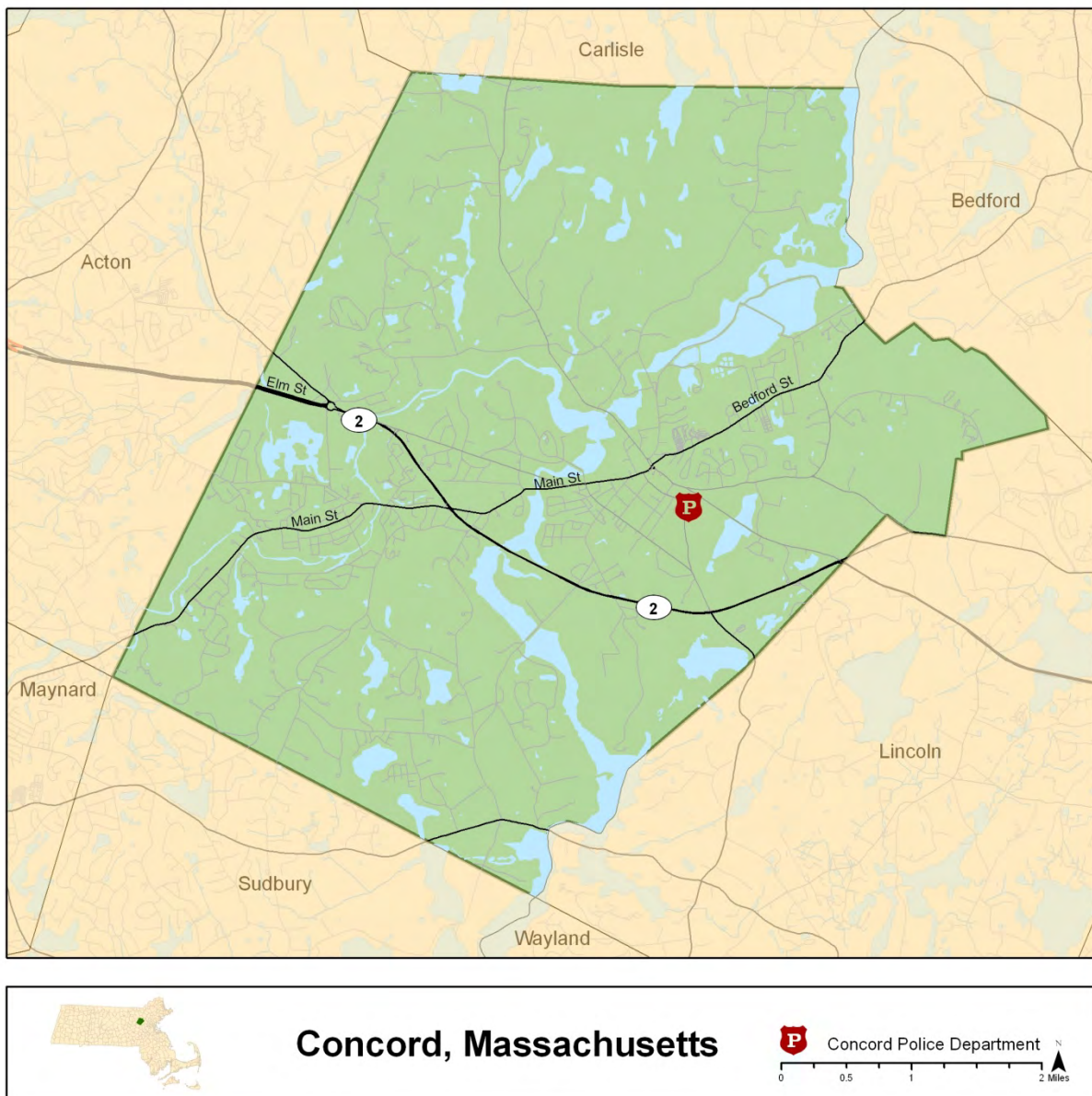


Figure 5 – Concord

A five-person Board of Selectmen and a Town Manager oversee the Town of Concord. The Board of Selectmen is the primary policy-making body for the Town on a variety of issues that affect the Town's provision of services. The Town Manager is responsible for managing all Town departments. The Town Manager's Office also has responsibility "for the continual review of policies and programs in an effort to provide improved service."¹⁶

3.4.1 Existing Conditions

3.4.1.1 Operations

The Concord Police Department operates the primary communications center for the town, dispatching police personnel and fire/rescue personnel.

Table 10 – Concord Operational Data

	Concord		
Staffing Levels			
Sworn or Civilian	Civilian		
1 on duty	1 shift		
2 on duty	2 shifts		
Console Positions	2.5		
Collective Bargaining	Teamsters		
Operating Procedures			
9-1-1 Call Transfers	All wireless calls are answered by the State Police and transferred to the appropriate PSAP.		
10-codes	No		
Unit Recommendation for Police	Yes		
Police Status Method	CAD		
EMD Usage	Medical Priority		
Fire Mutual Aid	Yes – Fire District 14		
Response Times (minutes)	1		
Call Volumes	2008	2009	2010
9-1-1 Wireline	3,178	2,901	2,836
9-1-1 Wireless	998	921	1,113
Non-emergency/Administrative			
Incident Dispatch Data	2008	2009	2010
Police	13,785	13,605	13,107
Fire	2,308	1,850	1,983
EMS		152	344
Training Levels	MPSCA: Basic Telecomm, Fire Comm, PD Comm, EMD, Tactical Comm, CPR, ICS		

¹⁶ http://www.concordma.gov/pages/ConcordMA_TownManager/index

	Concord
Budget Costs	
Full-time	
Part-time	

The lead dispatcher is the dispatch supervisor and trainer, and performs QA. The police department has eight full-time civilian dispatchers. Minimum staffing is two during the day and evening shifts, and one during the midnight shift; each shift is eight hours. Concord provides EMD and pre-arrival instructions using Medical Priority flip cards. Acton provides 9-1-1 call back-up for Concord.

Ancillary duties of the dispatchers include:

- Greeting the public
- Entering warrants and managing NCIC data
- Answering calls for public works after-hours
- Monitoring other radio frequencies for North Eastern Massachusetts Law Enforcement Council (NEMLEC)/BAPERN network
- Monitoring fire alarm signals
- Updating site file databases
- Liaising with animal control
- Managing Reverse 911 notification system

Police personnel have VHF mutual aid channels with Carlisle, Acton, Maynard, Westford, and Lincoln, as well as BAPERN area-wide tactical channels. Additionally, the communications center has radio contact with the National Park Service (Minuteman National Park), Massachusetts Correctional Institution at Concord (MCI-Concord) and Northeastern Correctional Center, and public works, including highway, municipal light, water, parks and trees.

Concord is located in Fire District 14 and HazMat District 3. Mutual aid is provided by other District 14 fire departments. Acton, Bedford, Lincoln, Maynard, Carlisle, Hanscom and Sudbury provide the first level of assistance during a serious fire. If the fire reaches a 4-alarm status, Ashland Control takes over run card management and mutual aid unit assignment for the incident.

3.4.1.2 Technology

Concord's IT department provides support to the police and fire departments.

The communications center is on the Town's fiber network, which is managed by the Concord Light Department. The public safety IT department intends to create their own network, independent of the Town's network, due to concerns regarding the single point of failure at Concord Light.

Table 11 – Concord Technical Data

	Concord
Technology	
CAD	IMC/TriTech
RMS	IMC/TriTech
Additional Systems	IMC/TriTech
Mapping/AVL/GIS	People GIS
Mobile Data	IMC/TriTech
Radio	Police - VHF - 482.3375 and Fire - VHF - 483.5375
Paging	
Logging Recorder	Nice DLR
Phone Systems, Servers and Connectivity	VESTA Pallas
Wireless Phase I and II Capabilities	Yes
Internet	Yes
Other Pertinent Technology	IMC Law, Fire and Medical RMS, Digitize alarm system, Ham radio (CARET) in EOC ¹⁷ and shelters (if deployed)

Concord's CAD system is IMC, version 17.49, originally installed in April 2004 and last updated in March 2011. The workstation uses a Windows XP Pro operating system and the server is Windows Server 2003. There is no redundant server. The CAD system is capable of supporting multiple jurisdictions and police, fire and EMS operations. The CAD system has an ANI/ALI interface. The CAD system also provides the following functionality: alarm monitoring, mapping, police field reporting, police mobile, police RMS, radio console push-to-talk, rip and run, staffing module, and Commonwealth/NCIC interfaces.

The mapping system is IMC CAD, which includes Shapefiles for Concord.

IMC mobile data is installed on Panasonic Toughbooks in eight police vehicles. The MDTs are interfaced with the CAD system and are used for status changes, queries and silent dispatch. The MDTs have mobile mapping. Verizon air cards are used for connectivity. The fire department has been testing a mobile Toughbook in one of the engines; the hope is eventually to install Toughbooks in the two primary engines, both ambulances, and one command vehicle.

The police department primarily operates on UHF 482.3375 and the fire department primarily operates on UHF 483.5375. Each department has two repeater sites and one remote receiver site managed by a signal voter system. The police and fire dispatch consoles are CENTRACOM Elite. Connectivity to the repeaters is via landline and fiber.

Concord also has a training room/EOC in the police department. Dispatch personnel staff the EOC in an emergency. There is an active Ham radio team, Concord Amateur Radio Emergency Team (CARET), which staffs the EOC and various shelters in an emergency. CARET is also used during pre-planned events, such as parades.

¹⁷ Emergency operations center

The communications center uses SymmTime software calibrated with the atomic clock at the Naval Observatory, Colorado for the CAD and instant recording systems. The radio control system uses a separate master clock on its own server.

Radio box alarms for Town buildings come into the communications center on a Digitize 3505 alarm receiver that is interfaced with the CAD system. King-Fisher protection system monitoring is also used. Both systems are broadcast only. Some advanced encryption standard (AES) system alarms use two-way signaling; these are capable of acknowledging the alarm and identifying specific alarm data, such as cause and location. There are approximately 110 alarm boxes in Concord.

The Concord Police Department has a mobile command post that is used for large pre-planned events and emergencies. The command post is a Freightliner van equipped with radio equipment, telephone, CAD system access, wireless connectivity, generator and external outlets. An on-board digital clock is independently synched with the atomic clock at the Naval Observatory, Colorado. Communications personnel staff the command post when it is operational.

3.4.1.3 Facility

The Concord Police Department Dispatch Center has limited room for expansion.

Table 12 – Concord Facility Data

	Concord
Facility	
Capacity	3 dispatch positions
Condition	Fair condition – limited room
Redundancy	Generator and UPS back-up
Size	Dispatch – 8'x24'

3.4.2 Assessment

The Concord Police Department operates the primary communications center for the town, dispatching police personnel and fire/rescue personnel. While the police chief has operational responsibility for the dispatch center, he is proactive in seeking input from the fire chief, who maintains appropriate control over fire-related support services provided by communications center staff. The relationship between the agencies is very good. Communications center staff provides EMD on medical emergency calls for service.

The Concord Police Department regularly has persons in lock up for protective custody, alcohol abuse or mental health problems. The department requires an officer in the building during lock ups. The responsibility for overseeing/monitoring the prisoners does not fall on the dispatchers.

Emerson Hospital is a regional hospital located in Concord that also has psychiatric facilities. The Concord Police and Fire Departments work closely in partnership with hospital administration to develop and exercise All-Hazards critical incident response plans. The Concord Police and Fire Departments also work closely in partnership with the National Park Service and the Massachusetts Division of Conservation and Recreation on response plans for public events and search/rescue operations.

Recommendations may be developed as further options are considered regarding any regionalization of services.

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3.5 Town of Acton

The town of Acton, located in western Middlesex County, is approximately 20.3 square miles in area, with .3 square miles of water. Acton has a population exceeding 21,900.

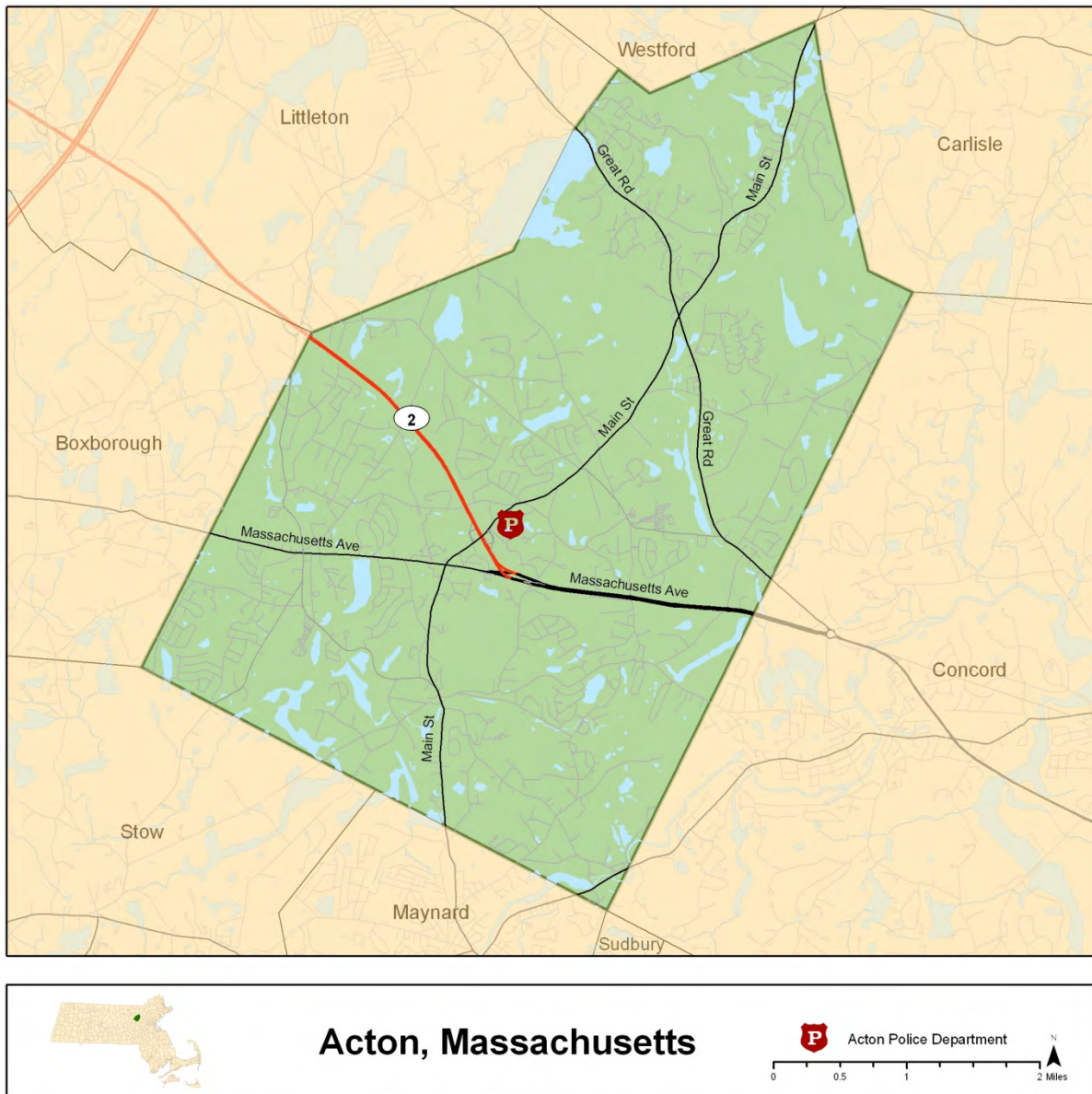


Figure 6 – Acton

A five-person Board of Selectmen and a Town Manager oversee the Town of Acton. The Town Manager is responsible for managing all Town departments, overseeing budgetary, financial, and personnel administration activities.

Acton and Boxborough operate shared junior and senior high schools, R.J. Grey Junior High School and the Acton-Boxborough Regional High School, both of which are located in Acton. The latter was named a Blue Ribbon School in 2009.¹⁸

3.5.1.1 Operations

The Town of Acton operates the primary communications center for law enforcement and fire from the Public Safety building. While the police chief currently administers the budget, the police chief and fire chief jointly manage the center, to include collective bargaining, personnel issues and training.

Table 13 – Acton Operational Data

	Acton		
Staffing Levels			
Sworn or Civilian	Civilian		
1 on duty			
2 on duty	2		
Console Positions	4 – 3 live		
Collective Bargaining	Teamsters		
Operating Procedures			
9-1-1 Call Transfers	All wireless calls are answered by the State Police and transferred to the appropriate PSAP.		
10-codes			
Unit Recommendation for Police	Yes		
Police Status Method	CAD		
EMD Usage	Yes		
Fire Mutual Aid	Yes – Fire District 14		
Response Times (minutes)			
Call Volumes	2008	2009	2010
9-1-1 Wireline	3,458	2,834	3,092
9-1-1 Wireless	1,362	1,246	1,407
Non-emergency/Administrative	68,645	56,152	60,166
Incident Dispatch Data	2008	2009	2010
Police	18,652	19,316	18,504

¹⁸ This was awarded by the U.S. Department of Education and is the highest honor a school can achieve. More information on the program can be found at http://en.wikipedia.org/wiki/Blue_Ribbon_Schools_Program.

	Acton		
Fire	3,310	2,901	2,982
EMS	1,462	1,479	1,535
Budget Costs			
Full-time	\$468,762 (Salaries)		
Part-time			

The communications center has eight full-time and two part-time civilian dispatchers. Minimum staffing is two, with dispatchers working eight-hour shifts. All staff are cross-trained on police and fire/EMS. Dispatch responsibilities rotate on a shift-by-shift basis from police to fire/EMS and vice versa to keep staff current. There is no dispatch supervisor. Concord and Sudbury provide 9-1-1 call back-up for Acton.

All dispatch staff are EMD-certified and provide EMD and pre-arrival instructions.

Ancillary duties of the dispatchers include:

- Entering warrants
- Greeting the public
- Answering all administrative calls into the building
- Monitoring other radio frequencies
- Selling parking stickers
- Answering records questions when department is closed
- Maintaining detail call list
- Maintaining shift call list
- Monitoring CJIS terminals
- Taking animals calls for dog officer
- Monitoring prisoners on CCTV
- Printing and disseminating motor vehicle and arrest information for officers
- Taking inspection calls
- Communicating with fire shift commanders and/or Fire Administration to schedule and/or redirect various inspections

Acton is located in Fire District 14. Mutual aid is provided by other District 14 fire departments. Concord, Maynard, Boxborough, Littleton and Westford provide the first level of assistance during a serious fire. If the fire reaches a 4-alarm status, Ashland Control takes over all dispatch functions for the incident on the regional Fire District 14 frequency.

3.5.1.2 Technology

Acton's IT department provides support for the communications center and understands mission critical technology.

Table 14 – Acton Technical Data

	Acton
Technology	
CAD	Pamet
RMS	Pamet
Additional Systems	Pamet
Mapping/AVL/GIS	
Mobile Data	Pamet
Radio	Police - VHF 154.815 and Fire -UHF 453.175
Paging	Zetron for Fire/EMS
Logging Recorder	Nice DLR
Phone Systems, Servers and Connectivity	VESTA Pallas
Wireless Phase I and II Capabilities	Yes
Internet	Yes
Other Pertinent Technology	Pamet Law and Fire RMS, SigCom Vision 21 alarm box system

Acton's CAD system is Pamet, version 4.0.3.5, originally installed in July 1987 and last updated in November 2010. The workstation uses a Windows operating system and the server is Windows Server 2003 Ent. There is no redundant server. The CAD system is capable of supporting multiple jurisdictions and police, fire and EMS operations. While the CAD system has an ANI/ALI interface, data is manually entered into the CAD system, rather than populating automatically.

The mapping system is ESRI ArcMap 9.2, originally installed May 2009, which includes GIS data for Acton.

HP/Data 911 provides the MDTs, which were originally installed in 1993 and last updated in July 2007. The mobile server is Windows Server 2003 and the software is Biokey Mobilecop version 6.0.

The police department operates on VHF 154.815 and the fire department operates on UHF 453.175. The police base station is located on Great Hill and the fire base station is located at 211 Main Street. The police and fire dispatch consoles are Zetron model 4118, which also provide paging. The consoles were originally installed in April 2005.

The Master Clock is connected to the CAD system, logging recorder, radio consoles, RMS, fire RMS, MDTs and 9 1-1 CPE.

Box alarms come into the Signal Communications Vision 21 located in the communications center. While the Vision 21 is not interfaced with the CAD system, alarm data is pre-loaded into the Pamet CAD.

3.5.1.3 Facility

The Acton Dispatch Center has room for expansion, with the potential for an additional two or three console positions, depending on layout.

Table 15 – Acton Facility Data

	Acton
Facility	
Capacity	4 dispatch positions
Condition	Very good
Redundancy	Generator and UPS back-up
Size	Dispatch – 36'x30'

3.5.2 Assessment

The Acton communications center dispatches police personnel and fire/rescue personnel. While the police chief currently administers the budget, the police chief and fire chief jointly manage the center. The relationship between the agencies is very good.

Acton has a significant investment in their building, which was built in 2005 and in excellent condition. There are separate areas for the records division, communications center, police operations, holding cells and the fire chief's office area. There is a tiered EOC and a training room/backup EOC, which is networked. The records division handles walk-in traffic during business hours.

Currently, minimum staffing requires one police dispatcher and one fire dispatcher at all times. There is no dispatch supervisor or lead dispatcher. L.R. Kimball recommends Acton strive to increase authorized civilian staff to accommodate a lead/supervisory position. This additional position would also assist Acton in being able to develop and maintain a training and QA program for EMD.

L.R. Kimball recommends continued efforts to identify attainable goals that will improve the Insurance Services Office (ISO) rating within the communications center.

Additional recommendations may be developed as further options are considered regarding any regionalization of services. Regardless of further decisions, Acton should take the above recommendations into consideration to improve services for their citizens, visitors and response agencies.

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3.6 Town of Maynard

The town of Maynard, located in central Middlesex County, is approximately 5.4 square miles in area, with .1 square mile of water. Maynard has a population slightly over 10,000.

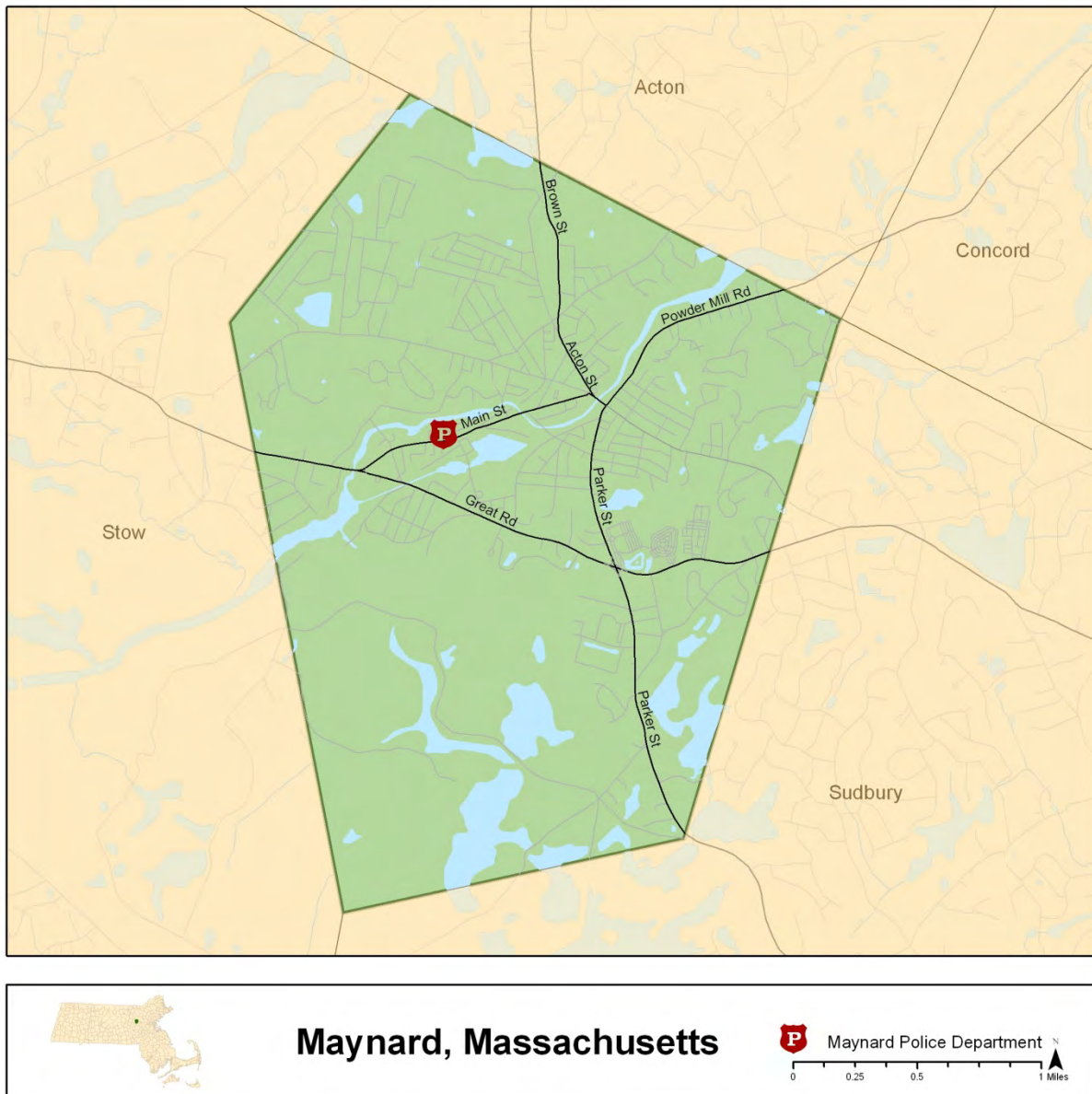


Figure 7 – Maynard

A five-person Board of Selectmen and a Town Administrator appointed by the Board oversee the Town of Maynard. The Board of Selectmen is the primary policy-making body for the Town, working with the Town Administrator on policy development. The Board oversees the Town Administrator in his role as supervisor of Town departments.

3.6.1 Existing Conditions

3.6.1.1 Operations

The Maynard Police Department operates the primary dispatch center for the town, dispatching police personnel and transferring calls for fire and ambulance service to the Maynard Fire Department. The dispatch center is staffed by sworn personnel, while firefighters operate the dispatch-only center from the fire station. There are plans to move fire dispatch operations to the police department dispatch center. At this time, the fire department is a limited secondary PSAP.

Table 16 – Maynard Operational Data

	Maynard		
Staffing Levels			
Sworn or Civilian	Sworn		
1 on duty	1		
2 on duty			
Console Positions	2		
Collective Bargaining	Police Bargaining Unit		
Operating Procedures			
9-1-1 Call Transfers	All wireless calls are answered by the State Police and transferred to the appropriate PSAP. Fire and EMS calls are transferred to the Maynard Fire Department.		
10-codes			
Unit Recommendation for Police			
Police Status Method	CAD		
EMD Usage			
Fire Mutual Aid	Yes – Fire District 14		
Response Times (minutes)			
Call Volumes	2008	2009	2010
9-1-1 Wireline	1,009	1,113	961
9-1-1 Wireless	407	507	516
Non-emergency/Administrative			
Incident Dispatch Data	2008	2009	2010
Police			
Fire			
EMS			
Budget Costs			

	Maynard
Sworn Staffing	\$225,000 (Salaries)

All call take and dispatch responsibilities for the police department are provided by sworn officers. Twenty-one full-time officers are certified as 9-1-1 call takers. Officers rotate through the dispatch center every two hours of a respective shift. Sudbury provides 9-1-1 call back-up for Maynard.

Currently, the Maynard Fire Department is the back-up dispatch center. A fireman is assigned dispatch/fire alarm duties. Maynard does not provide EMD or pre-arrival instructions.

Ancillary duties of the dispatch center include:

- Greeting the public
- Maintaining warrants
- Notifying public works
- Filling overtime and private details
- Monitoring prisoners

Police personnel have VHF mutual aid channels on their mobile radios with Acton and Stow, as well as area-wide tactical channels and ICALL and ITAC for communications with the Massachusetts State Police on their 800 MHz system.

Maynard is located in Fire District 14. Mutual aid is provided by other District 14 fire departments. Acton, Concord, Lincoln, Boxborough, and Sudbury provide the first level of assistance during a serious fire. If the fire reaches a 4-alarm status, Ashland Control takes over all dispatch functions for the incident on the regional Fire District 14 frequency.

3.6.1.2 Technology

Drive Tech provides IT support to the Maynard dispatch center.

Table 17 – Maynard Technical Data

	Maynard
Technology	
CAD	TriTech
RMS	TriTech
Additional Systems	
Mapping/AVL/GIS	
Mobile Data	TriTech
Radio	Police - VHF - 155.01 and Fire - UHF - 470.90
Paging	

	Maynard
Logging Recorder	Nice DLR
Phone Systems, Servers and Connectivity	VESTA Pallas
Wireless Phase I and II Capabilities	Yes
Internet	Yes
Other Pertinent Technology	TriTech Law RMS, Track Star AVL

Maynard's CAD system is IMC/Tri Tech, version 4.6, build 17, originally installed in February 2009 and last updated in April 2011. The workstation uses a Windows XP Pro operating system and the server is Windows Server 2003. There is no redundant server. The CAD system is capable of supporting multiple jurisdictions and police, fire and EMS operations. The CAD system has an ANI/ALI interface and provides the following functionality: mapping, police field reporting, police mobile, police RMS, radio console-push to talk, staffing module and Commonwealth/NCIC interfaces.

The police department uses a Drive Tech AVL system. IMC mobile data, installed in five police vehicles, is interfaced with the CAD system and is used for status changes, queries and silent dispatch.

The police department operates on VHF 155.01 and the fire department operates on UHF 470.90. The police dispatch consoles are Motorola MCC 5500, installed in February 2009 and last updated in December 2010. Their operating system is Windows XP.

The police department has an Acorn recording system in addition to the Nice logging system provided by the Commonwealth.

The police department dispatch center does not monitor outside alarms.

3.6.1.3 Facility

The Maynard Police Department Dispatch Center could accommodate one additional position without expansion of the current space.

Table 18 – Maynard Facility Data

	Maynard
Facility	
Capacity	2 dispatch positions
Condition	Recently renovated library – good condition
Redundancy	Generator and UPS back-up
Size	Dispatch – 24'x24'

3.6.2 Assessment

The Maynard Police Department operates the primary dispatch center for the town, dispatching police personnel and transferring calls for fire and ambulance service to the Maynard Fire Department. The dispatch center is staffed by sworn personnel, while firefighters operate the dispatch only center from the fire station.

L.R. Kimball recommends Maynard consider civilianizing their dispatch centers for both police and fire, and combine into a single operation at the police department. Civilian call takers/dispatchers would free sworn personnel and certified firefighters to handle more appropriate duties.

The quality of service in handling police and fire/EMS emergency communications is not balanced. While there may be plans to move fire dispatch operations to the police department dispatch center, fire dispatch is currently handled from the fire station. Law enforcement calls receive handling as soon as the 9-1-1 call is answered. Fire and EMS calls are handled after transfer of the original call or the relay of information to the Maynard Fire Department. This creates a built-in delay for all fire and EMS emergency calls.

Regardless of any decision to civilianize, to eliminate the transfer of fire/EMS emergency calls, L.R. Kimball recommends Maynard continue to work towards merging/consolidating fire dispatch operations with current police dispatch operations. With a merger of this type, the fire chief should maintain operational control over how calls for service are dispatched and have appropriate control over other fire-related support services that may be handled by a merged operation. The community will benefit through the elimination of transferred fire or EMS emergency calls or relaying of information. Other benefits include improved situational awareness and coordination of resources during incidents where both agencies respond and/or when Maynard agencies are part of a larger response.

Should Maynard elect to provide EMD services themselves, an additional position may be needed in order to develop and maintain a training and QA program in support of legislated EMD implementation and its on-going training requirements. Maynard should also take advantage of funding from the 911 Department to meet EMD's legislated requirements as soon as possible.

Additional recommendations may be developed as further options are considered regarding any regionalization of services. Regardless of further decisions, Maynard should take the above recommendations into consideration to improve services for their citizens, visitors and response agencies.

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3.7 Town of Lincoln

The town of Lincoln, located in southern Middlesex County, is approximately 15 square miles in area, with .6 square mile of water. Hanscom Air Force Base (AFB) is partially within the town limits. Lincoln has a population slightly exceeding 5,000; with Hanscom AFB, the population exceeds 6,300.

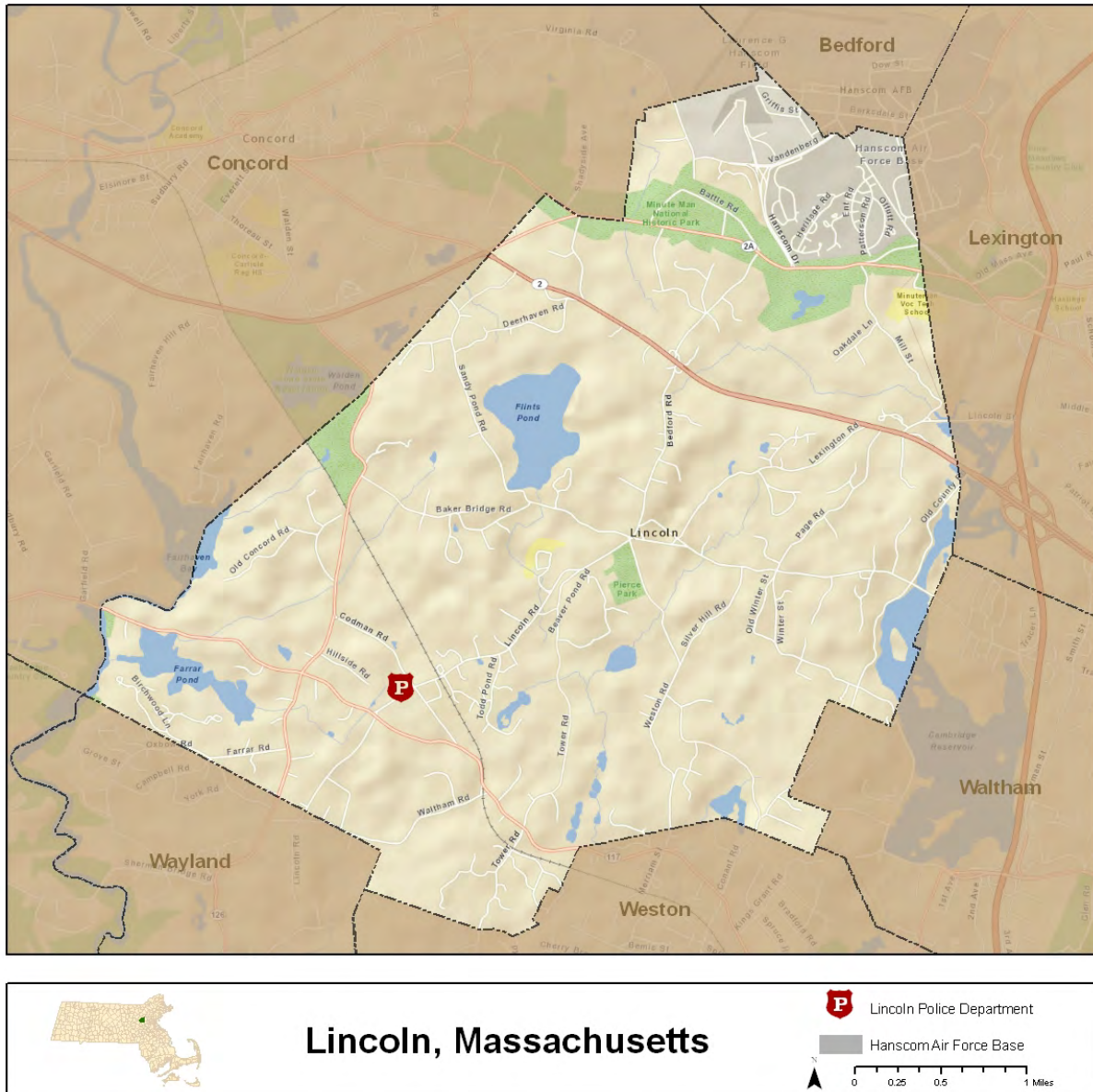


Figure 8 – Lincoln

A three-person Board of Selectmen and a Town Administrator appointed by the Board oversee the Town of Lincoln. The Board of Selectmen is responsible for “the general direction and management of the affairs and property of the Town.”¹⁹ The Town Administrator is responsible for the day-to-day operations of the Town departments to ensure effective and efficient delivery of services.

Lincoln is regarded as one of the wealthiest towns in the country.

Lincoln and Sudbury operate a shared high school, Lincoln-Sudbury Regional High School, which is located in Sudbury.

Hanscom AFB is physically located within the towns of Bedford, Concord, Lexington and Lincoln. The AFB is under the exclusive jurisdiction of the federal government. There are 750 housing units under the new AFB Housing Plan; all 750 housing units on the base are technically within the legal boundaries of Lincoln.

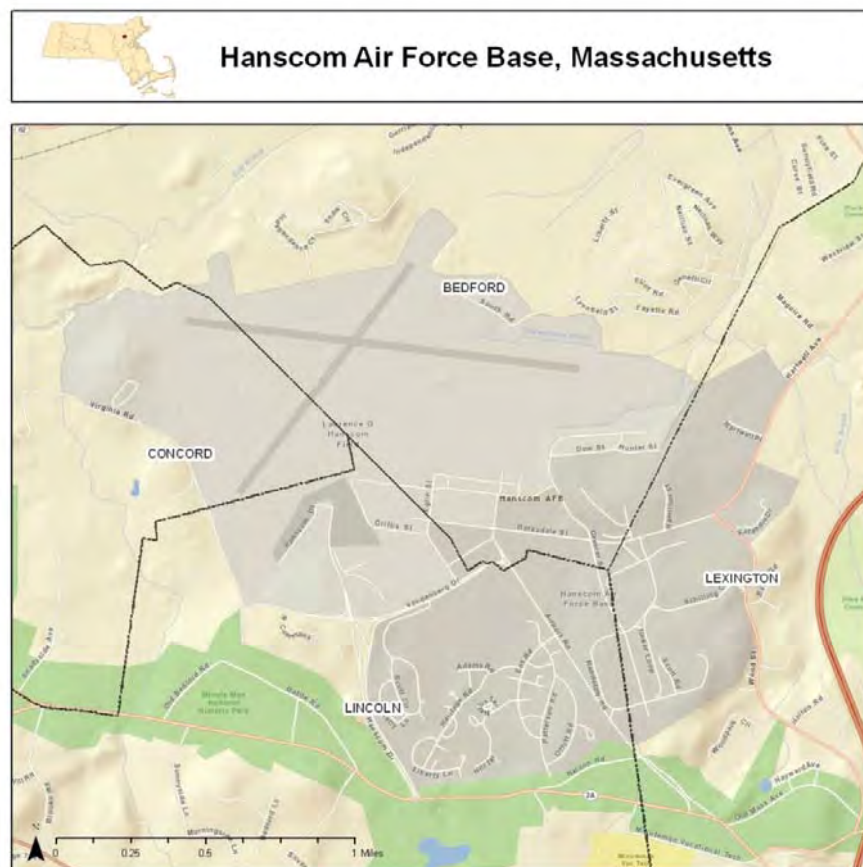


Figure 9 – Hanscom Air Force Base

¹⁹ <http://www.lincolntown.org/depts/bos.htm>

Calls for law enforcement from Hanscom AFB are transferred to the Department of Defense 66th Security Forces Squadron, Police Services Section, at Hanscom. Security Forces personnel are the initial police responders to calls involving military personnel and civilians. After assessing the incident, Security Forces personnel often contact the Lincoln Police Department if the incident involves a civilian, non-Air Force member, or juvenile. The police department's role is to ensure that all constitutional protections have been afforded to the involved parties should Security Forces personnel decline to take action on the incident. Due to constitutional protections, the Lincoln Police Department cannot deny services to individuals even though the incident took place within the exclusive federal jurisdiction of Hanscom AFB. The type of incidents typically handled by the department include: domestics, shoplifting, child abuse/neglect, restraining orders, harassment orders, larceny, and arrest warrants.

The Lincoln Police Department has a formalized memorandum of understanding with the 66th Security Forces and Middlesex District Attorney's Office regarding the policies and procedures of incidents that take place on Hanscom involving civilian and military personnel for which the government declines jurisdiction.

Hanscom AFB has its own fire department and private ambulance contractor. The AFB fire department handles some incidents on their own; however, if there is a house or building fire, the Lincoln Fire Department responds, and, upon arrival, takes over the scene. The private ambulance contractor on Hanscom is Armstrong Ambulance. The contract requires Armstrong to have one ambulance on the base for one hour in the morning and one hour in the afternoon.

MassPort is an independent public authority that manages Logan Airport in Boston, Worcester Regional Airport, Hanscom Field and the Port of Boston. The Massachusetts State Police are the primary law enforcement agency for Hanscom Field, which is primarily located in Bedford, with portions in Lincoln and Concord. The state police have a patrol assigned to the airport 24x7x365. MassPort has contracted with Hanscom AFB Fire Department for fire response to the airport.

3.7.1 Existing Conditions

3.7.1.1 Operations

The Lincoln Police Department operates the primary communications center for the town, dispatching police personnel and fire/rescue personnel.

Table 19 – Lincoln Operational Data

	Lincoln
Staffing Levels	
Sworn or Civilian	Civilian
1 on duty	1
2 on duty	
Console Positions	2
Collective Bargaining	Police Bargaining Unit
Operating Procedures	

	Lincoln		
9-1-1 Call Transfers	All wireless calls are answered by the State Police and transferred to the appropriate PSAP.		
10-codes			
Unit Recommendation for Police	Yes		
Police Status Method	CAD		
EMD Usage			
Fire Mutual Aid	Yes – Fire District 14		
Response Times (minutes)	2		
Call Volumes	2008	2009	2010
9-1-1 Wireline	759	651	658
9-1-1 Wireless	345	348	388
Non-emergency/Administrative	1,434	1,134	1,225
Incident Dispatch Data	2008	2009	2010
Police	6,321	8,767	8,231
Fire	893	937	1,083
EMS	357	363	474
Budget Costs			
Full-time	\$209,610 (Salaries) - \$63,922 (Benefits) - \$21,700 (Overtime)		
Part-time			

The police department has five full-time civilian dispatchers. Minimum staffing is one, with dispatchers working eight-hour shifts. There is a dispatch supervisor. Lincoln does not provide EMD or pre-arrival instructions. Bedford Public Safety Department provides 9-1-1 call back up for Lincoln.

Ancillary duties of the dispatchers include:

- Answering calls for public works and water after hours
- Dispatching and NCIC queries for National Park Police
- Greeting the public
- Monitoring other radio frequencies
- Notifying advanced life support (ALS) ambulances
- Handling requests for parking lot registration stickers
- Handling dog officer calls
- Entering stolen items into NCIC
- Testing and monitoring of fire alarms

Police personnel have VHF mutual aid channels and tactical channels available via dispatch, mobile, and portable radio systems.

Lincoln is located in Metrofire District 13. Metrofire is an association of 34 metropolitan Boston fire departments that provide mutual aid to the others. A control center is incorporated into the operations of the Boston Fire Department. Fire alarm operators monitor departmental activity and coordinate regional response.

3.7.1.2 Technology

Lincoln's IT director provides support to the communications center.

Table 20 – Lincoln Technical Data

	Lincoln
Technology	
CAD	Pamet
RMS	Pamet
Additional Systems	Firehouse
Mapping/AVL/GIS	
Mobile Data	Panasonic Toughbook
Radio	Police - UHF - 483.00 and Fire - UHF - 470.85
Paging	
Logging Recorder	Nice DLR
Phone Systems, Servers and Connectivity	VESTA Pallas
Wireless Phase I and II Capabilities	Yes
Internet	Yes
Other Pertinent Technology	Pamet Law RMS, Firehouse Fire RMS, Medical RMS (outsourced) and SigCom Vision 21 Alarm Box system

Lincoln's CAD system is Pamet, originally installed in 2001 and last updated in April, 2011. The workstation uses a Windows 7 operating system and the server is Windows Server 2008. There is no redundant server. The CAD system is capable of supporting multiple jurisdictions and police, fire and EMS operations. The CAD system does not have an ANI/ALI interface. The CAD system does provide police field reporting and police RMS.

The fire department has Firehouse CAD. A run slip is hand-written for each incident and then entered into Firehouse.

PocketCop mobile software is installed on Panasonic Toughbooks in four police vehicles. The MDTs are not interfaced with CAD, but are used for queries only. Air cards are used for connectivity.

The police department operates on UHF 483.00 and the fire department operates on UHF 470.85. Each department has a repeater on the same pole on Reservoir Bedford Road. The police and fire dispatch consoles are Zetron 4115.

Box alarms come into the Signal Communications Vision 21, which is located in the communications center.

3.7.1.3 Facility

The Lincoln communications center has limited room for expansion.

Table 21 – Lincoln Facility Data

	Lincoln
Facility	
Capacity	2 dispatch positions
Condition	Fair condition – limited room
Redundancy	Generator and UPS back-up
Size	Dispatch – 16'x14'

3.7.2 Assessment

The Lincoln Police Department operates the primary communications center for the town, dispatching police personnel and fire/rescue personnel. While the police chief has operational responsibility for the dispatch center, he is proactive in seeking input from the fire chief, who maintains appropriate control over fire-related support services provided by communications center staff. This is commendable.

Lincoln has had a 3-year renovation, with a significant investment, and has a new radio system. Money has also been spent on the tower.

Lincoln is in the process of exploring their options concerning the upcoming EMD regulations. Should the Town elect to provide the service themselves, L.R. Kimball recommends Lincoln strive to increase authorized civilian staff. Currently, only one call taker/dispatcher is on-duty at a time. A single dispatcher can quickly become overwhelmed. An additional position would also assist Lincoln in being able to develop and maintain a training and QA program in support of legislated EMD implementation and its on-going training requirements, should the Town elect to provide EMD. Regardless of whether Lincoln provides EMD themselves, L.R. Kimball recommends Lincoln take advantage of funding from the 911 Department and has their staff receive EMD training. This will provide a true perspective on the responsibilities involved and may assist the Town in making decisions in the future.

L.R. Kimball recommends that dispatch staff continue to develop relationships with police and fire personnel and take advantage of training or other opportunities to further their knowledge and understanding of police and fire operations.

L.R. Kimball recommends Lincoln continues to work with Hanscom AFB emergency response agencies and identify ways to streamline local response efforts and further develop existing partnerships. Federal partnerships have the ability to garner greater support for grant funding in terms of interoperability and data sharing.

Additional recommendations may be developed as further options are considered regarding any regionalization of services. Regardless of further decisions, Lincoln should take the above recommendations into consideration to improve services for their citizens, visitors and response agencies.

3.8 Town of Boxborough

The town of Boxborough, located in western Middlesex County, is approximately 10.4 square miles in area, with .1 square mile of water. Boxborough has a population slightly less than 5,000.

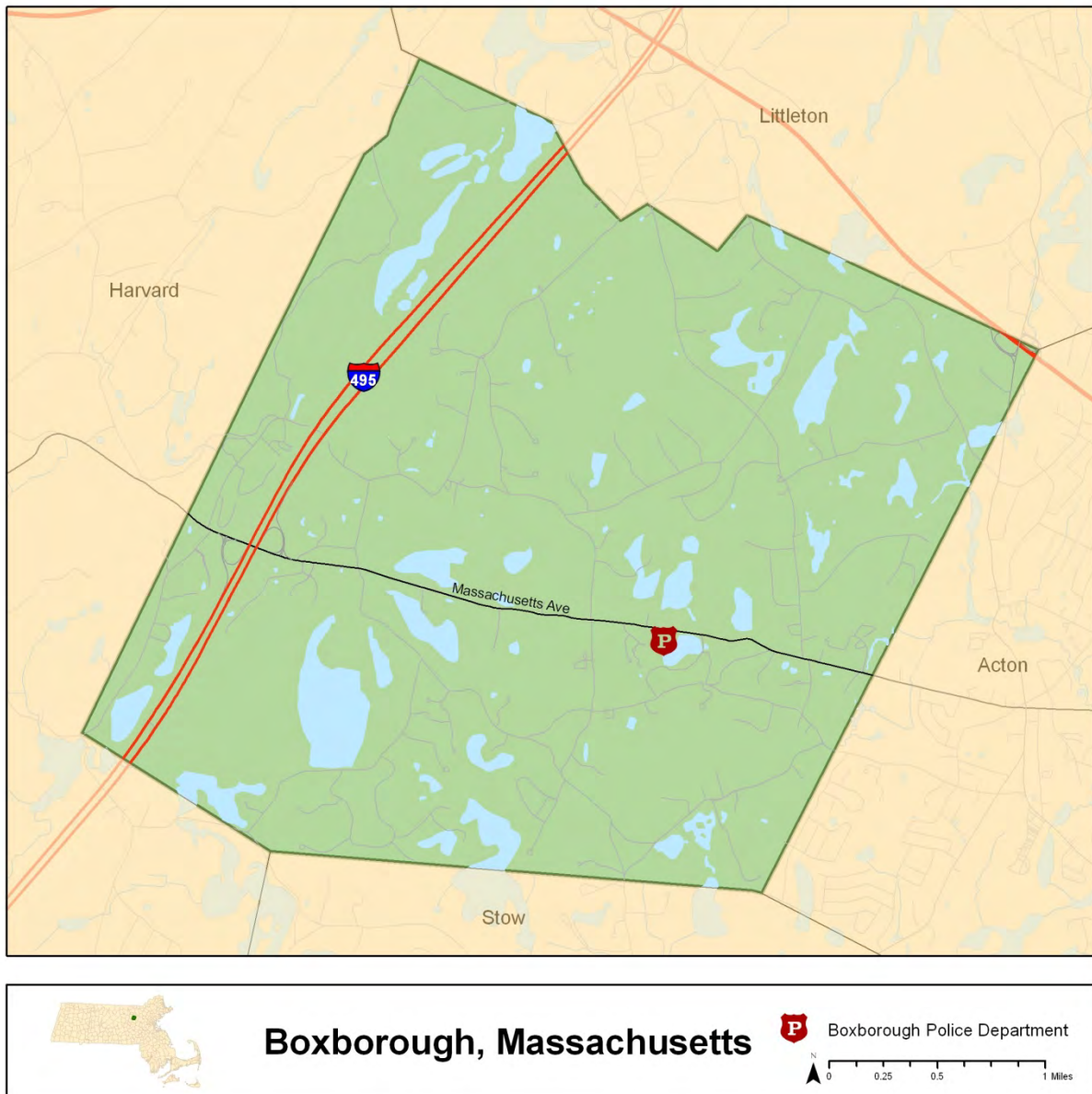


Figure 10 – Boxborough

A five-person Board of Selectmen and a Town Administrator appointed by the Board oversee the Town of Boxborough. The Board of Selectmen oversees appropriated spending and focuses on policy matters. The Town Administrator is responsible for the day-to-day operations of the Town departments and executing policy determined by the Board.

Boxborough and Acton operate shared junior and senior high schools, R.J. Grey Junior High School and the Acton-Boxborough Regional High School, both of which are located in Acton. The latter was named a Blue Ribbon School in 2009.

3.8.1 Existing Conditions

3.8.1.1 Operations

The Boxborough Police Department operates the primary communications center for the town, dispatching police personnel and fire/rescue personnel.

Table 22 – Boxborough Operational Data

	Boxborough		
Staffing Levels			
Sworn or Civilian	Mix		
1 on duty	1		
2 on duty			
Console Positions	2		
Collective Bargaining	Massachusetts Coalition of Police (Mass C.O.P.) Local 200A		
Operating Procedures			
9-1-1 Call Transfers	All wireless calls are answered by the State Police and transferred to the appropriate PSAP.		
10-codes			
Unit Recommendation for Police	Yes		
Police Status Method	CAD		
EMD Usage	Personnel Trained		
Fire Mutual Aid	Yes – Fire District 14		
Response Times (minutes)	0.5		
Call Volumes	2008	2009	2010
9-1-1 Wireline	540	565	526
9-1-1 Wireless	117	176	220
Non-emergency/Administrative	2,052	3,181	3,424
Incident Dispatch Data	2008	2009	2010
Police	873	1,016	959
Fire	1,352	1,324	1,001

	Boxborough		
EMS	805	803	447
Budget Costs			
Full-time	\$163,674 (Salaries) - \$62,683 (Benefits) - \$35,875 (Overtime)		
Part-time			

The police department has four full-time and four part-time civilian dispatchers; shortages are covered by sworn officers. All sworn officers are certified 9-1-1 call takers. Minimum staffing is one, with dispatchers working eight-hour shifts. There is a dispatch supervisor. Boxborough does not currently provide EMD or pre-arrival instructions, but civilian staff has all received the required training.

Ancillary duties of the dispatchers include:

- Entering warrants
- Greeting the public
- Entering general data
- Answering public works calls after hours
- Monitoring other radio frequencies
- Entering NCIC data
- Monitoring station security, access control (cell block, garage, front and side doors) and systems (generator; heating, ventilation and air conditioning [HVAC] alarms; septic and fire system)
- Preparing and distributing forms and bid packets for the public
- Organizing case files and records requests from other agencies
- Coordinating and directing telephone calls for staff
- Answering non-emergency telephone for fire department when station unmanned
- Conducting daily welfare calls to senior citizens
- Directing and issuing equipment to out-of-town detail officers
- Maintaining records according to retention schedule
- Maintaining database for community residential and commercial sites/locations

Boxborough is located in Fire District 14. Mutual aid is provided by other District 14 fire departments. If the fire reaches a 4-alarm status, Ashland Control takes over all dispatch functions for the incident on the regional Fire District 14 frequency.

3.8.1.2 Technology

Table 23 – Boxborough Technical Data

	Boxborough	
Technology		
CAD	IMC	
RMS	IMC	

	Boxborough
Additional Systems	IMC
Mapping/AVL/GIS	People GIS
Mobile Data	IMC
Radio	Police - VHF - 154.725 and Fire - VHF (low band) 46.5
Paging	Zetron for Fire/EMS
Logging Recorder	Nice DLR
Phone Systems, Servers and Connectivity	VESTA Pallas
Wireless Phase I and II Capabilities	Yes
Internet	Yes
Other Pertinent Technology	IMC Law, Fire and Medical RMS; SigCom Vision 21 Alarm Box system

Boxborough's CAD system is IMC/Tri Tech, version 4.6, build 17.8, originally installed in 2001 and last updated in 2011. The workstation operating system is Windows XP and the server is a Windows Server 2003. There is no redundant server. IMC has the ability to support multiple jurisdictions and police, fire and EMS operations.

Boxborough does not have a separate mapping/AVL/GIS system.

The police department uses the IMC mobile data system, installed in 2001 and last updated in 2011. The mobile system server is Windows XP. Police, fire and EMS mobiles all use IMC mobile. The police department has five MDTs, while the fire department has two. MDTs are used for status change and silent dispatch; there is no mobile mapping. Air cards are used for connectivity.

The police department operates on VHF 154.725 and the fire department operates on VHF 46.5. The communications center uses Motorola Command Starlite and Comtegra base stations. A repeater for the police department is located at Swanson Road; connectivity to the communications center is via T1. The 46.50 MHz fire radio is connected to the communications center via RTNA PG-17 circuit through Verizon. There is a remote police receiver and a UHF 471.600 MHz cross-band repeater for the 46.50 MHz fire radio at the Hagar site.

Box alarms come into the Signal Communications Vision 21, installed in 2005, which is located in the communications center. The Signal Communications Vision 21 is interfaced with the CAD system and monitors burglar, fire, medical and public works alarms. All alarm data is pre-loaded in the IMC CAD system for easy data entry.

Boxborough offers an emergency notification system called CodeRED to their residents. The communications center uses contact information provided to them by the Littleton Electric and Light Department. Through CodeRED, local public safety agencies and utilities are able to notify residents of emergencies. Residents can opt out of or add additional information to the call list via the Town Website. Boxborough also offers Nixle. Through Nixle, the Boxborough Police and Fire Departments can create and send messages to residents who have signed up for the service through the Town Website.

3.8.1.3 Facility

The Boxborough communications center has limited room for expansion.

Table 24 – Boxborough Facility Data

	Boxborough
Facility	
Capacity	2 dispatch positions
Condition	Older building with limited room
Redundancy	Generator and UPS back-up
Size	Dispatch – 8'x20'

3.8.2 Assessment

The Boxborough Police Department operates the primary communications center for the town, dispatching police personnel and fire/rescue personnel. While the police chief has operational responsibility for the dispatch center, the center is dual-run by the police and fire chiefs. The police chief is proactive in seeking input from the fire chief, who maintains appropriate control over fire-related support services provided by the dispatch staff. The relationship between the agencies is commendable.

Boxborough is proactive and has already sent civilian dispatch staff to EMD training provided by the 911 Department. L.R. Kimball recommends Boxborough strive to increase authorized civilian staff in preparation for EMD requirements, should the Town elect to provide the service themselves. Currently, one call taker/dispatcher is on-duty at a time. An EMD call and a working fire could easily overwhelm the center. An additional position would also assist Boxborough in being able to develop and maintain a training and QA program in support of legislated EMD implementation and its on-going training requirements. An additional position might also remove any dependency on sworn officers staffing the dispatch center. If sworn officers continue to cover shortages, L.R. Kimball recommends sworn personnel also receive EMD training and certification.

Currently, Boxborough does not have a mapping component to the current CAD system. L.R. Kimball recommends Boxborough look into procuring a mapping module for use in the dispatch center and also in the MDTs. This will require an investment not only in the CAD system, but also in improving any available GIS data. This recommendation is dependent upon future decisions to participate in a regional initiative as it would represent a financial and time investment in updating the functional components of an existing CAD that may/may not be selected to support any regionalized services.

Additional recommendations may be developed as further options are considered regarding any regionalization of services. Regardless of further decisions, Boxborough should take the above recommendations into consideration to improve services for their citizens, visitors and response agencies.

4. REGIONALIZATION OPTIONS

The Commonwealth of Massachusetts, through the 911 Department, supports PSAP consolidation with their Regional Emergency Communication Center Development Grant program. The program is designed to create a more effective 9-1-1 system and emergency dispatch response as well as regional interoperability. At this time, there is no legislated mandate for consolidation in Massachusetts.

After reviewing the assessments of current operations, the regional consolidation committee discussed ideas for regionalization, which included the following:

1. All eight towns
2. Sudbury and Lincoln
3. Wayland, Lincoln and Sudbury
4. Weston, Lincoln and Wayland
5. Concord, Acton, Lincoln, Maynard, Sudbury, Bedford, Carlisle and Hanscom AFB
6. Acton and Boxborough
7. Maynard, Acton, Concord, Lincoln, Boxborough and Sudbury
8. Maynard, Acton, Boxborough and Stow
9. Acton, Concord, Maynard, Boxborough, Littleton and Westford
10. Maynard, Acton and Stow
11. Sudbury, Lincoln, Wayland and Weston
12. Acton, Harvard, Littleton and Stow

The regional consolidation committee opted to remove any idea with entities outside the current Towns. This eliminated numbers 5, 8, 9, 10, and 12. Numbers 3 and 4 were eliminated as being too similar. With only two entities (numbers 2 and 6), it would be difficult to establish distinction from a parent organization; as such, these were also eliminated.

The three remaining – all eight towns (1); Maynard, Acton, Concord, Lincoln, Boxborough and Sudbury (7); and Sudbury, Lincoln, Wayland and Weston (11) – were narrowed to the following:

- Option 1: All eight towns
- Option 2: Maynard, Acton, Concord, and Boxborough
- Option 3: Sudbury, Lincoln, Wayland and Weston

Options 2 and 3 are geographically based.

Option 1 would regionalize all eight towns into one emergency communications center. Options 2 and 3 can be viewed as one option with two regional centers each comprised of four towns, or as two separate options if some Towns elected not to participate.

While each option is discussed later in this document, there are several common denominators that are applicable to any option, with only minimal modifications: funding, governance, organizational structure, operational methodology, and overall facility requirements. These are discussed individually, rather than repeated in each option.

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5. FUNDING APPROACHES

5.1 Current Funding

The current funding for the dispatch centers is derived from each Town's general funds in concert with the respective police agency. Each Town's general funds fully support all operating costs, which includes personnel, equipment, systems and networking, and the radio systems. The 911 Department funds and manages the 9-1-1 telephone system network and equipment.

5.2 Regionalization/Consolidation Cost Considerations

A common misconception is that regionalizing emergency communications will immediately save money for the participating entities. This is not entirely true. L.R. Kimball has found that there are immediate cost efficiencies, which may eventually lead to cost savings. This evolution typically occurs within three to five years, depending on the physical and operational state of the original agencies.

Often there is a need to create parity in pay and benefits for participating agency staff that are expected to become the skilled staff of the regional operation. Personnel costs usually account for the majority of an operating budget. Typically, emergency communications centers are understaffed and require increased staff and/or improvement of salary and benefits to a competitive level. Personnel costs in consolidated centers are usually higher due to the addition of an administrative/management staff structure and the costs to train and acclimatize staff to new systems and operational protocols. Until a decision on pay, classification and benefits is reached with Human Resources for a regional center, it is difficult to project personnel costs for a consolidated operation.

If a newly constructed or renovated facility is required, then those capital costs will elevate regionalization costs during the initial planning and implementation phases. Cost efficiencies derived from streamlining operations, technology (systems and networks) and facilities to one primary and one backup operation become reality as soon as the transition is complete. First time capital costs, such as constructing/renovating a facility, replacing the systems and creating a redundant robust network, and merging personnel under one administration, are temporary. The ongoing operational costs following go-live of the consolidated communications center typically and collectively create an overall cost savings. Depending on the funding model chosen, the time period for seeing the results of the cost efficiencies or cost savings will vary by agency.

Stakeholders and decision-makers must keep in mind that estimated projections are only to be used for planning. Actual costs will be based on decisions made regarding the location of a regional center and which systems will require upgrading or replacement. Network reconfiguration and streamlining costs cannot be estimated at this juncture without knowing when and where a regional operation will be located, or what type of connectivity will be required between the served agencies and the regional center.

5.2.1 Technology Costs

Capital costs include the technology that is the core of a regional operation that feeds the user agencies the data they require to operate effectively. These costs include CAD, 9-1-1 answering positions, radio console transition

costs, ergonomic dispatch furniture consoles, intensive use chairs, digital logging recorder, and a redundant master clock solution.

The Towns are already in a fairly good position for sharing of services as the 911 Department provides CPE to the dispatch centers. The 911 Department provides E9-1-1 equipment, database, network and technical support services to all primary PSAPs.²⁰ Each PSAP is provided a Spectracom Master Clock, Orion MapStar mapping, Vesta Pallas Instant Recall Recorder, and a call detail record system.

5.2.2 Facility Costs

The largest one time capital cost is usually associated with the construction or renovation of an appropriate facility. It is rare that an existing structure is found to be suitable to house a regional operation. While it may be possible to locate a facility of adequate size, typically the costs to renovate the floor space to current public safety industry standards for a hardened facility with adequate cable infrastructure become as costly as new construction. Most often regionalization/consolidation efforts require a new facility. Costs associated with both renovation and new construction options include site selection, evaluation and acquisition, and facility design, programming²¹ and construction.

Site acquisition costs are difficult to project as they are based on land values for a specific place and time. If stakeholders identify municipal-owned land that may be viable for locating a regional communications center and if a site evaluation shows the site to be a good location, then site acquisition costs could be minimal.

Projecting accurate costs for a new facility requires a much higher level of detail and planning than is within the scope of this project. However, broad budgetary numbers can be developed and used as a planning starting point. To determine a budgetary estimate, L.R. Kimball combines industry best practices, average hardened facility construction costs per square foot, and some basic assumptions about the programming of the facility.

The programming and design of the facility may or may not be part of an overall architectural contract. If procurement requirements allow, programming and design should be a separate process from construction. L.R. Kimball has found that few architectural firms have a level of expertise in PSAP programming and design and also have the local presence, as would be required during the construction phase. Separating these components give the stakeholders more control over the programming process toward developing a design that meets industry standards and the needs of the user agencies and participating municipalities.

5.2.3 Transition Costs

The final temporary costs of regionalization/consolidation are transition costs, which include planning support for the 18 to 30 month transition period. This type of project requires expertise that is not often found in existing local staff with full time responsibilities. These are also skill sets not often found in candidates for management positions in a new consolidated communications center. L.R. Kimball has found that locating qualified candidates with

²⁰<http://www.mass.gov/?pageID=eopsagencylanding&L=3&L0=Home&L1=Public+Safety+Agencies&L2=State+911+Department&sid=Eeops>

²¹ The process of defining space needs for a facility through identifying use of facility and individual office/floor square footage and costs.

consolidated PSAP management experience is doable; however, it becomes much harder to locate a candidate with experience in planning and implementing a consolidation.

To assist and support the planning, transition and implementation of consolidation, temporary professional services, with experience conducting multiple consolidation planning and transition projects, should be engaged. This will provide appropriate coordination of resources, planning documents and timelines, and necessary coordination between all stakeholders, vendors, contractors and user agencies.

5.2.4 Personnel Costs

Personnel costs during transition will increase. There is the cost to the participating agencies to maintain their existing operations and staff during training and transition activities. There is also the cost to train the existing staff on the new systems, equipment and protocols so that they are able to migrate successfully to the new operation. Potential certifications could include communications training officer (CTO), cardio-pulmonary resuscitation (CPR) and Association of Public-Safety Communications Officials (APCO) Supervisor.

Costs for hiring the administrative staff during the transition planning period will depend on the positions selected as necessary to the operation of a regional communications center. Other factors that affect cost include when each staff member is hired, which entity will bear these costs and what the pay and classification will be. The cost of hiring existing staff into the new operation will also depend on their existing pay and classification, seniority, position to be hired into and if/where adjustments are needed to create the parity in pay necessary to bring all staff to a fair and equitable level. Benefits usually prove to be the most difficult aspect of this effort. In order to not create roadblocks in the transition process, difficult decisions may be needed and/or specific decisions to 'grandfather' some benefits and/or address via natural attrition may be necessary.

Through this process, some staff may be able to remain at a pay and benefit level that differs from the majority of the staff for the remainder of their career or some pre-determined time period. This is sometimes necessary when an employee has considerable time in, may be close to retirement, or would suffer loss that cannot be reasonably compensated from changes in benefits.

5.2.5 Other Costs

Other operational costs are the recurring maintenance and service support costs of maintaining a facility, systems, equipment and networks.

5.3 Regionalization/Consolidation Funding Options

A crucial element of a successful regionalization/consolidation is establishing the funding mechanism by which operational and capital costs are identified, acquired and maintained. The current separate operations are funded by the individual Towns' general fund. If the Towns determine that regionalizing emergency communications will provide cost efficiencies and service improvements, then a regional emergency communications center will require a dedicated funding mechanism. Funding options exist at the federal, state and local level.

Table 25 provides a synopsis of funding sources.

Table 25 – Funding Sources

Funding Source	Use	Considerations
Federal Funds	Short-term funding option – One time project costs. May assist in the procurement of radio/ interoperability equipment and service costs.	<ul style="list-style-type: none"> • Good source of one-time project expenses • Should not be considered a long-term funding source • Should not be used as a primary source of funding • Many grants require a match
State Funds	Short- and long-term funding source – Provides a funding outlet for PSAPs looking to regionalize. Also, provides support to PSAPs for E9-1-1 service.	<ul style="list-style-type: none"> • On-going, long-term funding source • Incentives for consolidation • Funding amounts subject to the amount of surcharge collected • Certain aspects of funding are contingent upon the call volume of the PSAP and the population of the area served
Local General Funds	Short- and long-term funding source – Local tax revenue made available to support local agency projects and initiatives.	<ul style="list-style-type: none"> • On-going source of funding • Limited revenue available • Complements state funds to cover short- and long-term project costs
Bond Measures	Short-term – Measure passed by voters to fund short-term projects and initiatives.	<ul style="list-style-type: none"> • Quick upfront money • Measures may be difficult to pass (lack of voter support) • One-time funding not beneficial for long-term projects
Congressional Earmarks	Short-term – Money appropriated by Congress to fund local agency projects and initiatives.	<ul style="list-style-type: none"> • Good source of obtaining money to support unfunded projects • Can be difficult to come by (requires legislative approval) • Would not negatively impact county funds

5.3.1 Federal Funding

5.3.1.1 State Homeland Security Program (SHSP)

The SHSP grant is available to all 56 states and territories. Funding for this grant is made available for a variety of Homeland Security programs and initiatives, including radio interoperability. Equipment, such as radios, radio consoles and microwave may be covered.

Local agencies may apply for these grants through the State Administrative Agency (SAA), which in Massachusetts is the State Executive Office of Public Safety and Security (EOPSS).

It is important to note that this is a one-time funding source and there is no guarantee that a grant would be awarded.

5.3.1.2 Federal 9-1-1 Grants – House Resolution 2629 (H.R. 2629)

Another potential source of Federal funding might come from the 9-1-1 grant program authorized in pending legislation. H.R. 2629 was introduced on July 22, 2011 and seeks to re-authorize the 9-1-1 Implementation and Coordination Office and would establish the 9-1-1, E9-1-1 and Next Generation 9-1-1 Implementation Grant Program. This program would create a potential revenue source for which states and territories may apply. It is the responsibility of the state to work with local agencies to determine funding needs.

As the bill has not been enacted, this funding should not be considered a viable funding source at this time.

5.3.2 State Funding

Pursuant to Massachusetts General Law (M.G.L) Chapter 6A, the 911 Department has developed several grant programs for PSAPs. These grant programs are an excellent source of funding for PSAPs pursuing consolidation.

5.3.2.1 Public Safety Answering Point and Regional Emergency Communication Center Support and Incentive Grants

The purpose of this grant program is to provide general support and incentive funding to Massachusetts PSAPs. All primary PSAPs, regional PSAPs, regional secondary PSAPs, and RECCs are eligible for the support grant. Twenty-five percent of surcharge revenues collected from the previous fiscal year is allocated to this grant program. Distribution of funds is based on a formula that weighs both 9-1-1 call volume and population served.

In addition to the E9-1-1 support grant funding, the Commonwealth has established an incentive grant, which incentivizes the development of regional PSAPs and emergency communications centers. The funding is available to all existing regional PSAPs and RECCs. Grant funding is distributed to eligible entities based on the following formula:

- For regional PSAPs serving two municipalities, ½ of 1 percent of the total surcharge revenues collected from the previous fiscal year
- For regional PSAPs serving three to nine municipalities, 1 percent of the total surcharge revenues collected from the previous fiscal year;
- For regional PSAPs serving ten or more municipalities, 1 ½ percent of the total surcharge revenues collected from the previous fiscal year; and
- For RECCs, up to 4 percent of the total surcharge revenues collected from the previous fiscal year.

Funding may be used to reimburse allowable expenses related to the following categories:

- E911 telecommunicator personnel costs
- Heat, ventilation, air conditioning and other environmental control equipment
- CAD systems
- Radio consoles
- Console furniture and dispatch chairs
- Fire alarm receiving and alerting equipment associated with providing E9-1-1 service
- Other equipment related and maintenance associated with providing E9-1-1 service

- For regional PSAPs and RECCs ONLY: public safety radio systems
- For regional secondary PSAPs ONLY: regional secondary PSAP 9-1-1 CPE maintenance

5.3.2.2 Regional Public Safety Answering Point and Regional Secondary Public Safety Answering Point and Regional Emergency Communication Center Development Grant

The purpose of this grant is to support the development of regional PSAPs, regional secondary PSAPs and regional emergency communications centers. This includes the expansion and upgrade of existing regional PSAPs and regional secondary PSAPs to provide more effective 9-1-1 service and promote regional interoperability.

All primary PSAPs, regional PSAPs, regional secondary PSAPs, and RECCs, as well as the Middleborough and Northampton wireless state police PSAPs, are eligible to participate in this grant program. In addition, any public safety departments, municipalities or other governmental entities that intend to form regional PSAPs, regional secondary PSAPs or RECCs are also eligible, provided they submit documentation that proves the intent of all participating entities.

The following categories are eligible expenditures under this grant:

- PSAP 9-1-1 CPE for regional secondary PSAPs
- Feasibility studies
- Regional development, expansion, or upgrade
 - Facility construction and/or structural improvement
 - Equipment

The 911 Department has established development of regional PSAPs and RECCs, expansion of regional PSAPs and RECCs, and development/expansion of regional secondary PSAPs as its funding priorities.

Sudbury, on behalf of itself, Wayland, Weston, Concord, Acton, Maynard, Lincoln, and Boxborough, has already received funding from this grant for this regionalization study. This study will in turn support a request for planning and implementation funding; construction/renovation funds for a facility, if applicable; and on-going operational costs once a regional/consolidated center is live.

5.3.2.3 Training Grant and Emergency Medical Dispatch Grant

The purpose of the grant is to allow eligible entities to receive funding to reimburse the cost to train and certify E9-1-1 telecommunicators, including EMD programs and QA of EMD programs. All primary PSAPs, regional PSAPs, regional secondary PSAPs and RECCs are eligible.

For fiscal year 2012, 7 percent of the total surcharge revenue of the prior fiscal year was allocated to the Training Grant. Awards are distributed based on a formula that weighs 9-1-1 call volume and population served. The minimum award is \$7,000.

Grant priorities are the minimum training and certification requirements for E9-1-1 telecommunicators and minimum requirements for EMD. Only after these requirements have been met may funds be used for other eligible purposes.

Also available to primary PSAPs, regional PSAPs, regional secondary PSAPs and RECCs is the Emergency Medical Dispatch Grant. The purpose of this grant is to reimburse eligible entities for allowable expenses related to EMD services provided through a certified EMD resource.

Awards to grantees under this grant program are distributed on an as needed basis. The 911 Department determines the amount allocated to the grant program.

Eligible uses for the Training Grant include the following:

- Fees and expenses for training courses
- Personnel costs
- Training software and other products
- Lodging

Eligible uses for the Emergency Medical Dispatch Grant include the following:

- Certified EMD Resource
- Training courses held within and external to the Commonwealth of Massachusetts

5.3.3 Local Funding

5.3.3.1 General Funds

Where Federal and state funds are not sufficient to cover all capital and operational expenses, local municipalities should consider seeking funding from local government budgets. General funds consist of local tax revenue for use of agencies to fund capital and operational costs for special projects within a respective jurisdiction. Typically, this revenue is limited and must be shared among other local agencies.

5.3.3.2 Bonds

Issuing bond measures is another source of funding that could potentially assist local municipalities in consolidating PSAPs. A bond measure is an initiative to sell bonds for the purpose of acquiring funds for various public works projects, such as research, transportation infrastructure improvements, and others. These measures are put up for a vote in general elections and must be approved by a plurality or majority of voters, depending on the specific project in question. Such measures are often used in the United States when other revenue sources, such as taxes, are limited or non-existent.

5.3.3.3 Earmarks

In addition to bonds, another funding option available to local agencies is Congressional earmark funding. Merriam-Webster defines the term "earmark" as: "A provision in Congressional legislation that allocates a specific amount of

money for a specific project, program or organization.” Earmarks require Congressional action. Therefore, earmarks typically are not considered a primary source of funding. It is simply an option to consider.

5.4 Cost Sharing

There are several funding options that can be considered if deemed politically and fiscally feasible. The most equitable methods of determining how costs would be shared between the Towns involve balanced individual factors or formulas. If seeking a balanced funding approach, the most viable funding methods would be based on population, call volume (number of incoming emergency and non-emergency calls), calls for service (documented responses) and/or real estate assessments. Individually, these factors could be used to determine shared costs, or could be used in a formula that combines two or more of the factors. An alternative to formula-based methods is to simplify the mechanism by splitting costs equally. This option should be considered as the overall service level provided by a regional center would most likely be similar in that some Towns may have a higher population to be served, and others may have a higher level of service requests by comparison. If Towns project population growth and if a formula is used to determine how costs are shared, then that formula would require adjustment with the changes in growth patterns for the Towns.

5.5 Current and Consolidated Cost Comparison

L.R. Kimball cautions decision-makers not to directly compare the current cost to operate the disparate centers to future regional center costs. The best way to consider the differences between current costs and consolidated costs is as an apples-to-oranges comparison. Disparate operations in the current facilities, systems and service levels are not comparable to that of a well-planned, professionally implemented and managed consolidated operation.

The driving force behind any successful consolidation is the desire to improve services to citizens and responders. The cost of improving participating agencies to the level that a regional central entity could potentially provide is nearly impossible to project. Consider the overwhelming task and cost of improving most agency's facility, systems, equipment, training, supervision, service, and data and voice interoperability. Contrast this with the definite ability and ultimate cost of developing a regional entity or entities to provide a consistent level of service for each Town.

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5.6 Potential Cost Savings

Actual cost savings may not be realized for several years after regionalization/consolidation due to start up costs that include renovation/construction costs, capital purchases, relocation costs, standard operating procedure (SOP) development, training and acclimation of staff to new systems and protocols.

For the first years beyond planning and transition, after the initial investments have been made and operational support is fully transitioned to a normal level, cost savings will be realized in the following areas:

- Reduction in duplication of services, systems and network, and support, particularly during upgrading and/or replacing infrastructure and systems.
- Efficiency in operations and parity in public safety services through lower information and transaction costs. These costs savings are measured by convenience of performing tasks, and convenience of systems development, maintenance and upgrade/replacement. A reduction in the overall operational expenses should be noticed by the participating agencies. While there will be initial start up costs, annual maintenance fees will be reduced.

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6. GOVERNANCE

Governance refers to establishing a shared vision and a collaborative decision-making process supporting interoperability efforts to improve communication, coordination, and cooperation across jurisdictions.²² Developing an appropriate governance structure for a regional center is critical to enabling the PSAP's Director to effectively manage resources and provide the best possible service to user agencies and the communities.

MASS GEN. LAWS Ch. 40 § 4a allows for governmental units to enter into agreements to perform services jointly as long as the services fall under what any of the contracting units is authorized to perform by law. The regionalization effort undertaken by the Towns falls under this umbrella. Appendix B contains Chapter 40, Section 4a.

A regionalization of emergency communications should be a collaborative effort between public safety response agencies and municipalities. A business model approach of service provider and customer agencies will result in equal and optimal service to all user agencies.

When combining services, it is important to realize the PSAP's Director must utilize PSAP resources to address the needs of all user agencies equitably. While this balance is achievable, the governance structure can positively or negatively impact PSAP management's ability to maintain the balance for the long-term.

The balance of representation and authority is a point of negotiation for the planning phase of any governance structure or organization. A balance must be established between a supporting entity and the participating municipalities and other jurisdictions. Any governing agreement must clearly establish the authorities and responsibilities of all parties to avoid and/or address political and user agency control issues. This effort should ultimately result in the establishment of a regional PSAP that is a full partner with other public safety agencies, rather than a subordinate of the agencies.

6.1 Representative Governance Structure

Many types of boards or committees could be established to represent the agencies and jurisdictions served by a regional PSAP and identify specific authority and responsibilities. An Executive Board generally has full decision-making authority in all matters and is the responsible entity. An Advisory Board generally has the responsibility to make recommendations, but does not have decision-making authority and is not the entity fully responsible. A Steering Committee/Board generally has authority and responsibility that falls between an Executive Board and Advisory Board.

Regardless of the representative governance structure selected, a written agreement and bylaws need to be established to set forth specific authorities and responsibilities.

To mitigate concerns about control, ability to address emergency communications requirements and to have issues handled in a fair and equitable manner, L.R. Kimball recommends an Executive Board that would be a cross-functional executive group comprised of high-level stakeholders. An Executive Board is an entity that is responsible for the following:

²² U.S. Department of Homeland Security; March 2007.

- Overall strategic direction
- Operational parameters
- Operations-based decision-making
- Policy decisions
- Budget review and recommendations

L.R. Kimball recommends the Executive Board be comprised of term appointments of two police chiefs, two fire chiefs, two town managers and one at-large appointee to represent all participating towns. This configuration allows the served agencies and towns to have an appropriate level of control over how services are rendered. The appointment terms would be established in the bylaws supporting an IGA executed between the participating Towns. The public safety and town manager appointments should be staggered terms, such as one police chief appointment is one year, the second is two years; with the same for fire. Town manager representation could be made according to their term in office and staggered based on one to two years terms. The at-large member appointment could be made by the town or towns not directly represented in the original membership representation with a rotation of every three years. This diversity in membership will allow the board to maintain neutrality and effectiveness through limiting the term periods, limiting service, and insuring all towns enjoy membership and representation.

6.2 Supporting Entity

A regional PSAP will require a backbone structure for administrative services (payroll and other human resources needs) and support services (facilities maintenance, budget/finance, legal, risk management and procurement).

It would be cost prohibitive to establish a separate authority to provide payroll, human resources services, facilities maintenance, budget/finance, legal, risk management and procurement support. L.R. Kimball recommends that one town be identified to provide these services within the IGA, with compensation for same determined and agreed upon by the participating towns. The Executive Board is the authority under whom the regional center operates and the IGA is the agreement that establishes the regional center as serving all participating towns without the perception of allegiance or preferential treatment to the designated supporting town.

Should the towns decide that a separate entity is necessary to provide support services to the regional center, an authority could be developed to which the Towns contributed funding support. Funding a separate authority would be on on-going cost added to the funding of capital, transition and on-going operational costs for the regional center. A benefit to establishing an authority is that the Director and staff would then be employees of the authority and not of any specific town.

Some of the most important decisions to be made by the participating Towns will be those relative to human resources. Establishing pay and classification, preserving employee seniority, leave, retirement and other benefits are vital to the well-being of the transitioning employees. Decisions regarding these factors must be approached with the goal of keeping the employee whole.

L.R. Kimball recommends creating a working group of agency representatives and local human resources managers for each participating Town to converge job descriptions for the entry level trainee telecommunicator, call taker, dispatcher (by discipline/skill set), trainer, supervisor and Director. These job descriptions will be the base for determining eligibility of existing employees for transition and new hires. This working group should also review the

current salaries, benefits and classifications for transitioning employees and offer a recommendation to the Board for a competitive pay package. In determining where transitioning employees may fit in the new pay and classification plan, the working group may find employees that cannot be placed in the new plan without causing them harm. These employees may be grand-fathered into the new organization so as not to reduce their pay or benefits.

It is understood that all potential participating Towns wish to protect their employees. All employees should be afforded the opportunity to transition to the regional center. There will be a need to identify skill sets and abilities in order to properly place the transitioning employees in the regional operation. For this purpose, L.R. Kimball recommends an eligibility program and process be established. This program and process should be established by the regional center's Director and administrative staff, e.g. Training Coordinator, and approved by the Board. Each employee's position must be terminated by the current employing Town and established (hired) by the supporting Town or authority. The placement within the new organization (to include pay, classification, benefits) would be determined on the employee's skills and training needs.

Where possible, L.R. Kimball recommends that collective bargaining agreements be allowed to expire and a requirement for employment with the regional center be the negotiation of an agreement with one collective bargaining unit. This can be achieved by convening the representatives from each participating agency/Town to determine the agreement that best meets the majority of the needs of the transitional employees. If allowable, it may be in the best interest of the regional center Director and Board to begin meeting with the collective bargaining units' representatives as soon as practical to start discussions on how best to protect and serve the transitioning employees.

6.3 Working Groups

To augment the authority of an Executive Board and to provide operational guidance to a regional center, discipline-specific working groups should be formed – one for police service and one for fire/EMS services.

The working groups would be comprised of representatives from each agency served by the regional center. L.R. Kimball recommends maintaining a limited number of members per working group to avoid problems with coordination and decision-making processes that typically occur in larger groups. Appointment or assignment to these groups should be determined by agency heads. These groups will provide operational oversight via policy input to the Director via working group liaisons. To promote effective communication, L.R. Kimball recommends one liaison per working group. The liaisons should be elected from the group membership for a pre-determined term.

The discipline-specific working groups do not take the place of or usurp the authority of the Executive Board. The working groups should contribute to the Director's control over operational protocols within the structure of the supporting entity's policies.

Any established policies must be approved by the Executive Board and not conflict with existing Town policies, except where differences are necessary to conduct regional communications center business in the interest of public and responder safety.

6.4 Intergovernmental Agreement

All participating Towns should enter into an IGA under Chapter 40, Section 4a.

The IGA should establish the Executive Board, including membership, authority and responsibilities of the Board. The extent to which the Board's procedures (i.e., meetings, planning) are defined in the IGA is up to the parties to the agreement. Process and procedures for the Board can be established in the IGA, but do not need to be. Procedures can be established in a Charter and/or bylaws. If this is the case, the IGA should call for such procedures to be established.

The Board's authority should allow full control over operational protocols within the structure of the supporting entity's policies. Provisions should allow for decision-making authority into the hiring and evaluation processes, and termination where necessary, of the regional PSAP Director. Bylaws can be established to include a budget review process.

The IGA should identify and define the following:

1. Date
2. Signing participants
3. Jurisdictions covered in the agreement
4. Mission Statement of need and establishment of a regional communications center
5. Description of purpose and services to be provided by a regional communications center to the citizens and served agencies, and strategy for accomplishing regionalization
6. Establishment of funding mechanism: capital, transition and operational
7. Statement of how the location of a regional communications center will be determined and how the facility will be programmed/designed, if necessary
8. Establishment of the Executive Board to include membership, responsibility and authority, and meeting schedule
9. Establishment of user group(s) to provide input to operations
10. Reference to authority of the Director
11. Development of a transition plan to include operational, structural and technology changes will occur; the plan should also include how to best educate and attain buy in from the impacted agencies and citizens
12. Transitional issues, such as hiring of employees, existing and new; and how employees will be acclimated to the regional center organizationally and operationally²³
13. Description of how other duties, such as non-emergency/administrative calls and monitoring responsibilities, will be handled
14. Duration of agreement; withdrawal requirements; admission of new jurisdictions; mediation

A sample document may be found in Appendix C. The sample document references a county consolidation, but can be adapted as necessary.

L.R. Kimball recommends a Massachusetts attorney specializing in IGAs be consulted to craft or review any agreement, especially related to the creation of a governing board.

²³ It appears as though the intent of the law is for any employee of a participating agency to remain the employee of that agency. As such, L.R. Kimball recommends a Massachusetts attorney be consulted to confirm intent.

7. ORGANIZATIONAL STRUCTURE

An appropriate administrative infrastructure and delineation of duties must be created to direct and manage the operational staff toward the goals of the governing body. Whichever governance structure is utilized for a regional PSAP, a gateway or avenue to and from the user agencies and the emergency communications staff must be created. This section focuses on the most detailed and largest organizational structure needed, that of a regional center created to serve eight towns. The organizational structure needed to support smaller regional centers, such as a regional center supporting four towns, will require less depth of administrative staff. L.R. Kimball will differentiate where the number of participating towns impacts the organizational structure.

A complete administrative staff will require developing classification and pay comparable to department head and management level in the entity selected to support the administrative functions of a regional center. For example, if the regional center were to be created as a new Town department or under the governance of a new authority, the Director position would be classified as a department head.

From the anticipated workload and population of the Towns, the capacity of any regional center will require a number of management levels. Those tasked with planning a consolidation may use the organizational chart below (Figure 11) as a conceptual diagram for the possible management and operational staff, and respective roles.

While variations of this model can be formed, L.R. Kimball recommends stakeholders aspire to build the administrative structure in the manner illustrated. Multiple roles may be combined and assigned to one staff member, such as Training and QA and combined into one position or all technology supported by one administrator. Combining more responsibilities would occur in smaller regional configurations.

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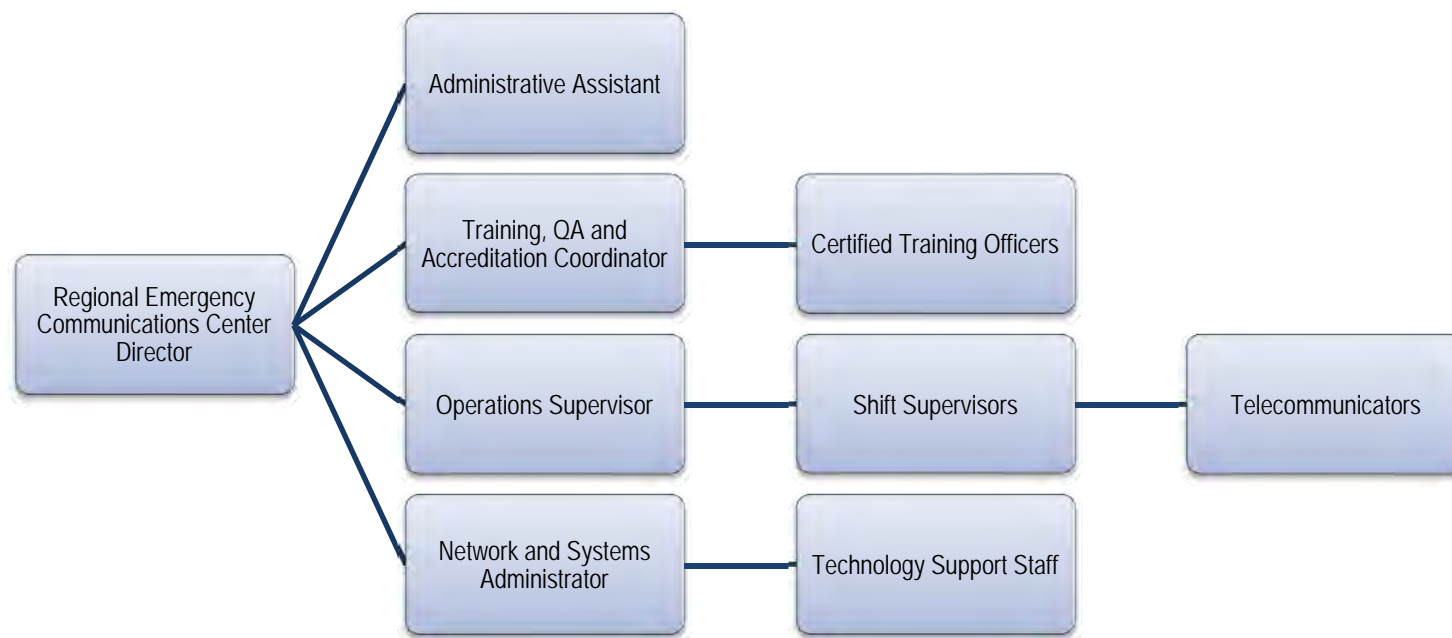


Figure 11 – Sample Regional PSAP Organizational Chart

Note: Multiple roles may be combined and assigned to one staff member, such as Training and QA, or all technology supported by one administrator. Actual positions and roles should be determined by the Director during the planning and implementation phase.

7.1 Management and Support Staff

Regional center management requires a team approach to maintain a flow and direction that will allow the center to transition into an efficient and effective regional operation. Management staff may include the following positions and responsibilities:

- Director with overall responsibility for the regional center, to include budget, personnel and operations
- Deputy Director to focus on HR issues and assist with the oversight of administration and operations
- Administrative assistant to support PSAP management and assist in managing the flow of administrative paperwork, submissions, document formation, and general records management
- Training Coordinator to manage entry level, remedial and in-service training programs
- QA Coordinator to manage the QA and quality control (QC) program
- Technical Support staff for administration of networks and systems, such as CAD, 9-1-1 telephony, and radio

Once a Director is working with the Board to plan and implement a regional initiative, specific positions, roles and responsibilities are defined and filled.

7.1.1 Director

The Director is a civilian position responsible for overall administrative management of the regional center, which includes preparing and administering the annual operating budget, overseeing all personnel management functions for the regional center, and providing vision and leadership to operations and administrative and technical services.

The Director is also responsible for developing, maintaining and enforcing the operational protocols that have been determined to best support the user agencies' needs. This can be accomplished through communicating and working with Working Groups.

The Director is ultimately responsible for the effective delivery of emergency communications for the Towns' public safety services.

7.1.2 Deputy Director

The Deputy Director is a civilian position that assists the Director in providing a stable and sound management structure that ensures consistency and responsiveness to any issues that arise concerning emergency communications. Responsibilities of the Deputy Director include:

- Recruiting, hiring, benefits, payroll, disciplinary action and other HR issues
- Overseeing staff schedules
- Preparing budgets and providing maintenance assistance
- Overseeing and administering operations
- Acting as the Director in times when the Director is not available (out sick, on vacation, attending training, etc.)
- Overseeing all systems and equipment administration, maintenance, upgrade and replacement
- Overseeing all new technology, networking, research and special projects

- Managing systems administrators and technicians supporting communications operations
- Coordinating and communicating with vendors, other departments and service providers

7.1.3 Administrative Assistant

An administrative assistant is needed to support the administrative positions and assist in managing the flow of administrative paperwork, submissions, document formation and general records management. The HR record keeping requirements for pay and training justify this position in most consolidated PSAPs.

7.1.4 Training Coordinator

The Training Coordinator is responsible for the coordination and training of all regional center operational personnel, and for developing and interacting with CTOs. In addition to new-hire training, 40-hours continuing education per year per telecommunicator is typically recommended and/or required to maintain and update skills. Certifications, such as EMD, require a minimum number of continuing education hours per year. The Training Coordinator is responsible for certification maintenance programs and for tracking and monitoring on-the-job training.

7.1.5 QA Coordinator

The QA Coordinator reviews calls, provides feedback on performance and ensures compliance with best practices and policies. This process provides evidence needed to establish and ensure that services provided by the regional center are of high quality and performed effectively. This position also helps identify organizational and individual training deficiencies and provides plans to rectify them. The QA function is required of any agency administering pre-arrival instructions and/or pursuing accreditation through the National Academies of Emergency Dispatch (NAED) or Commission on Accreditation for Law Enforcement Agencies (CALEA). This position would also be responsible for the creation of recordings for use in court or other official proceedings.

7.1.6 Technical Services

Systems administration and technical support for the CAD, 9-1-1 telephony, radio systems and other ancillary equipment/systems is vital in a consolidated PSAP environment. These systems allow the call takers/dispatchers and responders to provide services critical to the public. Maintaining these systems in peak operating condition is a full-time responsibility. Problems encountered with phones, radios and computers may require immediate response from a technician. L.R. Kimball recommends technical support staff report to regional center management, be knowledgeable of and responsible for all facets of the communications center operation, and be available 24/7 through an on-call schedule.

L.R. Kimball recommends the following technical services positions as individual positions or as one combined position:

- Network administrator
- CAD administrator, to include GIS, 9-1-1 mapping and 9-1-1 addressing support
- 9-1-1 telephone system administrator, to include support of ancillary systems (logger, Master Clock)
- Radio system administrator

These key staff members oversee the 24-hour support of the mission critical technology components for the regional center and would ideally be located at the regional center and report to the Director.

The National Fire Protection Association (NFPA) supports this recommendation by stating, "Emergency services dispatching entities shall have trained and qualified technical assistance available for trouble analysis and repair by in-house personnel or by authorized outside contract maintenance services."²⁴ Responsibilities include providing maintenance, support, troubleshooting and upgrades of:

- Radio consoles
- Voice logger
- 9-1-1 phone system
- Administrative phone system
- All communications center technology
- CAD system
- Assisting with maintenance of the Master Street Address Guide (MSAG)

7.1.7 Shift Supervision

Public safety best practices require 24/7 supervision. To supervise the average shift of seven staff daily, L.R. Kimball recommends a strong supervisory presence of one supervisor per shift dedicated to shift operations in the regional center.

NFPA has developed codes, standards, and recommended practices through a process approved by the American National Standards Institute (ANSI). The Technical Committee on Public Emergency Service Communication prepared the latest edition of NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems* (Edition 2010). Chapter 7 of sets forth the standards for PSAP operations; Section 1 of Chapter 7 addresses management.

NFPA 1221, 7.1.3 states, "At least one supervisor shall be on duty and available when more than two telecommunicators are on duty."

NFPA 1221, 7.1.4 states, "The supervisor shall be assigned to the operations room when there are more than three telecommunicators on duty."

Annex A of NFPA 1221 provides further explanation. A.7.1.3 states, "The supervisor position(s) in the communications center should be provided in addition to the telecommunicator(s) position(s). These supervisory personnel are intended to be available for problem solving."

The *Standards for Public Safety Communications Agencies* (SPSCA), established jointly by CALEA and APCO, does not specifically address staffing or supervision in a PSAP. However, both sets of standards reference utilizing 'Incident Command System' (ICS) protocols. (CALEA Standard 46.1.2 and SPSCA Standard 7.1.2 are mandatory for accreditation.)

²⁴ NFPA 1221, Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems, Section 7.1.1.1

The Department of Homeland Security, coordinating with federal, state and local governments established the National Incident Management System (NIMS). ICS falls under the 'Command and Management' element of NIMS. ICS represents best practices and is the standard for emergency management across the country. ICS requires a supervisor when there are between three and seven persons performing similar functions. (The optimal span of control is five.) A manageable span of control allows supervisors to supervise and control their subordinates, while allowing for efficient communications between all parties.

While NFPA standards and ICS require dedicated supervisory personnel, there are in-house considerations as well. A consolidated PSAP will have greater geographic boundaries and agency responsibilities. A dedicated supervisor assigned to each shift:

- Provides coordination and direction during major emergency incidents, such as severe weather, high profile incidents, wildfires
- Is available for problem solving
- Is a single point of contact for subscriber agencies
- Is readily able to identify areas for growth among subordinates
- Allows for formalized development of career paths
- Has the ability to document employees' performance for annual/periodic reviews
- Provides a more narrow scope of supervision when implementing new policies and procedures
- Provides more supervision for diversified, complex tasks
- Is able to stay current with technological changes/advancements
- Provides guidance to new employees who have less training and experience
- Provides greater knowledge of laws, procedures, and administrative processes
- Is able to focus on the operations of the communications center as a whole and not have split responsibilities with a dispatch position
- Is able to focus on customer service to public, subscriber agencies
- Allows for improved communications with management, subordinates, and subscriber agencies
- Spends more time with subordinates individually, on a daily basis
- Allows for operational efficiency
- Is able to identify areas for remedial training, counseling or discipline, when appropriate
- Is able to address issues upon occurrence, not after the fact
- Is able to set priorities
- Allows for delegation of tasks/responsibilities

LEAPS/NCIC dispatchers also require a supervisor's assistance to approve broadcast messages and enter persons, vehicles, etc. into LEAPS/NCIC. Confirmation of positive responses is time critical and requires a response within ten minutes.

L.R. Kimball recommends the assignment of one dedicated supervisor, or assistant supervisor, to each shift in order to comply with recommended/best practices as set forth by the NFPA and the Department of Homeland Security. Selection and placement of the supervisory staff should first be attempted through existing qualified staff. If an internal process does not provide qualified individuals, an external hiring process will be needed.

7.1.8 Operational Staff

To provide efficient service to the public and local emergency services, emergency communications centers must ensure that an adequate number of qualified staff is on duty at all times. When this does not occur, service quality can diminish and the short- and long-term effects on staff often lead to staffing issues, overworked personnel and attrition increases.

Determining appropriate staffing levels for a communications center is a complex process that involves a combination of mathematical calculations based on a quantifiable work load, such as 9-1-1 and administrative call volume and number of dispatch positions, and operational knowledge and experience to account for very real but less quantifiable needs, such as shift management and oversight.

To assess current staffing levels and predict future regionalization expansion needs, L.R. Kimball uses tools designed to estimate staffing levels, such as Erlang C²⁵ and the APCO's Project RETAINS (Responsive Efforts to Address Integral Needs in Staffing)²⁶, combined with workload data and service call counts derived from completed PSAP surveys; current call processing; police, fire and EMS dispatch methods and supervision and interviews with staff from all organizational levels.

The Erlang C calculator is a standard tool in the public safety industry utilized to assist emergency communications centers in determining call taker staffing needs. This tool simplifies the complicated calculations required to predict and analyze performance. The calculator can be used to answer such questions as how many call taker positions are needed, how many calls can be handled, and how many trunks are needed. As the tool relates to recommending the number of positions needed, variables, such as the calls received per hour, average call duration, average answer delay and required answering performance goal, are needed for the calculation.

Once the number of call taker positions is determined, the actual number of employees is determined using Project RETAINS.

APCO's Project RETAINS is a nationally recognized program/tool developed to assist public safety communications centers with staffing issues. The program tools are designed to assist communications center managers, HR and budget personnel, and local elected officials in addressing the challenges associated with hiring and retaining qualified personnel for the critical positions required in a PSAP. Project RETAINS utilizes formulas and provides processes that estimate staffing needs by looking at factors such as the available hours employees can work, turnover rates, coverage hours and call volume. The results can then be compared with current staffing levels.

To ensure adequate staffing levels, Project RETAINS uses the local methodology to identify the number of call takers necessary to answer 9-1-1 calls and incoming ten-digit telephone lines. These calls must be answered in an acceptable manner, within acceptable call answering and call processing times. This same methodology allows for the identification of the number of qualified on-duty dispatchers.

Call volume is the prime factor in determining the number of trunks and workstations needed to handle a communications center's projected workload. The NENA standard is to answer 90 percent of 9-1-1 calls within ten

²⁵ Formula used to determine the number of agents needed to staff a call center for a specified desired probability of queuing.

²⁶ <http://www.apcointl.org/about/9-1-1/retains/>

seconds. The NFPA standard, used by the ISO, is to answer 95 percent of calls on emergency lines within 15 seconds.

Projected staffing for a regional center serving all eight towns or two regional centers serving four towns each is provided in the individual option sections.

7.1.8.1 Call Takers

Call taking in an emergency communications environment is a high stress and critical function. Call takers are the first member of public safety to “touch” an incident being reported by the public. To the public, call takers represent the police, fire and EMS personnel who will be responding to their emergency. The ability of the call taker to accurately identify the caller’s needs and respond quickly and efficiently can have a substantial impact on an incident’s outcome and the public’s overall confidence in the emergency communications system.

7.1.8.2 Dispatchers

Standard emergency communications best practices dictate that a police dispatcher should only be responsible for one primary dispatch channel; the practice of assigning multiple primary dispatch channels to one dispatcher is not recommended. In a consolidated environment, maintaining individual dispatch positions for agencies that have low call volumes is not cost effective and is not recommended.

The anticipated workload does not constitute the need for each police agency to have individually monitored channels. There will be an operational need to consolidate some of the police agencies onto existing radio dispatch talk groups to reduce the number of primary police dispatch talk groups to a level that provides the best service in the most cost effective manner possible.

A dispatcher-to-police unit ratio of 20 to 30 units per radio channel is acceptable, depending upon the expected level of service provided by the dispatcher, law enforcement activity, technology in use and the method by which the communications center utilizes their dispatch personnel. While there is no official national standard for this ratio, accepted industry practice falls within these numbers.

Based on the call volume for fire/EMS response reported across the region for all eight towns, and/or for regional centers serving four towns, the dispatch and monitoring needs can be handled by one primary fire/EMS dispatch position and one tactical fire/EMS position for handling incident command scenarios and/or notifications. Merging fire/EMS dispatch and monitoring to one primary dispatcher supported by a tactical dispatch position will reduce the number of overall staff needed. The tactical position can also perform as a relief dispatcher and/or call taker when not busy.

8. OPERATIONAL METHODOLOGY

The recommended operational methodology in a regional PSAP is a combined duty floor operation staffed by multiple levels of cross-trained staff. A call processing flow is recommended that facilitates appropriate and free interaction and coordination among disciplines. To generate an effective call processing flow, the operational floor arrangement must allow open communications and supervision.

A combined duty floor operation begins with establishing areas of concentrated activity, which serves several purposes.

- Similar and dependent services are managed in and by a group responsive setting, such as grouping by call taking, law enforcement dispatching, and fire/EMS dispatching.
- Supervision and coordination of resources are focused in one area of the communications floor.
- The ability to isolate and protect other areas during high priority and long-term incidents enables normal activity to continue and alleviates unrelated background noise.
- Resources not provided electronically are easier to maintain and keep deskbound.

Ideally, a regional PSAP will be configured operationally to have an area equipped and assigned for call taking, with a supervisor position centrally placed on the communications floor with equal vantage points and access to the dispatching areas. Law enforcement dispatching will be equipped and assigned to one side of this core and fire/EMS to the other. With tools, such as CAD, intra-communications/ messaging, and resource monitors, available for communication and coordination of resources, the law enforcement and fire/EMS dispatch areas will be better able to jointly respond to all priority levels. Other floor configurations can affect the same or similar communication and supervisory paths, and can be explored during the facility programming phase of planning.

8.1 Call Handling Process and Review

Policies and procedures will define the entire call flow process from off-hook through follow-up. Based on the current and future needs, L.R. Kimball recommends the process outlined below.

1. Certified call takers answer and document calls for service in a fully functional customized CAD system that routes calls to the appropriate dispatchers. The same call takers provide EMD when needed and other information as appropriate based on call type.
2. Based on pre-established priority assignments sourced to the nature of the event and response type, the receiving dispatchers notify and assign calls to units/apparatus.
3. The same dispatchers monitor responding units/apparatus for status changes and requests for further information or services.
4. The same dispatchers receive, relay, and document all information exchanged among other dispatchers/call takers, units/responders, and other service providers. The call for service is cross-referenced to other calls, when and where appropriate, and closed with appropriate disposition documentation.
5. If further information or documentation is necessary after the call is closed, the dispatcher or call taker is capable of performing updates.
6. Within 30 days of call conclusion, random/assigned QA is performed by a QA coordinator/supervisor.
7. Follow-up training/re-training where needed is conducted and documented; follow-up adjustments to policy and procedures are conducted, where needed, as a result of QA review.

8.1.1 Current Call Processing and Dispatch Methodology

The dispatch centers receive 9-1-1 and non-emergency calls for the towns they serve. All eight dispatch centers are considered primary PSAPs in that 9-1-1 wireline calls are routed directly to them; 9-1-1 wireless calls are transferred from the State Police to the respective primary PSAP.

Wayland, Concord, Acton, Lincoln and Boxborough are consolidated at the municipal level as they answer all incoming 9-1-1 calls and directly dispatch for the local emergency services located within their respective community. Sudbury, Weston and Maynard and Weston transfer fire and EMS calls to the fire departments in their community. These fire agencies are limited secondary PSAPs. When the calls are transferred, the agencies receive the voice and the ANI/ALI data available at the time of the call transfer. They have no mapping and the location data they receive cannot be updated.

There is no true separation of duties for call takers/dispatchers in the dispatch centers; each call taker/dispatcher answers calls for service and dispatches emergency service personnel. Answering incoming calls for service and dispatching emergency personnel are the primary responsibilities of a PSAP. Maintaining accurate information on these responsibilities assists in determining PSAP personnel needs. The call takers/dispatchers in the dispatch centers perform a myriad of additional duties, such as greeting the public at a walk-up window during business hours and after hours, monitoring holding cells via closed CCTV, and record keeping, including payroll and administrative reports.

The querying of a caller more than once wastes valuable time and is a cause for caller confusion and frustration. Transferring an emergency call is contrary to public safety best practices wherein the telecommunicator originally receiving the call should remain in communication with the caller. Call transfers create additional points of failure, such as the phone network, the disparate systems and equipment, the possibility of the receiving agency being busy, and human error. This call processing methodology is not only detrimental to the caller, but to the responders. In some instances the emergency responder's safety is at risk, and time is of the essence for both the responders and the public they serve. Each law enforcement, fire, and EMS agency has a duty to respond in a timely manner based upon the nature of the emergency and the requirements of certifying and assessing organizations such as CALEA, the ISO, NFPA, and the Center for Public Safety Excellence (CPSE).

8.1.2 Regionalized Call Processing and Dispatch Methodology

NENA 56-005, *9-1-1 Call Answering Standard*, states "[n]inety percent (90%) of all 9-1-1 calls arriving at the Public Safety Answering Point (PSAP) shall be answered within ten seconds during the busy hour (the hour each day with the greatest call volume, as defined in the NENA Master Glossary 00-001). Ninety-five (95%) of all 9-1-1 calls should be answered within twenty (20) seconds."

NFPA 1221, Section 7 states "Ninety-five percent of alarms²⁷ received on emergency lines shall be answered within 15 seconds, and 99 percent of alarms shall be answered within 40 seconds" and "Ninety percent of emergency alarm processing shall be completed within 60 seconds, and 99 percent of alarm processing shall be completed within 90 seconds." NFPA does not address police call processing and dispatching. Crimes in progress or medical calls may require the call taker to be on line with the caller longer than 90 seconds. This is especially true in situations where the call taker is providing EMD pre-arrival instructions. The key to this standard, as it would be to any response standard, is to dispatch units in a timely and efficient manner.

²⁷ NFPA 1221 defines an alarm as "a signal or message from a person or device indicating the existence of an emergency or other situation that requires action by an emergency response agency."

Potential response time decreases will be due to:

- True call taker and dispatcher environment
- Accurate caller location identification
- Coordination of resources
- Direct access to mutual aid

A true call taker and dispatcher system allows call takers to be on line with the caller, obtaining vital information for responders, while the dispatcher sends units. 9-1-1 callers are queried to determine the incident type (nature), the incident location, vital information, and the caller's callback phone number. The call information is then sent via CAD to the appropriate dispatcher(s) for radio dispatch of field units. Because the call taker remains on line with the caller (where necessary), further information important to response and mitigation of the incident can be gathered, entered into CAD, and viewed by the dispatcher(s) and relayed to the field units. This model will improve the service provided to callers by potentially reducing the overall response times and the number of times a caller is queried, by reducing the multiple points of failure, and by creating, in essence, one geographic response area.

Intervention protocols administered during call taking can be time intensive. In a consolidated environment, however, the call delivery time via CAD to the respective dispatcher(s) is not delayed by this process. If a caller is in danger, such as a domestic violence situation, it is protocol to stay on the line with the caller until help arrives. If a caller is reporting a structure fire with known or possible occupants and/or citizens are attempting to extinguish the fire or rescue the occupants themselves, it is protocol to keep the caller on the line to ascertain further information. If a caller is reporting a medical emergency and is in a position to administer aid to the patient, it is protocol to keep the caller on the line to provide instructions. These are but a few call types that will require the call taker to stay on the line until responders arrive on scene. Thus, the call taker connection to the caller cannot be accurately measured or captured in a table. However, the call taker's effort of creating an event in the CAD system and forwarding it to the dispatcher(s) is measurable and plays a significant role in reducing the overall call processing time. Time savings is realized through elimination of the separate call processes.

Situations where a caller may remain on the line, which will increase the call taker's time and potentially the total response time, may include:

- More intensive EMD protocols
- In-progress/just occurred events
- Suicidal or homicidal persons

In these instances, the responders are already dispatched and are kept apprised of the updated information by the dispatcher(s). The unit's/apparatus' initial dispatch response overall will be reduced by having the call available for dispatch simultaneously and potentially all necessary responders, law enforcement, fire and EMS, dispatched at once. A medical call is often the highest priority call taken, and as such, every effort for the fastest response should be made. Responders from all disciplines can be dispatched and additional information relayed while en route to a call for service.

Language barriers for emergency callers are common in many communications centers serving a diverse population. The 911 Department provides language interpretation services through Qwest to the primary PSAPs free of charge. However, if there is staff fluent in foreign languages and they are called upon to translate during their assigned shifts, these staff members should be compensated with a pay differential or per call bonus.

Proximity, standardized protocols and unified systems create expedient and successful handling of every call received. There are no opportunities to lose a call in a transfer, or miss vital information in re-questioning the caller two or three times. There is the benefit of enhanced responder safety by providing information sooner, more completely, accurately and in real-time for all responders.

Consolidated operations will bring about increased efficiencies and coordination of communications and emergency response services. A reduction in the number of call takers and dispatchers handling the call, plus the elimination of transfers between different PSAPs with differing protocols and equipment equals faster overall response time and saves lives.

A benefit of regionalizing all eight towns or as two regional centers each serving four towns will be the ability to transition wireless 9-1-1 calls from the State Police to direct routing to the regional center(s). Additionally, coordinating responses with other levels of government response, such as incidents involving or impacting Hanscom Air Force Base, becomes more efficient through a regional approach rather than individual Towns' communications centers.

8.2 Administrative Call Handling

One of the commonly voiced concerns from participating agencies is the desire to maintain the quality of service levels currently provided. In many of the public safety agencies, the emergency call taking and dispatching functions are a small percentage of their roles. Particularly in the smaller agencies, the dispatcher is the agency's initial point of contact and is usually the municipality's only after-hours contact. The dispatchers act as switchboard operators assisting callers with locating individuals and services within the respective agency and municipality served. The dispatchers also provide a myriad of municipal services unique to their locality and are able to direct or transfer callers to outside municipalities and/or services.

In a regional environment, some of these services may continue without noticeable interruption, if the function is in direct support of 9-1-1. These needs may be accommodated through established protocol, training and technology. For example, when a caller contacts a regional PSAP on a non-emergency or administrative line requesting to speak with specific supervisory or responding agency staff, or any person/office in any of the agencies, the call taker simply locates the requested party's number and transfers the caller or directs the caller to the appropriate agency.

Functionality exists in current phone systems, CPE or separate PBXs to program frequently called numbers. There are also many ways to store and update this data to prevent the loss of contact information, schedules, call back information and more. Speed dial functionality is also prevalent in CPE and PBX systems, allowing the call taker to quickly locate pre-programmed numbers to provide to the caller or to transfer the call. Established protocol, training and commitment by the served agencies and consolidated PSAP staff to maintain accurate contact information and schedules are paramount to successfully serving these callers.

Many non-emergency/administrative functions are handled by the existing PSAPs. Functions that are not relative to the processing of 9-1-1 calls will continue to be handled at the local level by the agency or municipality. During the planning phase, all jurisdictions will need to evaluate and determine how best to handle non-emergency and administrative needs, both common and unique. Some examples and a potential for handling them follow.

- There may be instances where dispatcher(s) currently function as the initial contact for non-public safety-related services; a jurisdiction or municipality may elect to staff a clerical position for normal business hours.
- Law enforcement records request calls can be of a high or low priority. The decisions made on how best to handle each agency's after-hours records requests will impact requests from field units as well.
 - Low priority requests are requests for copies of previously entered reports. These requests can usually be referred to appropriate records staff during normal business hours and may involve a payment requirement, such as job application criminal history requests.
 - High priority requests are requests for actual paperwork, such as warrants, detention orders or court ordered documents. Protocol will have to be established for handling these records requests after hours.

If records requests from units are to be made through the consolidated PSAP, then arrangements for access to those records must be determined.
 - Protocols for handling external requests from other law enforcement agencies must be established.
- Animal control calls are public service calls related to public safety needs and should be handled in a consolidated dispatch environment.
- Public works calls are also related to public safety, and citizens can be directed to a non-emergency line in a regional PSAP for public works calls, with appropriate protocols in place.
- Special event calls, such as calls asking when a road or bridge will be closed or calls asking when a municipality's holiday parade will take place, can be suited to a regional PSAP environment with appropriate notification process and protocols, training and communication.

A regional PSAP can handle non-emergency/administrative calls by forwarding or direct routing. These configuration and protocol options can be applied to public safety-related non-emergency/administrative calls for all participating agencies that do not have staff consistently available during normal business hours and after-hours.

- Any non-emergency line/administrative line can be permanently routed to the PSAP.
- A new number/alternate number can be listed/advertised for non-emergency service for any agency. The new number/listing provides direct contact with the consolidated PSAP.
- Any non-emergency/administrative line can be configured to roll-over to the consolidated PSAP's non-emergency/administrative lines if not answered within a prescribed number of rings.

Citizens also access services via walk-in. If there is a need to continue 24/7 walk-in service once the PSAPs are consolidated, individual municipalities may decide to staff their offices after hours. A more efficient method is to provide this service in one or more ways, such as:

- Providing signage and/or recordings that direct visitors or callers to appropriate after-hours contacts or providing directions/instructions for handling/reporting the situation(s). The recordings or signs should begin with instructions to dial 9-1-1 (or use a call box if provided) if there is an emergency.
- Posting/distributing the regional PSAP's non-emergency number(s) with specific information that can be obtained from the PSAP staff. For example, requests for agency-specific information, after-hours contacts for municipal services, and non-emergency requests for service. This requires that contact information for each municipality, including updated contact names and numbers, be posted and available at all times to consolidated PSAP staff. For optimum access and ease of use, an automated mechanism will best serve the multiple municipalities and service providers participating in consolidation.

- Providing an external call box at respective agency headquarters/stations in a well-lit location with adequate posted instructions on how to contact the regional PSAP in case of emergency, and with appropriate contact information for non-emergency requests. These hotlines should ring directly into the regional PSAP and should arrive on dedicated 9-1-1 trunks routed through the ANI/ALI controller so that staff is immediately aware of the caller's location information.
 - For example, if an unstaffed station has a call box located at both the rear and front entrance of a building, the location information can be delivered with appropriate directions.
 - The trunks should be set up to allow the call taker to call back the phone in case re-contact with the caller is necessary.

8.3 Coordination of Resources

During incident command situations and long-term and/or large-scale events, the ability to quickly coordinate responses and shared resources with emergency management will be greatly enhanced in a regional PSAP with the appropriate training, protocols and up-to-date reference material readily available.

Coordination of resources also applies to mutual aid, which will be coordinated at the regional PSAP. This will decrease response times as dispatchers will be able to better anticipate the needs of responders and be better prepared to meet those needs upon request. The processes for accessing mutual aid beyond Town jurisdictions will be improved and better coordinated through standardizing protocols, enabled interoperability, and data sharing beyond the regional PSAP.

A critical area that is vital to regionalization decisions by stakeholders in Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough is the effect of regionalization on the participating agencies' ability to manage joint responses to local, regional, state and federal events. PSAPs have a critical relationship with emergency management. During short- or long-term incidents, the roles and responsibilities of the PSAPs and emergency management require close communication and coordination with public safety responders, service providers and various local, state and federal responders.

Communication and coordination efforts between the existing PSAPs and emergency management are currently fragmented. This is due to eight PSAPs, all of which receive, process and coordinate information from the public and for responders. The PSAPs are often the first to be notified by the community and alert/warn agencies when a publically known incident is pending or has occurred, as in natural disasters or overt acts of terror. In cases such as contained spills or homeland security threats, the individual PSAPs are often the first point of contact for questions from the public.

It is beneficial to examine short- and long-term incidents to illustrate how a critical incident unfolds with the current PSAPs versus a regional PSAP. Man-made or natural disasters occur as unplanned, impending events and potentially require long-term EOC activations.

8.4 Training

Currently, call taker and dispatcher training are limited to the state requirements and on-the-job training. Responder agency-developed training or protocols account for the remainder of training provided to dispatch center staff.

8.4.1 Training Needs

Currently, an identified need is to improve call taking and dispatching skills. The use of protocols, sets of standardized discipline-specific procedures, are needed for handling and processing emergency medical, fire, and law enforcement calls. Protocol training for all dispatch center employees will improve the quality of service provided to citizens and public safety agencies.

Instructor certification of key staff will allow for mentoring and provide for the possibility that some training can be conducted in-house. This certification could, initially, be through a CTO program. CTOs observe, instruct, mentor, and document the successes or deficiencies of newly hired and existing employees.

In addition to the Commonwealth's requirements, and to increase the value of and add defensibility to operational staff training, L.R. Kimball recommends participation in telecommunicator- and dispatcher-specific courses offering certification, such as CPR, hazardous materials awareness, and emergency medical, fire, and/or law enforcement dispatch. L.R. Kimball also recommends each dispatch center employee receive NIMS and ICS training.²⁸ L.R. Kimball recommends CTO certification for supervisory staff responsible for training and QA training and certification for supervisory staff responsible for call review.

Another identified need, as in any profession, is continuing education to maintain and improve proficiency. Annual in-service training and re-certification are two ways to accomplish this.

8.4.2 Planning

Training needs are a core focus of regionalization planning. The commitment to call taker and dispatcher training in the current dispatch centers and a future regional center(s) will directly relate to the quality of service provided. An investment in a strong new-hire and on-going training program, and a continuing education program, will result in a high level of service provided to the public and public safety responders. A QA program will provide a tool to constantly monitor that level of service.

The table below illustrates the hours and type of training that a new employee should receive prior to taking actual calls for service. Once this basic training is successfully completed, the employee should be ready to take calls under the direct supervision of a CTO.

Table 26 – Sample Curriculum

Sample Training Curriculum – New Employee	
Hours	Course
40	State Basic Telecommunicator Training
8	CPR
24	Emergency Medical Dispatch
24	Law Enforcement Dispatch
24	Emergency Fire Dispatch

²⁸ Suggested telecommunicator NIMS-related training includes ICS-100, Introduction to the Incident Command System; ICS-700, National Incident Management System (NIMS), An Introduction; and ICS-800, National Response Framework, An Introduction. The Emergency Management Institute (EMI) offers these courses online.

Sample Training Curriculum – New Employee	
Hours	Course
12	NCIC/LEAPS
8	Suicide Intervention
8	Domestic Violence Awareness
8	NIMS and ICS
8	Hazardous Materials Awareness
16	Town and Agency Policies and Procedures
8	CAD
8	Telephony and Customer Premises Equipment
4	Radio System
4	Mapping
16	Call Simulation
220	TOTAL

An important consideration for training and operational improvements includes the selection and implementation of an EMD program that will interface with a CAD system.

Many training resources are available from a range of prices. Appendix D contains a list of training resources and websites for review.

8.5 Quality Assurance Programs

By design, the purpose of a QA program in a regional center should be to ensure that established policies and procedures, and call take and dispatch guidelines are followed. Call take and dispatch must be measured against specific performance goals.

A well-developed and defined QA program ensures consistency of operations, identifies problems, and identifies corrective actions to resolve the issues. Through a QA program, calls are reviewed, feedback on performance is provided, and compliance with policies, procedures, standards and best practices is ensured.

When providing EMD, adherence to the structured protocol becomes even more important. “This is especially true for agencies that provide some measure of post-dispatch and/or pre-arrival instructions to callers, directing the caller to actively do something to stabilize a patient or begin to mitigate an emergency before the arrival of the dispatched first responders. Evaluating performance and compliance with protocols and procedures becomes as necessary as the provision of the protocol itself, since doing so incorrectly could wind up harming the patient or exposing the agency to liability.”²⁹

EMD requirements in the Commonwealth require a continuous QA program. Regulation 560 CMR 5.00 states:

By July 1, 2012, and thereafter, each primary PSAP, regional PSAP, RECC, and wireless state police PSAP that provides EMD through certified emergency medical dispatchers and each

²⁹ <http://www.9-1-1magazine.com/The-Numbers-Game/>

certified EMD resource shall establish a continuous quality assurance, improvement, and management program that shall include, at a minimum, the following:

- (1) documentation of the quality assurance case review process utilized to identify EMD compliance with the EMDPRS;
- (2) written approval of the EMD medical director;
- (3) ongoing random case review in accordance with the guidelines of the EMDPRS; and
- (4) regular feedback of performance results to emergency medical dispatchers.³⁰

The QA process also provides evidence needed to establish that services provided by the regional center are of high quality and performed effectively. Any areas of weakness identified through the QA process are then able to be analyzed by the regional center's Director or other management personnel. The analysis determines the amount of risk that the weakness creates for the public and responders. Based on the analysis, the weakness is then addressed through policy/procedure, equipment or training.

This process creates a structured risk management program. This recommendation complies with CALEA standards which state, "The agency should consider both external and internal areas that can be the basis of injury to the public or other employees and create liability for the agency. Other areas of concern include possible omission or failure of policies and procedures, employee or supervisor negligence, and deficient equipment or training."³¹

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³⁰ 560 CMR: State 911 Department; 560 CMR 5.00: Regulations Establishing Certification Requirements For Enhanced 911 Telecommunicators, Governing Emergency Medical Dispatch, And Establishing 911 Call Handling Procedures

³¹ CALEA Standards for Public Safety Communications Agencies, July 2007, Section 1.2.1

9. FACILITY REQUIREMENTS

This section addresses general facility requirements for a modern emergency communications center. It also contains specific space requirements and cost estimates for a single regional center serving eight towns and two regional centers each serving four towns.

9.1 Site Evaluations

An evaluation should be completed for all candidate sites to help score or rate them and identify the best possible sites for a regional PSAP. Utilizing a criteria matrix provides the ability to review potential sites for both positive and negative factors and to sum up the findings in a reviewable fashion. A matrix³² from NENA can be used and/or expanded. The document contains the following major criteria:

- Site accessibility
- Adequate site space
- Attractive neighbor profile
- Cost differentials
- Electrical power and utilities
- Facility development (existing building)
- Site integrity
- Quality of life (amenities)
- Security issues
- Telecommunications availability/access

9.2 Threat and Vulnerability Assessment

An in-depth facility hazard assessment of all proposed sites, new or existing, should be conducted for a regional PSAP facility. This study will help identify potential hazards and/or threats that could impact the facility. Dependent on the number and/or type of threats identified, additional review of these and other criteria will be necessary during the civil/engineering portion of the design and construction of a new or renovated site.

At a minimum, the following types of threats/hazards should be reviewed:

- Natural Threats
 - Weather
 - Seismic/Geological
 - Service interruptions
- Civil Threats
 - Terrorism
 - Vandalism
 - Cyber-security
 - General environmental

³² *Public Safety Answering Point Site Selection Criteria Operations Information Document (OID)*, NENA, July, 2007, <http://www.nena.org/sites/default/files/PSAPSiteSelectionCriteriaFINAL071707.pdf>

- Accident Hazards
 - Internal
 - External (vicinity)
- Personal Safety

More specific critical information that needs to be reviewed during this hazard assessment process includes the following general areas:

- Lightning/Storms
- Tornados
- Loss of power or telecommunications
- Earthquake
- Fire
- Railroad proximity
- Unauthorized entry/security
- Terrorism
- Airport flight paths
- Flooding
- Site adjacencies
- Accidents (HazMat)

9.3 Backup Facility

Whether a new facility is required or an existing facility renovated to accommodate a regional PSAP, there will be a need to identify, plan for and equip a long-term backup facility. In the event a regional PSAP had to be evacuated or was rendered uninhabitable, there will be a need to maintain and relocate to a backup center at another location.

A backup PSAP is essential to maintaining an acceptable level of 9-1-1 call processing and emergency services dispatching. Without a backup center, call processing and dispatching would be severely compromised if operations at a regional PSAP ceased for whatever reason. Evacuation and relocation of staff may be caused by environmental and/or technical infrastructure failure. Failures of the 9-1-1 internal or external telecommunications, radio dispatch equipment, or electrical service equipment are situations when evacuation to a backup PSAP could be warranted.

A backup facility should be reviewed for specific requirements. It will require robust and diverse systems that share operational and functional redundancy and physical capabilities with the primary facility. The selected backup facility can also serve as a cost-effective location for off-site installation of backup servers or database maintenance for any or all critical systems in use at the primary facility. The primary and backup facility can provide systems redundancy for each other. It is best if the facility has sufficient hardening and redundant power/telecommunications connectivity to function in this capacity.

L.R. Kimball recommends a backup center sized to accommodate the full capacity of any communications center.

The facility should have the ability to support a temporary short-term and long-term loss of the primary facility. Short-term would be designated as two to five days and long-term would be considered a longer period (for example, days, weeks, months.)

L.R. Kimball does not recommend a “mobile command post” solution as the only means for backup communications. These typically work as a temporary solution until a more robust, reliable and well-equipped backup center can be staffed and begin operations.

With the proper connectivity to the primary facility, the backup facility can augment operations at the primary facility during times of disaster or high call volume when additional call taking and/or dispatching resources are needed.

The backup facility should be geographically diverse for weather-related or other localized disasters and emergencies. The backup facility should be served by alternate utilities (telephone home office, power grid, etc.)

9.4 Best Practices – Facility Planning

When proceeding with construction of a new facility or renovations to an existing building, consideration should be given to industry best practices for PSAPs.

The design of a space intended to support 24/7/365 operations must meet the needs of a modern PSAP. Of great importance is the comfort and safety of the staff and the capacity of the space to address current needs, as well as the needs for the next ten to twenty years. A hardened design is desired and intended to allow this operation to continue when the surrounding community is affected by power outages, severe weather events, or man-made and/or natural disasters. There are compromises and decisions required to accommodate limitations in funding, vision and, at times, politics. The effort and attention given to the design of a new facility, and specifically to the allocation of the communications space and support areas by the facility occupants, will determine the capacity and life span of the structure, service and, ultimately, the organization.

The industry standards cited and used to guide the design input and technology best practices recommended include NFPA Section 1221, CALEA, NENA, and APCO. These standards-setting bodies provide standards and guidance in the operations and technical aspects of a modern PSAP. The National Electrical Safety Code (NESC); the latest edition of NFPA 70, National Electrical Code (NEC); American National Standards Institute/Telecommunications Industry Association/Electronic Industries Alliance (ANSI/TIA/EIA) standards; the BICSI Telecommunications Distribution Method Manual; and Motorola R56 Standards and Guidelines for Communication Sites impact the electrical and cable infrastructure. The Institute of Electrical and Electronic Engineers’ (IEEE) standards impact electrical, grounding and communications systems design.

Additional consideration must be given to codes adopted by the local jurisdictional authority. For example, if the most recent version of the International Building Code (IBC) is used, specific criteria must be followed to ensure the stability and integrity of buildings identified as critical facilities.

9.4.1 Spatial Requirements

In emergency communications operations, the number of workstations drives the floor and adjacency needs. Industry standards provide direction in determining the amount of space required to properly support emergency communications within a range of SF based on the organizational and operational model. The number of required workstations is developed by first reviewing the future operations of the PSAP and determining the number of personnel required for the workload. The quantity of positions is then determined to support the required staff. Training needs and future expansion must also be taken into consideration.

Programming based on the concept of a consolidated organization provides a range of available SF on a per console basis. To adequately support the current workload in a consolidated environment, eight workstations are needed with at least one additional workstation for training, over flow and special events. An additional space allotment on the main floor should be given to accommodate future consoles.

The number of workstations projected for an operation is used in combination with the amount of SF per position to project the total work area of the PSAP floor. Consideration must be given to providing space for areas such as administrative offices, a training room, a kitchen, locker space, storage, hallways and bathroom facilities.

For a regional center serving all eight towns, a facility of approximately 8,500 SF is needed to accommodate up to ten workstation consoles, associated administrative office space, equipment room needs and other associated space needs. This projection is based on a preliminary programming spreadsheet that utilizes standard office spaces and known space needs for workstations, rack spaces and adjacencies. This tool was used to provide an estimated projection of space needs. This tool also uses a low to high range estimated cost-to-build per square foot to project a range of cost to build a new facility. The low range is \$375 and the high range is \$425 to construct per square foot. The price range to build a regional center that serves all eight towns is projected to be from \$3.1 to \$3.6 million. If facility costs are split equally between the participating eight towns, the share will be an approximate range of \$387,000 to \$450,000. The results of this preliminary programming exercise can be adjusted to accommodate editing the base information; for example administrative office, storage or bunkroom spaces, or the addition of space for other functions, such as municipal data storage or emergency management offices.

For a regional center serving the four towns of Sudbury, Wayland, Weston and Lincoln, or a center serving the towns of Concord, Acton, Maynard and Boxborough, individual facilities of approximately 6,500 SF each are needed to accommodate up to seven workstation consoles per facility, associated administrative office space, equipment room needs and other associated space needs. The price range to build two regional centers that serves four towns each is projected to be from \$2.4 to \$2.7 million per center. If facility costs are split equally between four towns, the share will be an approximate range of \$600,000 to \$675,000. The results of this preliminary programming exercise can be adjusted to accommodate editing the base information or the addition of space for other functions.

These projected space needs and cost estimates are based on new construction. Projecting costs to re-purpose an existing communications center or non-communications center facility will require specific architectural review and study of the proposed site(s).

9.4.1.1 PSAP Workstations

Within the allotted space, each position can require up to 175 SF of floor space per workstation and work area on the operations floor. The 175 SF represents the individual footprint of a position as normally fitting within a 10-foot by 10-foot area (100 SF) with the remaining 75 SF representing the necessary areas surrounding the furniture footprint, such as pathways, open areas, doorway access and clearance allowance in compliance with the Americans with Disabilities Act (ADA). This preliminary spatial allocation number is generally used for planning and can fluctuate with various room configurations and/or system furniture solutions.

Appendix E contains a diagram of a generic or typical ergonomic dispatch workstation, followed by a fixture schedule identifying the various systems and equipment normally installed at the workstation.

9.4.1.2 Equipment Rooms

An allowance of 25 SF is standard to accommodate the footprint of each single enclosed equipment cabinet or rack with a minimum three-foot clearance around. This also includes aisle-ways, accommodations for doors and room shapes/sizes, clearance for wall-mounted equipment, fire suppression and cabling infrastructure.

To project the space needs for an equipment room or rooms, planners must know the number and type of systems and equipment needed to support a regional PSAP. This space estimate should include utility considerations and demarcation points for all services. Other uses for this space may include network servers and routers, secure data storage for served agencies' records servers or repositories.

9.4.1.3 Training Room

A regional center will need to construct an area to provide training for new employees. Call takers and dispatchers must master a wide range of interpersonal and technical skills and must perform their functions in a high-stress mission critical mode. There is an on-going need for call takers and dispatchers to maintain their existing proficiency and skills. A well-equipped systems training room or area will provide the required environment and equipment to carry out this critical training away from the operations floor and from the distractions found inside a 'live' PSAP.

L.R. Kimball recommends a dedicated systems training room or area with one or two positions that are identical to the consoles on the operations floor, equipped with CAD, phone and radio, to support training and live calls.

The training area can be used for new employee and continuing education training, incident overflow during high periods of call activity (severe weather) and can be staffed with additional call takers or dispatchers for special operations, EOC activations and other activities, and to monitor employee activity and perform QA.

9.4.2 Security

Security will need to be included in new facility planning. The main entry doors should have security cameras for reviewing access and egress. All external doors should have a swipe card security system for entry to the building. This will allow all employees ease of access and will provide the capability to record when doors are opened and by whom. Doors should be allowed to be opened from the inside without a card to allow visitors egress without assistance. Though the 24/7 operations of the PSAP require monitoring and remote control of the security system, the primary responsibility of monitoring and controlling access to the building during normal business hours should be accommodated elsewhere in the facility. The PSAP, however, should maintain direct control over access and egress of the PSAP area.

A fence should be constructed around the perimeter of the facility for added security. This includes an entry gate to the parking lot. This gate should operate with a swipe card system and have an intercom system allowing visitors to speak with an employee and request entry to the facility. Appropriate lighting of all parking areas, entrances and pathways is required to provide safe arrival and departure for the communications staff on all shifts. Dedicated close proximity and secure parking is desired to enhance the security provided for PSAP staff.

Security levels will need to be established for the facility as a whole and where additional hardening is deemed necessary, such as the PSAP and equipment rooms. Internal doors needing restricted access could utilize the swipe card system and could be programmed to allow access to management-level staff only.

9.4.3 Flooring

A new facility should have a raised computer floor installed in the PSAP and the equipment room(s) if possible. The computer floor will need to be a minimum of eight inches higher than the existing floor and is typically comprised of two-foot square floor panels. The floor panels can be purchased with static dissipative carpet or other sound reduction material/coating on the topside for use in the PSAP. This will allow for a much quieter operation in this area. The equipment room panels should be static dissipative, but not carpeted.

9.4.4 Lighting

PSAP lighting should consist of indirect and/or task lighting. Dimmers or multiple switches should be used to provide different light levels for different shifts, which will provide a more pleasing work environment and will help reduce computer screen glare.

9.4.5 Acoustics

PSAP walls should be covered with an acoustic tile that will serve to prevent sound from reverberating throughout the room. Finish materials and building configuration should be designed to absorb ambient noise.

9.4.6 Cable Infrastructure

Cable trays should be placed under the raised floors in the PSAP and the equipment room. Cable trays will allow all cabling to be strategically routed from equipment to their termination point. An organized cabling system allows for future access for move, add or change activity. Consideration should be given to color-coding the different cables (radio, telephone, CAD network, administrative network, etc.) and/or labeling each cable every few feet to facilitate troubleshooting and repair. Proper grounding of all equipment is critical and should be per Motorola R56 specifications or equivalent. Overhead feeds from equipment rooms that require transition to the floor cable trays should follow the same requirements for placement. User outlets should be coordinated with furniture layout.

9.4.7 HVAC

The PSAP will need dedicated and redundant HVAC systems that will maintain a near-constant temperature and humidity level in the operations room and the 9-1-1 equipment rooms. This will increase the life cycle of all electronic components and lessen the chance of a system failure due to lightning or static electricity.

9.4.8 Fire Suppression

A double interlock, dry pre-action fire suppression system should be used in areas where mission critical equipment is located. This system type is designed to minimize the likelihood of water leakage in the equipment rooms by keeping the piping in that room sealed from the main supply until activation. The remaining facility will need to be properly sprinkler-protected for fire suppression as required by code.

9.4.9 Utilities

Separate service entrances and redundancy are desired in support of emergency communications. Utilities to this area must be secured. Multiple source points and use of underground lines should secure power, voice and data cable entrances. Multiple source points of gas lines and water should also be considered. Creating or extending service modes/infrastructure into or through unsecured areas of the facility or external grounds may also create

opportunities for points of failure or targets. For example, designing a secure enclosed area for a generator, but leaving fuel tanks in an unsecured/non-enclosed area, compromises the security of the facility.

9.4.10 Emergency Power

A UPS should be installed that will support all computer, telephony and electrical equipment in the event of a power disruption. A generator that can support all essential equipment in the event of an electrical power interruption should enhance this.

9.4.11 Other Services

Power, water and communications service providers should be contacted as early as possible in the planning process. Confirming the availability of the appropriate level of a specific utility and explaining the increased service needs due to increased use, redundancy, diversity and backup system requirements will allow adequate time for utility planning, preparation and installation.

9.4.12 Ductbanks

Ductbanks will be required for communications and electrical service. Separate trenches are preferred, but are not always practical. Industry guidelines recommend that electrical conduits and telecommunications conduits maintain a minimum separation of 36 inches when co-located in the same trench.

Ductbanks should be encased in concrete throughout their entire length. At transition points where ductbanks terminate at the base of respective utility poles and cables are routed from underground to aerial facilities, the communication trunk cables and electrical power feeder cables should be encased with U-Guard up the side of the pole. The U-Guard should extend into the conduit; no cable sheath should be exposed. Industry guidelines recommend that this facility employ diverse path routing for both the electrical feed and the communication trunk cabling. This will require communications and power to each have two separate ductbanks, each routed to opposite sides of the site's perimeter.

The optimum power configuration includes two appropriately sized UPS units fed from two separate power grids. To provide the highest level of redundancy, each grid transformer feeds to one of two UPS units; each UPS is capable of supporting 100 percent of the power load and backing the other up in the event one should fail.

The optimum communication configuration is comprised of two groups of trunk cables with each group routed through separate communication ductbanks. The trunks are then extended to separate end central offices. Each trunk group should be capable of managing 100 percent of the communication circuits and be configured to automatically route circuits from one trunk group to the other in the event one trunk group goes into a fail or overload condition.

9.4.13 Other Considerations

Equipment room layout requirements are addressed by all affected parties such as the designers, contractors, service providers and vendors. Prior to installation, the following questions must be addressed:

- Will racks and/or cabinets be used?
- How will voice cables terminate—backboard or rack?

- How are data cables for the automated systems terminated? On which racks?
- What will go in each rack—power and HVAC system requirements, cross connections to adjacencies?
- Is tie cabling needed for mobile unit parking location and connection or a tower shelter?
- What are the demarcation requirements regarding rack space, backboard space, power, OSP conduits quantity and site perimeter termination point?
- How many antenna cable conduits to rooftop and/or tower for public safety radio and amateur radio (RACES³³) are needed?

Facility design should include an outlet floor plan that provides for the following:

- Outlet composition to include cable quantity and type for voice, data, cable television (CATV), radio, 9-1-1 telephony, private branch exchange (PBX) or IP circuits for administrative phone system, CAD and local area network (LAN) for the PSAP and also standard administrative outlets
- Outlet locations inside each room including the support, administrative and management area of the building need to be considered; access off the communications area floor for the various technologies such as telephone management information system (MIS), CAD and digital recorder remote playback and monitoring will be needed
- Floor box locations
- Optional or future components
 - Overhead projection locations (overhead projector links for presentation input)
 - Video panel locations
 - Wall clocks
 - Message board locations

Audio-visual design considerations should include video distribution and input/output requirements (for example, switching and matrix equipment). Consideration should be given to additional operational issues, equipment or systems:

- Video monitoring (on-site CCTV camera system)
- Security monitoring (electronic security and access control)
- Interoperability patch (NAWAS³⁴, Local Help and National Call channel monitors)
- Municipal alarm monitoring (government buildings, schools, banks, etc.)
- Emergency notification system (for example, Reverse 9-1-1)
- Traffic signal liaison and/or Department of Transportation (DOT) video feeds
- Animal control
- Warrant service
- LEAPS/NCIC
- Parking enforcement
- Vehicle towing/impound, VIN assistance
- Emergency management systems
- Homeland security
- Radio site/system manager

³³ Radio Amateur Civil Emergency Service

³⁴ National Warning System

- Portable backup radios
- Master Clock time display
- Network printers
- Fax machine

9.4.14 Traffic Study

A formal traffic study should be conducted to gauge the area's current traffic flow and the impact the PSAP staff's transportation activity will have; this will assist in determining additional traffic signage, signaling requirements and site (driveway) entry point options consistent with the respective DOT's associated policies.

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10. COMPLETE REGIONALIZATION

One option available to the Towns is to regionalize all eight towns into one emergency communications center. A regional center serving Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough would provide a greater level of service and efficiency than can be realized in separate centers.

10.1 Staffing

In projecting PSAP staffing, L.R. Kimball used actual call volumes provided by the PSAPs and took into consideration the processed emergency and non-emergency calls.

Each dispatch center provided 9-1-1 calls statistics for their respective Towns for 2008, 2009 and 2010. Table 27 denotes the 9-1-1 call statistics.

Table 27 – 9-1-1 Call Statistics

9-1-1 Calls			
Dispatch Center	2008	2009	2010
	Wireline	Wireline	Wireline
	Wireless	Wireless	Wireless
Sudbury	1,853	1,788	1,809
	892	848	961
Wayland	1,601	1,280	1,291
	815	698	782
Weston	1,630	1,459	1,723
	828	695	703
Concord	3,178	2,901	2,836
	998	921	1,113
Acton	3,458	2,834	3,092
	1,362	1,246	1,407
Maynard	1,009	1,113	961
	407	507	516
Lincoln	759	651	658
	345	348	388
Boxborough	540	565	526
	117	176	220
Total Wireline	14,028	12,591	12,896
Total Wireless	5,764	5,439	6,090
Total	19,792	18,030	18,986

Five dispatch centers were able to provide ten-digit emergency and non-emergency call data for 2008, 2009 and 2010. Table 28 denotes the ten-digit call statistics.

Table 28 – Ten-digit Call Statistics

Non-emergency/Administrative Calls			
Dispatch Center	2008	2009	2010
Sudbury	37,525	37,525	37,525
Wayland	10,000	10,000	10,000
Weston			
Concord			
Acton	68,645	56,152	60,166
Maynard			
Lincoln	1,434	1,134	1,225
Boxborough	2,052	3,181	3,424
Total	119,656	107,992	112,340

In calculating call load for the dispatch centers, L.R. Kimball used a formula of 90 seconds call time and 30 seconds wrap up time. This is valid for processing an incoming emergency call or a non-emergency call requiring a dispatch, but does not take into consideration the calls that are transferred to a secondary PSAP, police administration, or another office.

It is important to note that the provided call volumes are annual counts. Industry tools calculate staffing by hour of the day. To arrive at these numbers, L.R. Kimball applies estimated formulas (e.g., busy month, busy time of day). As such, projections are open to management interpretation. This means that known busy or less busy periods can be staffed differently, such as one less call taker on a midnight shift or an additional call taker during busy evening hours; or consideration given to the use of the fire dispatcher and/or supervisor/training staff for call takers when available.

To meet NENA and NFPA standards in handling the projected call volume, a consolidated communications center serving all eight Towns will require staffing two call take positions around the clock. Call volume alone does not require two call take positions 24/7; however, should the Towns elect to perform EMD, then at least two call takers are needed on-duty at all times.

Only the number of call takers required to adequately staff a consolidated PSAP can be accurately determined using the APCO and Erlang C calculations. L.R. Kimball customized the formulas to calculate the estimated number of dispatchers and supervisors needed. Based on the incident volume of each town's public safety responses, L.R. Kimball projects two police dispatch positions to monitor all eight law enforcement agencies; one fire dispatch position for all eight towns' fire and EMS agencies; one tactical/relief dispatch position for supporting police and fire in high priority and/or incident command scenarios, as well as relieving dispatchers; and one supervisor position per shift.

Table 29 – Law Enforcement CAD Events

CAD Events – Law Enforcement				
Dispatch Center	2008	2009	2010	Average
Sudbury	18,158	15,813	15,223	16,398
Wayland	12,588	12,154	11,480	12,074
Weston	13,575	16,235	16,835	15,548
Concord	13,785	13,605	13,107	13,499
Acton	18,652	19,316	18,504	18,824
Maynard				
Lincoln	6,321	8,767	8,231	7,773
Boxborough	873	1,016	959	949
Total	83,952	86,906	84,339	85,065

Table 30 – Law Enforcement Events and Units on Duty

Dispatch Center	2010 Events	Average Law Enforcement Units on Duty
Sudbury	15,223	4
Wayland	11,480	4
Weston	16,835	4
Concord	13,107	6
Acton	18,504	5
Maynard		3
Lincoln	8,231	2
Boxborough	959	2
TOTAL	84,339	30

Based on existing call volume and average units on duty, L.R. Kimball recommends maintaining two law enforcement dispatch talk groups, separated geographically. Based on current statistics, there should be a need for no more than two law enforcement dispatch positions in the regional center.

Table 31 – Fire Events

CAD Events – Fire				
Dispatch Center	2008	2009	2010	Average
Sudbury	877	882	1,131	963
Wayland	2,376	2,344	2,636	2,452
Weston	2,152	2,009	2,453	2,205
Concord	2,308	1,850	1,983	2,047
Acton	3,310	2,901	2,982	3,064
Maynard				

CAD Events – Fire				
Dispatch Center	2008	2009	2010	Average
Lincoln	893	937	1,083	971
Boxborough	1,352	1,324	1,001	1,226
Total	13,268	12,247	13,269	12,928

In a consolidated communications center, consideration should be given to placing the fire departments on the same dispatch talk group or channel. This configuration would be practical not only for the operations of the consolidated communications center, but also for the fire departments, especially for events that require mutual aid and the simultaneous dispatch of multiple agencies.

Based on current statistics, L.R. Kimball anticipates two fire positions would be needed in the consolidated communications center. The recommended configuration would be one primary fire dispatch position and one tactical/operations fire position. This tactical fire position would also serve as a relief dispatch position for police dispatch. During any significant fire event, the tactical/operations position should be staffed and tasked with monitoring active fire events, including fire ground operations/communications. When there are no active fire events, the primary and tactical fire positions can be used as a backup for call taking.

Table 32 – EMS Events

CAD Events – EMS				
Dispatch Center	2008	2009	2010	Average
Sudbury	1,066	1,161	1,214	1,147
Wayland	730	784	994	836
Weston	996	983	1,134	1,038
Concord		152	344	248
Acton	1,462	1,479	1,535	1,492
Maynard				
Lincoln	357	363	474	398
Boxborough	805	803	447	685
Total	5,416	5,725	6,142	5,844

In a consolidated communications center, consideration should be given to placing EMS on the same dispatch talk group or channel as the fire departments. This configuration would be practical not only for the operations of the consolidated communications center, but also for incidents that require fire response as well.

Based on current statistics, L.R. Kimball anticipates one EMS position would be needed in the consolidated communications center. If EMS dispatch is combined with fire dispatch, this EMS position would be the tactical position and handle all radio traffic after initial dispatch. When there are no active EMS incidents, the tactical position can be used as a backup for call taking.

10.1.1 Projected Staffing³⁵

Based on Erlang C calculations and the Project RETAINS formula, the minimum projected staff needed in the consolidated communications center is 39, which includes supervisory staff. The projected staff is broken down as 9 certified call takers, 24 certified dispatchers and 6 supervisors. While completely cross-trained staff is desired, projected minimum certified staff is provided as guidance toward meeting call volume and dispatching needs. The staffing projections represent the number of FTE employees needed to staff two call take positions between 8:00 a.m. and midnight and one call take position between midnight and 8:00 a.m., and two law enforcement dispatch positions, one fire/EMS dispatch position, one tactical fire/EMS relief dispatch position, and one supervisor position 24-hours a day.

Conditions and options may be present that will require adjusting the staff projections.

- Appropriately qualified senior staff can be trained and compensated to fill in for absent supervisors.
- Certified part-time staff can be used to augment operations staff as needed, during training, identified high call volume periods, special events and on-going high priority incidents that deplete full-time staff capacity.
- The addition of at least one assistant supervisor or senior dispatcher per shift will augment the operations supervisors' ability to properly oversee the staff, and will enhance the ability to maintain training and certification levels, and manage personnel issues.

Many of the existing staff can be expected to transition to a consolidated communications center. Through attrition and qualification procedures, the possibility exists that several staff members will not transition to a consolidated center. A hiring process will be necessary to fill additional staff positions.

Currently, the eight Towns have a total of 42 full-time authorized positions and 10 part-time authorized positions.

10.1.2 Workstations

L.R. Kimball recommends the workstations/consoles be identically equipped with critical technology: 9-1-1 answering equipment, CAD and radio consoles. This configuration allows each position to be used for the dispatch of any discipline and provides appropriate backups.

For facility sizing purposes, space for at least one future console should be included on the operations floor, which could be used for overflow calls during incidents, special operations, and training.

In addition to the recommended total consoles for the operations floor, at least one training console should be located off the operations floor and could be partially to fully equipped based on need and funding.

Table 33 summarizes projected staffing levels and necessary console positions.

³⁵ It should be noted that Maynard did not provide police, fire or EMS incident volumes. Staffing was calculated based on the data provided by the respective towns, and using estimated data for Maynard. Estimated incident figures for Maynard were 12,000 law events, 3,000 fire events, and 900 EMS events. Staffing figures recommended by L.R. Kimball are inclusive of Maynard's estimated data.

Table 33 – Staffing and Consoles

Staffing		Console Positions	
Certified FTEs Needed	Number	Workstations Needed	Number
Call Takers	9	Call Taker	2
Law Enforcement Dispatchers	12	Law Enforcement Dispatch	2
Fire/EMS Dispatchers	6	Fire/EMS Dispatch	1
Tactical Dispatchers	6	Fire/EMS Tactical/Relief Dispatcher	1
Supervisors	6	Supervisor	1
Total	39		
		Total	7
		Training (off operations floor)	1 – 2
		Total	8 – 9
		Future Consoles	1 – 2
		Total	9 – 11

A re-evaluation of available statistical call volume and data should be performed every three to six months during the planning and implementation phases to ensure accuracy in staffing projections.

10.2 Technology

10.2.1 CPE

The 911 Department procures and is responsible for maintaining telephone CPE equipment at each PSAP, including:

- Cassidian Communications, formerly PlantCML, Vesta Pallas CPE
- Cassidian Communications MagIC CDR
- MapStar mapping
- Nice Digital logging recorder
- Spectracom time synchronization

Sudbury, Wayland, Weston, Maynard, Lincoln and Boxborough each have two positions with 9-1-1 answering equipment; Concord and Acton have three. Each primary PSAP has four wireline and four wireless trunks into the dispatch centers.

Each dispatch center has current technology that allows staff to automatically receive and plot wireless Phase II calls, and mapping software that displays the caller's location. L.R. Kimball recommends a CAD system interface that

accepts the X, Y coordinates of the caller and automatically converts that location to the closest available street address, intersection or address point in the CAD system.

If consolidation moves forward, decision-makers will need to coordinate with the 911 Department to design a robust 9-1-1 network to ensure the proper routing of 9-1-1 calls to the consolidated center. The network will have to be engineered to route all 9-1-1 calls to the consolidated center within a network that provides as much diversity and redundancy as possible.

PSAPs must be cognizant of upcoming NG9-1-1 standards and work with the 911 Department in finalizing the future IP network and supporting PSAP infrastructure/equipment that will adhere to associated standards. Although next generation standards are still being developed, there is enough information being provided that new networks are being designed and installed, and new CPE equipment is being made available by vendors and advertised as being NG9-1-1 capable.

10.2.2 CAD Systems

Sudbury, Wayland, Acton and Lincoln use a PAMET CAD system. Weston, Concord, Maynard and Boxborough use an IMC (now TriTech) CAD system.

Both CAD systems are capable of supporting multiple jurisdictions. Several fire departments indicated that neither vendor offers a CAD system that supports the fire-related needs of their agencies.. According to the surveys, only two PSAPs use fire and EMS-related CAD interfaces.

Selecting a CAD vendor that best meets the needs of all public safety disciplines is important in a consolidated PSAP. Each agency indicated that conversion of historical data is important and needs to be considered when either upgrading or procuring a new system. Six PSAPs have been using their current CAD since 2004. Two PSAPs have had their CAD system since 2008 and 2009. Five of the eight PSAPs have mapping, but only two PSAPs' mapping interfaces with their CAD. All eight police departments have MDTs in their vehicles, but only five agencies have it interfaced with CAD.

L.R. Kimball recommends participating PSAPs develop a consensus on CAD system requirements and upgrade one of the existing CAD systems **or** develop a comprehensive RFP to procure a CAD system that meets the needs of all agencies. To assist the decision process, agencies will need to complete a thorough needs assessment to determine the modules, functionality and features that are needed by all agencies to be served by the consolidated communications center. This is the only way to ensure that the needs of all agencies have been researched and addressed. This needs and functionality assessment should be conducted whether the decision is to procure a brand new system or expand/upgrade an existing system.

Upgrading the CAD system, or procuring a new system, can provide a number of system enhancements, including:

- Additional fire department functionality
- Additional modules/interfaces
- Additional GIS/mapping capabilities
- Address points as verifiable locations
- Evolving technologies such as NG9-1-1 and CAD-to-CAD

- Fault tolerant or high availability back room equipment (minimum 99.999 percent uptime guarantee)
- Adequate system sizing and event history

To ensure end user acceptance in a consolidated communications center, L.R. Kimball recommends that first responders do not lose any existing functionality once a consolidated center is brought on-line. L.R. Kimball recommends pursuing additional functionality or features that could be implemented during the consolidation to help encourage end user acceptance of the project.

Table 34 lists interfaces that should be supported by the selected CAD system. While the consolidated communications center may not choose to implement all interfaces immediately, it is likely more cost effective to include most, if not all, in the initial CAD procurement rather than adding at a later date.

Table 34 – Recommended CAD Interfaces

CAD Interfaces	
Alphanumeric Paging, includes e-mail and text messaging	Mobile Mapping
AVL with Routing	Pictometry
Call Taker/Dispatcher Mapping	Police Field Reporting
Digital Recorder	Police Mobile Data
E9-1-1 ALI Data	Police RMS
Emergency Dispatch Software	Radio Console/PTT/Emergency
Fire Mobile	Radio Tone Encoding
Fire RMS	Rip & Run
Fire Station Alerting	TDD/TTY
NCIC/LEAPS	Web CAD
Master Clock	Wireless Phase II

Sufficient redundancy should exist within the CAD system to ensure that no single point of failure exists, should the entire CAD system go down. To ensure the fullest extent of redundancy, the production server(s) should be located at the consolidated communications center facility with a redundant geo-diverse back-up server installed off-site.

The CAD system should be designed to take advantage of current fail-over and other backup technologies that enable continued operation, notwithstanding single or multiple component failure. Fail-over should be an automatic switchover solution that requires no manual intervention and no delay in switchover.

Participating PSAPs should continue to assess the current operations and needs of the local agencies on an on-going basis to assure that CAD system functionality and features continue to provide the required level of service. All should continue to work with the selected vendor and other users in an effort to pursue future software and hardware enhancements that would ensure that the system is providing the best possible solution for a consolidated PSAP and local emergency services.

10.2.3 Mapping/GIS

A consolidated center should work closely with participating GIS departments to ensure accurate GIS mapping data is available for use in the center.

When the CAD system is upgraded or replaced the ultimate goal would be to have a single integrated mapping solution for all critical functions such as 9-1-1 telephony equipment, CAD, mobile and AVL.

10.2.4 Logging Recorder

Each PSAP has a logging recorder solution provided by the 911 Department and records both telephone and radio system conversations. Each Nice digital logging recorder has 16 channels; usage varies from all 16 channels used to 6.

A new logging recorder solution is recommended for the consolidated center. The new recorder will need the capacity to record all telephone and radio traffic and have sufficient on-line storage to retrieve historical data. A fully redundant back room hardware solution should be considered for the consolidated center.

10.2.5 Master Clock

Each dispatch center has a master clock solution provided by the 911 Department. All critical systems/technology should be interfaced to the master clock.

In a consolidated center, a fully redundant master clock solution should be installed and integrated with all critical systems. This includes CAD, 9-1-1 answering positions, administrative phone system, logging recorder, radio consoles, administrative computers and display clocks.

10.2.6 Radio Systems

Consolidation of a public safety radio dispatch operation is driven by several elements: existing radio systems currently in use, connectivity from an existing dispatch facility to the radio system/transmitter site, and existing dispatch console systems.

An optimal scenario is when the agencies affected by consolidation use the same type of radio technology and share a common frequency band, providing seamless operational coverage. This is not the case for Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough. Currently, three police departments are on VHF radio channels, four on UHF, and one on 800 MHz. Six fire departments are on UHF and two on VHF.

A variety of radio consoles are in use.

Table 35 – Radio Consoles

Dispatch Center	Radio Consoles	# of Radio Consoles	Installed
Sudbury Police	Motorola CENTRACOM Series 2	2	1991
Sudbury Fire	Zetron 4010R	1	
Wayland Public Safety	Zetron 4115	2	2003

Dispatch Center	Radio Consoles	# of Radio Consoles	Installed
Weston Police	Zetron 4001R	2	2001
Weston Fire	Zetron 4010R	2	
Concord Public Safety	Motorola CENTRACOM Elite	3	2003
Acton Public Safety	Zetron 4115	2	2005
Maynard Police	Motorola MCC5500	2	2009
Lincoln Police and Fire	Zetron 4115	2	?
Boxborough Police	Motorola Command Starlite	1	2004
	Motorola Comtegra	1	?

Console connectivity to the various radio base stations is a combination of microwave, fiber and telephone radio circuits. Sudbury, Wayland, Weston and Acton use radio signal comparators and voters operating on the radio systems. Should existing radio systems be reused within the consolidated PSAP, backhaul circuits will need to be expanded to provide connectivity to the new location. In most cases, RF control stations may be used to provide alternate or backup connectivity to repeater systems.

Repeated and simplex VHF low band, VHF high band, UHF and 800 MHz channels within the region are used for primary day-to-day dispatch of the local emergency services. Wayland and Weston Fire have simulcast systems. Table 36 details primary dispatch repeater out channels used by the eight dispatch centers.

Table 36 – Primary Dispatch Channels

PSAP	Primary Dispatch Channel	Radio Frequency
Sudbury	Sudbury Police	800 MHz – 852.9215 MHz
	Sudbury Fire	UHF – 482.7500 MHz
Wayland	Wayland Police	UHF – 484.4375 MHz
	Wayland Fire	UHF – 483.4125 MHz
Weston	Weston Police	UHF – 472.2375 MHz
	Weston Fire	VHF – 154.1600 MHz
Concord	Concord Police	UHF – 482.3375 MHz
	Concord Fire	UHF – 483.5375 MHz
Acton	Acton Police	VHF – 154.8150 MHz
	Acton Fire	UHF – 453.1750 MHz
Maynard	Maynard Police	VHF – 155.0100 MHz
	Maynard Fire	UHF – 470.9000 MHz
Lincoln	Lincoln Police	UHF – 483.0000 MHz
	Lincoln Fire	UHF – 470.8500 MHz
Boxborough	Boxborough Police	VHF – 154.7250 MHz
	Boxborough Fire	VHF – 46.5000 MHz

Each law enforcement and fire agency has a number of operational channels available for use.

There are two primary options for radio system deployment: reuse of existing conventional systems or migration to a shared regional trunking system. Should existing conventional systems be reused, patching systems should be enhanced to provide more seamless unit-to-unit connectivity across frequency bands. This level of connectivity will be provided through the implementation of new dispatch consoles, which will provide improved capacity and improved patching capabilities. Several underlying limitations with this option include the fact that unit-to-unit simplex operation will not be available across frequency bands without the use of a deployable gateway; cross band connectivity will require dispatcher intervention to deploy a patch; cross band connectivity will depend on overlapping coverage from all frequency bands involved in the patch; and patching result in the use of two channels simultaneously, thereby reducing available channel resources. Each conventional repeater will have a different frequency, creating operational difficulty for users roaming throughout the region. Users will have to be aware of what in-band channels they may roam to, and must physically change frequencies on their radio to access different sites for additional coverage.

The recommended system is a wide-area 700/800 MHz trunked system that would provide coverage and capacity necessary to meet the needs of all member agencies. For this system, L.R. Kimball recommends system design coverage to be 95 percent of each community, from a portable radio with the antenna at hip-height, and located inside an appropriate building. The definition of an appropriate building is: medium industrial buildings (-12 dB signal penetration) for the urban/suburban areas and light building (-6 dB signal penetration) for all rural areas. The system should be sized to accommodate a minimum of 250 end users system-wide with a grade of service of one percent or less.

10.2.6.1 Radio Console Recommendations

A consolidated communications center will require a standardization of radio consoles. Currently four radio consoles from different manufacturers and/or models are used. Equipment ranges in age from ~10 years to 2 years. From a cost perspective, expanding use of Maynard's MCC 5500 consoles would be a logical choice as they are the newest. However, the consoles should be reviewed to make sure they will functionally fit the needs of the consolidated center. The MCC5500 is a control station-based console and will require on-site radios to provide the interface for each conventional channel or trunked talk group. If a trunking system is implemented, a console solution that provides a direct interface to the trunking system is recommended to eliminate the need for individual control station radios for each channel. A rough budgetary estimate is ~\$70,000 per console.

10.2.6.2 Radio Infrastructure Recommendations

A full analysis of the radio systems of the participating agencies would be necessary to ensure that the infrastructure needed to provide the appropriate level of radio coverage is present. If it is not, then specific upgrades would need to be identified. If substantial and expensive upgrades are needed, developing a radio plan that migrates agencies to the same radio platform should be considered. A common radio platform would improve radio interoperability regionally and would allow a more efficient use of PSAP personnel by combining small agencies onto a single police and a single fire dispatch frequency

During the planning phase of a consolidation project, participating agencies will need to consider and address the following:

- Maintaining connectivity to the various base stations/radio sites for the dispatch of fire and EMS agencies during the transition to a regional system. Determining if the existing base station equipment and locations provide the best possible radio coverage footprint.
- Maintaining connectivity to the various base stations/radio sites for connectivity to law enforcement backup channels during the transition to a regional system. Determining if the existing base station equipment and locations provide the best possible radio coverage footprint.
- Identifying if any existing base station sites/equipment can be relocated to a centralized regional site to reduce the number of sites while providing, at a minimum, the same level of coverage or possibly even better coverage. Consolidation of sites would reduce the cost for needed connectivity.
- Identifying the best solution available to provide a fault tolerant connectivity solution between the consolidated PSAP and the required radio sites/equipment via microwave, fiber optic, T1 or a combination thereof.
- Identifying any need for replacement base stations and radios within the radio sites and user community to bring everyone into full compliance with the upcoming Federal Communications Commission (FCC) narrow-banding mandate.
- Identifying if a multi-service tower capable of supporting microwave, control and base station equipment is needed at the consolidated PSAP. The tower site and equipment would also provide radio system redundancy during any loss of connectivity to the remote sites.

10.2.7 Alarm Systems

All Towns have alarm systems that are being monitored by the primary or secondary PSAPs. These alarms will still require monitoring.

10.3 Cost Estimates

The following section provides budgetary cost estimates for regionalizing all eight towns' emergency communications centers. **These estimates are for planning purposes only** and should be re-evaluated during the planning process as decisions are made regarding location, systems and operational configuration and functions.

10.3.1 Current Operating Costs

The current total cost to operate eight separate dispatch centers is approximately \$3,233,596. Table 37 details the current operational costs as reported for each center. Estimates are based on comparable-sized centers in the region and are so indicated in the notes.

Table 37 – Current Operating Costs

Town/PSAP	Salaries	Benefits	Overtime	Other Operational Costs *	TOTAL
Sudbury	Police - \$174,113	\$45,000	\$50,786	** \$40,073	\$309,972
	Fire - \$107,000	\$30,000			\$137,000
Wayland	\$358,652	\$53,770	\$75,000	☐☐ \$88,355	\$575,777
Weston	\$207,500		\$51,000	¥ \$93,960	\$352,460
Concord ☐	\$417,600			\$62,400	\$480,000
Acton	\$468,762			\$27,979	\$496,741
Maynard	\$225,000			\$27,690	\$252,690
Lincoln	\$214,915	\$63,922	\$21,700	\$27,094	\$327,631
Boxborough	\$163,674	\$62,683	\$35,875	\$39,093	\$301,325
TOTALS	\$2,337,216	\$255,375	\$234,361	\$406,644	\$3,233,596

* Includes building costs, system maintenance, connectivity, other equipment, training, etc. – when provided.

** Sudbury's facility costs for communications were estimated at 5% of total building costs provided.

☐☐ Wayland's facility costs for communications were estimated at 15% of total building costs provided.

¥ Weston's additional items for communications were estimated at 10% of total costs provided.

☐ Concord's figures were estimated.

10.3.2 Projected Costs

10.3.2.1 Projected Personnel Costs

Total projected salary costs in year one of consolidation cannot accurately be projected without extensive planning sessions with the supporting entity's Human Resource staff. On-going personnel costs for the consolidated communications center will depend on the final number of staff, their pay and classification, and skill sets that may require additional compensation, and the administrative structure.

To allow the eight towns to budget for personnel costs for a regional center, L.R. Kimball recommends a budgetary figure of \$3,100,000, minimum. This estimate is for a staff of 39, a Director, an administrative assistant, and technical support staff, and includes benefits. This estimate is based on the current total reported personnel costs and estimates based on similarly sized regional centers. Those costs not reported are estimates and will require accurate reporting before final costs can be projected.

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10.3.2.2 Projected Technology Costs

Projected technology costs will vary depending on the decisions of the participating Towns as to the technology to be used within a regional center.

Table 38 – Technology Costs

Technology: Systems and Specialized Furniture	Budget Estimates	Total Estimated Cost Range
CAD	\$90,000 per position	\$900,000
Radio Console ³⁶ Transition Costs	\$50,000 per new console position \$5,000 transition cost per console	\$500,000 \$50,000
Ergonomic Dispatch Furniture Consoles ³⁷	\$18,000 per new position \$2,000 transition cost per position	\$180,000 \$20,000
Intensive Use Chairs	\$1,000 per position	\$10,000
Redundant Master Clock Solution	\$15,000 approximately	\$15,000
TOTAL		\$995,000 to \$1,605,000

The estimates above do not include associated costs for developing requirements for each system, procurement and installation planning support, additional equipped positions for training or resource monitoring, or any ancillary system deemed necessary for the consolidated communications center. These associated costs can be projected to be 10 percent of the overall system(s) costs. For a regional center, these associated costs could range from \$99,500 to \$160,500 depending on the decisions and direction of the stakeholders. Professional support services, such as procurement and implementation services, typically are slightly greater than 10 percent of total purchase per automated system; however, these costs vary based on the level of support contracted.

For total technology and associated costs, and professional services, the Town should collectively budget between \$1,094,500 and \$1,765,500 over the 18 to 30 month consolidation planning, transition and implementation period. Planners will be able to adjust these projections based on potential cost saving measures, such as upgrading an existing CAD system versus purchasing new.

10.3.2.3 Projected Facility Costs

For a regional center serving all eight towns, a facility of approximately 8,500 SF is needed to accommodate up to ten workstation consoles, associated administrative office space, equipment room needs and other associated space needs. This projection is based on a preliminary programming spreadsheet that utilizes standard office spaces and known space needs for workstations, rack spaces and adjacencies. This tool was used to provide an estimated projection of space needs. This tool also uses a low to high range estimated cost-to-build per square foot to project a range of cost to build a new facility. The low range is \$375 and the high range is \$425 to construct per square foot. The price range to build a regional center that serves all eight towns is projected to be from \$3.1 to \$3.6 million. If facility costs are split equally between the participating eight towns, the share will be an approximate range of \$387,000 to \$450,000. The results of this preliminary programming exercise can be adjusted to accommodate

³⁶ Harris Co. Regional System administers network. Equipment (console) costs are responsibility of cities.

³⁷ This assumes six new positions and six positions transitioned from Sugar Land.

editing the base information; for example administrative office, storage or bunkroom spaces, or the addition of space for other functions, such as municipal data storage or emergency management offices.

If new construction is not possible, one of the larger existing centers could be renovated to accommodate the regional center. The facilities housing the eight towns' communications centers are not currently capable of accommodating a regional center of a size and capacity serving all eight towns. Acton's communication center would require the least amount of renovation as it appears to have the most available space and ability to expand. Once a decision is made toward regionalizing all eight towns, a location will have to be identified and if no new construction occurs then renovation costs can be projected.

10.3.2.4 Projected Transition Costs

To assist and support the planning, transition and implementation of consolidation, temporary professional services, with experience conducting multiple consolidation planning and transition projects, should be engaged. This will provide appropriate coordination of resources, planning documents and timelines, and necessary coordination between all stakeholders, vendors, contractors and user agencies. Planning costs are determined by the level of support needed and calculated in hours of effort and time on-site. These costs average approximately \$100,000 annually during the transition and implementation year(s) depending on the level of on-site support needed during these phases. Support should increase in the final six months of implementation, as this is tied to the occupancy of the facility, the automated systems and networking installations and cut over; and the training and migration of personnel.

10.3.3 Summary

Total projected one-time costs are illustrated below. The figures in the table represent the high end figures and assume that a new facility will be necessary.

Table 39 – Projected One-time Costs

Projected One-time Costs	
Capital Costs – Facility	\$3,600,000
Capital Costs – Technology	\$1,605,000
Transition Costs – Professional Services	\$250,000
TOTALS	\$5,455,000

Should all eight towns pursue regionalization, a rough budgetary estimate, for planning purposes only, is \$5,455,000, which does not include personnel costs for the eight centers while working towards regionalization, or after a transition.

Table 40 – Operational Costs

Operational Costs		
	Current Operational Costs *	Projected Operational Costs **
Salaries, Benefits, and Overtime	\$2,826,952	\$3,100,000
Other Operational Costs	\$406,644	\$276,750
TOTALS	\$3,223,596	\$3,376,750
* As illustrated in Table 37, some operational costs have not been provided. As such, this is not a true comparison. ** Projected operational costs are based on a staff of 39 with an approximate salary and benefits of \$50,000 each, a Director, an administrative assistant, and technical staff. Other costs are based on 15% of technology capital costs, plus 1% of building costs.		

Higher operating costs are to be expected as the Towns will be creating something different, improving service, professionalism, training, and supervision.

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11. SUDBURY, WAYLAND, WESTON AND LINCOLN REGIONALIZE

One option available to the Towns is to regionalize into two centers each with four towns. This could be viewed as a singular option or as two separate options if some Towns elected not to participate. The four town approaches are geographically based. For purposes of this report, the four town approaches towards regionalization are discussed separately.

11.1 Staffing Levels

In projecting PSAP staffing, L.R. Kimball used actual call volumes provided by the PSAPs and took into consideration the processed emergency and non-emergency calls.

Each dispatch center provided 9-1-1 calls statistics for their respective Towns for 2008, 2009 and 2010. Table 41 denotes the 9-1-1 call statistics.

Table 41 – 9-1-1 Call Statistics

9-1-1 Calls			
Dispatch Center	2008	2009	2010
	Wireline	Wireline	Wireline
	Wireless	Wireless	Wireless
Sudbury	1,853	1,788	1,809
	892	848	961
Wayland	1,601	1,280	1,291
	815	698	782
Weston	1,630	1,459	1,723
	828	695	703
Lincoln	759	651	658
	345	348	388
Total Wireline	5,843	5,178	5,481
Total Wireless	2,880	2,589	2,834
Total	8,723	7,767	8,315

Most dispatch centers were able to provide ten-digit emergency and non-emergency call data for 2008, 2009 and 2010. Table 42 denotes the ten-digit call statistics.

Table 42 – Ten-digit Call Statistics

Non-emergency/Administrative Calls			
Dispatch Center	2008	2009	2010
Sudbury	37,525	37,525	37,525
Wayland	10,000	10,000	10,000
Weston			
Lincoln	1,434	1,134	1,225
Total	48,959	48,659	48,750

In calculating call load for the dispatch centers, L.R. Kimball used a formula of 90 seconds call time and 30 seconds wrap up time. This is valid for processing an incoming emergency call or a non-emergency call requiring a dispatch, but does not take into consideration the calls that are transferred to a secondary PSAP, police administration, or another office.

It is important to note that the provided call volumes are annual counts. Industry tools calculate staffing by hour of the day. To arrive at these numbers, L.R. Kimball applies estimated formulas (e.g. busy month, busy time of day). As such, projections are open to management interpretation. This means that known busy or less busy periods can be staffed differently, such as one less call taker on a midnight shift or an additional call taker during busy evening hours; or consideration given to the use of the fire dispatcher and/or supervisor/training staff for call takers when available.

To meet NENA and NFPA standards in handling the projected call volume, a regional communications center serving Sudbury, Wayland, Weston and Lincoln will require staffing one call take position 24-hours a day. Should the Towns elect to perform EMD, at least two call takers should be on-duty at all times; however, call volume does not dictate the need for two call takers full time. A second call taker can be accommodated by a dispatcher or supervisor when necessary.

Only the number of call takers required to adequately staff a regional PSAP can be accurately determined using the APCO and Erlang C calculations. L.R. Kimball customized the formulas to calculate the estimated number of dispatchers and supervisors needed. Based on the incident volume of each Town's public safety responses, L.R. Kimball projects one police dispatch positions to monitor the four law enforcement agencies; one fire dispatch position for the four towns' fire and EMS agencies; one tactical/relief dispatch position for supporting police and fire in high priority and/or incident command scenarios, as well as relieving dispatchers; and one supervisor position per shift.

Table 43 – Law Enforcement CAD Events

CAD Events – Law Enforcement				
Dispatch Center	2008	2009	2010	Average
Sudbury	18,158	15,813	15,223	16,398
Wayland	12,588	12,154	11,480	12,074

CAD Events – Law Enforcement				
Dispatch Center	2008	2009	2010	Average
Weston	13,575	16,235	16,835	15,548
Lincoln	6,321	8,767	8,231	7,773
Total	50,642	52,969	51,769	51,793

Table 44 – Law Enforcement Events and Units on Duty

Dispatch Center	2010 Events	Average Law Enforcement Units on Duty
Sudbury	15,223	4
Wayland	11,480	4
Weston	16,835	4
Lincoln	8,231	2
TOTAL	51,769	14

Based on existing call volume and average units on duty, L.R. Kimball recommends maintaining one law enforcement dispatch talk group. Based on current statistics, there should be a need for no more than one law enforcement dispatch position in the regional PSAP.

Table 45 – Fire Events

CAD Events – Fire				
Dispatch Center	2008	2009	2010	Average
Sudbury	877	882	1,131	963
Wayland	2,376	2,344	2,636	2,452
Weston	2,152	2,009	2,453	2,205
Lincoln	893	937	1,083	971
Total	6,298	6,172	7,303	6,591

Table 46 – EMS Events

CAD Events – EMS				
Dispatch Center	2008	2009	2010	Average
Sudbury	1,066	1,161	1,214	1,147
Wayland	730	784	994	836
Weston	996	983	1,134	1,038
Lincoln	357	363	474	398
Total	3,149	3,291	3,816	3,419

Based on current statistics, L.R. Kimball anticipates two fire positions would be needed in the regional communications center. The recommended configuration would be one primary fire dispatch position and one tactical/operations fire position. During any significant fire event, the tactical/operations position should be staffed and tasked with monitoring active fire events, including fire ground operations/communications. When there are no active fire events, either position can be used as a primary backup for call taking.

In a regional communications center, consideration should be given to placing EMS on the same dispatch talk group or channel as the fire departments. This configuration would be practical not only for the operations of the regional communications center, but also for incidents that require fire response as well. Based on current statistics, between the fire/EMS dispatch position and the fire tactical/operations position, EMS on-scene operations should be able to be covered by these positions, or the call taker when not actively on a call.

11.1.1 Projected Staffing

Based on Erlang C calculations and the Project RETAINS formula, the minimum projected staff needed in the regional communications center is 27, which includes supervisory staff. The projected staff is broken down as 5 certified call takers, 16 certified dispatchers and 6 supervisors. While completely cross-trained staff is desired, projected minimum certified staff is provided as guidance toward meeting call volume and dispatching needs. The staffing projections represent the number of FTE employees needed to staff an average of one call take position, one law enforcement dispatch position, one fire/EMS dispatch position, one tactical fire/EMS dispatch position, and one supervisor position 24-hours a day.

Conditions and options may be present that will require adjusting the staff projections.

- Appropriately qualified senior staff can be trained and compensated to fill in for absent supervisors.
- Certified part-time staff can be used to augment operations staff as needed, during training, identified high call volume periods, special events and on-going high priority incidents that deplete full-time staff capacity.
- The addition of at least one assistant supervisor or senior dispatcher per shift will augment the operations supervisors' ability to properly oversee the staff, and will enhance the ability to maintain training and certification levels, and manage personnel issues.

Many of the existing staff can be expected to transition to the regional communications center. Through attrition and qualification procedures, the possibility exists that several staff members will not transition to a regional center. A hiring process will be necessary to fill additional staff positions.

Currently, Sudbury, Wayland, Weston and Lincoln have a total of 22 full-time authorized positions and 4 part-time authorized positions.

11.1.2 Workstations

L.R. Kimball recommends the workstations/consoles be identically equipped with critical technology: 9-1-1 answering equipment, CAD and radio consoles. This configuration allows each position to be used for the dispatch of any discipline and provides appropriate backups.

For facility sizing purposes, space for one future console should be included on the operations floor, which could be used for overflow calls during incidents, special operations, and training.

In addition to the recommended total consoles for the operations floor, at least one training console should be located off the operations floor and could be partially to fully equipped based on need and funding.

Table 47 summarizes projected staffing levels and necessary console positions.

Table 47 – Staffing and Consoles

Staffing		Console Positions	
Certified FTEs Needed	Number	Workstations Needed	Number
Call Takers	5	Call Taker	1
Law Enforcement Dispatchers	6	Law Enforcement Dispatch	1
Fire/EMS Dispatchers	6	Fire/EMS Dispatch	1
Tactical Dispatchers	4	Fire/EMS Tactical/Relief Dispatcher	1
Supervisors	6	Supervisor	1
Total	27		
		Total	5
		Training (off operations floor)	1 – 2
		Total	6 – 7
		Future Consoles	1
		Total	7 – 8

A re-evaluation of available statistical call volume and data should be performed every three to six months during the planning and implementation phases to ensure accuracy in staffing projections.

11.2 Technology

11.2.1 CPE

The 911 Department procures and is responsible for maintaining telephone CPE equipment at each PSAP, including:

- Cassidian Communications, formerly PlantCML, Vesta Pallas CPE
- Cassidian Communications MagIC CDR
- MapStar mapping

- Nice Digital logging recorder
- Spectracom time synchronization

Sudbury, Wayland, Weston, and Lincoln each have two positions with 9-1-1 answering equipment. Each primary PSAP has four wireline and four wireless trunks into the dispatch centers.

Each dispatch center has current technology that allows staff to automatically receive and plot wireless Phase II calls, and mapping software that displays the caller's location. L.R. Kimball recommends a CAD system interface that accepts the X, Y coordinates of the caller and automatically converts that location to the closest available street address, intersection or address point in the CAD system.

If regionalization moves forward, decision-makers will need to coordinate with the 911 Department to design a robust 9-1-1 network to ensure the proper routing of 9-1-1 calls to the regional center. The network will have to be engineered to route all 9-1-1 calls to the regional center within a network that provides as much diversity and redundancy as possible.

PSAPs must be cognizant of upcoming NG9-1-1 standards and work with the 911 Department in finalizing the future IP network and supporting PSAP infrastructure/equipment that will adhere to associated standards. Although next generation standards are still being developed, there is enough information being provided that new networks are being designed and installed, and new CPE equipment is being made available by vendors and advertised as being NG9-1-1 capable.

11.2.2 CAD Systems

Sudbury, Wayland and Lincoln use a PAMET CAD system. Weston uses an IMC (now TriTech) CAD system.

Both CAD systems are capable of supporting multiple jurisdictions. Several fire departments indicated that neither vendor offers a CAD system that supports fire-related needs of their agencies. According to the surveys, only Weston use fire and EMS-related CAD interfaces.

Selecting a CAD vendor that best meets the needs of all public safety disciplines is important in a regional PSAP. . Each agency indicated that conversion of historical data is important and needs to be considered when either upgrading or procuring a new system. Sudbury, Wayland and Lincoln have been using PAMET CAD for over ten years. Weston has been using IMC CAD since 2008. Users of PAMET CAD have very few CAD interfaces. Wayland has none. Sudbury has call taker/dispatcher mapping and police RMS; Lincoln has police reporting and police RMS. Weston is interfaced with 9-1-1 ANI/ALI and all police, fire and EMS records and alerting systems. Three of the four PSAPs have mapping, but only Weston uses CAD mapping. All four police departments have MDTs in their vehicles, but only Weston has it interfaced with CAD.

L.R. Kimball recommends participating PSAPs develop a consensus on CAD system requirements and upgrade one of the existing CAD systems or develop a comprehensive RFP to procure a CAD system that meets the needs of all agencies. To assist the decision process, the agencies need to complete a thorough needs assessment to determine the modules, functionality and features that is needed by all agencies to be served by the regional communications center. This is the only way to ensure that the needs of all agencies have been researched and

addressed. This needs and functionality assessment will need to be conducted whether the decision is to procure a brand new system or expand/upgrade an existing system.

Upgrading the CAD system, or procuring a new system, can provide a number of system enhancements, including:

- Additional fire department functionality
- Additional modules/interfaces
- Additional GIS/mapping capabilities
- Address points as verifiable locations
- Evolving technologies such as NG9-1-1 and CAD-to-CAD
- Fault tolerant or high availability back room equipment (minimum 99.999 percent uptime guarantee)
- Adequate system sizing and event history

To ensure end user acceptance in a regional communications center, L.R. Kimball recommends that first responders do not lose any existing functionality once a regional center is brought on-line. L.R. Kimball recommends pursuing additional functionality or features that could be implemented during the regionalization to help encourage end user acceptance of the project.

Table 34 (Section 10.2.2) lists interfaces that should be supported by the selected CAD system.

Sufficient redundancy should exist within the CAD system to ensure that no single point of failure exists, should the entire CAD system would go down. To ensure the fullest extent of redundancy, the production server(s) should be located at the regional communications center facility with a redundant geo-diverse back-up server installed off-site.

The CAD system should be designed to take advantage of current fail-over and other backup technologies that enable continued operation, notwithstanding single or multiple component failure. Fail-over should be an automatic switchover solution that requires no manual intervention and no delay in switchover.

Participating PSAPs should continue to assess the current operations and needs of the local agencies on an on-going basis to assure that CAD system functionality and features continue to provide the required level of service. All should continue to work with the selected vendor and other users in an effort to pursue future software and hardware enhancements that would ensure that the system is providing the best possible solution for a regional PSAP and local emergency services.

11.2.3 Mapping/GIS

A regional center should work closely with participating GIS departments to ensure accurate GIS mapping data is available for use in the center.

When the CAD system is upgraded or replaced, the ultimate goal would be to have a single integrated mapping solution for all critical functions such as 9-1-1 telephony equipment, CAD, mobile and AVL.

11.2.4 Logging Recorder

Each PSAP has a logging recorder solution provided by the 911 Department and records both telephone and radio system conversations. Each Nice digital logging recorder has 16 channels; usage varies from all 16 channels used to 8.

A new logging recorder solution is recommended for a regional center. The new recorder will need the capacity to record all telephone and radio traffic and have sufficient on-line storage to retrieve historical data. A fully redundant back room hardware solution should be considered for the regional center.

11.2.5 Master Clock

Each dispatch center has a master clock solution provided by the 911 Department. All critical systems/technology should be interfaced to the master clock.

In a regional center, a fully redundant master clock solution should be installed and integrated with all critical systems. This includes CAD, 9-1-1 answering positions, administrative phone system, logging recorder, radio consoles, administrative computers and display clocks.

11.2.6 Radio Systems

Consolidation of a public safety radio dispatch operation is driven by several elements: existing radio systems currently in use, connectivity from an existing dispatch facility to the radio system/transmitter site, and existing dispatch console systems.

An optimal scenario is when the agencies affected by consolidation use the same type of radio technology and share a common frequency band, providing seamless operational coverage. Sudbury Police operates on 800 MHz. Wayland, Weston and Lincoln police departments operate on UHF radio channels. Sudbury, Wayland and Lincoln fire departments are on UHF; Weston Fire is on VHF.

A variety of radio consoles are in use.

Table 48 – Radio Consoles

Dispatch Center	Radio Consoles	# of Radio Consoles	Installed
Sudbury Police	Motorola CENTRACOM Series 2	2	1991
Sudbury Fire	Zetron 4010R	1	
Wayland Public Safety	Zetron 4115	2	2003
Weston Police	Zetron 4001R	2	2001
Weston Fire	Zetron 4010R	2	
Lincoln Police and Fire	Zetron 4115	2	?

Console connectivity to the various radio base stations is a combination of microwave, fiber and telephone radio circuits. Sudbury, Wayland, and Weston use radio signal comparators and voters operating on the radio systems.

Should existing radio systems be reused within the regional PSAP, backhaul circuits will need to be expanded to provide connectivity to the new location. In most cases, RF control stations may be used to provide alternate or backup connectivity to repeater systems.

Repeated and simplex VHF low band, VHF high band, UHF and 800 MHz channels within the region are used for primary day-to-day dispatch of the local emergency services. Wayland and Weston Fire have simulcast systems. Table 49 details primary dispatch repeater out channels used by the four dispatch centers.

Table 49 – Primary Dispatch Channels

PSAP	Primary Dispatch Channel	Radio Frequency
Sudbury	Sudbury Police	800 MHz – 852.9215 MHz
	Sudbury Fire	UHF – 482.750 MHz
Wayland	Wayland Police	UHF – 484.4375 MHz
	Wayland Fire	UHF – 483.4125 MHz
Weston	Weston Police	UHF – 472.2375 MHz
	Weston Fire	VHF – 154.16 MHz
Lincoln	Lincoln Police	UHF – 483.000 MHz
	Lincoln Fire	UHF – 470.85 MHz

Each law enforcement and fire agency has a number of operational channels available for use.

There are two primary options for radio system deployment; reuse of existing conventional systems or migration to a shared regional trunking system. Should existing conventional systems be reused, patching systems should be enhanced to provide more seamless unit-to-unit connectivity across frequency bands. This level of connectivity will be provided through the implementation of new dispatch consoles that will provide improved capacity and improved patching capabilities. Several underlying limitations with this option include the fact that unit-to-unit simplex operation will not be available across frequency bands without the use of a deployable gateway; cross band connectivity will require dispatcher intervention to deploy a patch; cross band connectivity will depend on overlapping coverage from all frequency bands involved in the patch; and patching result in the use of two channels simultaneously, thereby reducing available channel resources. Each conventional repeater will have a different frequency, creating operational difficulty for users roaming throughout the region. Users will have to be aware of what in-band channels they may roam to, and must physically change frequencies on their radio to access different sites for additional coverage.

The recommended system is a wide-area 700/800 MHz trunked system, which will provide coverage and capacity necessary to meet the needs of all member agencies. For this system, L.R. Kimball recommends system design coverage to be 95 percent of each community, from a portable radio with the antenna at hip-height, and located inside an appropriate building. The definition of an appropriate building is: medium industrial buildings (-12 dB signal penetration) for the urban/suburban areas and light building (-6 dB signal penetration) for all rural areas.

11.2.6.1 Radio Console Recommendations

A regional communications center will require a standardization of radio consoles. Currently four radio consoles from different manufacturers and/or models are used. Equipment is at least eight years old. A newer, more flexible radio console may be a better option for a regional center. If a trunking system is implemented, a console solution that provides a direct interface to the trunking system is recommended. A rough budgetary estimate is ~\$70,000 per console.

11.2.6.2 Radio Infrastructure Recommendations

A full analysis of the radio systems of the participating agencies would be necessary to ensure that the infrastructure needed to provide the appropriate level of radio coverage is present. If it is not, then specific upgrades would need to be identified. If substantial and expensive upgrades are needed, developing a radio plan that migrates agencies to the same radio platform should be considered. A common radio platform would improve radio interoperability regionally and would allow a more efficient use of PSAP personnel by combining small agencies onto a single police and a single fire dispatch frequency.

During the planning phase of a regionalization project, participating agencies will need to consider and address the following:

- Maintaining connectivity to the various base stations/radio sites for the dispatch of fire and EMS agencies during the transition to a regional system. Determining if the existing base station equipment and locations provide the best possible radio coverage footprint.
- Maintaining connectivity to the various base stations/radio sites for connectivity to law enforcement backup channels during the transition to a regional system. Determining if the existing base station equipment and locations provide the best possible radio coverage footprint.
- Identifying if any existing base station sites/equipment can be relocated to a centralized regional site to reduce the number of sites while providing, at a minimum, the same level of coverage or possibly even better coverage. Consolidation of sites would reduce the cost for needed connectivity.
- Identifying the best solution available to provide a fault tolerant connectivity solution between the regional PSAP and the required radio sites/equipment via microwave, fiber optic, T1 or a combination thereof.
- Identifying any need for replacement base stations and radios within the radio sites and user community to bring everyone into full compliance with the upcoming FCC narrow-banding mandate.
- Identifying if a multi-service tower capable of supporting microwave, control and base station equipment is needed at the regional PSAP. The tower site and equipment would also provide radio system redundancy during any loss of connectivity to the remote sites.

11.2.7 Alarm Systems

All Towns have alarm systems that are being monitored by the primary or secondary PSAPs. These alarms will still require monitoring.

11.3 Cost Estimates

The following section provides budgetary cost estimates for regionalizing Sudbury's, Wayland's, Weston's, and Lincoln's emergency communications centers. **These estimates are for planning purposes only** and should be re-evaluated during the planning process as decisions are made regarding location, systems and operational configuration and functions.

11.3.1 Current Operating Costs

The current total cost to operate four separate dispatch centers is approximately \$1,702,840. Table 50 details the current operational costs as reported for each center. Estimates are based on comparable-sized centers in the region and are so indicated in the notes.

Table 50 – Current Operating Costs

Town/PSAP	Salaries	Benefits	Overtime	Other Operational Costs *	TOTAL
Sudbury	Police - \$174,113	\$45,000	\$50,786	** \$40,073	\$309,972
	Fire - \$107,000	\$30,000			\$137,000
Wayland	\$358,652	\$53,770	\$75,000	▣▣ \$88,355	\$575,777
Weston	\$207,500		\$51,000	¥ \$93,960	\$352,460
Lincoln	\$214,915	\$63,922	\$21,700	\$27,094	\$327,631
TOTALS	\$1,062,180	\$192,692	\$198,486	\$249,482	\$1,702,840
* Includes building costs, system maintenance, connectivity, other equipment, training, etc. – when provided. ** Sudbury's facility costs for communications were estimated at 5% of total building costs provided. ▣▣ Wayland's facility costs for communications were estimated at 15% of total building costs provided. ¥ Weston's additional items for communications were estimated at 10% of total costs provided..					

11.3.2 Projected Costs

11.3.2.1 Projected Personnel Costs

Total projected salary costs in year one of consolidation cannot accurately be projected without extensive planning sessions with the supporting entity's Human Resource staff. On-going personnel costs for the regional communications center will depend on the final number of staff, their pay and classification, and skill sets that may require additional compensation, and the administrative structure.

To allow Sudbury, Wayland, Weston and Lincoln to budget for personnel costs for a regional center, L.R. Kimball recommends a budgetary figure of \$1,980,000, minimum. This estimate is for a staff of 27, a Director, an administrative assistant, and technical support staff, and includes benefits. This estimate is based on the current total reported personnel costs and estimates based on similarly sized regional centers. Those costs not reported are estimates and will require accurate reporting before final costs can be projected.

11.3.2.2 Projected Technology Costs

Projected technology costs will vary depending on the decisions of the participating Towns as to the technology to be used within a regional center.

Table 51 – Technology Costs

Technology: Systems and Specialized Furniture	Budget Estimates	Total Estimated Cost Range
CAD	\$90,000 per position	\$630,000
Radio Console Transition Costs	\$70,000 per new console position \$5,000 transition cost per console	\$490,000 \$35,000
Ergonomic Dispatch Furniture Consoles	\$18,000 per new position \$2,000 transition cost per position	\$126,000 \$14,000
Intensive Use Chairs	\$1,000 per position	\$7,000
Redundant Master Clock Solution	\$15,000 approximately	\$15,000
TOTAL		\$701,000 to \$1,268,000

The estimates above do not include associated costs for developing requirements for each system, procurement and installation planning support, additional equipped positions for training or resource monitoring, or any ancillary system deemed necessary for the consolidated communications center. These associated costs can be projected to be 10 percent of the overall system(s) costs. For a regional center, these associated costs could range from \$70,100 to \$126,800 depending on the decisions and direction of the stakeholders. Professional support services, such as procurement and implementation services, typically are slightly greater than 10 percent of total purchase per automated system; however, these costs vary based on the level of support contracted.

For total technology and associated costs, and professional services, the Town should collectively budget between \$771,100 and \$1,394,800 over the 18 to 30 month planning, transition and implementation period. Planners will be able to adjust these projections based on potential cost saving measures, such as upgrading an existing CAD system versus purchasing new.

11.3.2.3 Projected Facility Costs

The facilities housing Sudbury's, Wayland's, Weston's and Lincoln's communications centers are not currently capable of accommodating a regional center of a size and capacity to serve the four towns.

For a regional center serving the four towns of Sudbury, Wayland, Weston and Lincoln, a facility of approximately 6,500 SF is needed to accommodate up to seven workstation consoles per facility, associated administrative office space, equipment room needs and other associated space needs. This projection is based on a preliminary programming spreadsheet that utilizes standard office spaces and known space needs for workstations, rack spaces and adjacencies. This tool was used to provide an estimated projection of space needs. This tool also uses a low to high range estimated cost-to-build per square foot to project a range of cost to build a new facility. The low range is \$375 and the high range is \$425 to construct per square foot. The price range to build a regional center serving four towns is projected to be from \$2.4 to \$2.7 million. If facility costs are split equally between four towns, the share will

be an approximate range of \$600,000 to \$675,000. The results of this preliminary programming exercise can be adjusted to accommodate editing the base information or the addition of space for other functions. The results of this preliminary programming exercise can be adjusted to accommodate editing the base information; for example administrative office, storage or bunkroom spaces, or the addition of space for other functions, such as municipal data storage or emergency management offices.

11.3.2.4 Projected Transition Costs

To assist and support the planning, transition and implementation of consolidation, temporary professional services, with experience conducting multiple consolidation planning and transition projects, should be engaged. This will provide appropriate coordination of resources, planning documents and timelines, and necessary coordination between all stakeholders, vendors, contractors and user agencies. Planning costs are determined by the level of support needed and calculated in hours of effort and time on-site. These costs average approximately \$100,000 annually during the transition and implementation year(s) depending on the level of on-site support needed during these phases. Support should increase in the final six months of implementation, as this is tied to the occupancy of the facility, the automated systems and networking installations and cut over; and the training and migration of personnel.

11.3.3 Summary

Total projected one-time costs are illustrated below. The figures in the table represent the high end figures and assume that a new facility will be necessary.

Table 52 – Projected One-time Costs

Projected One-time Costs	
Capital Costs – Facility	\$2,700,000
Capital Costs – Technology	\$1,268,000
Transition Costs – Professional Services	\$250,000
TOTALS	\$4,218,000

Should Sudbury, Wayland, Weston and Lincoln pursue regionalization, a rough budgetary estimate, for planning purposes only, is \$4,218,000, which does not include personnel costs for the four centers while working towards regionalization, or after a transition.

Table 53 – Operational Costs

Operational Costs		
	Current Operational Costs *	Projected Operational Costs **
Salaries, Benefits, and Overtime	\$1,453,358	\$1,980,000
Other Operational Costs	\$249,482	\$217,200
TOTALS	\$1,702,840	\$2,197,200

* As illustrated in Table 37, some operational costs have not been provided. As such, this is not a true comparison.
** Projected operational costs are based on a staff of 27 with an approximate salary and benefits of \$50,000 each, a Director, an administrative assistant, and technical staff. Other costs are based on 15% of technology capital costs, plus 1% of building costs.

Higher operating costs are to be expected as the Towns will be creating something different, improving service, professionalism, training, and supervision.

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12. CONCORD, ACTON, MAYNARD AND BOXBOROUGH REGIONALIZE

12.1 Staffing Levels

In projecting PSAP staffing, L.R. Kimball used actual call volumes provided by the PSAPs and took into consideration the processed emergency and non-emergency calls.

Each dispatch center provided 9-1-1 calls statistics for their respective Towns for 2008, 2009 and 2010. Table 54 denotes the 9-1-1 call statistics.

Table 54 – 9-1-1 Call Statistics

9-1-1 Calls			
Dispatch Center	2008	2009	2010
	Wireline	Wireline	Wireline
	Wireless	Wireless	Wireless
Concord	3,178	2,901	2,836
	998	921	1,113
Acton	3,458	2,834	3,092
	1,362	1,246	1,407
Maynard	1,009	1,113	961
	407	507	516
Boxborough	540	565	526
	117	176	220
Total Wireline	8,185	7,413	7,415
Total Wireless	2,884	2,850	3,256
Total	11,069	10,263	10,671

Two of the dispatch centers were able to provide ten-digit emergency and non-emergency call data for 2008, 2009 and 2010. Table 55 denotes the ten-digit call statistics.

Table 55 – Ten-digit Call Statistics

Non-emergency/Administrative Calls			
Dispatch Center	2008	2009	2010
Concord			
Acton	68,645	56,152	60,166
Maynard			

Non-emergency/Administrative Calls			
Dispatch Center	2008	2009	2010
Boxborough	2,052	3,181	3,424
Total	20,523	59,333	63,590

In calculating call load for the dispatch centers, L.R. Kimball used a formula of 90 seconds call time and 30 seconds wrap up time. This is valid for processing an incoming emergency call or a non-emergency call requiring a dispatch, but does not take into consideration the calls that are transferred to a secondary PSAP, police administration, or another office.

It is important to note that the provided call volumes are annual counts. Industry tools calculate staffing by hour of the day. To arrive at these numbers, L.R. Kimball applies estimated formulas (e.g. busy month, busy time of day). As such, projections are open to management interpretation. This means that known busy or less busy periods can be staffed differently, such as one less call taker on a midnight shift or an additional call taker during busy evening hours; or consideration given to the use of the fire dispatcher and/or supervisor/training staff for call takers when available.

To meet NENA and NFPA standards in handling the projected call volume, a regional communications center serving Concord, Acton, Maynard and Boxborough will require staffing one call take position 24-hours a day. Should the Towns elect to perform EMD, at least two call takers should be on-duty at all times; however, call volume does not dictate the need for two call takers full time. A second call taker can be accommodated by a dispatcher or supervisor when necessary.

Only the number of call takers required to adequately staff a regional PSAP can be accurately determined using the APCO and Erlang C calculations. L.R. Kimball customized the formulas to calculate the estimated number of dispatchers and supervisors needed. Based on the incident volume of each Town's public safety responses, L.R. Kimball projects one police dispatch positions to monitor the four law enforcement agencies; one fire dispatch position for the four towns' fire and EMS agencies; one tactical/relief dispatch position for supporting police and fire in high priority and/or incident command scenarios, as well as relieving dispatchers; and one supervisor position per shift.

Table 56 – Law Enforcement CAD Events

CAD Events – Law Enforcement				
Dispatch Center	2008	2009	2010	Average
Concord	13,785	13,605	13,107	13,499
Acton	18,652	19,316	18,504	18,824
Maynard				
Boxborough	873	1,016	959	949
Total	33,310	33,937	32,570	33,272

Table 57 – Law Enforcement Events and Units on Duty

Dispatch Center	2010 Events	Average Law Enforcement Units on Duty
Concord	13,107	6
Acton	18,504	5
Maynard		3
Boxborough	959	2
TOTAL	32,570	16

Based on existing call volume and average units on duty, L.R. Kimball recommends maintaining one law enforcement dispatch talk group. Based on current statistics, there should be a need for no more than one law enforcement dispatch position in the regional PSAP.

Table 58 – Fire Events

CAD Events – Fire				
Dispatch Center	2008	2009	2010	Average
Concord	2,308	1,850	1,983	2,047
Acton	3,310	2,901	2,982	3,064
Maynard				
Boxborough	1,352	1,324	1,001	1,226
Total	6,970	6,075	5,966	6,337

Table 59 – EMS Events

CAD Events – EMS				
Dispatch Center	2008	2009	2010	Average
Concord		152	344	248
Acton	1,462	1,479	1,535	1,492
Maynard				
Boxborough	805	803	447	685
Total	2,267	2,434	2,326	2,425

Based on current statistics, L.R. Kimball anticipates two fire positions would be needed in the regional communications center. The recommended configuration would be one primary fire dispatch position and one tactical/operations fire position. During any significant fire event, the tactical/operations position should be staffed and tasked with monitoring active fire events, including fire ground operations/communications. When there are no active fire events, either position can be used as a primary backup for call taking.

In a regional communications center, consideration should be given to placing EMS on the same dispatch talk group or channel as the fire departments. This configuration would be practical not only for the operations of the regional communications center, but also for incidents that require fire response as well. Based on current statistics, between the fire/EMS dispatch position and the fire tactical/operations position, EMS on-scene operations should be able to be covered by these positions, or the call taker when not actively on a call.

12.1.1 Projected Staffing³⁸

Based on Erlang C calculations and the Project RETAINS formula, the minimum projected staff needed in a regional communications center is 28, which includes supervisory staff. The projected staff is broken down as 5 certified call takers, 17 certified dispatchers and 6 supervisors. While completely cross-trained staff is desired, projected minimum certified staff is provided as guidance toward meeting call volume and dispatching needs. The staffing projections represent the number of FTE employees needed to staff an average of one call take position, one law enforcement dispatch position, one fire/EMS dispatch position, one tactical fire/EMS dispatch position, and one supervisor position 24-hours a day.

Conditions and options may be present that will require adjusting the staff projections.

- Appropriately qualified senior staff can be trained and compensated to fill in for absent supervisors.
- Certified part-time staff can be used to augment operations staff as needed, during training, identified high call volume periods, special events and on-going high priority incidents that deplete full-time staff capacity.
- The addition of at least one assistant supervisor or senior dispatcher per shift will augment the operations supervisors' ability to properly oversee the staff, and will enhance the ability to maintain training and certification levels, and manage personnel issues.

Many of the existing staff can be expected to transition to the regional communications center. Through attrition and qualification procedures, the possibility exists that several staff members will not transition to a regional center.

Currently, Concord, Acton and Boxborough have a total of 20 full-time authorized positions and 6 part-time authorized positions. Maynard was excluded from this count as sworn law enforcement officers staff the communications center. It is highly unlikely that any sworn personnel would transition to a civilian operation.

12.1.2 Workstations

L.R. Kimball recommends the workstations/consoles be identically equipped with critical technology: 9-1-1 answering equipment, CAD and radio consoles. This configuration allows each position to be used for the dispatch of any discipline and provides appropriate backups.

³⁸ It should be noted that Maynard did not provide police, fire or EMS incident volumes. Staffing was calculated based on the data provided by the respective towns, and using estimated data for Maynard. Estimated incident figures for Maynard were 12,000 law events, 3,000 fire events, and 900 EMS events. Staffing figures recommended by L.R. Kimball are inclusive of Maynard's estimated data.

For facility sizing purposes, space for one future console should be included on the operations floor, which could be used for overflow calls during incidents, special operations, and training.

In addition to the recommended total consoles for the operations floor, at least one training console should be located off the operations floor and could be partially to fully equipped based on need and funding.

Table 60 summarizes projected staffing levels and necessary console positions.

Table 60 – Staffing and Consoles

Staffing		Console Positions	
Certified FTEs Needed	Number	Workstations Needed	Number
Call Takers	5	Call Taker	1
Law Enforcement Dispatchers	7	Law Enforcement Dispatch	1
Fire/EMS Dispatchers	6	Fire/EMS Dispatch	1
Tactical Dispatchers	4	Fire/EMS Tactical/Relief Dispatcher	1
Supervisors	6	Supervisor	1
Total	28		
		Total	5
		Training (off operations floor)	1 – 2
		Total	6 – 7
		Future Consoles	1
		Total	7 – 8

A re-evaluation of available statistical call volume and data should be performed every three to six months during the planning and implementation phases to ensure accuracy in staffing projections.

12.2 Technology

12.2.1 CPE

The 911 Department procures and is responsible for maintaining telephone CPE equipment at each PSAP, including:

- Cassidian Communications, formerly PlantCML, Vesta Pallas CPE
- Cassidian Communications MagIC CDR
- MapStar mapping

- Nice Digital logging recorder
- Spectracom time synchronization

Maynard and Boxborough each have two positions with 9-1-1 answering equipment; Concord and Acton have three. Each primary PSAP has four wireline and four wireless trunks into the dispatch centers.

Each dispatch center has current technology that allows staff to automatically receive and plot wireless Phase II calls, and mapping software that displays the caller's location. L.R. Kimball recommends a CAD system interface that accepts the X, Y coordinates of the caller and automatically converts that location to the closest available street address, intersection or address point in the CAD system.

If regionalization moves forward, decision-makers will need to coordinate with the 911 Department to design a robust 9-1-1 network to ensure the proper routing of 9-1-1 calls to the regional center. The network will have to be engineered to route all 9-1-1 calls to the regional center within a network that provides as much diversity and redundancy as possible.

PSAPs must be cognizant of upcoming NG9-1-1 standards and work with the 911 Department in finalizing the future IP network and supporting PSAP infrastructure/equipment that will adhere to associated standards. Although next generation standards are still being developed, there is enough information being provided that new networks are being designed and installed, and new CPE equipment is being made available by vendors and advertised as being NG9-1-1 capable.

12.2.2 CAD Systems

Acton uses a PAMET CAD system. Concord, Maynard and Boxborough use an IMC (now TriTech) CAD system.

Both CAD systems are capable of supporting multiple jurisdictions. Several fire departments indicated that neither vendor offers a CAD system that supports fire-related needs of their agencies. According to the surveys, only Boxborough uses fire and EMS-related CAD interfaces.

Selecting a CAD vendor that best meets the needs of all public safety disciplines is important in a regional PSAP. Each agency indicated that conversion of historical data is important and needs to be considered when either upgrading or procuring a new system. Acton has used a PAMET CAD system since 1987. IMC CAD systems were put in place in 2001, 2004 and 2009. Two of the four PSAPs have mapping, but only Concord uses a mapping interface with their CAD. All four police departments have MDTs in their vehicles, but only those with an IMC CAD system have them interfaced with CAD.

L.R. Kimball recommends participating PSAPs develop a consensus on CAD system requirements and upgrade one of the existing CAD systems or develop a comprehensive RFP to procure a CAD system that meets the needs of all agencies. To assist the decision process, the agencies need to complete a thorough needs assessment to determine the modules, functionality and features that is needed by all agencies to be served by the regional communications center. This is the only way to ensure that the needs of all agencies have been researched and addressed. This needs and functionality assessment will need to be conducted whether the decision is to procure a brand new system or expand/upgrade an existing system.

Upgrading the CAD system, or procuring a new system, can provide a number of system enhancements, including:

- Additional fire department functionality
- Additional modules/interfaces
- Additional GIS/mapping capabilities
- Address points as verifiable locations
- Evolving technologies such as NG9-1-1 and CAD-to-CAD
- Fault tolerant or high availability back room equipment (minimum 99.999 percent uptime guarantee)
- Adequate system sizing and event history

To ensure end user acceptance in a regional communications center, L.R. Kimball recommends that first responders do not lose any existing functionality once a regional center is brought on-line. L.R. Kimball recommends pursuing additional functionality or features that could be implemented during the regionalization to help encourage end user acceptance of the project.

Table 34 (Section 10.2.2) lists interfaces that should be supported by the selected CAD system.

Sufficient redundancy should exist within the CAD system to ensure that no single point of failure exists, should the entire CAD system go down. To ensure the fullest extent of redundancy, the production server(s) should be located at the regional communications center facility with a redundant geo-diverse back-up server installed off-site.

The CAD system should be designed to take advantage of current fail-over and other backup technologies that enable continued operation, notwithstanding single or multiple component failure. Fail-over should be an automatic switchover solution that requires no manual intervention and no delay in switchover.

Participating PSAPs should continue to assess the current operations and needs of the local agencies on an on-going basis to assure that CAD system functionality and features continue to provide the required level of service. All should continue to work with the selected vendor and other users in an effort to pursue future software and hardware enhancements that would ensure that the system is providing the best possible solution for a regional PSAP and local emergency services.

12.2.3 Mapping/GIS

A regional center should work closely with participating GIS departments to ensure accurate GIS mapping data is available for use in the center.

When the CAD system is upgraded or replaced the ultimate goal would be to have a single integrated mapping solution for all critical functions such as 9-1-1 telephony equipment, CAD, mobile and AVL.

12.2.4 Logging Recorder

Each PSAP has a logging recorder solution provided by the 911 Department and records both telephone and radio system conversations. Each Nice digital logging recorder has 16 channels; channel usage varies.

A new logging recorder solution is recommended for a regional center. The new recorder will need the capacity to record all telephone and radio traffic and have sufficient on-line storage to retrieve historical data. A fully redundant back room hardware solution should be considered for the regional center.

12.2.5 Master Clock

Each dispatch center has a master clock solution provided by the 911 Department. All critical systems/technology should be interfaced to the master clock.

In a regional center, a fully redundant master clock solution should be installed and integrated with all critical systems. This includes CAD, 9-1-1 answering positions, administrative phone system, logging recorder, radio consoles, administrative computers and display clocks.

12.2.6 Radio Systems

Consolidation of a public safety radio dispatch operation is driven by several elements: existing radio systems currently in use, connectivity from an existing dispatch facility to the radio system/transmitter site, and existing dispatch console systems.

An optimal scenario is when the agencies affected by consolidation use the same type of radio technology and share a common frequency band, providing seamless operational coverage. Three police departments are on VHF radio channels; Concord operates on UHF. Two fire departments are on VHF and two on UHF.

A variety of radio consoles are in use.

Table 61 – Radio Consoles

Dispatch Center	Radio Consoles	# of Radio Consoles	Installed
Concord Public Safety	Motorola CENTRACOM Elite	3	2003
Acton Public Safety	Zetron 4115	2	2005
Maynard Police	Motorola MCC5500	2	2009
Boxborough Police	Motorola Command Starlite	1	2004
	Motorola Comtegra	1	?

Console connectivity to the various radio base stations is a combination of microwave, fiber and telephone radio circuits. Acton uses radio signal comparators and voters operating on the radio systems. . Should existing radio systems be reused within the regional PSAP, backhaul circuits will need to be expanded to provide connectivity to the new location. In most cases, RF control stations may be used to provide alternate or backup connectivity to repeater systems.

Repeated and simplex VHF low band, VHF high band and UHF channels within the region are used for primary day-to-day dispatch of the local emergency services. Table 62 details primary dispatch repeater out channels used by the four dispatch centers.

Table 62 – Primary Dispatch Channels

PSAP	Primary Dispatch Channel	Radio Frequency
Concord	Concord Police	UHF – 482.3375 MHz
	Concord Fire	UHF – 483.5375 MHz
Acton	Acton Police	VHF – 154.815 MHz
	Acton Fire	UHF – 453.175 MHz
Maynard	Maynard Police	VHF – 155.01 MHz
	Maynard Fire	UHF – 470.90 MHz
Boxborough	Boxborough Police	VHF – 154.725 MHz
	Boxborough Fire	VHF – 46.50 MHz

Each law enforcement and fire agency has a number of operational channels available for use. There are two primary options for radio system deployment; reuse of existing conventional systems or migration to a shared regional trunking system. Should existing conventional systems be reused, patching systems should be enhanced to provide more seamless unit to unit connectivity across frequency bands. This level of connectivity will be provided through the implementation of new dispatch consoles which will provide improved capacity and improved patching capabilities. Several underlying limitations with this option include the fact that unit to unit simplex operation will not be available across frequency bands without the use of a deployable gateway, cross band connectivity will require dispatcher intervention to deploy a patch, cross band connectivity will depend on overlapping coverage from all frequency bands involved in the patch, and patching result in the use of two channels simultaneously, thereby reducing available channel resources. Each conventional repeater will have a different frequency, creating operational difficulty for users roaming throughout the region. Users will have to be aware of what in-band channels they may roam to, and must physically change frequencies on their radio to access different sites for additional coverage.

The recommended system is a wide-area 700/800 MHz trunked system which will provide coverage and capacity necessary to meet the needs of all member agencies. For this system L. R. Kimball recommends system design coverage to be 95 percent of each community, from a portable radio with the antenna at hip-height, and located inside an appropriate building. The definition of an appropriate building is: medium industrial buildings (-12 dB signal penetration) for the urban/suburban areas and light building (-6 dB signal penetration) for all rural areas. The system should be sized to accommodate a minimum of 35 talk groups capable of handling at least 200 end users system-wide.

12.2.6.1 Radio Console Recommendations

A regional communications center will require a standardization of radio consoles. Currently four radio consoles from different manufacturers and/or models are used. Equipment ranges in age from ~10 years to 2 years. From a cost perspective, expanding use of Maynard's MCC 5500 consoles would be a logical choice as they are the newest. However, the consoles should be reviewed to make sure they will functionally fit the needs of a regional center. The MCC5500 is a control station based console and will require on-site radios to provide the interface for each conventional channel or trunked talk group. If a trunking system is implemented, a console solution that provides a

direct interface to the trunking system is recommended to eliminate the need for individual control station radios for each channel. A rough budgetary estimate is ~\$70,000 per console.

12.2.6.2 Radio Infrastructure Recommendations

A full analysis of the radio systems of the participating agencies would be necessary to ensure that the infrastructure needed to provide the appropriate level of radio coverage is present. If it is not, then specific upgrades would need to be identified. If substantial and expensive upgrades are needed, developing a radio plan that migrates agencies to the same radio platform should be considered. A common radio platform would improve radio interoperability regionally and would allow a more efficient use of PSAP personnel by combining small agencies onto a single police and a single fire dispatch frequency.

During the planning phase of a regionalization project, participating agencies will need to consider and address the following:

- Maintaining connectivity to the various base stations/radio sites for the dispatch of fire and EMS agencies during the transition to a regional system. Determining if the existing base station equipment and locations provide the best possible radio coverage footprint.
- Maintaining connectivity to the various base stations/radio sites for connectivity to law enforcement backup channels during the transition to a regional system. Determining if the existing base station equipment and locations provide the best possible radio coverage footprint.
- Identifying if any existing base station sites/equipment can be relocated to a centralized regional site to reduce the number of sites while providing, at a minimum, the same level of coverage or possibly even better coverage. Consolidation of sites would reduce the cost for needed connectivity.
- Identifying the best solution available to provide a fault tolerant connectivity solution between the regional PSAP and the required radio sites/equipment via microwave, fiber optic, T1 or a combination thereof.
- Identifying any need for replacement base stations and radios within the radio sites and user community to bring everyone into full compliance with the upcoming FCC narrow-banding mandate.
- Identifying if a multi-service tower capable of supporting microwave, control and base station equipment is needed at the regional PSAP. The tower site and equipment would also provide radio system redundancy during any loss of connectivity to the remote sites.

12.2.7 Alarm Systems

All Towns have alarm systems that are being monitored by the primary or secondary PSAPs. These alarms will still require monitoring.

12.3 Cost Estimates

The following section provides budgetary cost estimates for regionalizing Concord's, Acton's, Maynard's, and Boxborough's emergency communications centers. **These estimates are for planning purposes only** and should

be re-evaluated during the planning process as decisions are made regarding location, systems and operational configuration and functions.

12.3.1 Current Operating Costs

The current total cost to operate four separate dispatch centers is approximately \$1,530,756. Table 63 details the current operational costs as reported for each center. Estimates are based on comparable-sized centers in the region and are so indicated in the notes.

Table 63 – Current Operating Costs

Town/PSAP	Salaries	Benefits	Overtime	Other Operational Costs *	TOTAL
Concord [▫]	\$417,600			\$62,400	\$480,000
Acton	\$468,762			\$27,979	\$496,741
Maynard	\$225,000			\$27,690	\$252,690
Boxborough	\$163,674	\$62,683	\$35,875	\$39,093	\$301,325
TOTALS	\$1,275,036	\$62,683	\$35,875	\$157,162	\$1,530,756
* Includes building costs, system maintenance, connectivity, other equipment, training, etc. – when provided.					
▫ Concord's figures were estimated.					

12.3.2 Projected Costs

12.3.2.1 Projected Personnel Costs

Total projected salary costs in year one of consolidation cannot accurately be projected without extensive planning sessions with the supporting entity's Human Resource staff. On-going personnel costs for the regional communications center will depend on the final number of staff, their pay and classification, and skill sets that may require additional compensation, and the administrative structure.

To allow Concord, Acton, Maynard and Boxborough to budget for personnel costs for a regional center, L.R. Kimball recommends a budgetary figure of \$2,030,000, minimum. This estimate is for a staff of 28, a Director, an administrative assistant, and technical support staff, and includes benefits. This estimate is based on the current total reported personnel costs and estimates based on similarly sized regional centers. Those costs not reported are estimates and will require accurate reporting before final costs can be projected.

12.3.2.2 Projected Technology Costs

Projected technology costs will vary depending on the decisions of the participating Towns as to the technology to be used within a regional center.

Table 64 – Technology Costs

Technology: Systems and Specialized Furniture	Budget Estimates	Total Estimated Cost Range
CAD	\$90,000 per position	\$630,000
Radio Console Transition Costs	\$70,000 per new console position \$5,000 transition cost per console	\$490,000 \$35,000
Ergonomic Dispatch Furniture Consoles	\$18,000 per new position \$2,000 transition cost per position	\$126,000 \$14,000
Intensive Use Chairs	\$1,000 per position	\$7,000
Redundant Master Clock Solution	\$15,000 approximately	\$15,000
TOTAL		\$701,000 to \$1,268,000

The estimates above do not include associated costs for developing requirements for each system, procurement and installation planning support, additional equipped positions for training or resource monitoring, or any ancillary system deemed necessary for the consolidated communications center. These associated costs can be projected to be 10 percent of the overall system(s) costs. For a regional center, these associated costs could range from \$70,100 to \$126,800 depending on the decisions and direction of the stakeholders. Professional support services, such as procurement and implementation services, typically are slightly greater than 10 percent of total purchase per automated system; however, these costs vary based on the level of support contracted.

For total technology and associated costs, and professional services, the Town should collectively budget between \$771,100 and \$1,394,800 over the 18 to 30 month planning, transition and implementation period. Planners will be able to adjust these projections based on potential cost saving measures, such as upgrading an existing CAD system versus purchasing new.

12.3.2.3 Projected Facility Costs

For a regional center serving the four towns of Concord, Acton, Maynard and Boxborough, a facility of approximately 6,500 SF is needed to accommodate up to seven workstation consoles per facility, associated administrative office space, equipment room needs and other associated space needs. This projection is based on a preliminary programming spreadsheet that utilizes standard office spaces and known space needs for workstations, rack spaces and adjacencies. This tool was used to provide an estimated projection of space needs. This tool also uses a low to high range estimated cost-to-build per square foot to project a range of cost to build a new facility. The low range is \$375 and the high range is \$425 to construct per square foot. The price range to build a regional center serving four towns is projected to be from \$2.4 to \$2.7 million. If facility costs are split equally between four towns, the share will be an approximate range of \$600,000 to \$675,000. The results of this preliminary programming exercise can be adjusted to accommodate editing the base information or the addition of space for other functions. The results of this preliminary programming exercise can be adjusted to accommodate editing the base information; for example administrative office, storage or bunkroom spaces, or the addition of space for other functions, such as municipal data storage or emergency management offices.

If new construction is not possible, Acton's existing center could be renovated to accommodate the regional center. Acton's communication center would require the least amount of renovation as it appears to have the most available space and ability to expand.

12.3.2.4 Projected Transition Costs

To assist and support the planning, transition and implementation of consolidation, temporary professional services, with experience conducting multiple consolidation planning and transition projects, should be engaged. This will provide appropriate coordination of resources, planning documents and timelines, and necessary coordination between all stakeholders, vendors, contractors and user agencies. Planning costs are determined by the level of support needed and calculated in hours of effort and time on-site. These costs average approximately \$100,000 annually during the transition and implementation year(s) depending on the level of on-site support needed during these phases. Support should increase in the final six months of implementation, as this is tied to the occupancy of the facility, the automated systems and networking installations and cut over; and the training and migration of personnel.

12.3.3 Summary

Total projected one-time costs are illustrated below. The figures in the table represent the high end figures and assume that a new facility will be necessary.

Table 65 – Projected One-time Costs

Projected One-time Costs	
Capital Costs – Facility	\$2,700,000
Capital Costs – Technology	\$1,268,000
Transition Costs – Professional Services	\$250,000
TOTALS	\$4,218,000

Should Concord, Acton, Maynard and Boxborough pursue regionalization, a rough budgetary estimate, for planning purposes only, is \$4,218,000, which does not include personnel costs for the four centers while working towards regionalization, or after a transition.

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Table 66 – Operational Costs

Operational Costs		
	Current Operational Costs *	Projected Operational Costs **
Salaries, Benefits, and Overtime	\$1,373,594	\$2,030,000
Other Operational Costs	\$157,162	\$217,200
TOTALS	\$1,530,756	\$2,247,200
* As illustrated in Table 63, some operational costs have not been provided. As such, this is not a true comparison. ** Projected operational costs are based on a staff of 28 with an approximate salary and benefits of \$50,000 each, a Director, an administrative assistant, and technical staff. Other costs are based on 15% of technology capital costs, plus 1% of building costs.		

Higher operating costs are to be expected as the Towns will be creating something different, improving service, professionalism, training, and supervision.

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13. IMPACT, INTEROPERABILITY AND COORDINATION

13.1 Staff and Responder Impact and Benefits

The operational staff (call takers and dispatchers) of each town's dispatch center will be the most impacted by a regional initiative as they may be physically re-located and will be required to learn and adapt to the differences between the participating towns' response agencies. These employees will also benefit from a larger agency as there will be immediate relief and/or back-up in the room during overwhelming incidents; they also may enjoy an improved level of training, supervision and overall professionalism, as well as increased opportunities for advancement within their chosen profession.

The second most impacted by a regional initiative will be the response agencies, which currently enjoy the small town flavor of dispatch, most likely personally know the dispatch staff and expect that the dispatchers anticipate many of their needs. The operational staff may also provide other support, such as follow up and report services. In a regional operation, these relationships and support services may continue in a similar manner, or may change in delivery method or simply transition to employees within the respective response agency. The benefits of a regional approach to dispatching outweigh the perception of service level changes. Improvements to overall professionalism, training, supervision and ability to increase staffing more quickly during high priority events are improvements to the dispatch services. Situational awareness and communication among the response agencies is improved through the physical location of multiple towns' emergency communications in one room and closer coordination of response and recovery for day-to-day and large-scale events.

Response agencies should be kept informed of the progress of any regionalization effort and notified when their support is needed. For example, during the cross-training of transitioning staff, the responders' patience and support is critical to the success of the transition process; as is a formal training program and coordination with the response agencies.

13.2 Emergency Communications Interoperability

Interoperability refers to the ability to communicate with other agencies and is a critical component of public safety radio systems, especially during disasters. Another component of interoperability is the sharing of data.

Regionalization is one way to improve voice and data interoperability as it has the potential to enhance coordination, cooperation and interoperability among the responding agencies. This can save the lives of those served, while providing increased levels of safety to emergency responders. The opportunities that regionalization of all eight towns or of four towns provides include improved interoperability all public safety agencies, neighboring jurisdictions, other regions, State and federal levels of response. A regional "hub" as a core facilitates further regionalization in the future with the potential addition of neighboring towns.

Many current funding opportunities and anticipated opportunities are based on interoperability, data sharing, and multi-agency center needs rather than those of single entity, stand-alone center.

13.3 Coordination

In a regional center, calls for service that require all three disciplines (police, fire, and EMS) are coordinated through a central point. As an example, a 9-1-1 call reports a motor vehicle accident with personal injury and the need for extrication. The call taker obtains the necessary information and then sends the call to dispatch via the CAD system. Based on how the call is entered into the CAD system, the call will automatically route to all appropriate dispatchers simultaneously. All applicable agencies will receive the call without delay with access to the same information. Cross-jurisdictional and/or multi-agency responses will routinely be coordinated by and between the dispatchers. This coordination will decrease response times and allow sharing of vital information between the responding agencies.

In a regional environment, the cross-training that allows individual position assignments and focus on single tasks (call taking, dispatching, teletype transactions, training, etc.) allows ease of access to all resources located in the center (manuals, contact information, other knowledge bases), as well as those resources that must be accessed from other agencies. External resources will be easier to access and coordinate and range from high-priority services, such as air ambulances and emergency response requests for non-public safety services, to lower priority services, such as a wrecker.

During incident command situations and long-term and/or large-scale events, the ability to quickly coordinate responses and shared resources will be greatly enhanced in a regional center with the appropriate training, protocols and up-to-date reference material readily available.

Coordination of resources will also apply to mutual aid. Mutual aid in and among participating towns and neighboring jurisdictions or other levels of government response and recovery can be coordinated through a single location. This can decrease overall response times as dispatchers will be able to better anticipate the needs of responders and be better prepared to meet those needs upon request. The processes for accessing mutual aid beyond town jurisdictions will be improved and better coordinated through standardizing protocols, enabled interoperability, and data sharing beyond a regional emergency communications center.

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14. COST BENEFIT ANALYSIS

This section provides an analysis of the expected costs of regionalization weighted against the expected benefits. This type of cost benefit analysis compares costs to seemingly intangible results such as service levels and operational improvements combined with more tangible economies of scale. One area of difficulty in this process for public safety communications consolidation initiatives is the attempt to place value on protecting life and property. Decision-makers should keep in mind that the accuracy of a cost benefit analysis is wholly dependent on the accuracy of estimates. Use of such an analysis should only be part of a planning process that includes validation and evaluation of all projections as the project progresses.

The reported current costs are included in this reporting of projections and expected results to benchmark the cost of maintaining the current level of service. The projected costs represent the cost of improving service.

Table 67 contains reported current costs.

Table 67 – Current Operational Costs

Town/PSAP	Salaries	Benefits	Overtime	Other Operational Costs *	TOTAL
Sudbury	Police - \$174,113	\$45,000	\$50,786	** \$40,073	\$309,972
	Fire - \$107,000	\$30,000			\$137,000
Wayland	\$358,652	\$53,770	\$75,000	*** \$88,355	\$575,777
Weston	\$207,500		\$51,000	¥ \$93,960	\$352,460
Concord ▫	\$417,600			\$62,400	\$480,000
Acton	\$468,762			\$27,979	\$496,741
Maynard	\$225,000			\$27,690	\$252,690
Lincoln	\$214,915	\$63,922	\$21,700	\$27,094	\$327,631
Boxborough	\$163,674	\$62,683	\$35,875	\$39,093	\$301,325
TOTALS	\$2,337,216	\$255,375	\$234,361	\$406,644	\$3,233,596
* Includes building costs, system maintenance, connectivity, other equipment, training, etc. – when provided. ** Sudbury's facility costs for communications were estimated at 5% of total building costs provided. *** Wayland's facility costs for communications were estimated at 15% of total building costs provided. ¥ Weston's additional items for communications were estimated at 10% of total costs provided. ▫ Concord's figures were estimated.					

Study participants and decision-makers are warned that although efforts were made to identify all current costs, not all costs were accessible. For those areas where costs were not known or could not be extrapolated from a parent department's budget, L.R. Kimball provided estimates from similarly sized agencies and industry experience. These costs represent an approximate expenditure by the participating Towns to operate within their existing systems. The cost to continue to provide service independent of other towns can be expected to increase as would other municipal service costs. A change in population, technology trends, service provision requirements and public expectation may

all be factors in increased cost of taking 9-1-1 calls and dispatching response agencies. The type and quality of service provided by the individual Towns' dispatch centers differ from a regional center(s) in coverage/response area, situational awareness, and coordinated response and recovery.

Table 68 contains all projected costs for an eight town regional center and for the four town regional centers.

Table 68 – Projected Costs Comparison

Projected Costs Comparison			
Costs	Complete Regionalization	Sudbury, Wayland, Weston and Lincoln	Concord, Acton, Maynard and Boxborough
Capital Costs – Facility (One-time)	\$3,600,000	\$2,700,000	\$2,700,000
Capital Costs – Technology (One-time)	\$1,605,000	\$1,268,000	\$1,268,000
Transition Costs – Professional Services	\$250,000	\$250,000	\$250,000
Operational Costs – Salaries/Benefits (1 year)	\$3,100,000	\$1,980,000	\$2,030,000
Operational Costs – Other Expenses (1 year)	\$276,750	\$217,200	\$217,200
TOTALS	\$8,831,750	\$6,415,200	\$6,465,200

These projected costs are based on what it would take to bring all eight towns into a regional center, or into two four-town regional centers. In order to consolidate these disparate operations, costs were identified to plan and implement (transition costs), house and equip (capital costs) and staff and organize (operational costs). From the assessment of the current operations, L.R. Kimball noted areas where improvement to service could be achieved through a properly planned and implemented consolidation. Service improvements can be made through a reduction or elimination of call transfers, formal training, increased supervision and support, improved situational awareness and better coordinated response and recovery. Cost efficiencies can be achieved through maintaining single systems and streamlined networks; pooling resources give more buying power to the participants when pursuing systems to support NG9-1-1 innovations. While there will only be one or two facilities to maintain, Towns will not realize cost savings in terms of operational expenses. The current dispatch centers are all housed in the main police and/or fire headquarters. These areas would still be part of the respective buildings and, more likely than not, reused for other purposes, thus still incurring electrical and other associated costs.

As mentioned previously, there are many benefits to a carefully planned and implemented regionalization effort.

- Service level improvements – This is the single most important reason to consider consolidation. 9-1-1 call takers and dispatchers are truly the “first responder on the scene” and can substantially affect the outcome of an incident. Service improvements typically achieved are noted below.
 - Reduction or elimination of the transfer of 9-1-1 calls between PSAPs improves response times and lowers the potential for human or technology errors.

- Quicker call processing and dispatch times, which can result in faster on-scene times for field personnel.
 - Sharing of physical space enables communications between call takers and law enforcement, fire, and EMS dispatchers to be virtually instantaneous. This improved communications enables field personnel to receive information more quickly and accurately, which is particularly important in multi-jurisdictional incidents. This communication is the least tangible or quantifiable benefit of regionalization/consolidation, but is one of the most key.
 - If large enough, a consolidated PSAP can utilize a call taker/dispatcher organizational structure. This structure enables call takers to focus solely on the incoming call and obtain the best information possible. The dispatcher's ability to focus solely on field personnel improves responder safety.
 - Standardized training of all emergency communications personnel increases consistency of service delivery regionally.
 - A single regional communications center allows resource management during major incidents from a single point of control rather than fragmenting control among multiple dispatch centers.
 - A consolidated environment will offer the opportunity to benefit from state-of-the-art technology, improved training, and expanded career opportunities that would not be otherwise financially or organizationally feasible.
- Personnel
- Personnel receive consistent and improved training. The potential exists for more training opportunities as staff is available to cover when an employee is in training.
 - There will be a career ladder.
 - Consolidation of dispatch centers allows sworn personnel to be redeployed to other law enforcement or fire department responsibilities.
- Cost savings – While cost savings are possible, understanding two key points is critical before consolidating for financial reasons alone. First, not all consolidations result in cost savings. A common misconception is that consolidating will result in significant personnel reductions, thus significant cost savings. Consolidations do not normally involve staff reductions.

Commonly, the real cost savings come from the elimination of redundant and expensive technology such as CAD systems, 9-1-1 answering equipment, radio consoles, and logging recorders, as well as maintenance costs associated with these systems. The single set of technology and systems found in a consolidated environment reduces costs associated with procurement, connectivity and maintenance. The level of savings is dependent upon the number of participants and the technology costs for which the municipalities are responsible. For example, in many states the costs associated with procuring and maintaining PSAP technology is 100 percent the responsibility of the PSAP and the participating agencies/municipalities, while in other states, like Massachusetts, the 911 Department bears the cost of the majority of the necessary PSAP technology. Under the Massachusetts model, the majority of cost savings resulting from a reduction in the number of PSAPs will be realized at the state level, rather than locally.

Second, in scenarios where cost savings are achievable, the actual realization of the savings may not occur for several years. The consolidation process can be expensive and can generate substantial one-time start-up and capital costs for facility and technology needs. These costs can delay the actual cost savings.

The decision to be made is whether the value of the benefits of consolidation is or will be worth the cost to plan and implement a regional center(s). L.R. Kimball finds that a regionalization effort is practical and feasible for the participating towns and sees a financial benefit to one regional center serving all eight towns versus two centers serving four towns each. The obvious advantage to one center is a single management structure and a single facility versus two management structures and potentially two new facilities. The advantage to two regional centers serving four towns each is that the two centers can serve as backups for the other. In an eight town regional center, backup planning may range from considering maintaining an existing site as a backup, develop another municipal property as a backup, contract with a neighboring regional center or construct a backup site.

Incentive to regionalize at some level comes from limited legislated funding support. However, it is unknown if there will be on-going financial support from the Commonwealth. The decision to regionalize is a long-term commitment that generally does not present opportunities to return to the previous separated configuration.

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15. POLITICAL CONSIDERATIONS

During the last two decades, the emergency communications component of public safety services nationwide viewed the regionalization or consolidation of emergency communications centers as a trend. This trend was due to a recognized need or benefit at a local, regional or state level and was achieved when factors, such as finances and political agreement, allowed. This approach could be deemed passive or reactionary. In recent years, regionalization has become the de facto model of efficiency, prompted not only by the tragic events of September 11, 2001, and the aftermath of Hurricane Katrina, but by the realization of truly attainable benefits. And not only as promoted from within public safety, but also in response to the mandates of governmental entities that had begun to use consolidation/regionalization for achieving cost savings and efficiencies in non-public safety services such as trash collection and school transportation, and in their associated support and service needs.

Accordingly, regionalizing emergency communications centers is now driven by the goal of overall improvement of service to the public as well as services offered: technological, financial, and governmental purposes – local, regional, state, and federal – based upon clearly defined needs and desired results. In essence, regionalization is an approach that is proactive and preemptive – vision-centric for the good of the public and the public safety service providers. Generally, the results of regionalization include an enhancement of services; the potential to increase the types of services available; a reduction in the duplication of systems, equipment, and facilities; an increase in purchasing clout; cost sharing; and a reduction in recurring and fixed costs.

Specific political considerations for Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough are the same as similar initiatives across the country, and also include local considerations of control, fair and equitable funding contribution methods, and location of the regional center(s).

15.1 Governance and Control

Any governance structure must clearly establish the authorities and responsibilities of all parties to avoid and/or address political and user agency control issues. This effort should ultimately result in the establishment of a regional center that is a full partner with other public safety agencies, rather than a subordinate of the agencies.

While feasible and practical, the decision to regionalize these operations will depend on the political initiative and financial prospects in this endeavor by the participating Towns. In some respects the participating towns are similar in politics and community make-up and size. To best meet the needs of the participating Towns an administrative structure must be established that is responsive to, but remains independent of, the relationship between each Town and the heads of their respective public safety response agencies. Often when the communications center is a part of one political entity or one public safety agency, conflicts between the Towns and/or heads of those agencies can virtually eliminate any forward movement by the regional board and communications director for the center. The director and center become a political football bounced between the Towns, or between the police and fire/EMS agencies. While current relationships are positive, maintaining balanced representation on a regional executive/advisory board would protect the regional center from the impact of negative relationships in the future.

To move forward with regionalizing emergency communications operations, buy-in is required from all stakeholders, and next steps must be taken to maintain the momentum of the project. Political, financial and visionary roadblocks

often derail such projects when studies and recommendations documents and planning tools are set aside and not acted upon immediately.

By establishing a governance agreement and setting up an organizational and management structure for the regional center in the early stages of planning, participants may avoid work stoppage and delays caused by political or “turf” battles. Such an approach provides a regional solution to emergency communications needs that spreads beyond political boundaries.

15.2 Funding Method

Much of the technology needed in an emergency communications center is provided via state distribution of 9-1-1 surcharge revenue. Facility and personnel costs are the responsibility of the local governments, which is typical across the country. In initiatives involving multiple government entities, an equitable funding formula or singular factor are used to distribute the burden of the one-time capital costs and the on-going operational costs. Sometimes these are separate formulas or factors. Some towns in this study are of similar size and population, while a few are significantly smaller. Factors and formulas in use nationally include population only, real estate assessments only, or some combination of these factors; also in place are use-based formulas, such as call volume and work load formulas, which include population and non-emergency duties to be performed by the regional center.

Planners and decision-makers may review existing funding methods for other regional initiatives to see if similar formulas or methods may work for funding a regional center. In addition to this review, L.R. Kimball recommends pursuing the simplest funding model(s) before looking into the formulaic approaches. The three simplest methods are 1) equal contribution by all participants, 2) population-based contribution, or 3) real estate assessment-based contribution.

Pros and cons of each method follow.

- Equal contribution
 - Pros
 - Accounting ease
 - No need to adjust when other factors change
 - Participants introduced after the initial regionalization can be added with ease
 - Cons
 - Unbalanced approach benefiting larger towns
 - Without other factors, contribution balance can become hardship to smaller participants
 - New participants cannot be tapped for larger contribution to offset impact of additional services
- Population-based contribution
 - Pros
 - Population tends to determine level of system use overall, allowing heavier users to pay more for service
 - Can be adjusted as population fluctuates
 - Accounting ease
 - Cons

- If population is not indicative of system use, this method tends to penalize larger participants
- If tourism creates large and/or long-term fluctuations in population, this method will not provide level of impact-based funding that would be needed
- Real Estate Assessment contribution
 - Pros
 - Balanced funding approach based on higher volume and revenue bearing the largest burden of funding the regional center
 - Accounting ease as tied to other services
 - Introduction of proffered services to funds for public safety services
 - Cons
 - Balanced approach based on volume and revenue may not accurately reflect system use
 - If assessment process is weighted with other services or processes, may not be easiest formula
 - If any participating town has a dissimilar compilation of residential and business/industry, then may not provide same level of ease and proffers

15.3 Location

To create autonomy, L.R. Kimball recommends construction/renovation of a separate facility to house a regional center – one that is not occupied by any of the served agencies. Many times this cannot be avoided due to funding limitations and/or the need to not abandon a significant investment by one or more of the participants, such as the Town of Acton. Acton has a large suitable facility that, with what appears to be minimal alteration, can accommodate a regional center serving all eight towns or a regional center serving four towns. Typically, L.R. Kimball does not recommend the co-location of a regional emergency communications center in an existing or future building of a participating user agency. When done, the project rarely gains a distinct or independent image from the user agency where the center is located. This is generally dependent on the local political environment. It is L.R. Kimball's experience that placing a regional center in an existing communications facility may create enough political issues to derail a potential regionalization project. For this reason, the regional center's governing body most often chooses to promote a more independent presence and does not want to co-locate with any existing or future user agencies. However, this is an option available to the participating Towns. With limited options available and possible budgetary constraints, all available options should at least be reviewed, discussed and the final determination placed on the project decision-makers and stakeholders.

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16. IMPLEMENTATION

16.1 Key Coordination Issues

Key coordination issues for an eight or four town regional center(s) will be governance, funding, planning and implementation. Governance coordination will require participants, at a minimum, to identify, document and sign-off on a definition of what the regional center is, what it will and will not do/provide, type of governing body (executive or advisory board, steering committee) and representation by the participants.

An IGA will be necessary to establish who the participants are, how they will be represented and what the intent or purpose is of the participants. Once these basic principles are established and the participants have committed to the agreement, then a funding method or methods must be identified, documented and committed to by the Towns in support of capital, transitional and on-going operational costs.

Based on the agreement and funding commitments, the Towns will then need to commit to a workable plan of action that will result in a regional center. A critical component of the regional plan is a reasonable and flexible timeline based on the longest scheduled activity, such as construction/renovation of a facility or procurement of a system(s).

16.2 Effective Transition

Regardless of which regional configuration is selected, there are basic requirements that must be met to achieve success: standardization and/or development of policies and procedures, training, and gaining and maintaining buy-in and commitment from all stakeholders. If these requirements are not met, the regionalization effort will fail or result in an operation that does not meet the needs of the participating towns. The obvious components of success include a suitable facility and providing automated systems that support a regional operation. These are components that require a financial commitment, but do not require cultivation among stakeholders and long-term commitment beyond funding.

Standardization of policies and procedures will require representatives from each of the participating towns' response agencies and from the existing communications centers. These representatives will need to form a committee(s) to compile and review all existing policies and procedures/protocols to identify what is standard operating procedure and what areas/activities/tasks can be standardized for the regional operation. This committee(s) should also be tasked with developing regional-centric policies/procedures/protocols where none exist. This committee may have sub-committees established to address individual policies and procedures by agency or response type.

One area that is often overlooked or not properly addressed is operational transition from separate independent communications centers to a regional communications center. Though less tangible than the space and technology needs, the operational needs will make or break any regional effort. Participating towns' staff that desire to transition to a regional center will require standardization of services, and cross-training for call taking and dispatching functions in support of all participating towns' response agencies. This level of training will require a formal eligibility and training program to be established before training begins. Eligibility criteria is needed to identify and document the skill levels and certifications of transitioning staff in order to identify training needs and for placement within the new organization. A Director and a Training Coordinator and training staff are necessary to the success of an

eligibility process and a cross-training program. The training must be conducted while the current operations are still in service and before the regional center is cut over. This is tricky and will most likely involve overtime and other financial support from the participating towns. Each existing employee may require up to 40-hours of training in a classroom setting and on-the-job, depending on the employee's skill level. If an employee is already handling calls and dispatching responders for police, fire and EMS, then their training may be limited to acclimation to standardized services or those services that could not be standardized by regional planners. If an employee is certified to handle and dispatch law enforcement calls only, then they will require additional training to attain certification as a call taker and dispatcher of fire and EMS calls.

Finally, gaining and maintaining buy-in and commitment from all stakeholders during the life of a regional initiative is paramount to keeping the project on track and a priority for all involved. If commitment comes from participating towns believing that regionalization is the right thing to do to improve service to citizens, visitors and responders, then this project is more likely to succeed. If participants see regionalization as a means to save money in the provision of public safety services, then this project could fail. Regionalization costs money. Construction/renovation of a suitable facility, procuring/upgrading systems in support of a regional operation, creating parity in pay and providing training for transitioning employees, hiring new administrative and operational staff – all are costly investments into regionalizing emergency communications. The payoff is that the resulting system (facility, technology, operations) will provide improved service and create service and cost efficiencies for the participating towns. At some future time, there will be savings as there will be a single facility to maintain and single systems to upgrade/replace. The service efficiencies and elevated quality of service that can be provided in a larger center will improve service to all participating towns and increase the opportunities for employees, grant funding and coordination of resources.

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17. RECOMMENDATION

L.R. Kimball recommends the Towns of Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough pursue consolidation of all dispatch centers in their respective jurisdictions into one regional emergency communications center.

L.R. Kimball's recommendations toward regionalization are as follows:

- Establish governance
 - Establish an Executive Board with full decision-making authority in all matters, comprised of term appointments of two police chiefs, two fire chiefs, two town managers and one at-large appointee to represent all participating towns.
 - Identify one town to provide these services, with compensation for same determined and agreed upon by the participating towns. Establishing pay and classification, preserving employee seniority, leave, retirement and other benefits are vital to the well-being of the transitioning employees. Decisions regarding these factors must be approached with the goal of keeping the employee whole.
 - All participating Towns should enter into an IGA, allowed under MASS GEN. LAWS Ch. 40 § 4a. The IGA should establish the Executive Board, including membership, authority and responsibilities.
- Identify a fair and equitable funding method
 - Develop a formula based on a combination of population and real estate assessments. Use-based formulas have produced unsafe practices by user agencies if they attempt to save money by not reporting all activity. The different size and funding capacities of the Towns make the "split costs evenly" option an unfair and unbalanced funding method, particularly for the smaller participants.
- Locate a site to house the regional center
 - Plan for a facility to house approximately 39 operational staff, including supervisors, with seven consoles, plus at least two additional consoles for training and future growth.
 - Construct/renovate a separate facility to house a regional center – one that is not occupied by any of the served agencies.
- Hire a Director to facilitate the planning process and develop the regional center's operational programs such as eligibility/hiring, training, protocols (e.g. EMD) and QA programs.
 - Training needs are a core focus of regionalization planning. The commitment to call taker and dispatcher training directly relates to the quality of service provided. An investment in a strong new-hire

and on-going training program, and a continuing education program, will result in a high level of service provided to the public and public safety responders. A QA program will provide a tool to constantly monitor that level of service. A well-developed and defined QA program ensures consistency of operations, identifies problems, and identifies corrective actions to resolve the issues. A QA program is also a requirement of EMD.

- Enhance regional interoperability with neighboring jurisdictions' voice and data systems by identifying infrastructure, network components and frequencies that can be shared, interfaced or reconfigured to provide ease of access and use for daily response and major incidents. Voice and data interoperability with neighboring towns and levels of government response will improve emergency services response and recovery efforts.
- Develop a consensus on CAD system requirements and upgrade one of the existing CAD systems or develop a comprehensive RFP to procure a CAD system that meets the needs of all agencies.
- Reuse existing conventional systems or migrate to a shared regional trunking system. Should existing conventional systems be reused, patching systems should be enhanced to provide more seamless unit-to-unit connectivity across frequency bands. L.R. Kimball recommends a wide-area 700/800 MHz trunked system that would provide coverage and capacity necessary to meet the needs of all member agencies.
- Plan for an operational methodology that is a combined duty floor operation staffed by multiple levels of cross-trained staff. A call processing flow is recommended that facilitates appropriate and free interaction and coordination among disciplines. Ideally, a regional emergency communications center will be configured operationally to have an area equipped and assigned for call taking, with a supervisor position centrally placed on the communications floor with equal vantage points and access to the dispatching areas. Law enforcement dispatching will be equipped and assigned to one side of this core and fire/EMS to the other.
- Plan to certify call takers that would answer and document calls for service in a fully functional customized CAD system that routes calls to the appropriate dispatchers. The same call takers would provide EMD when needed, should the Towns elect to provide this service, and other information as appropriate. Based on pre-established priority assignments sourced to the nature of the event and response type, the receiving dispatcher(s) would notify and assign calls to the appropriate field unit/apparatus. The same dispatchers would monitor responding units/apparatus for status changes and requests for further information or services.

The current momentum should be maintained by progressing directly into the planning and implementation phases.

18. NEXT STEPS

If a decision is made by participating Towns to regionalize in some fashion, the Towns should maintain the current momentum by progressing directly into the planning and implementation phases. The success of this phase and its individual components will have a direct impact on the success of the regionalization initiative(s).

The steps below represent a phased approach that will maximize investments and allow costs to be phased into whichever funding mechanism is agreed upon by the participants. Pre-consolidation is the planning and transition period. Governance, funding, and decisions made regarding where the operation will be housed (existing or new construction) will determine the length of this period, which is typically one to three years. Post-regionalization is the burn-in period immediately following the physical go-live of the regional communications center, when the technical and operational transition has been completed. This burn-in period may be several months to several years as all components (technical, operations, personnel) and issues are addressed, such as acceptance periods for systems and equipment; and acclimation, grandfathering and/or attrition resolves personnel issues.

➤ Step 1

In year one of planning, participants must determine the direction of the Towns' decision-makers and obtain commitments from all stakeholders to proceed with the planning phase. Coinciding with commitments, site selection should occur. The cost associated with this step is the evaluation of potential sites. This should be conducted by an architect with experience in public safety communications center design. A typical evaluation includes determination of necessary site land area and features to consider in siting and planning the facility; general review of utilities and infrastructure necessary and available to support emergency communications needs, including considerations of service diversity and systems redundancy essential to continuity of operations; review of potential threats and vulnerabilities associated with the site; mitigation options available in development of facility programming and design. Once a site is selected, procurement and construction/renovation costs must be identified and funds acquired.

➤ Step 2

Year one should also include hiring a Director. Once the supporting entity is determined and captured in an intergovernmental agreement, the Towns' stakeholders/planning committee should work together in the hiring process to name a Director who will assist in accomplishing the operational objectives of regionalization. The cost associated with this step is the salary and benefits of the position, which will be approximately \$90,000 to \$100,000, annually.

➤ Step 3

These tasks can begin to be addressed in year one by the Director and the planning committee.

- **Task A** - Develop transition and migration plans in alignment with construction schedules, if applicable. These plans are dynamic and will undergo multiple revisions and adjustments through the life of the project.

- **Task B** - Identify a suitable backup/alternate site and plan as soon as practical. Backup plans should include several layers of contingency planning.
- **Task C** - Converge and develop common policies and procedures, and protocols in support of the new regional operation. Training and QA/QC programs should be developed in conjunction with this effort.

The costs associated with these tasks should be minimal, yet are difficult to quantify as the effort is one of staff hours contributed by the Director, planning committee members and existing communications staff.

➤ Step 4

New systems and technology must be implemented where applicable. CAD implementation is critical and should be a priority. The Towns must begin addressing this need as soon as possible as the CAD system is typically the longest lead time for implementation. The costs associated with this step will be determined as decisions are made with regard to the systems to be replaced, upgraded and/or transitioned.

The Towns will need to:

- Identify systems, network components and equipment to be replaced. Develop system specifications and functional requirements for use in procurement processes. Coordinate purchase and implementation to coincide with construction/renovation schedule.
- Identify systems, network components and equipment to be migrated to the regional center.
- Coordinate migration plan to coincide with construction/renovation schedule.

The length of time to replace or upgrade other systems will depend on the system. Lead times can vary from three months to a year depending on the procurement process and implementation timeline.

➤ Step 5

These tasks will require commitment of staff hours by the Director, planning committee and Towns' services, such as HR.

- **Task A** - Develop and implement two-phase hiring process that will identify qualified employees from the dispatch centers and identify qualified candidates from external hiring pools to fill available positions. Pay and benefits equalization within a pre-determined classification and benefits system should be addressed for transitioning employees.
- **Task B** - Continue filling remaining administrative, management and support positions.
- **Task C** - Train employees on new systems and protocols.

The costs associated with bringing on new administrative staff, transitioning existing operational staff and hiring new operational staff as needed to complete the regional center staff allotment will be determined after classification and pay is determined during the planning phase and in accordance with the supporting entity.

➤ Step 6

These final tasks will require continued staff hours from administrative personnel and municipal support services.

- **Task A** - Adjust and implement final migration plans as facility occupancy is allowed and systems installation and cutover dates can be confidently projected.
- **Task B** - Direct transition from the individual dispatch centers into the regional communications center.

18.1 Transition Components Summary

➤ Facility

Locate a suitable site and proceed with the design and construction of a new facility or renovation of existing facility. Maintain operational and design expertise in the design and construction to identify and address needs specific to public safety communications.

➤ Technical (Equipment)

Phase automated systems and console furniture installations based on integrations and interfacing systems. (This allows for coordination of vendors and enhanced ability to monitor installations, testing, training, and acceptance.)

➤ Operational (Personnel)

Phase staff into the consolidated PSAP immediately after new operating procedures acclimation training and systems training.

18.2 Planning and Implementation Assistance

As with all planning and transition efforts pre- and post-regionalization, L.R. Kimball recommends the Towns maintain professional services support in planning the regionalization; procuring and implementing systems, equipment and network changes; developing merged policies and procedures; and training of staff. The cost associated with this type of support from any qualified consulting firm will be determined on the level of support needed and, therefore, the number of hours dedicated to this effort.

Outsourcing planning, implementation, and technical transition management frees the planning committee and communications center management to concentrate on developing policies, budgets, and personnel, all of which are critical to the success of regionalization.

Appendix F contains a project plan that may be used as a template for transition and migration planning.

ACRONYMS

ADA	Americans with Disabilities Act
AES	Advanced Encryption Standard
AFB	Air Force Base
ALI	Automatic Location Identification
ALS	Advanced Life Support
ANI	Automatic Number Identification
ANSI	American National Standards Institute
APCO	Association of Public-Safety Communications Officials
AVL	Automatic Vehicle Location
BAPERN	Boston Area Police Emergency Radio Network
C.O.P.	Coalition of Police
CAD	Computer Aided Dispatch
CALEA	Commission on Accreditation of Law Enforcement Agencies
CAMA	Centralized Automatic Message Accounting
CARET	Concord Amateur Radio Emergency Team
CATV	Cable Television
CCTV	Closed-circuit Television
CJIS	Criminal Justice Information Services Division
CPE	Customer Premise Equipment
CPR	Cardio-pulmonary Resuscitation
CPSE	Center for Public Safety Excellence
CTO	Communications Training Officer
DOT	Department of Transportation
E9-1-1	Enhanced 9-1-1
EMD	Emergency Medical Dispatch
EMDPRS	Emergency Medical Dispatch Protocol Reference System
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOPSS	Executive Office of Public Safety and Security
ESN	Emergency Service Number
ESRK	Emergency Services Routing Key
FCC	Federal Communications Commission
GIS	Geographic Information System
HVAC	Heating, Ventilation, and Air Conditioning
IBC	International Building Code
ICS	Incident Command System
IEEE	Institute of Electrical and Electronic Engineers
IGA	Intergovernmental Agreement

IP	Internet Protocol
ISO	Insurance Services Office
IT	Information Technology
LAN	Local Area Network
LEC	Local Exchange Carrier
MDT	Mobile Data Terminal
MHz	Megahertz
MIS	Management Information System
MSAG	Master Street Address Guide
MSC	Mobile Switching Center
NAED	National Academies of Emergency Dispatch
NAWAS	National Warning System
NCIC	National Crime Information Center
NEC	National Electrical Code
NEMLEC	North Eastern Massachusetts Law Enforcement Council
NENA	National Emergency Number Association
NEPBA	New England Police Benevolent Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NG9-1-1	Next Generation 9-1-1
NIMA	National Incident Management System
PBX	Private Branch Exchange
PSAP	Public Safety Answering Point
QA	Quality Assurance
QC	Quality Control
RACES	Radio Amateur Civil Emergency Service
RECC	Regional Emergency Communications Center
RETAINS	Responsive Efforts to Address Integral Needs in Staffing
RFP	Request for Proposal
RMS	Records Management System
SAA	State Administrative Agency
SEIU	Service Employees International Union
SETB	Statewide Emergency Telecommunications Board
SF	Square Feet
SHSP	State Homeland Security Program
SOP	Standard Operating Procedure
SPSCA	Standards for Public Safety Communications Agencies
SRDB	Selective Routing Database
TIA	Telecommunications Industry Alliance
UHF	Ultra High Frequency

UPS	Uninterruptible Power Supply
VHF	Very High Frequency
WSP	Wireless Service Provider

APPENDIX A – AREA WIDE 3 AGENCY LIST

Central District			
Arlington PD	DEA	Medford PD	Suffolk Sheriff's Office
Belmont PD	Dedham PD	MGH Police & Security	Suffolk Univ. PD
Bentley College PD	Emerson College PD	Milton PD	Transit PD
Beth Israel/Deaconess PD	Everett PD	MIT PD	Tufts Univ. Police
Boston College PD	FBI	National Park Service	U Mass Boston Police
Boston PD	Federal Reserve Police	Newton PD	US Postal Inspectors
Boston Univ. PD	Harvard Univ. PD	Northeastern Univ. PD	Veteran's Affairs (Boston)
Brookline PD	Lasell College PD	Quincy PD	Waltham PD
Bunker Hill Comm. College	Lexington PD	Revere PD	Watertown PD
Cambridge PD.	Malden PD	Somerville PD	Winthrop PD
Chelsea PD	MassPort	State Police Boston	

North District			
Amesbury PD	Hamilton PD	Middleton PD	Salem State University Police Salisbury PD
Beverly PD	Haverhill PD	N. Shore Comm. College	
Boxford PD	Ipswich PD	Nahant PD	Saugus PD
Danvers PD	Lynn PD	Newbury PD	State Police Danvers
Essex County Sheriff's Office	Lynnfield PD	Newburyport PD	Swampscott PD
Essex PD	Manchester PD	Peabody PD	Topsfield PD
Georgetown PD	Marblehead PD	Rockport PD	W. Newbury PD
Gloucester PD	Merrimac PD	Rowley PD	Wenham PD
Groveland PD	Middlesex County Sheriff's Office	Salem PD	Salem State Univ. Police

South District			
Abington PD	Hanover PD	Norfolk County Sheriff's Office	Scituate PD
Avon PD	Hingham PD	Norwell PD	Sharon PD
Braintree PD	Holbrook PD	Norwood PD	Stoughton PD
Canton PD	Hull PD	Plymouth County Sheriff's Office	Walpole PD
Cohasset PD	Marshfield PD	Randolph PD	Westwood PD
Duxbury PD	Medfield PD	Rockland PD	Weymouth PD

West District			
Ashland PD	Franklin PD	Natick PD	Wayland PD

Babson College PD	Lincoln PD	Needham PD	Wellesley College PD
Bellingham PD	Mansfield PD	Norfolk PD	Wellesley PD
Dover PD	MEMA	Plainville PD	Weston PD
Foxboro PD	Millis PD	Sherborn PD	Wrentham PD
Framingham PD			

Northwest District			
Andover PD	Dunstable PD	N. Andover PD	Veteran's Affairs (Bedford)
Bedford PD	Groton PD	N. Reading PD	VA Hospital Police
Billerica PD	Lawrence PD	Pepperell PD	Wakefield PD
Burlington PD	Littleton PD	Reading PD	Westford PD
Carlisle PD	Lowell PD	Stoneham PD	Wilmington PD
Chelmsford PD	Melrose PD	Tewksbury PD	Winchester PD
Concord PD	Methuen PD	Townsend PD	Woburn PD
Dracut PD	Middlesex County Sheriff's Office	Tyngsboro PD	

APPENDIX B – MASS GEN. LAWS CH. 40 § 4A

Section 4A. The chief executive officer of a city or town, or a board, committee or officer authorized by law to execute a contract in the name of a governmental unit may, on behalf of the unit, enter into an agreement with another governmental unit to perform jointly or for that unit's services, activities or undertakings which any of the contracting units is authorized by law to perform, if the agreement is authorized by the parties thereto, in a city by the city council with the approval of the mayor, in a town by the board of selectmen and in a district by the prudential committee; provided, however, that when the agreement involves the expenditure of funds for establishing supplementary education centers and innovative educational programs, the agreement and its termination shall be authorized by the school committee. Any such agreement shall be for such maximum term, not exceeding twenty-five years, and shall establish such maximum financial liability of the parties, as may be specified in the authorizing votes of the parties thereto. A governmental unit, when duly authorized to do so in accordance with the provisions of law applicable to it, may raise money by any lawful means, including the incurring of debt for purposes for which it may legally incur debt, to meet its obligations under such agreement. Notwithstanding any provisions of law or charter to the contrary, no governmental unit shall be exempt from liability for its obligations under an agreement lawfully entered into in accordance with this section. For the purposes of this section, a "governmental unit" shall mean a city, town or a regional school district, a district as defined in section 1A, a regional planning commission, however constituted, a regional transit authority established under chapter 161B, a water and sewer commission established under chapter 40N or by special law, a county, or a state agency as defined in section 1 of chapter 6A.

[Second paragraph effective until July 27, 2010. For text effective July 27, 2010, see below.]

All agreements put into effect under this section shall provide sufficient financial safeguards for all participants, including, but not limited to: accurate and comprehensive records of services performed, costs incurred, and reimbursements and contributions received; the performance of regular audits of such records; and provisions for officers responsible for the agreement to give appropriate performance bonds. The agreement shall also require that periodic financial statements be issued to all participants. Nothing in this section shall prohibit any agreement entered into between governmental units from containing procedures for withdrawal of a governmental unit from said agreement.

[Second paragraph as amended by 2010, 188, Sec. 23 effective July 27, 2010. For text effective until July 27, 2010, see above.]

All agreements put into effect under this section shall provide sufficient financial safeguards for all participants, including, but not limited to: accurate and comprehensive records of services performed, costs incurred, and reimbursements and contributions received; the performance of regular audits of such records; and provisions for officers responsible for the agreement to give appropriate performance bonds. The agreement shall also require that periodic financial statements be issued to all participants. Nothing in this section shall prohibit any agreement entered into between governmental units from containing procedures for withdrawal of a governmental unit from said agreement. A decision to enter into an intermunicipal agreement under this section, or to join a regional entity, shall be solely subject to the approval process of the towns' elected bodies.

All bills and payrolls submitted for work done under any such agreement shall be plainly marked to indicate that the work was done under authority thereof. Any reimbursement for or contribution toward the cost of such work shall be made at such intervals as the agreement provides. The amount of reimbursement received under any such agreement by any governmental unit shall be credited on its books to the account of estimated receipts, but any funds received under the provisions of section fifty-three A of chapter forty-four for contribution toward the cost of such work may be expended in accordance with the said provisions. The equipment and employees of a governmental unit while engaged in performing any such service, activity or undertaking under such an agreement shall be deemed to be engaged in the service and employment of such unit, notwithstanding such service, activity or undertaking is being performed in or for another governmental unit or units.

APPENDIX C – SAMPLE INTERLOCAL AGREEMENT

INTERGOVERNMENTAL AGREEMENT

_____ COUNTY CONSOLIDATED
PUBLIC SAFETY ANSWERING POINT (PSAP)
[date]

This Agreement, effective as of _____, 20XX, made and first entered into by and among the undersigned governmental jurisdictions to include [enter all municipalities/jurisdictions/agencies, etc.].

WITNESSETH:

WHEREAS, jurisdictional entities within _____ County formed the Consolidated Dispatch Committee, including multi-jurisdictional representation from law enforcement, fire and EMS entities within _____ County; as well as a County Administration representative and [a federal agency representative – if appropriate]; and this committee has been exploring the benefits of consolidating public safety communications within _____ County; and

WHEREAS, a [enter any studies here] Study was completed in [date], based upon a scope of work developed by the Consolidated Dispatch Committee and paid for by _____; and

WHEREAS, the Study found that the current emergency call processing is inefficient, potentially detrimental, involving _____ Public Safety Answering Points (PSAPs), and that 9-1-1 emergency calls frequently have built-in delays involving transfers to other centers; and

WHEREAS, the jurisdictions and residents of _____ County would benefit in terms of life safety and efficiency of service from a consolidated 9-1-1 Public Safety Answering Point (PSAP) providing services to _____ County and the municipalities and fire protection departments within _____ County; and

WHEREAS, the undersigned governmental jurisdictions wish to agree to the establishment and maintenance of a consolidated Public Safety Answering Point (PSAP), to be hereafter known as "_____ County Consolidated PSAP"; and

WHEREAS, the establishment of such PSAP will provide improved police, fire and emergency medical service communications within the boundaries of the participating jurisdictions (the "Consolidated Service Area", together with such other jurisdictions as may hereafter contract with the undersigned for communications services; and

WHEREAS, the establishment and maintenance of such PSAP will be of substantial benefit to the citizens of the undersigned governmental jurisdictions and the public in general;

NOW THEREFORE, as an exercise of the police power and authority granted by the Constitution and laws of the State of South Carolina, and in consideration of the mutual terms, covenants and conditions set forth herein, it is hereby agreed and covenanted among the undersigned as follows:

1.0 PURPOSE:

This Intergovernmental Agreement to establish the [REDACTED] County Consolidated PSAP contains the following organizational objectives:

- 1.1 To promote the health, safety and general welfare of the citizens throughout [REDACTED] County. To that end, the parties wish to continually improve procedural efficiency and technical capabilities of emergency call-taking, emergency call processing, and all emergency response communications.
- 1.2 To save lives by improved call processing time which reduces response times to emergency incidents.
- 1.3. To improve safety to emergency responders.
- 1.4 To effectively receive calls for routine and emergency assistance, based on structured call intake protocols, and coordinate response resources to those calls for service based on the needs of the caller and the direction of field response agencies.
- 1.5 To provide all participating agencies with a single contact point for the notification of emergencies and receipt of emergency assistance requests, and for the control of coordinated dispatch for law enforcement, fire and EMS.
- 1.6 To bring about increased efficiencies and coordination of communications and emergency response services, including the use of the National Incident Management System and the National Response Plan. These communications improvements are intended to impact emergency response for all types of scenarios that are generally broken into three categories:
 - A) Emergencies that occur daily in the community: those "typical" crimes, fires, and medical emergencies.
 - B) Local, small scale disasters, such as a school bus accident.
 - C) Large scale and/or national level disasters, such as terrorist attacks or natural disasters.
- 1.7 To provide the public and field response agencies with highly trained, certified and/or credentialed 9-1-1 employees who strive to provide the best service possible to all parties involved.
- 1.8. To set the goals of 1) meeting NFPA's 1221 standards, 2) meeting National Emergency Medical Dispatch (EMD) standards for Accreditation and attaining this accreditation, and 3) meeting CALEA's Standards for Public Safety Communications Agencies and attaining CALEA accreditation.
- 1.9 To provide funding to ensure the appropriate level of service to all parties involved as defined by user agencies by establishing funding mechanisms and defining the budget process for the center.

- 1.10 To provide for operational oversight from a "Consolidated Dispatch Board" of emergency response leaders.
- 1.11 To ensure accountability to the field response agencies by creating User Groups which provide feedback to the Consolidated Dispatch Board.
- 1.12 To provide a mechanism for the addition or withdrawal of parties to the Agreement.
- 1.13 To establish an alternate center to serve as a backup, overflow and training site, and as a secondary location where emergency dispatchers will function in the event that they need to evacuate the primary Consolidated PSAP.

2.0 DEFINITIONS:

As used in this Agreement the following words and phrases shall have the meanings indicated unless the context clearly requires otherwise:

- 2.1 "PSAP" (Public Safety Answering Point) shall mean the facility housing the equipment and personnel that provide 9-1-1 call answering, processing and dispatching services.
- 2.2 "9-1-1 Services" shall mean those services and equipment to answer 9-1-1 calls on a 24-hours-per-day basis.
- 2.3 "Other Services" shall mean services related to emergency service or jurisdictional communications provision, such as administrative call-taking.
- 2.4 "County" shall mean County.
- 2.5 "E9-1-1" (Enhanced 9-1-1) shall mean the emergency communications system which connects the public to emergency response.
- 2.6 "Participants" shall mean the parties to this Agreement and such other entities as become parties in the future.
- 2.7 "County Consolidated PSAP" shall mean collectively the parties to this Agreement in their capacity as providers and/or receivers of 9-1-1 services; or, as the context may require, the system of providing such services; or the facility housing the countywide 9-1-1 operations.
- 2.8 "Consolidated Dispatch Board" shall mean the multi-jurisdictional Board of Law Enforcement, Fire and EMS leaders established to guide the establishment and operations of the County Consolidated PSAP.

3.0 COUNTY TO ESTABLISH A DEPARTMENT OF PUBLIC SAFETY COMMUNICATIONS:

The parties agree that County, through operational funding as established in Section 9, will establish and

maintain a Department of Public Safety Communications which will operate the County Consolidated PSAP. County will provide the backbone structure to provide important and necessary services such as payroll, employee benefits, facilities maintenance, budget/finance, legal, risk management and procurement. This arrangement provides significant cost efficiencies since the infrastructure and capabilities are in place to provide the administrative and support services to a department serving countywide needs. The Center Director and all employees of the Center will be County employees, subject to all County personnel policies and procedures.

4.0 PROGRAMMING AND CONSTRUCTION OF FACILITY:

County will purchase, lease, or otherwise obtain the use of an existing facility or build a new facility for the purpose of locating and establishing the Consolidated PSAP, at the County's expense. Other uses of the land and the building to be used for the Consolidated PSAP may also be considered. Construction or renovation of a consolidated dispatch facility and other related capital costs not covered by 9-1-1 fees will be based upon appropriations made at County Council's discretion.

The Consolidated PSAP will include at least the following: (1) dispatch area, (2) Director and supervisor administrative offices, technology specialist offices, clerical and reception office space, (3) radio/recording/CAD/9-1-1 technology equipment rooms, (4) storage for inventory, supplies and records, (5) locker room, (6) bathroom/shower facilities, (7) kitchen, (8) lunch/break room, (9) training area, and (10) multi-purpose classroom/conference room.

County agrees that the existing Communications Centers or other suitable facilities will be available as a backup center in the event that the Consolidated PSAP employees must evacuate the primary Consolidated PSAP. This will not preclude the County from utilizing this space for other purposes, with the understanding that the space must be secured, maintained, accessible and activated as needed under the primary purpose and use as the Consolidated PSAP's alternate/back-up/overflow site. This site may also be used for Consolidated Dispatch training purposes.

5.0 TRANSITION ISSUES:

The parties agree to cooperate in the many complex aspects of transitioning into the Consolidated PSAP. Transition elements include, but are not limited to the following:

- 5.1 There will be continued involvement of the Consolidated Dispatch Board in all phases of the establishment of the PSAP.
- 5.2 All reasonable attempts will be made to hire a Director during the facility programming phase, subject to the funding agreement as indicated in Section 9. The hiring of the Director shall involve the Board, as indicated in Section 6.
- 5.3 Hiring of employees:
 - A) Employees who meet qualifications standards, at the time of cutover, will be transferred to the new Consolidated PSAP. Supervisory and other specialty positions will be filled by the Center Director.

- B) Subject to the conditions below, the Center Director will hire dispatchers that meet the qualifications standards adopted by the Board, from emergency communications centers of the parties to this agreement. A readiness program to assist current dispatchers to meet qualifications standards will be made available during the establishment phase of the facility. (Readiness training and funding responsibilities as referred to in Sections 9.3 and 9.4.)
- C) Dispatchers must meet the minimum qualifications established for the position, unless they have been hired less than six months before cutover to the Consolidated PSAP, in which case they will have a period of six months from cutover to meet the minimum qualifications. All new hire employees will be subject to the County's standard probationary period and all other [REDACTED] County employment policies and procedures.
- D) It is the intent of this Agreement that the hiring of dispatch staff at participating agencies will take place, subject to the pay scales established for the Consolidated PSAP, and with existing longevity and position level taken into consideration, among other things. Criteria which may render a participating dispatch center employee ineligible for County employment at the Consolidated PSAP include, but are not limited to, the following:
- Convicted felon or other significant information found on a criminal records check
 - The employee has been determined "not eligible for re-hire" as a [REDACTED] County employee
 - Inability to pass a drug test
 - Inability to pass a basic literacy exam
 - Education level which is not equivalent to a high school diploma or higher
- 5.4 Individual municipal and agency needs and requests regarding other services such as non-public safety administrative call-taking or other non-emergency communications functions will be determined early in the planning stage and will have specific protocols, training and technology needs established and well-defined. Funding for other services will be as indicated in Section 9.
- 5.5 Costs for the transition period prior to moving into the Consolidated PSAP will be handled as indicated in Section 9.
- 5.6 A transition plan will be developed by [REDACTED] County working closely with the Consolidated Dispatch Board. [REDACTED] County will establish a transitional budget and be responsible for managing this budget and paying transitional expenses, including but not limited to staffing of Director and other positions identified as needed prior to cutover, dispatcher training course fees (see 5.7 below) and consultant planning assistance. Some transitional funding may come from other participating jurisdictions, and 9-1-1 and grant money will be used wherever possible.
- 5.7 The staff time (including necessary overtime) involved in the initial Consolidated Dispatch-related training of dispatchers hired or anticipated to be hired by the Consolidated PSAP Director, will be borne by the participating Centers where they are working prior to the cutover date. Dispatcher training course fees will be borne by [REDACTED] County during the six months prior to cutover to the consolidated PSAP. However, fees for supervisory/QA/trainer courses will be paid by [REDACTED] County only when employees have been selected for supervisory/QA/trainer positions by the Consolidated PSAP Director.

6.0 CONSOLIDATED DISPATCH BOARD:

With the execution of this Agreement, the existing "Consolidated Dispatch Committee" will be disbanded and the "Consolidated Dispatch Board" will be established as follows:

6.1 Membership:

County:	2 (Sheriff & EMS Director)
XXXXXXX:	2 (Police Chief & Fire Chief)
XXXXXXX:	2 (Police Chief & Fire Chief)
XXXXXXX:	1 (Police Chief)

One appointee to serve on the Board through cutover to the Consolidated PSAP. Following this, these municipalities will appoint a police chief from one of the other two jurisdictions and rotate these appointments every 3 years.

Fire Chiefs Association: 2 Representatives selected by the Association. These appointees must not be from one of the jurisdictions listed above. The two fire chiefs appointed by the Chiefs Association, who have served on the Consolidated Dispatch Committee, will serve on the Board through cutover to the Consolidated PSAP. Following this, the Chiefs Association will make new fire chief appointments every 3 years.

Non-Voting Member: County Administrator Designee (to serve as Liaison to County Administration and Secretary to the Board).

Non-Voting Member (Advisor): Federal Agency representative selected by majority vote of the Board based upon nomination by the Chair or another Board member.

6.2 Responsibility and Authority: The Consolidated Dispatch Board shall have the responsibility to:

- A) elect a Chairperson from its members by a majority vote of the Board. The Chairperson will serve a two-year term and may be re-elected for subsequent terms. The Chairperson will have the authority and responsibility:
 - a. to preside at regular and special meetings of the Board;
 - b. to appoint a member of the Board to act as Chairperson in his/her absence. This appointment may be made on a case-by-case basis or for a designated period of time, not to exceed three consecutive meetings;
 - c. to call special meetings as appropriate;
 - d. to appoint committees as appropriate;
 - e. to represent the Board or appoint another member or the PSAP Director to represent the Board at various jurisdictional meetings where consolidated dispatch is on the agenda;
 - f. to provide the County Administrator with performance reviews of the Center Director and make written recommendations regarding his or her performance, utilizing the County

Personnel Policies & Procedures, as may be amended from time to time, and with significant input from Board members.

- B) establish, together with the Director, the mission and goals of the [REDACTED] County Consolidated PSAP;
- C) work together with the County Administrator to develop an appropriate Director job description and criteria for employment. The Consolidated Dispatch Board will interview qualified applicants and select a candidate (or candidates) for whom a written recommendation will be provided to the County Administrator;
- D) establish operational protocols, policies and procedures for the Consolidated PSAP with the assistance of the Director;
- E) consider and resolve questions, issues and disputes presented to the Board by the User Groups or parties to this Agreement;
- F) work with the Director to submit to the County Administrator a recommended budget for the Consolidated PSAP by no later than December 15 of each year for the following fiscal year beginning July 1;
- G) provide advocacy for both capital and operational needs of the Center, and work toward funding efficiencies and grant opportunities;
- H) annually adopt a long-range comprehensive plan as described in Section 8, Item J;

6.3 Meetings of the Board:

- A) Any member of the Consolidated Dispatch Board may designate a representative to attend meetings in the member's place. The designee must be from the same jurisdiction and the member will ensure that the designee is knowledgeable and prepared. While so designated, the representative shall assume all rights and responsibilities of a full member. However, members themselves are expected to attend the majority of meetings. If a member misses 3 out of 12 meetings during a calendar year, a letter of concern will be written to the member, with copies to the Governing Body and Administrative Head of the jurisdiction.
- B) Regularly scheduled meetings of the Consolidated Dispatch Board shall be held monthly at such time and place as determined by mutual agreement. Special meetings may be called by the Chairman as appropriate.
- C) A quorum shall be necessary to convene a meeting. Five members shall constitute a quorum. All motions presented for approval shall require majority vote in order to move forward. Additional procedural rules for Board meetings will be established by the Board within the first 90 days of the Board's existence.

- D) The **Consolidated Dispatch Board** will be a public body subject to the South Carolina Freedom of Information Act.

7.0 USER GROUPS:

Two User Groups will be established for the purpose of providing the opportunity for all user agencies to have input into the operations of the Consolidated PSAP. There will be a Law Enforcement User Group and a separate Fire/EMS/Rescue/Emergency Management User Group. Membership in each group will include the Chief (or designee) of each agency which utilizes the Consolidated PSAP for Emergency Communications. These groups will meet at least quarterly and provide written feedback to the **Consolidated Dispatch Board** regarding any concerns, problems, or recommendations related to operational protocols or any other aspects of the Center's performance to meet their needs.

User Group recommendations relative to service levels, staffing levels, performance standards, operational procedures and protocols or systems shall be made to the Consolidated PSAP Director no later than August 15 of each year in order to be considered for implementation in the next budget year.

8.0 CENTER DIRECTOR:

The **County** Consolidated PSAP will be managed, operated and supervised by a Center Director, who will be a **County** employee subject to the County's personnel policies and other employee regulations. The hire/fire/evaluation of the Center Director shall occur as outlined in Section 6.2.

8.1 Responsibility and Authority of the Center Director:

- A) The Center Director shall be the administrative head of the **County** Consolidated PSAP and will be responsible for handling administration and personnel matters within the framework of **County** regulations and personnel policies.
- B) The Center Director shall be responsible for following operational policies and protocols established by the **Consolidated Dispatch Board** as outlined in Section 6.2, Item D.
- C) The Director will prepare a proposed budget for Board approval and will assist the Board in submitting to the County Administrator a recommended budget for the Consolidated PSAP by no later than December 15 of each year for the following fiscal year beginning July 1.
- D) The Center Director will be responsible for managing the PSAP within the approved annual budget.
- E) The Center Director will work closely with the **County 9-1-1 Coordination staff** regarding equipment, training, and other issues for which 9-1-1 funds can be utilized to maintain the best available technology and training to best serve citizens.
- F) The Center Director will be responsible for all activities of the Consolidated PSAP, including but not limited to oversight of call-taking, dispatching, records (custodian), recording, staffing, training, and

security.

- G) The Center Director shall establish and utilize performance standards for employees. The Director shall actively and continually consider and evaluate all means and opportunities toward the enhancement of operational effectiveness of emergency communications for the benefit of the public and emergency response agencies.
- H) The Center Director shall review and evaluate proposals from User Committees for changes to service levels, performance standards, and/or operational procedures. The Director will prepare a written report on such proposals to include, at a minimum, implementation costs, benefits and liabilities, and will provide a recommendation. Such reports and recommendations will be forwarded to the Consolidated Dispatch Board for review. Final decisions will be made by the Board on all changes in service levels, performance standards and operational procedures, contingent upon available funding for implementation. However, in order to meet the need for procedural changes in a dynamic deployment situation, the Director will be given authority to alter the procedures during critical circumstances.
- I) The Center Director will participate in a non-voting capacity in meetings of the Consolidated Dispatch Board and the User Groups. Should it be necessary for the Center Director to miss a meeting, he/she will have a designee present.
- J) The Center Director will develop appropriate long-range plans, including strategic capital improvements, staffing, technology, and other matters. A comprehensive long-range plan will be developed and updated yearly. This plan will be presented to the Consolidated Dispatch Board on a yearly basis at a date and time determined by the Board. Each year the Board and Director will reach consensus on the plan, and the Board will take action to adopt the plan.

9.0 FUNDING:

- 9.1 **Capital:** Capital costs will include start-up costs associated with building & equipping PSAP, to include such things as land acquisition, programming, designing and constructing the facility, computer Aided Dispatch (CAD) for multi-jurisdictional use, dispatch Center furnishings & equipment not funded through 9-1-1 surcharge, in-building circuitry, grounding, HVAC (heating ventilation and air conditioning), electrical, cable pathways, cabling for radio, CAD, 9-1-1 equipment (CPE), local area network (LAN) and future networks, systems networking & connection needs (911 & other phone lines, radio, CAD, NCIC) to the primary PSAP, and the alternate/backup PSAP, with built-in redundancy. (Municipal and/or departmental connections will also be needed in support of email access, department/municipal systems and information access)

County will provide funding for Capital costs as authorized by County Council. County Council's Capital Improvement Plan includes \$XX Million for Consolidated Dispatch, subject to final appropriations by County Council.

- 9.2 **Transitional:** Transitional costs will involve staffing and **consultant costs** before Center becomes fully operational, to include initial personnel costs to hire the Director and other staff, training and equipping staff, consultant planning services, and training of dispatchers who will be moving from participating jurisdictions to the Consolidated PSAP.
- 9.3 **Transitional costs funded by [REDACTED] County:** The County's projected Transitional costs are estimated at approximately \$XX million over three fiscal years, primarily to cover early hiring of high level staff and consultant expenses. These expenses will be borne by [REDACTED] County, subject to budget approval by [REDACTED] County Council. During the six months prior to cutover date, the County will pay dispatcher training/certification fees for those dispatchers at participating centers who are hired or anticipated to be hired by the Consolidated PSAP.
- 9.4 **Transitional costs funded by participating Jurisdictions:** Personnel staff time (including necessary overtime) involved in the initial Consolidated PSAP related training of dispatchers who are hired or anticipated to be hired by the Consolidated PSAP, will be borne by the participating dispatch agencies where they are employed prior to the cutover date. This will facilitate dispatchers at participating agencies being employed by the Consolidated PSAP, while allowing them to remain at their current respective agencies until cutover date.
- 9.5 **Operational:** Operational costs involve costs to operate once PSAP becomes activated, including salaries, benefits, support staff, training and employee specific equipment and supplies (uniforms, headsets, etc.), systems maintenance and support costs, facility maintenance, utilities, other indirect costs (factored in projections at 10%), and capital replacement fund to provide future funding toward capital improvement plans such as lifecycle replacement of systems and equipment, NG9-1-1 upgrades and building renovations.
- 9.6 Operational costs, projected at approximately \$XX million in FYXX (first possible year of Consolidated PSAP Operations), increasing annually at a rate of 4% per year as shown on Attachment A, are to be handled through [REDACTED] County taking on all operational costs on an incremental basis, as follows:
- A. **First year of Consolidated Dispatch operations (potentially FYXX):** Participating jurisdictions will pay 100% of their "status quo" costs (costs they would otherwise incur for continuing their own dispatch operations). Attachment A includes each jurisdiction's future projected "status quo" costs. For the first operational year of the Consolidated PSAP, each jurisdiction will pay [REDACTED] County an amount equal to their status quo costs as shown on this chart (given by fiscal year). If the first year of consolidated dispatch operations is FYXX, then the jurisdictions will pay the full status quo amount indicated for FYXX.
- B. **Second year of Consolidated Dispatch operations (potentially FYXX):** Participating jurisdictions will pay approximately 50% of their "status quo" costs. Attachment A will be used and each jurisdiction will pay [REDACTED] County an amount equal to 50% of their status quo costs as shown on this chart (given by fiscal year). If the second year of consolidated dispatch operations is FYXX, the jurisdictions will pay 50% of the full status quo amount indicated for FYXX.

- C. Third year and beyond: [REDACTED] County will take on the full costs of Consolidated Dispatch.
- 9.7 **Operational Funding as it relates to areas outside of [REDACTED] County:** Special financial arrangements will be worked out between [REDACTED] County and those entities which have areas outside of [REDACTED] County which are within their jurisdiction, to ensure that these citizens being served by the center are paying a portion of costs.
- 9.8 **Existing Funding (funding currently used for 9-1-1 service provision and expected to continue):** Wireline and wireless 9-1-1 surcharges currently fund countywide 9-1-1 equipment, call counting software, networking/connectivity, logging recorders and mapping for the PSAPs. Uses for 9-1-1 funding may expand in the future, per legislative changes. [REDACTED] County will make use of 9-1-1 funds wherever possible.
- 9.9 **Radio System funding:** The countywide radio system funding structure is not expected to change with the advent of consolidation. The Consolidated PSAP will be responsible for operational costs associated with connectivity to the County's Radio system and the maintenance costs of radio dispatch consoles.
- 9.10 **Grant Funding:** Applicable grants will be sought in order to assist in funding [REDACTED] County's Consolidated PSAP.
- 9.11 **Other Services Funding:** Funding of desired other services, such as municipal administrative call-taking or other non-emergency functions, will be identified by participating jurisdictions early in the planning stage. The participating agency requesting other services will reach a separate agreement with [REDACTED] County related to the compensation for other services, following review and recommendation by the Consolidated Dispatch Board.
- 10.0 **EQUIPMENT:**
Equipment and furnishings for the PSAP shall be purchased in the County's name and be the property of [REDACTED] County. The purchase and maintenance of all equipment necessary to receive calls, radio transmissions, and data at the locations (or vehicles) of participating jurisdictions will be the responsibility of the jurisdictions. The parties may engage in cooperative purchasing activities, including but not limited to use of South Carolina State Contracts.
- [REDACTED] County and the participating jurisdictions will cooperate together and with local, state and federal agencies in order to maximize interoperability and economies of scale, grant-funding, and other means to reduce costs for equipment and operations. The Center Director, working with the Board, will develop uniform standards for a multi-jurisdictional Computer Aided Dispatch (CAD) system with expandable ports for multiple interfaces such as Records Management System (RMS), Fire Reporting, EMS Reporting and message switching for MDTs or other data-sharing interfaces. Each jurisdiction will be responsible for purchasing and maintaining its own records/data management module and related CAD interface. Access to internal CAD information via the internet may also be an option, and will be funded by each participating jurisdiction. All participating jurisdictions, including those jurisdictions electing not to purchase separate modules and interfaces, will have access to their jurisdiction's call counts and calls for service CAD data upon request to the Center.

11.0 DURATION OF AGREEMENT - WITHDRAWAL:

The initial duration of this Agreement shall be for a period of five (5) years from the date hereof, and thereafter shall be automatically extended for consecutive two (2) year periods unless terminated by the parties. In the event that any party desires to withdraw from this Agreement, said party must give 12 months' advance written notice to the other parties, and the withdrawal shall take effect only as of the beginning of the succeeding fiscal year of the County, unless otherwise agreed between the parties. (By way of example and not in limitation, if notice is delivered later than the end of business June 30 of a given year, the Agreement shall continue until the end of the following fiscal year. Notice delivered June 30, 2010, equals withdrawal June 30, 2011. Notice given July 1, 2010, or later, equals withdrawal June 30, 2012.)

12.0 ADMISSION OF NEW JURISDICTIONS:

Additional jurisdictions may become participants by written addendum to this Agreement, with the approval of the majority of participating governing bodies, upon recommendation by the **Consolidated Dispatch Board**, with terms and conditions as agreed upon.

13.0 MEDIATION:

Any controversy between the members with regard to the application or interpretation of this Agreement shall be submitted to the **Consolidated Dispatch Board** for resolution. If the Board's action does not resolve the controversy, it may be submitted for mediation. Upon failure of mediation, each party reserves all rights and remedies otherwise available under South Carolina law.

14.0 RESPONSIBILITY FOR LOSS:

Each participating jurisdiction agrees to be responsible and assume the risk of liability for its own wrongful and/or negligent acts or omissions, or those of its officers, agents, or employees to the extent that liability exists.

15.0 SEVERABILITY:

Should any part of the Agreement be determined by a court of competent jurisdiction to be invalid, illegal or against public policy, said offending section shall be void and of no effect, and shall not render any other section herein, nor this Agreement as a whole, invalid. Those rights and obligations under this Agreement, which by their nature should survive, shall remain in effect after termination, suspension or expiration hereof.

16.0 EXECUTION:

This Agreement, or amendments hereto, shall be executed on behalf of each participating jurisdiction by its duly authorized representative and pursuant to an appropriate motion, resolution or ordinance of each participating jurisdiction. This Agreement, or any amendment thereto, shall be deemed adopted upon the date of execution by the last so authorized representative.

17.0 SIGNATURES:

Each party to this Agreement shall sign a signature page to constitute valid execution.

18.0 ENTIRE AGREEMENT:

This document encompasses the entire Agreement of the members. No understanding or amendment, addendum, or addition to this Agreement shall be effective unless made in writing and signed by all members.

APPENDIX D – TRAINING RESOURCES

Leadership, Supervision and General Operations Courses

APCO <http://www.apcointl.org/institute/training.htm>

NENA <http://www.nena.org/education/courses>
<http://www.nena.org/education/cmcp>

National Emergency Communications Institute (NECI)
<http://www.neci911.com/>

Emergency Medical Dispatch Protocols

National Academy of Emergency Dispatch
<http://www.emergencydispatch.org/>
http://www.prioritydispatch.net/tra_overview.php

APCO <http://www.apcointl.org/institute/training.htm>

PowerPhone <http://www.powerphone.com/home/index.cfm>

NECI <http://www.neci911.com/>

American Society for Testing Materials (ASTM)

This standards-setting body has several related to EMD:

- F1560-94 Standard Practice for Emergency Medical Dispatch Management,
- F1258-95 Standard Practice for Emergency Medical Dispatch, and
- F1552-94 Standard Practice for Training Instructor Qualification and Certification Eligibility of Emergency Medical Dispatchers

www.astm.org

Public Safety Training <http://www.pstc911.com/>

Professional Pride <https://ppride.dgswa.com/>

Emergency Fire and Law Enforcement Dispatch Protocols

National Academy of Emergency Dispatch

www.emergencydispatch.org/

www.prioritydispatch.net/

Personal Development Training

Jim Rohn www.jimrohn.com

Napoleon Hill Institute www.naphill.org

Jeffrey Gitomer www.Gitomer.com

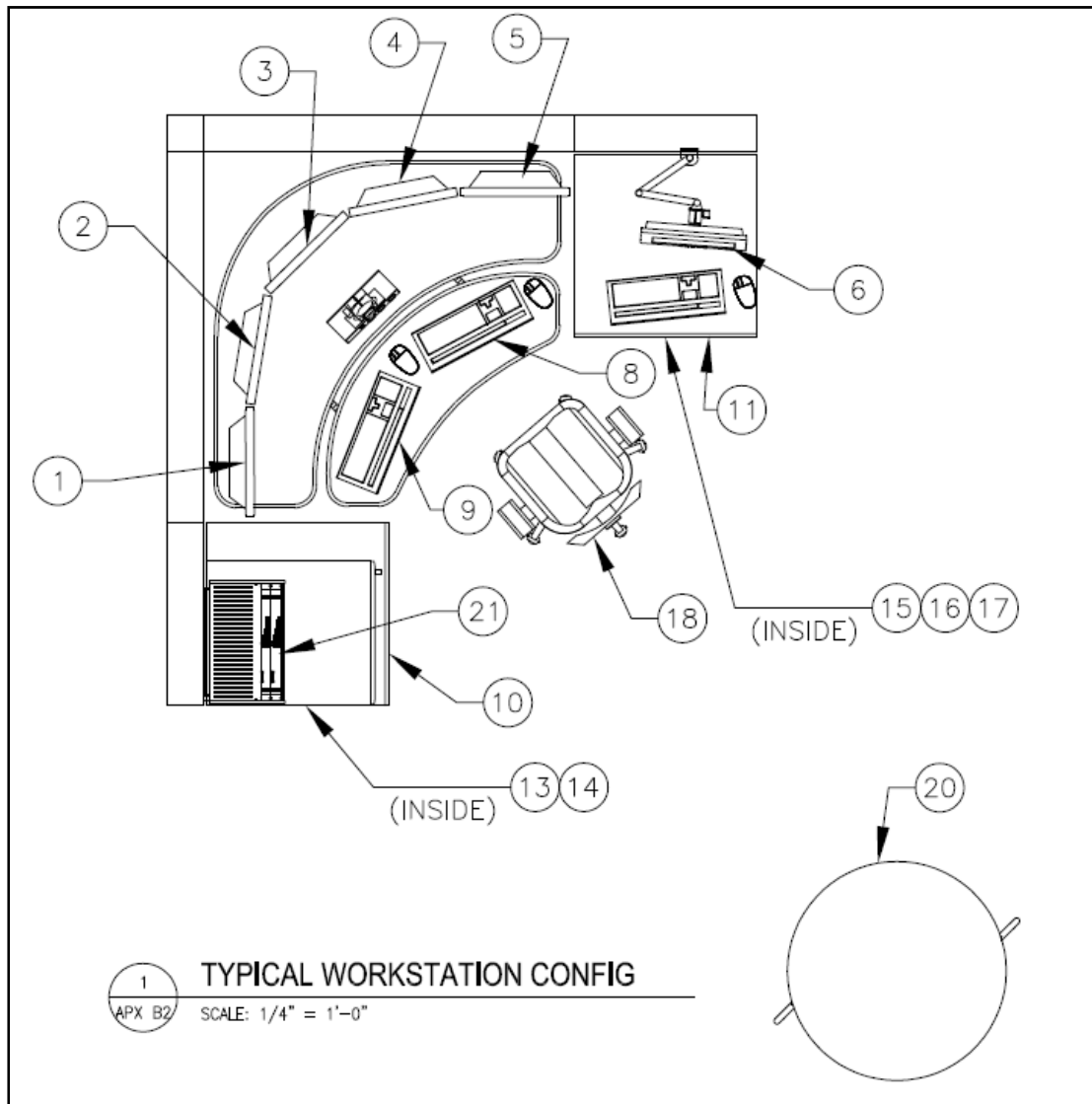
Success Magazine www.success.com

NIMS

Emergency Management Institute
<http://www.fema.gov/emergency/nims/NIMSTrainingCourses.shtml>

APPENDIX E – WORKSTATION DIAGRAM

Note: This diagram and schedule are for reference only and are not representative of the County's current or future technical dispatch furniture configuration.



The table below illustrates the specialized equipment that may appear at a typical communications console position. The infrastructure design supporting electrical and data cabling needs for each position on the PSAP floor requires protected and unprotected power feeds, multiple Category 6 (CAT6) cable drops and sometimes specialized RF cabling. Today's established dispatch furniture products typically accommodate floor box access and/or surface mount termination points.

DISPATCH FURNITURE FIXTURE SCHEDULE

ID #	ITEM	DESCRIPTION	SUPPLIED and INSTALLED BY	COMMENTS
1	CAD SCREEN 1	FREESTANDING 21" LCD MONITOR	OWNER	
2	CAD SCREEN 2	FREESTANDING 21" LCD MONITOR	OWNER	
3	CAD SCREEN 3	FREESTANDING 21" LCD MONITOR	OWNER	
4	TELEPHONY SCREEN	FREESTANDING 21" LCD MONITOR	PHONE VENDOR	COORDINATE MAKE/MODEL WITH OWNER
5	RADIO SCREEN	FREESTANDING 21" LCD MONITOR	RADIO VENDOR	COORDINATE MAKE/MODEL WITH OWNER
6	NCIC SCREEN	SWING ARM MOUNT 21" LCD MONITOR	OWNER	LOCATED @ SHARED AREAS BETWEEN D1-2, D3-4 AND D5-6
7	HOME CONFINEMENT SCREEN	SWING ARM MOUNT 21" LCD MONITOR	OWNER	LOCATED AT S1 ONLY
8	CAD INPUT	STANDARD KEYBOARD & MOUSE	OWNER	
9	TELEPHONY INPUT	STANDARD KEYBOARD w/NUMBER PAD & MOUSE	PHONE VENDOR	
10	RADIO INPUT	STANDARD KEYBOARD & MOUSE	RADIO VENDOR	LIMITED USE ITEM TO BE STORED AT POSITION
11	NCIC INPUT	STANDARD KEYBOARD & MOUSE	OWNER	LOCATED @ SHARED AREAS BETWEEN D1-2, D3-4 AND D5-6
12	HOME CONFINEMENT INPUT	STANDARD KEYBOARD & MOUSE	OWNER	LOCATED AT S1 ONLY
13	CAD COMPUTER	STANDARD PC	OWNER	
14	TELEPHONY COMPUTER	STANDARD PC	PHONE VENDOR	COORDINATE POSITION IN CABINET WITH OWNER
15	RADIO COMPUTER	STANDARD PC	RADIO VENDOR	COORDINATE POSITION IN CABINET WITH OWNER
16	NCIC COMPUTER	STANDARD PC	OWNER	LOCATED @ SHARED AREAS BETWEEN D1-2, D3-4 AND D5-6
17	HOME CONFINEMENT PC	STANDARD PC	OWNER	LOCATED AT S1 ONLY
18	24 / 7 CHAIR	DISPATCH CHAIR RATED FOR USE IN 24 / 7 ENVIRONMENT	FURN. VENDOR	COORDINATE MAKE/MODEL WITH OWNER
19	COMMON WORK AREAS	PENINSULA EXTENSIONS AND SHARED CABINET SPACE	FURN. VENDOR	SIZE AND QUANTITY PER PLAN, COORDINATE FINISH w/OWNER

DISPATCH FURNITURE FIXTURE SCHEDULE

ID #	ITEM	DESCRIPTION	SUPPLIED and INSTALLED BY	COMMENTS
20	BINDER STORAGE/PRINTER	APPROX 38" ROTATING RESOURCE CENTER	FURN. VENDOR	TWO UNITS TOTAL PER PLAN, PRINTERS BY OWNER
NOT SHOWN	HEADSET & INTERFACE	PHONE AND RADIO SYSTEM INTERFACE TO HEADSET	PHONE/RADIO	RADIO & PHONE VENDORS SHALL COORDINATE w/OWNER
	TELEPHONY SPEAKER	INSTANT RECALL REC. PLAYBACK STANDARD PC SPEAKER	PHONE VENDOR	COORDINATE MAKE/MODEL WITH OWNER
	RADIO SPEAKER	UNSELECTED AUDIO STANDARD PC SPEAKER	RADIO VENDOR	COORDINATE MAKE/MODEL WITH OWNER
	BACKUP PHONE HANDSET	SHELF MOUNT/FREE STANDING DESK SET w/RECEIVER	OWNER	
	BACKUP RADIO/ENCODER	19" RACK MOUNT EQUIPMENT (APPROX 8 RACK UNITS)	RADIO VENDOR	19" MOUNTING RAILS BY FURN MFR.
	TASK LIGHT	FREESTANDING FLUORESCENT TASK LIGHT	FURN. VENDOR	
	GROUND BUS BAR	MIN. 1" x 6" x 1/4" PRE-DRILLED COPPER GROUND BUS BAR	FURN. VENDOR	TIE TO UNDERFLOOR GROUND GRID BY TELECOM CONTRACTOR
	INPUT EXTENSION CABLES	USB TYPE CABLE EXTENSIONS (AS NECESSARY)	FURN. VENDOR	SEE NOTE #3
	SCREEN EXTENSION CABLES	VGA TYPE CABLE EXTENSIONS (AS NECESSARY)	FURN. VENDOR	SEE NOTE #3
	POWER DISTRIBUTION	MIN. 8 OUTLET 20 AMP POWER STRIP	FURN. VENDOR	SEE NOTES #4, 5, & 6
	ELECT HEIGHT ADJUSTMENT	POWERED LIFT BASE - KEYBOARD AND DISPLAY PLATFORM	FURN. VENDOR	

NOTES:

- 1.) CCTV CAMERA FEEDS TO BE TIED INTO WORKSTATION VIA ADMIN-LAN CONNECTION TO NETWORK EQUIPMENT LOCATED IN SYSTEMS ROOM #116. ADMIN LAN EQUIPMENT BY OWNER. SEE ASSOCIATED ELECTRONIC SECURITY DRAWINGS FOR INSTALLATION DETAILS.
- 2.) REMOTE ACCESS CONTROL TO BE TIED INTO WORKSTATION VIA RADIO CONSOLE AUXILIARY INPUTS. SEE ASSOCIATED ELECTRONIC SECURITY DRAWINGS FOR INSTALLATION DETAILS AS WELL AS NECESSARY COORDINATION WITH OWNER AND RADIO SYSTEM VENDOR.
- 3.) FURNITURE VENDOR/MANUFACTURER TO SUPPLY/INSTALL INPUT AND SCREEN SIGNAL EXTENSION CABLES AS NECESSARY. EACH EXTENSION CABLE SHALL BE APPROPRIATELY TESTED AND LABELED ON EACH END.
- 4.) POWER STRIPS SHALL BE LOCATED IN SUCH A MANNER THAT MONITOR, PC AND EQUIPMENT POWER CORDS DO NOT EXCEED 6' IN LENGTH. COORDINATE QUANTITY OF POWER STRIPS WITH ELECTRICAL DRAWINGS/CIRCUIT COUNT AND OWNER REQUIREMENTS.
- 5.) POWER AND COMMUNICATIONS CABLING SHALL BE SEPARATED TO THE GREATEST PRACTICAL EXTENT.
- 6.) EACH POWER STRIP SHALL BE LABELED TO IDENTIFY UPS OR NON-UPS CIRCUITS.

APPENDIX F – TRANSITION AND MIGRATION PLAN TEMPLATE

The project plan outline that follows is a template that may be used for initiating transition and migration planning. This is a dynamic outline and planning document that provides a generic starting point for communications center management and decision-makers to begin planning activities. This outline will require detailed review and revision during the planning phase of regionalization/consolidation to further customize it as the effort moves forward. This plan outline can easily be placed into project management software (for example, MS Project) to allow ease of scheduling. Timelines can be developed and can be overlaid to help develop and illustrate the overall schedule. This is an important tool for coordinating construction and technology schedules and operational transitions.

Note: Not all items listed may be applicable to a specific initiative.

A. Future Facility

- Identify Facility Requirements
 - Spatial
 - Redundancies
 - Pathways
 - Wiring infrastructure
 - Technologies
 - Furnishings
 - Dispatch console furniture
 - Other technical furnishings
- Program to Accommodate Systems & Operations
 - Studies and permitting
 - Facility implementation
 - Design
 - Schematic design
 - Design development
 - Construction documents
 - Bid
 - Build
- Utilities/Connectivity
 - Telephone/Data - dual facility entrance
 - Power - diverse power grid
 - Commercial broadband/ISP
 - Cable TV
 - Fuel/natural gas
- Building Occupancy
 - Systems installation
 - Testing

- Acceptance
- Training
- Closeout

B. Systems (Technology)

- Identify System Requirements - *Each PSAP*
 - Inventory 10-digit lines
 - Identify use (Emergency versus agency Admin)
 - Make decision whether to keep line at agency, or transition for consolidated PSAP coverage
- Computer Aided Dispatch
 - Collect data and define requirements for new system
 - CAD incident types
 - Interface requirements
 - CAD incident dispositions
 - Define data conversion requirements
 - Response boundaries and unit recommendations
- Logging Recorder
 - Verify inventory
 - Evaluate systems (configuration requirements and review of agency/system statistics)
 - Identify system requirements
 - *For each PSAP*
 - Inventory existing channels (determine ""what"" is being logged)
 - Determine Analog, IP, or Digital
 - Determine special procedures and agency-specific requirements (recording requirements, reporting, etc.)
- CPE
 - Verify inventory
 - Evaluate systems (configuration requirements and review of agency/system statistics)
 - Identify system requirements
 - *Each PSAP*
 - Determine ring-down requirements, speed dials, etc.
- GIS
 - Determine mapping layers for CAD use
 - Determine feasibility of point layer for address verification
 - Determine status of jurisdictional boundary, beat, and response zone layers (shape files)
 - Determine ortho-photography layer status, accuracy, and synchronization with point layer(s) and building footprints

C. Future Systems

- CAD System Procurement
 - Needs assessment
 - RFP development
 - RFP evaluation
 - Bid evaluation
 - Vendor and contract negotiation - work effort (after the selection of the primary vendor and before award of contract. This effort assumes that contract negotiation is successful.)
 - Completion of vendor and contract negotiations - milestone
- CAD Implementation
 - CAD hardware procurement and installation
 - CAD master file set-up
 - CAD map set-up
 - CAD master file review and continued set-up
 - CAD interface integration
 - CAD acceptance testing
 - CAD integration testing
 - CAD user training (at least 16 hour per dispatcher)
 - CAD go-live
 - CAD functional testing
 - Closeout
- System Furniture Procurement
 - Turnover of building - Occupancy
 - Furniture layout
 - Furniture assessment
 - Development of layout
 - Review of layout
 - Approval of layout
 - System furniture RFP
 - Contract
 - Contract negotiations
 - Contract award
 - Contract signing / notice to proceed
 - System furniture ordering and installation
 - System furniture installation inspection/training
- Telephony Procurement
 - Installation of console furniture
 - Telephone procurement
 - Network requirements
 - Telephony assessment
 - Development of network requirements

- Review of requirements
 - Approval of requirements
- Telephony RFP (Telephone CPE)
 - Develop telephony RFP
 - RFP distribution
 - RFP evaluation
 - Selection of vendor to begin negotiations
- Contract
 - Contract negotiations
 - Contract award
 - Contract signing / notice to proceed
- Telephony Equipment Ordering and Installation
 - Order telephony hardware and equipment
 - Telephony equipment shipped
 - Unpack and inventory hardware and equipment
 - Hardware and equipment installed
 - Software installation, internal programming and internal testing
 - Completion of hardware and equipment installation
- Develop call flow plan
 - ACD call flow (how incoming calls flow)
 - Call overflow process
 - Transferring calls
 - Console layout
 - Incoming line/button layout
 - Call queues
 - Agent set ups and logins
 - Agent work modes
 - Naming conventions
- Telephony circuits
 - Order 9-1-1 trunks
 - Install 9-1-1 trunks
- Admin phone lines
 - Order admin lines
 - Install admin lines
- Telephony equipment testing
- Coordinate & test E9-1-1 CAD interface
- Digital recorder cross connects
- Telephony system training
 - System administrator
 - Management information system - answering position
 - Management information system – PBX
 - Answering position training – users
 - Administrative phone system training
- System acceptance & readiness for cutover
- Commencement of system maintenance/warranty

- Logging Recorder Procurement
 - Network design
 - Logging recorder & channel assessment
 - Positions to be recorded
 - Phone lines to be recorded
 - Radio channels to be recorded
 - Q/A software requirements
 - IRR needed
 - Development of network design
 - Review of network
 - Approval of network
 - Logging recorder RFP
 - Recording equipment ordering and installation
 - Digital recorder software/cross connects
 - Recording equipment inspection/training
 - System acceptance & readiness for cutover
- Radio Consoles
 - Radio design
 - Console/equipment room configuration/assessment
 - Positions available/needed.
 - Back room equipment available/needed.
 - Features to be included
 - Development of network design
 - Types of consoles
 - Interfaces to other systems
 - IRR
 - Migration issues, if any
 - Review of design
 - Approval of design
 - Radio system SOW
 - Radio FCC licensing
 - Contract
 - Radio equipment ordering and installation
 - Radio equipment inspection/training
 - Radio acceptance test
 - Radio system acceptance & readiness cutover
- Master Clock
 - Design/redundancy
 - Radio consoles
 - CAD
 - Logging recorder
 - Telephone CPE

- LAN/IT network
 - Mapping/GIS
 - Wall clocks
 - Cabling/connectivity
 - Procurement
 - Installation
- Structured Cable System
 - Implementation
 - Design review
 - Testing
 - Cable infrastructure inspection / acceptance
 - Final inspection and acceptance
 - Readiness for cutover
 - System available
- Electronic Security System
 - System installation
 - Implementation
 - Finalize design - coordinate w/ architect
 - Installation complete
 - System operational test
 - Electronic security inspection / acceptance
 - Final inspection
 - User training
 - Readiness for occupancy
 - System available
- Audio Visual System
 - System installation
 - Implementation
 - Finalize design
 - Product order placed
 - Installation process
 - System operational test
 - System control inspection / acceptance
 - Final inspection
 - User training
 - Readiness for cutover
 - System available/burn in/stability testing
- LAN & WAN
 - System installation
 - Implementation
 - Finalize design - coordinate w/ architect and PSAP management

- Verify data jacks for specialized systems in admin areas
 - CAD
 - 9-1-1 MIS
 - Logging recorder
 - CPE activity monitor
 - Radio console admin
- Installation complete

➤ System Control Inspection / Acceptance

- Punch list inspection
- Punch list corrections
- Final inspection
- Acceptance
- Readiness for cutover
- Network security verified
- IP addressing
- System available

D. Operations

- Staff/equipment migration
- Readiness
- Develop move/stay plan and equipment list
- Arrange for mover
- Orient staff to move parameters
- Staff facility tours
- Finalize new facility operating procedures
- Verify facility readiness
- Building activation/acceptance
- Building systems tests
- Fire suppression
- Emergency power off buttons
- Generator/UPS
- Test corrections/operating procedure modifications
- Final operations inspection
- As-built review and cataloging
- Electronic asset management database
- Acceptance

E. Staff Facility Training

- Conduct needed training
- Cutover

F. System Available

- Go / no go decision
- Cut over/live calls
- Debrief/lessons learned

G. Facility Dedication

- Schedule
- Arrangements
- Announcement
- Ceremony

H. Operations Transition

- Current operations

Review current operations and assess any change in operations that will be necessary with the move to the new facility.

- Verify inventory
- Training
 - New facility
 - Security/building access
 - Backup systems/power/UPS/generator
 - HVAC
 - Fire alarm/protection
 - System furniture
 - New technology
 - Telephone
 - CAD
 - Radio consoles
 - Logging recorder
 - Audio visual system
 - Operations
 - Policies and procedures
 - Standard operating guidelines
 - Facility and operations acclimation training
- Training locations
- Training staff
- Staffing

Review and address any staffing requirements that will be needed for required training. This includes any changes in schedules that will be required to allow staff to be trained and/or any changes in schedules that will be needed to cover existing operations while staff is being trained.

- Staffing levels

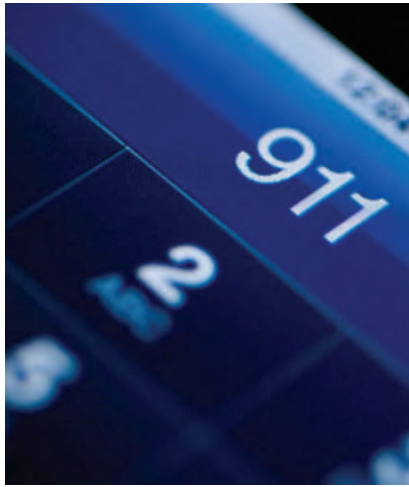
Identify required staffing levels for existing operations while training is being conducted.

- Overtime procedures
- Workload definitions
- Call volume determinations
- Peak times
- Radio traffic channel usage/availability
- Standard operating guidelines (related to the transition only)
- Backup procedures
- Work flow processing on processes affected by move/transition
- Emergency operating procedures (how used during transition)
- Adjacencies
- Admin office
- EOC
- Other agencies and departments
- Evaluation of inventoried processes

I. Future Operations

- Identification of New Operations Requirements (What is required operationally to bring new facility on-line)
- Staffing
- Overtime Needs
- Duration planning for transition time frame
- Scheduling
- Standard Operating Procedures
- Backup Procedures
- Emergency Operations
- Mutual Aid and Other Agency Dependencies
- Workflow Processing
- Workload
- Anticipating Call Volumes
- Radio Channel Assignment and Usage
- Programming to Accommodate Facilities & Systems
- Implementation of Operations Transition Plan
- Testing
- Acceptance
- Training
- Cutover

- J. Media Relations
- K. Go/No-Go Decisions
- L. Contingency Plans
- M. Post Cut-over Status Monitoring/Stability



Report for

Regionalization Recommendations and Implementation Addendum

prepared for

The Towns of Sudbury, Wayland,
Weston, Concord, Acton,
Maynard, Lincoln and Boxborough,
Massachusetts

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1. INTRODUCTION

In November 2011, L.R. Kimball provided the Towns of Sudbury, Wayland, Weston, Concord, Acton, Maynard, Lincoln and Boxborough (collectively, the Towns) with its Regionalization Recommendations and Implementation report. The Towns jointly commissioned L.R. Kimball to assess, inventory and analyze current conditions; and to provide recommendations regarding feasibility of a regional approach to emergency communications.

Through the course of the study, L.R. Kimball has determined that regionalization of all eight towns is practical and feasible from a political and financial perspective.

At the request of the State of Massachusetts Regional PSAP¹ Coordinator, Christine Sheridan, L.R. Kimball expanded on specific areas of the Regionalization Recommendations and Implementation report. The additional report content is presented here in the form of a report addendum.

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¹ Public safety answering point

2. IMPACT OF REGIONALIZATION TO PUBLIC ACCESS

A primary concern expressed by the agencies is the potential loss to the community of 24/7 access to public safety agencies. While how the service is delivered will change, the community will still have 24/7 access to public safety agencies. 9-1-1 calls will be received by the regional center where local public safety agencies will be dispatched. Administrative calls will be processed much as they are now. Citizens can visit an agency or call phone lines dedicated to administrative calls during regular business hours. After business hours, the public will need to be redirected to the regional center for issues that require immediate attention or directed to appropriate voicemail for specific administrative questions or concerns.

The following programs were specifically identified regarding this issue of public access:

- The Safe Haven Act of 2004² – The Massachusetts Safe Haven Act of 2004 decriminalized the abandonment of newborn infants by allowing the voluntary abandonment to a hospital, police department, or manned fire station. The key parts of this legislation state any newborn infant seven days of age or less that is voluntarily placed with a hospital, police department, or fire station by a parent of said newborn infant shall not constitute neglect or abuse or violation of abuse or neglect statutes. This Act requires that the delivery of an infant be to an appropriate person at any of these agencies.

In a regional center scenario where police or fire stations may be closed after hours, a phone would need to be installed either in an open lobby or outside the building that will automatically ring in the regional center. The regional center would then dispatch the appropriate police or fire personnel to take custody of the infant. Video cameras may also be used to monitor or view the entrances of the facility after hours. This would not be monitored by the regional center; however, access to this feed would enable the regional center to monitor or view the area when needed.

- The Clean Needle Program – The Clean Needle Program is a needle exchange program that has established four pilot programs in Massachusetts. According to the Aids Action Committee website³, the four locations in Massachusetts that have needle exchange programs are:
 - Boston – Addicts Hope Opportunity Prevention Education (AHOPE)
 - Cambridge – Aids Action Committee of MA
 - Northampton – Tapestry Health Systems
 - Provincetown – AIDS Support Group of Cape Cod

This program will not be impacted by a regional communications center as access to local public safety agencies is not necessary.

² <http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleXVII/Chapter119/Section391-2>

³ http://action.aac.org/site/PageServer?pagename=info_needles

- Elder Abuse Counseling – Elder abuse counseling will not be impacted by regionalization. The Sudbury-Wayland-Lincoln Domestic Violence Roundtable recommends that victims or witnesses to elder abuse call 9-1-1 to report it.

Reports to 9-1-1 will still be processed and dispatched to the appropriate agency.

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3. TELECOMMUNICATOR ANCILLARY DUTIES

As is commonly found in smaller PSAPs, the PSAP staff currently performs a variety of duties in addition to those related to the receipt and processing of 9-1-1 calls and the dispatch of field personnel. The participating agencies have nine to thirty non-emergency communications-related ancillary duties. Some of these duties, such as sending animal control or notifying public works, may be provided by the regional center, but many of the duties will not. How the duties that remain with each municipality are absorbed and who performs the duty is often of primary concern to those considering a regional PSAP. If additional staff must be hired within the municipality to perform these duties, then any potential cost savings realized as a result of the regionalization effort will be reduced. Each agency will need to evaluate these tasks and decide if they really need to be provided in the same manner as exists today or if they can be discontinued or provided in a manner that does not require after-hours staffing.

All PSAPs in this study are located off of the front lobby of their respective facilities. The dispatchers are all tasked with greeting people entering the building, and most answer administrative calls for police, fire, or other municipal needs, which are routed or transferred accordingly. During normal business hours, most agencies will want someone to perform the administrative duties that are currently performed by the 9-1-1 dispatcher. Clerical work, filling overtime or detail requests, permits, prisoner monitoring, fleet maintenance records, lost and found, burning permits, and reports are all functions that will not move to a regional 9-1-1 center. The potential impact on these duties on the current PSAPs if a regional 9-1-1 dispatch center is established is identified below.

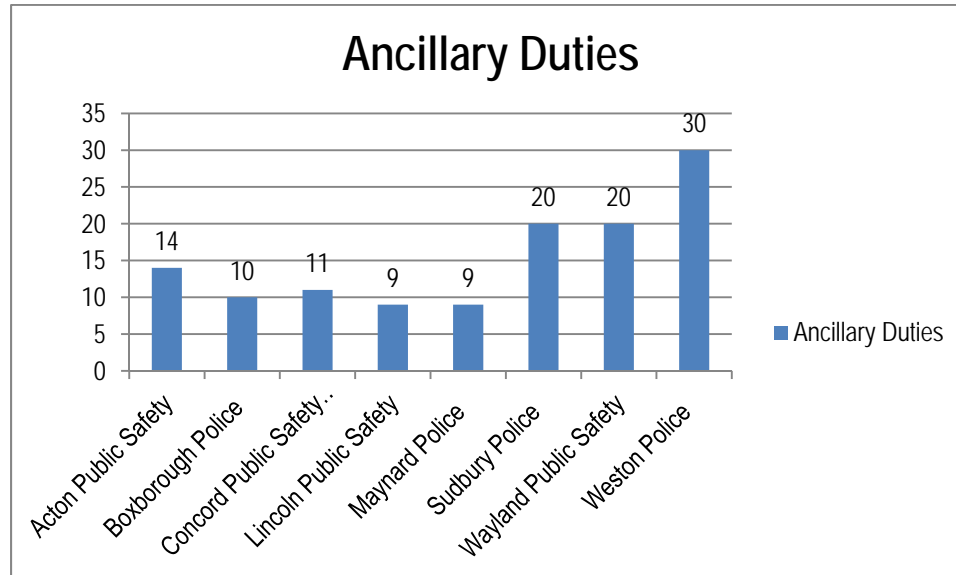


Figure 1 – Number of Ancillary Duties by PSAP

3.1 Acton Public Safety

The Acton Public Safety building is located on Main Street in Acton. The Police Department's Records Section currently provides a person to greet people entering the building during business hours. Anyone entering the building after business hours and on weekends is greeted by the dispatch staff. Because of the central location of the building in the downtown area, an additional administrative person may be required in the early evening hours to provide assistance to any walk-in traffic should regionalization of emergency communications take place. Answering administrative calls, selling parking stickers, and fire inspection-related duties are functions that will remain within the municipality. These and/or other ancillary duties may need to be re-assigned or redirected to existing or new administrative staff. The police department will need to provide a system and/or person to maintain and fill the police detail list. Since the Acton facility provides support for police and fire, additional duties may need to be assigned to current staff or new staff. If the eight communities were to create a regional 9-1-1 dispatch center, Acton's ancillary duties may require staffing their former PSAP with administrative personnel 12 hours a day, Monday through Friday. Depending on the nature of permits or licensing by police and/or fire, limited weekend hours may be necessary.

3.2 Boxborough Police Department

The Boxborough Police Department is located away from the town's center and is in a sparsely populated part of the community. Given the physical location of the facility, it may be more difficult to reassign duties to existing employees. Therefore, Boxborough may need additional clerical staff to greet people entering the building during business hours, answering administrative calls, assisting with clerical duties that are currently performed by PSAP staff, conducting daily welfare calls to senior citizens, and maintaining database information on their local community. Walk-in traffic for the Police Department is approximately 1,000 a year and most happen between 7:00 a.m. and 11:00 p.m. Weekend walk-ins numbers are slightly less than the weekday traffic.

3.3 Concord Public Safety

The Concord Public Safety complex is located in downtown Concord. Because of the town's historic significance, the complex receives a large volume of foot traffic. Should regionalization occur, it will require administrative or clerical staff to greet walk-in traffic, assist tourists and visitors with directions, and to update files for the police and fire departments. The complex will likely require weekend staffing as well due to the amount of foot traffic.

3.4 Lincoln Public Safety

The Lincoln Public Safety building is located on Lincoln Road and is removed from the center of the town. Lincoln Road is a two-lane municipal road that is not located near any main thoroughfares. As a result of these location characteristics, the area has very little foot traffic. The joint public safety facility will require some administrative staff to greet members of the public, answer administrative phones for the police and fire departments, and provide the parking lot registration stickers for residents. Some early evening and limited Saturday hours may need to be covered by administrative personnel. Lincoln Police indicated if they joined a regional 9-1-1 center they would still need to staff their building on a 24/7 basis.

3.5 Maynard Police Department

The Maynard Police Department is located on Main Street, adjacent to the Town Office building. Administrative or clerical staff will be needed to greet the public, answer administrative calls for the department, assist with police-related matters, and queries concerning the Town Office after business hours. Staffing will be required after normal business hours, but it will not be necessary during the overnight hours. The police department will need to provide a system and/or person to schedule or fill details and overtime shifts. Maynard plans to staff their department with a police officer on a 24/7 basis.

3.6 Sudbury Police Department

The Sudbury Police Department is located on Route 20, which is a heavily travelled two-lane roadway through the region. Foot traffic is limited, but drive-up traffic is quite common. The department will require administrative staff for walk-in traffic and for a variety of ancillary duties, including tracking the vehicle maintenance schedule, burn permits, lost and found, maintaining the contact list, and miscellaneous data entry tasks for the department officers. Staffing would encompass business hours and early evening hours.

3.7 Wayland Public Safety

The Wayland Public Safety building is located just off Route 20, which is a heavily traveled roadway that runs through this region. Walk-up and drive by traffic will require staffing the building during normal business hours into the early evening. The ancillary duties that will need to be provided by the administrative staff include greeting walk-ins, business (non-emergency) calls, data entry for police reports, burning permits, and managing the Home Check log for town residents.

3.8 Weston Police Department

The Weston Police Department is located on Route 20, which is the main travel route in the region. Drive-up traffic will require administrative staff during business hours into the early evening hours. Ancillary duties for this staff will include walk-in traffic, directions, issuing a variety of permits (pistol, parking, and burial), office supplies and printing equipment, data entry, reports, forms, filing, and officer paid detail forms.

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4. DARK OR CLOSED STATIONS

Another issue that arises out of regionalization and the associated reduction of staff on-duty 24/7 is a dark or closed station. When each municipality has its own PSAP, there is staff on-duty around the clock. Once a regional PSAP is established, built-in 24/7 staffing is no longer there at the local level, which results in dark or closed stations after normal business hours. Dark stations present two main concerns for police departments. First, departments are often concerned that failure to have the station open on a 24/7 basis will be perceived as a lowering of service levels by the community. Second, departments are concerned about who will monitor prisoners if the station is closed on off-hours.

Each of the eight municipal PSAPs is located in a police department or a public safety complex containing both police and fire departments, and has a lock-up for prisoners. Dispatchers are able to monitor prisoners and cells while they are processed. If any of these communities decide to pursue regionalization of 9-1-1 and dispatch, the individual departments may consider a regional lock-up model or may continue to use their own facility. If a "dark or closed" station is used, the department must develop or maintain policies and procedures to address the handling of prisoners. The procedures in a "dark or closed" station should be based on officer safety. These rules should include the need to have another officer present during the booking process.

After the booking process is complete, Massachusetts requires that each occupied cell be visibly or physically checked by a law enforcement officer or lock-up personnel as is required by a reasonable standard of care of detainees.⁴ Staffing a lock-up facility would only be necessary when a prisoner is being held. It is not necessary to staff a facility 24/7. When court is in session, people who are arrested can be brought to the court of jurisdiction. When the court is closed, the arrested party usually has a right to be released on bail. The bail commissioner who is contacted will hear the facts surrounding the arrest and the commissioner will set bail or order that said person is held without bail. Generally, only a small portion of people who are taken into custody are held without bail and have to be jailed over night. Based on the number of arrests per year provided by the eight police departments, no departments have prisoners in their cells every night of the week.

Barring union or contract issues, auxiliary or special police officers or authorized lock-up personnel could be used for prisoner watches. Staffing these lock-up facilities could be done using on-call personnel who can respond to the facility in a reasonable amount of time. These individuals could be paid a stipend for the on-call status and a four hour minimum if utilized. The processing and bailing of prisoners will usually take several hours. If the individual in custody is incapacitated or in custody for a non-bailable warrant or cannot make bail, staff will be required to monitor and check the individual until the next sitting of the court. All district courts in Massachusetts are in session Monday through Friday. Anyone arrested from Friday evening through Sunday will be arraigned Monday morning. The police departments involved in this study have procedures in place regarding prisoners who are detained overnight and on weekends. Sudbury and Weston use dispatch staff to monitor prisoners. Maynard uses the officer assigned dispatch duties to monitor prisoners. Boxborough uses civilian lock-up personnel to monitor their prisoners. The remaining police departments use uniformed officers for prisoner watches. All departments require the use of sworn officers if the prisoner is a suicide threat.

⁴ <http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleVII/Chapter40/Section36BH>

4.1 Acton Police Department

Acton Police arrests approximately 222 people annually. Acton is assigned to Concord District Court and bail commissioners are assigned on a rotating schedule. Acton has four male cells, two female cells, a group cell that can hold up to 11 people and two juvenile rooms. Based on the size, condition and location of the public safety facility, Acton could serve as a regional lock-up for all the agencies in the area who are assigned to Concord Court.

4.2 Boxborough Police Department

Boxborough Police arrests approximately 129 people annually. They are the only department in this study assigned to Ayer District Court for criminal matters. In Massachusetts, each district court in the county has its own bail commissioners. Participating in a regional lock-up with the other communities in this study will be problematic for Boxborough because of the court jurisdiction. Dispatchers currently monitor prisoners during the booking process, but Boxborough Police use civilian staff (not dispatch) for prisoner watch duties. The system is the most cost effective option for them based on an hourly rate of \$14.59 per hour. Boxborough may want to ascertain if the agencies that are part of the Devens Regional Communication Center (RCC) plan to address the regional lock-up issue, because the four agencies in the Devens RCC are all assigned to Ayer District Court.

4.3 Concord Police Department

Concord Police arrested 280 people in 2011. If prisoners are held overnight, an officer remains in the building to monitor and physically check the prisoners. Concord has three adult cells and one female/juvenile cell. The district court is located in Concord, which may make Concord an option for a regional lock-up for the three other towns in this study who are assigned to Concord District Court.

4.4 Lincoln Police Department

Lincoln Police averages 80 to 100 arrests annually. Lincoln has two jail cells that can be partitioned to accommodate a female prisoner. Prisoners held overnight have to be monitored and checked by a uniformed officer. Lincoln is served by Concord District Court. If regionalization of emergency communications is pursued, Lincoln may be able to contract with Acton or Concord for use of their lock-up.

4.5 Maynard Police Department

Maynard Police arrested 225 people in 2011. Maynard has three male cells, one female cell, and a handicapped accessible cell located in the basement of the building. Currently overnight prisoners are monitored and checked visually via closed circuit television (CCTV) by the officer assigned dispatch duties. Maynard's criminal cases are assigned to Concord District Court. If regionalizing emergency dispatch is pursued, Maynard may be able to contract with Acton or Concord for use of their lock-up.

4.6 Sudbury Police Department

Sudbury Police averages 150 to 200 arrests annually. Sudbury has three adult jail cells and one juvenile holding room. If a prisoner is held overnight, the dispatcher conducts a cell tour every 15 minutes. If a prisoner requires a hospital trip or is a serious suicide threat, an officer will be assigned. If this creates a shortage of patrol units, a replacement will be called in. Criminal cases for Sudbury and Wayland are heard in Framingham District Court.

Since both departments use the same court and bail commissioner, they may want to use each other's lock-up facilities on a weekly or monthly alternating schedule. However, the arrest rate for the two departments is quite different. Wayland has approximately 70 arrests, while Sudbury has 150 to 200 arrests annually; therefore, an appropriate usage fee would need to be negotiated.

4.7 Wayland Police Department

Wayland Police averages 70 arrests annually. If a prisoner is held overnight and is low risk, dispatchers will monitor them on video and audio feeds, and an officer will conduct a check every half hour. High risk prisoners require constant video and audio monitoring by the dispatcher and an officer will be called in for prisoner watch duty. Criminal cases in Wayland are heard in Framingham District Court.

4.8 Weston Police Department

Weston Police arrested 93 people in 2011. If a prisoner is held overnight, audio and video feeds from the cells are monitored by the dispatcher. If the prisoner is a suicide risk, an officer is assigned to check every 15 minutes. Criminal cases in Weston are heard in Waltham District Court. No other municipality in this study is assigned to Waltham District Court.

4.9 Summary

According to Massachusetts General Law (MGL), Chapter 40, Section 34, each town containing more than 5,000 inhabitants must maintain a secure and convenient lock-up to which persons arrested without a warrant may be committed. A magistrate may commit a prisoner charged to the lock-up in a town where the prisoner was arrested or in a town where court is held.⁵ Based on this MGL, it could only be inferred that any region-wide lock-up plan could only involve a facility "in a town where the court is held." But according to MGL Chapter 40 Section 4J, which covers public safety mutual aid agreements and defines "mutual aid assistance," the cross-jurisdictional provision of emergency services, materials or facilities from one party to another when existing resources are, or may be, inadequate,⁶ allows for agencies who have such agreements to share existing resources. As a result, police departments with mutual aid agreements could create a regional lock-up plan, which could involve each department providing their facility on a rotating basis or it could be one department that offers the service and personnel for a fee.

The court of jurisdiction for the eight towns is not the same, which creates an issue for a regional lock-up plan. Acton, Concord, Lincoln, and Maynard are assigned to Concord District Court. Sudbury and Wayland are assigned to Framingham District Court. Boxborough is assigned to Ayer District Court, while Weston is assigned to Waltham District Court. Each court has their own bail commissioners and the commissioners are specific to their court's jurisdiction. Creating a regional lock-up for all eight towns or either one of the grouping of four would require agreements of the one, two or three other district courts and/or their bail commissioners to travel outside of their jurisdiction in order to bail prisoners for their court.

⁵ <http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleVII/Chapter40/Section34>H

⁶ <http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleVII/Chapter40/Section4J>H

Table 1 identifies the number of jail cells, the number of arrests, prisoner watch policy, and court of jurisdiction. Based on the arrest numbers provided by the police departments, Lincoln, Wayland and Weston average less than two arrests per week. Acton and Sudbury average between two and four arrests per week. Concord and Maynard average four to six arrests per week, and Boxborough averages over six arrests per week.

Table 1 – Holding Cell Overview

	Number of Cells	Arrests Per Year	Average Arrests Per Week ⁷	Prisoner Watch	District Court
Acton Public Safety	4 male, 2 female, 1 gang, 2 juvenile	222	4.27	Monitored by officer	Concord
Boxborough Police Department	3 adult	129	2.48	Lock-up personnel (Civil - \$14.59 per hr)	Ayer
Concord Public Safety Communication	3 adult	280	5.38	Monitored by officer	Concord
Lincoln Public Safety	2 with a partition for female	80 – 100	1.54 – 1.92	Monitored by officer	Concord
Maynard Police Department	3 male, 1 female, 1 handicapped accessible	225	4.33	Monitor video and audio from dispatch - 2-way audio	Concord
Sudbury Police Department	3 adult, 1 juvenile	150 – 200	2.88 – 3.85	Dispatcher tours cells every 15 minutes	Framingham
Wayland Public Safety	2 male, 2 female, 1 juvenile	70	1.35	Low risk/cooperative prisoner - constant video and audio monitoring by dispatcher and an officer every half hour	Framingham
Weston Police Department	3 adult, 1 female / juvenile, 1 padded cell	93	1.79	Monitor video and audio from dispatch - 2-way audio - Q5 requires officer to check every 15 minutes	Waltham

4.10 Potential Solutions

A closed station is concern for most police departments in regards to how walk-in traffic and monitoring prisoners will be handled. Many police departments across the country secure their building after-hours. Visitors communicate with staff inside the building via intercom or telephone. Each town in this study allows after-hours walk-in traffic. However, walk-ins must communicate with the dispatchers through a reinforced window in the lobby. In a regional dispatch environment, technology will allow emergency dispatchers to communicate via audio and/or video means,

⁷ Average arrest per week is based on arrest per year number divided by 52 (weeks). It does not account for seasonal fluctuations.

and open lobby doors to provide a safe and secure place until an officer arrives. The options available to the individual department can be geared to personal preferences. An audio Internet Protocol (IP) solution that provides remote building (lobby) access may cost between \$5,000 and \$10,000 per location. This same system could provide for an alternate mode during business hours.

Table 2 – Audio IP Cost Estimates

Regional 9-1-1 Center	Audio IP Secure Building System	Maintenance Agreement (Annual)
8 Towns	\$40,000 to \$80,000	\$4,000 to \$8,000
2 Centers of 4 Towns	\$20,000 to \$40,000 (each center)	\$2,000 to \$4,000 (each center)

4.11 Staffing Current Facilities

In order to determine the best option for each community, it is important to determine whether a station actually needs to be kept open after business hours by assessing the ancillary duties not transferred to a regional PSAP. Can any of them be performed by other agencies or departments and still provide the same level of service? Walk-in traffic is a concern for all the PSAPs. The best way to determine when a police station needs to be open is to track the number of people who visit the station after business hours, when they visit, why they visit (appointments, make a complaint, etc.) and how did they arrive at the station. Each question can identify information to define the town's real needs and expectations. The data collected will provide each agency with a clear and accurate picture as to the use of the facility. It will also identify busy days and times for staffing purposes. The reason for the visit can lead to considering other methods to fulfill the same needs better, faster, and more economically.

4.12 Staffing Costs

Each agency provided a salary range for a single staffing position. Table 3 identifies the cost for staffing each agency with administrative personnel. The higher amount was used if a salary range was provided. Agency responses were wide ranging; therefore, table includes the costs of providing an administrative staff based on three basic options:

- 8 hours a day – seven days a week
- 16 hours a day – seven days a week
- 24 hours a day – seven days a week

Table 3 – Cost Estimates for Staffing Options

	Annual Salary	Annual Cost (8 hrs per day)	Annual Cost (16 hrs per day)	Annual Cost (24 hrs per day)
Acton Public Safety	\$56,000	\$132,720	\$176,960	\$265,440
Boxborough Police Department	\$50,440	\$119,543	\$159,390	\$239,086
Concord Public Safety Communications	\$42,728	\$101,265	\$135,020	\$202,531
Lincoln Public Safety	\$34,000 to \$45,000	\$106,650	\$142,200	\$213,300

	Annual Salary	Annual Cost (8 hrs per day)	Annual Cost (16 hrs per day)	Annual Cost (24 hrs per day)
Maynard Police Department	\$50,000	\$118,500	\$158,000	\$237,000
Sudbury Police Department	\$33,960 to \$44,446	\$105,337	\$140,449	\$210,674
Wayland Public Safety	\$53,268	\$126,245	\$168,327	\$252,490
Weston Police Department	\$43,305 to \$48,755	\$115,549	\$154,066	\$231,099

For these calculations, staffing one position 8-hours a day, 7-days a week requires approximately slightly over two employees, which allows for time off, etc. Staffing a position 16-hours a day, 7-days a week requires slightly over three employees, and staffing one position 24-hours a day requires almost five employees.

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5. INSURANCE SERVICES OFFICE (ISO) RATINGS

ISO is the leading source of information about property/casualty insurance risk. ISO classifications have traditionally had significant impact on the insurance rates paid by municipalities or fire districts. ISO assesses virtually every aspect of a department or district and assigns a Public Protection Classification (PPS) or risk factor. The PPC scores range from 1 to 10, with 1 being the highest or best possible score. Insurance companies pay ISO for this information and use it to determine individual department or district insurance rates.

ISO evaluates three main areas:

- Fire alarms and communications systems (10%)
- Fire department (50%)
- Water supply (40%)

The fire alarms and communications system evaluation is based on how well the fire department receives fire alarms and dispatches its resources. The communications center is evaluated by reviewing:

- Number of 9-1-1 operators at the center
- Telephone service, including the number of telephone lines coming into the center
- Listing of emergency numbers in the telephone book
- Dispatch circuits
- How the center notifies firefighters about the location of the emergency⁸

A regional communications center which meets National Fire Protection Association (NFPA) standards recommended in this report will meet or exceed ISO standards for the fire alarms and communications systems for all towns served. The regional center will support current or improve ISO ratings in the areas that are rated under the communications systems. A regional center provides the following:

- More 'operators' in the center providing backfill during high activity periods
- Potential for improved telephone system with more circuits (9-1-1 lines)
- Potential for improved dispatching capabilities through more robust radio system and standardized dispatching protocols

⁸ <http://www.isomitigation.com/ppc/0000/ppc0010.html>

6. COST COMPARISONS

In section 5.5 of the Regionalization Recommendations and Implementation report, L.R. Kimball cautioned that a cost comparison of current costs and costs for a regional PSAP is an apples-to-oranges comparison. Current costs were provided by the PSAP survey forms that were sent to each of the eight primary PSAPs. Not all of the PSAP Costs sections were completed by each PSAP. The "PSAP Costs" worksheet listed nine categories of equipment, facility and personnel expenses found in most PSAPs. Seven of the eight PSAPs provided cost information for 42 of the 63 line items. Facility costs for some of the agencies were not identified; as such L.R. Kimball estimated these based on industry standards. Concord did not provide any PSAP costs; as such, L.R. Kimball estimated total costs based on industry standards and costs of like-size agencies in this study. The 21 items that had no cost information can be interpreted several ways – including agencies had no costs for those items, costs could not be isolated from the larger agency, or determined at the time the survey was completed. Missing information makes an accurate portrayal of current costs and regionalized costs difficult.

One area of the current costs that did show the potential for cost savings, even with only partial information, was technology costs. In "Year Four" of the "Consolidation Costs" for the eight-town regional communication center, the cost of maintaining the computer aided dispatch (CAD) system and the radio systems would be \$63,000 and \$49,000 respectively. In the PSAP survey, seven of the eight PSAPs spent a total of \$192,544 on their CAD system. Five of the eight PSAPs spent \$49,037 on their radio system. Individual expenditures can be reduced in a consolidated / regional organization as a single radio or CAD system will cost less to maintain and will provide a more robust technological support to operations.

The tables and figures below are based on the survey data provided and cost estimates as identified in the initial report. They do not reflect a true comparison of current conditions and the projected costs, but do represent a portrayal of costs for the towns in the three models by three different funding models.

Table 4 and Figure 2 are based on a regional center for all eight towns. These depict the costs identified in the PSAP Survey with the cost estimates in "Year 4" of the "Consolidation Costs" chart (apples to oranges). It contains a comparison based on three funding models: cost per population, cost per 9-1-1 call volume, and costs shared equally by all towns. In this configuration, the three largest towns – Acton, Concord, and Sudbury – account for more than 50 percent of the population and 9-1-1 call volume. The combined population for the three smallest towns – Boxborough, Lincoln, and Maynard – almost equals Acton's population and the combined call volume for the smallest towns is less than the each of the two largest towns.

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Table 4 – 8-Town Regional Center

Primary PSAP	Acton Public Safety	Boxborough Police	Concord Public Safety	Lincoln Public Safety	Maynard Police	Sudbury Police	Wayland Public Safety	Weston Police
2010 Census Population	21,924	4,996	17,668	6,362	10,106	17,659	12,994	11,261
2010 – 9-1-1 Wireless	1,407	220	1,113	388	516	961	782	703
2010 – 9-1-1 Call Total	4,499	746	3,949	1,046	1,477	2,770	2,073	2,426
Current Expenses	\$496,741	\$301,325	\$480,000	\$327,631	\$252,690	\$446,972	\$575,777	\$352,460
Cost Estimate (Yearly)	\$3,311,500							
% of Population	21%	5%	17%	6%	10%	17%	13%	11%
Cost per Population	\$705,073	\$160,671	\$568,200	\$204,601	\$325,007	\$567,911	\$417,885	\$362,152
Difference	\$208,332	-\$140,654	\$88,200	-\$123,030	\$72,317	\$120,939	-\$157,892	\$9,692
% by 9-1-1 Call Volume	24%	4%	21%	6%	8%	15%	11%	13%
Cost by 9-1-1 Call Volume	\$784,707	\$130,116	\$688,777	\$182,441	\$257,615	\$483,138	\$361,568	\$423,138
Difference	\$287,966	-\$171,209	\$208,777	-\$145,190	\$4,925	\$36,166	-\$214,209	\$70,678
Cost Shared Equally								
Cost per Community	\$413,938	\$413,938	\$413,938	\$413,938	\$413,938	\$413,938	\$413,938	\$413,938
Difference	-\$82,804	\$112,613	-\$66,063	\$86,307	\$161,248	-\$33,035	-\$161,840	\$61,478

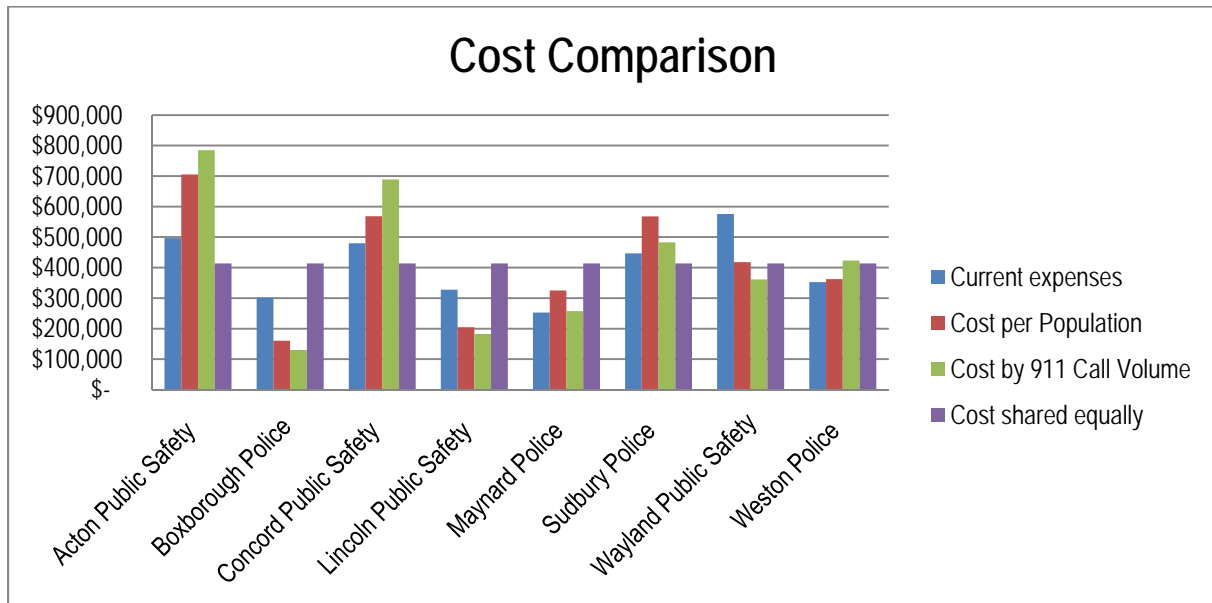


Figure 2 – 8-Town Regional Center

Table 5 and Figure 3 are based on a regional center for Lincoln, Sudbury, Wayland, and Weston. These depict the costs identified in the PSAP Survey with the Cost estimates in “Year 3” of the “Consolidation Costs” chart. It contains a comparison based on three funding models: cost per population, cost per 9-1-1 call volume, and costs shared equally by the towns. Sudbury accounts for 37 percent of the population and 33 percent of the 9-1-1 call volume in this configuration. Weston, which is third in total population, has the second highest call volume. Lincoln, which has the smallest number of people, accounts for the same percentage of 9-1-1 calls – 13 percent.

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Table 5 – Lincoln, Sudbury, Wayland, and Weston Regional Center

Primary PSAP	Lincoln Public Safety	Sudbury Police	Wayland Public Safety	Weston Police
2010 Census Population	6,362	17,659	12,994	11,261
2010 – 9-1-1 Wireless	388	961	782	703
2010 – 9-1-1 Call Total	1,046	2,770	2,073	2,426
Current Expenses	\$327,631	\$446,972	\$575,777	\$352,460
Cost Estimate (Yearly)	\$2,088,500			
% of Population	13%	37%	27%	23%
Cost per Population	\$275,231	\$763,958	\$562,142	\$487,170
Difference	-\$52,400	\$316,986	-\$13,635	\$134,710
% by 9-1-1 Call Volume	13%	37%	25%	29%
Cost by 9-1-1 Call Volume	\$262,727	\$695,748	\$520,681	\$609,345
Difference	-\$64,904	\$248,776	-\$55,096	\$256,885
Cost Shared Equally				
Cost per Community	\$522,125	\$522,125	\$522,125	\$522,125
Difference	\$194,494	\$75,153	-\$53,652	\$169,665

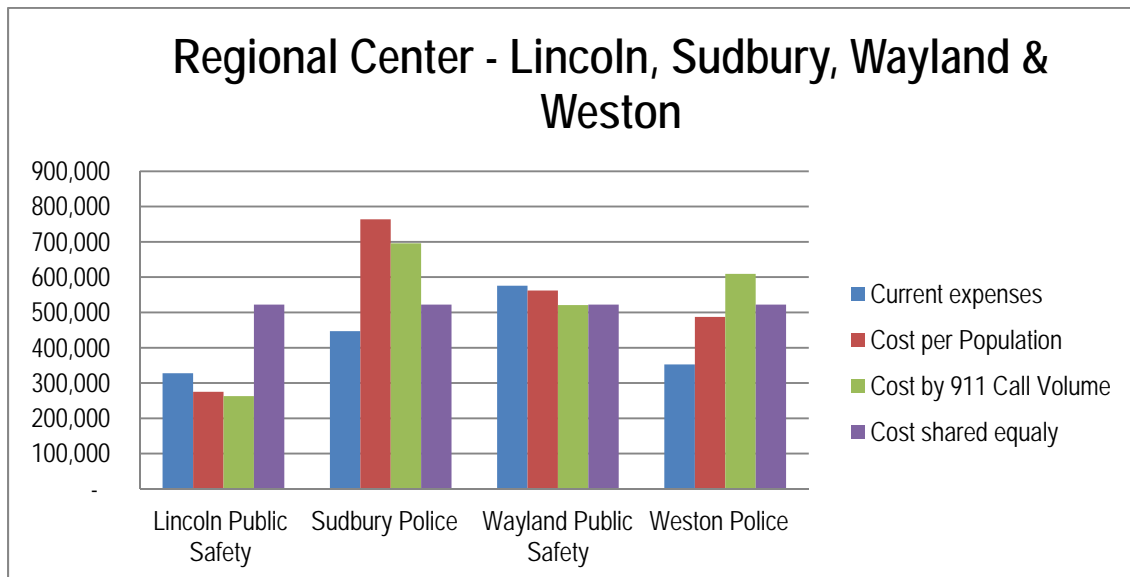


Figure 3 – Lincoln, Sudbury, Wayland, and Weston Regional Center

Table 6 and Figure 4 are based on a regional center for Acton, Boxborough, Concord and Maynard. These depict the costs identified in the PSAP Survey with the cost estimates in "Year 3" of the "Consolidation Costs" chart. It contains a comparison based on three funding models: cost per population, cost per 9-1-1 call volume, and costs shared equally by the towns. Based on this regional center model, the town of Acton has 40 percent of the total population and 42 percent of the 9-1-1 call volume. Concord represents 32 percent of the population and 37 percent of the 9-1-1 calls. Boxborough's and Maynard's population and 9-1-1 call volume together are smaller than Acton and Concord individually.

Table 6 – Acton, Boxborough, Concord, and Maynard Regional Center

Primary PSAP	Acton Public Safety	Boxborough Police	Concord Public Safety	Maynard Police
2010 Census Population	21,924	4,996	17,668	10,106
2010 – 9-1-1 Wireless	1,407	220	1,113	516
2010 – 9-1-1 Call Total	4,499	746	3,949	1,477
Current Expenses	\$496,741	\$301,325	\$480,000	\$252,690
Cost Estimate (Yearly)	\$2,139,500			
% of Population	40%	9%	32%	18%
Cost per Population	\$857,615	\$195,432	\$691,130	\$395,323
Difference	\$360,874	-\$105,893	\$211,130	\$142,633
% by 9-1-1 Call Volume	42%	7%	37%	14%
Cost by 9-1-1 Call Volume	\$902,035	\$149,571	\$791,761	\$296,134
Difference	\$405,294	-\$151,754	\$311,761	\$43,444
Cost Shared Equally				
Cost per Community	\$534,875	\$534,875	\$534,875	\$534,875
Difference	\$38,134	\$233,550	\$54,875	\$282,185

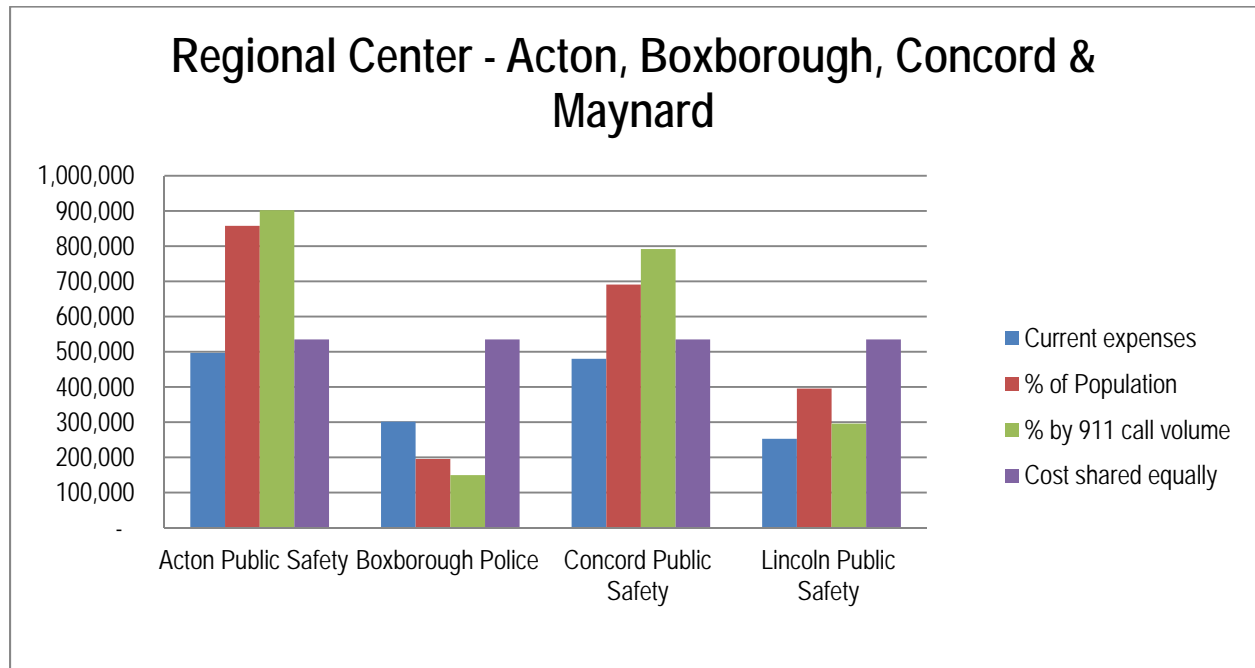


Figure 4 – Acton, Boxborough, Concord, and Maynard Regional Center

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Figures 5 through 12 are a cost comparison for each town based on the three funding models. In each figure, a regional center with all eight towns is the more cost effective model.

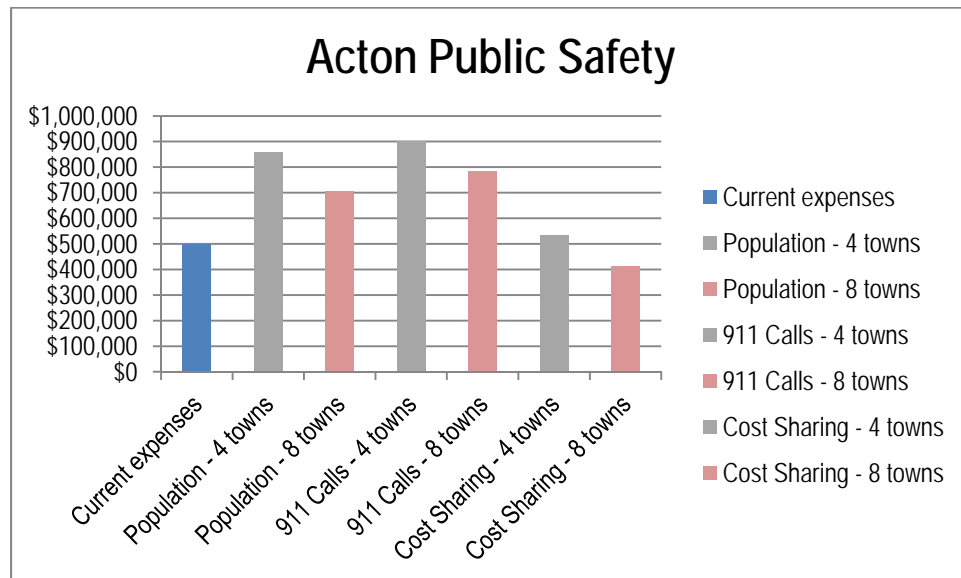


Figure 5 – Acton Cost Comparison

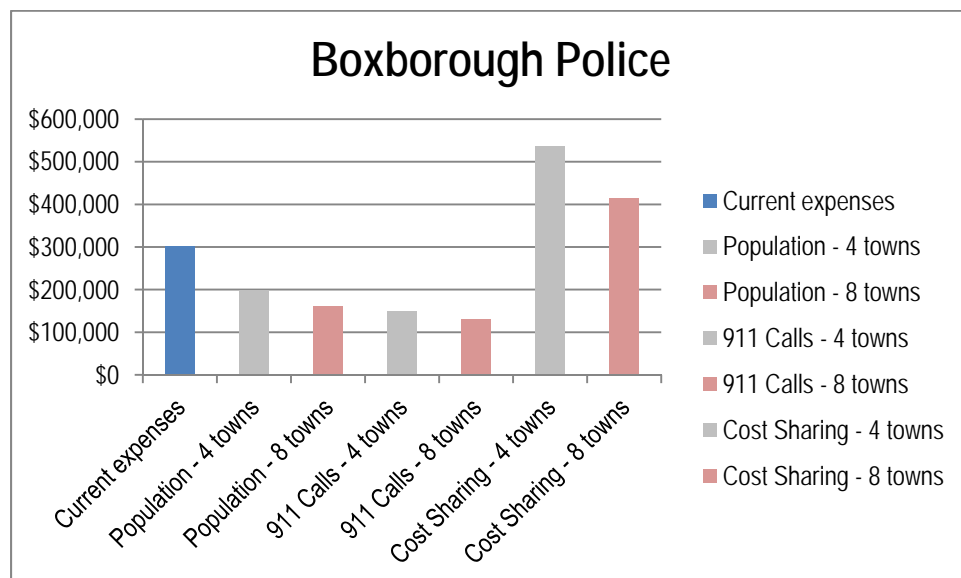


Figure 6 – Boxborough Cost Comparison

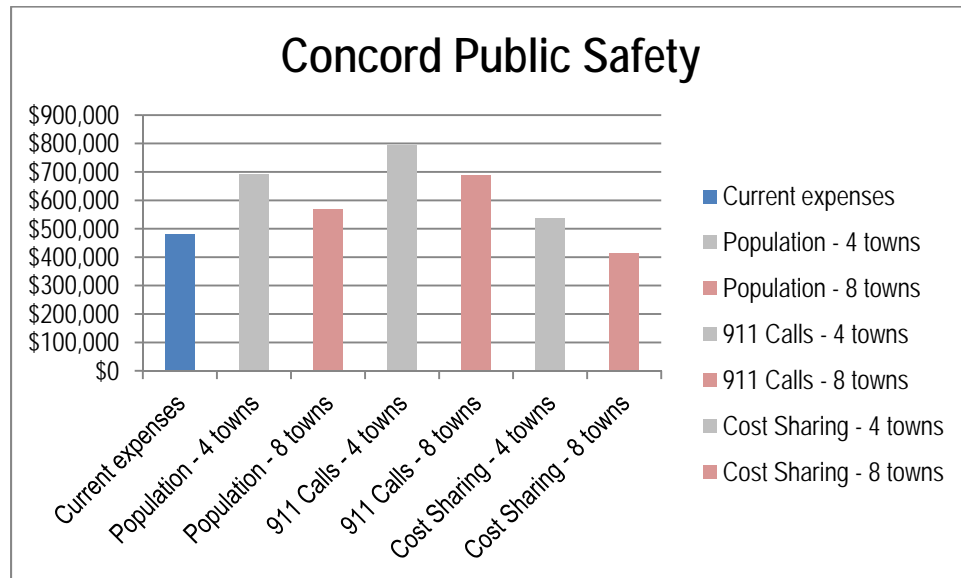


Figure 7 – Concord Cost Comparison

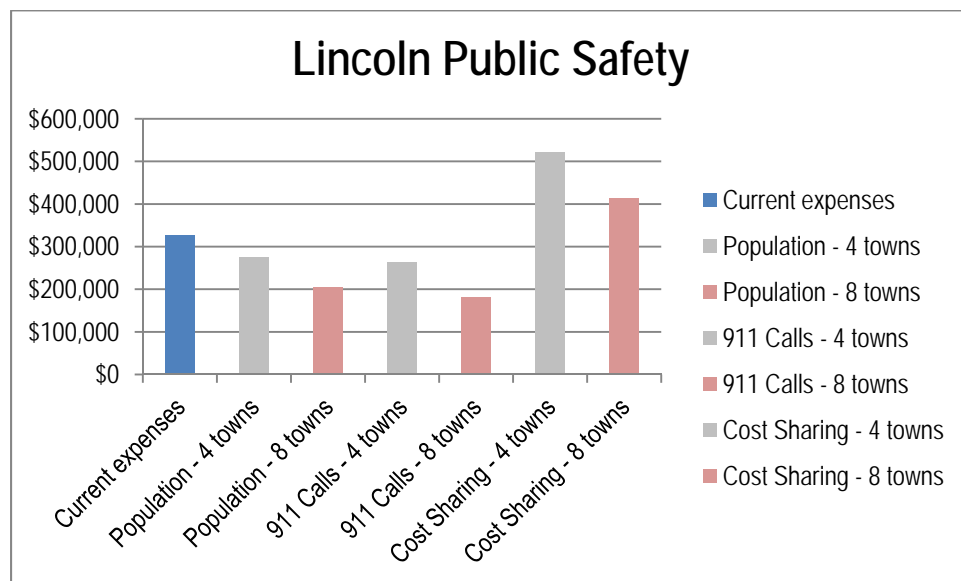


Figure 8 – Lincoln Cost Comparison

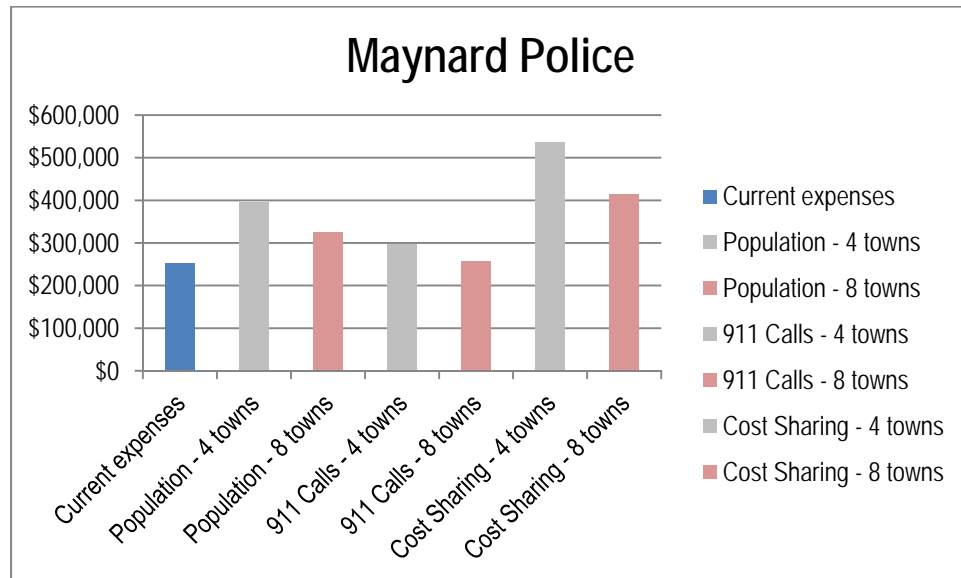


Figure 9 – Maynard Cost Comparison

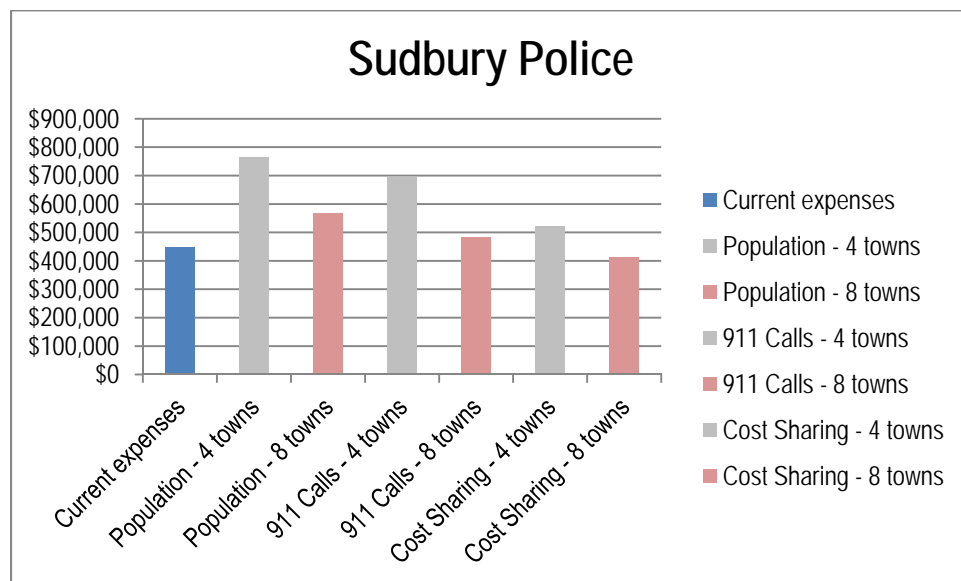


Figure 10 – Sudbury Cost Comparison

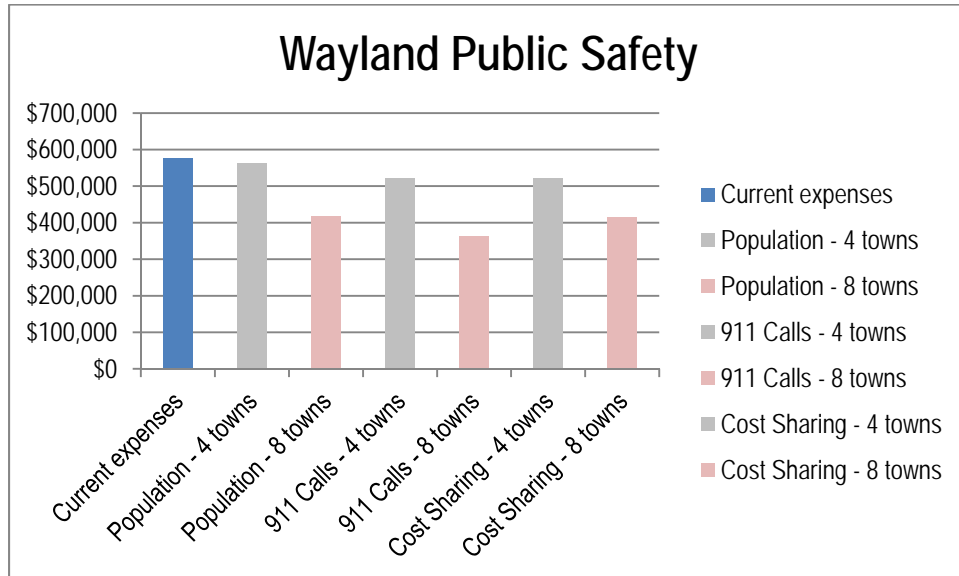


Figure 11 – Wayland Cost Comparison

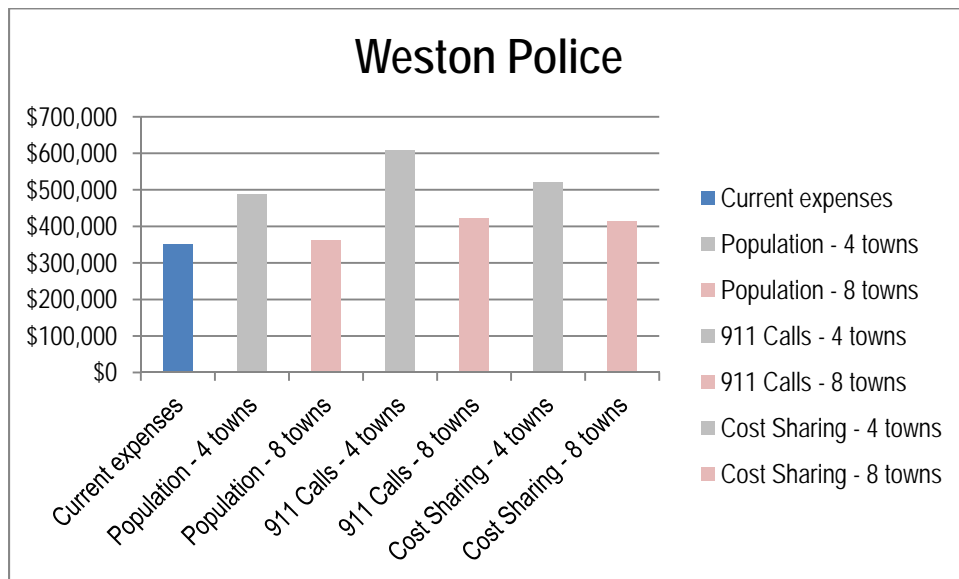


Figure 12 – Weston Cost Comparison

7. COST ESTIMATE WORKSHEETS

Total cost estimates worksheets identify the three categories of expenses in a regional dispatch center including personnel, equipment, and facility-related costs. (Please refer to the Appendix.) Key points are as follows:

- The first two or three years, costs actually reflect the transition time from individual PSAPs to the new regional center.
- The assumptions in each cost estimate worksheet include the need for a new facility and new equipment, and that the transition time will be shorter for the four-town models.
- First year estimates for an eight-town regional center are costs primarily related to establishing a new facility. Second year costs are a combination of facilities and equipment costs and salary for a new PSAP director to lead the regionalization transition.
- By the end of the third year the PSAP will be operational.
- Other employee costs during these transition periods are not identified because staffing will remain in the current PSAPs at their current rate.
 - Note: Training during the final two to three months prior to the physical transition to the regional center(s) will require planning. One method of addressing these costs is to have the existing participating PSAPs pay any overtime costs associated with this type of preparatory training. This may include systems training, acclimation training to a regional set of policies and procedures, and protocols.
- None of the cost estimate worksheets include costs for staffing the existing agencies with administrative personnel after regionalization.
- All facility and equipment costs are eligible for some funding under the State 911 Department grant program. State 911 will only provide 9-1-1 equipment for the number of positions dictated by CMR 560 based on total population and 9-1-1 call volume. Any positions that are over the number allowed by their formula will not be equipped with 9-1-1 answering equipment.
- Each recommended configuration in the L.R. Kimball report is higher than the number provided using the State's formula.
 - Note: While L.R. Kimball recommends all positions be fully equipped, it is feasible to operate with the allowable number of positions equipped with call taking equipment. The equipment configuration may be organized as a certain number of positions equipped with dispatch consoles, while others have call answering equipment. Several positions may overlap to accommodate the balance of duties for day-to-day operations, as well as special events. All positions should be equipped with the CAD system.

Table 7 – Answering Equipment Recommendations

	Recommended	Allowed
Full Regionalization	7	5
Lincoln, Sudbury, Wayland, and Weston	5	3
Acton, Boxborough, Concord, and Maynard	5	4

Miscellaneous Equipment Cost Estimates are the cost of additional equipment that will be necessary in any of the regional plans recommended. Key points are as follows:

- Each community has existing fire alarm receiving equipment. The municipal alarms systems will need to be installed in a new regional center. Alarms for private homes will need to be routed to a private alarm company as the regional center will not receive private alarms directly.
- Security systems at all the existing facilities will need to be linked to the regional PSAP. The system includes remote access and communications with customer at the existing buildings.
- The purchase of the miscellaneous equipment is eligible for State 911 grant funds. Maintenance and/or service agreements (Year 4) are the responsibility of the regional center.

The following funding projection information was provided by Christine Sheridan of the State 911 Department. These funding numbers are projections only and are not based on detailed grant applications numbers.

Table 8 – FY2012 Projections – Sudbury RECC Configurations

Funding	Support	RECC	Total Grant Funding
Sudbury Project RECC -1 (Sudbury, Acton, Boxborough, Concord, Lincoln, Maynard, Wayland, Weston)	\$212,770	\$437,460	\$650,230
Sudbury Project RECC -2 (Acton, Boxborough, Concord, Maynard)	\$115,525	\$280,045	\$395,570
Sudbury Project RECC -3 (Lincoln, Sudbury, Wayland, Weston)	\$97,245	\$241,233	\$338,478
Sudbury Project RECC -4A (Acton, Boxborough, Concord, Maynard)	\$115,525	\$238,859	\$354,384
Sudbury Project RECC -4B (Sudbury, Lincoln, Wayland, Weston)	\$97,245	\$198,601	\$295,846
<p>Notes:</p> <p>Grant funding provided are projections only and do not guarantee any level of funding.</p> <p>Grant funding projections provided above presumes that for RECC 1-3 only 1 of these 3 RECCs will open and RECC 4 a & b presumes that both RECCs will be operational.</p> <p>Calculations assume configurations are as noted. Changes to the communities included/excluded will impact funding levels.</p> <p>Above projections are calculated based upon anticipated RECC configurations for FY 2012. It is anticipated that the Nashoba Valley RECC (Devens) and South Shore RECC (Hingham) projects would be added to the RECC category for FY 2012. Timelines impacting current project(s) may impact these projections. Allocation amounts are further subject to change in compliance with the following excerpt from the S&I grant guidelines "The percentages in clauses i to iv, inclusive, and the percentages of the total amounts allocated to each grantee eligible within such clauses i through iv may be adjusted by the State 911 Commission to ensure a proper allocation of incentive funds as more regional PSAPs and regional emergency communication centers are added. The amount allocated to a grantee may be adjusted or capped."</p>			

8. GOVERNANCE

Christine Sheridan, Regional PSAP Coordinator for MA State 911 Department, supplied additional documents and information concerning matters that could impact any planned regionalization as a result of the L.R. Kimball report. The documents included copies of the following:

- Governance agreements from two existing regional communications centers in Massachusetts, including the Revere Regional Center and Nashoba Valley Regional Center.
- The proposed Legislature Senate Bill # 02037, which would allow two or more communities to create a regional 9-1-1 emergency communication district. These districts would be a public employer, a body politic and corporate with powers and duties.
- Preliminary analysis chart of the three regional models proposed by L.R. Kimball that identifies the number of 9-1-1 positions that the state will provide to each of the three models.

Ms. Sheridan advised that a community that joined a regional center and wanted to leave it and revert back to having its own PSAP would have to explain the reasons for the request, in detail, to the State 911 Department. She further stated that, to her knowledge, only one town has made that request, which the State 911 Department did not grant.

The following is a synopsis of the governance agreements for the Revere Regional Center and Nashoba Valley Regional Center. The Revere center is a hosted model, where a larger city center is taking over call taking and dispatch for a smaller community. The Nashoba Valley center is a dispatch district that will provide call taking and dispatch for four communities.

8.1 Revere Regional Center

The city of Revere and the town of Winthrop have created a regional 9-1-1 center. Revere operates the center and has overall responsibility for the quality of service and staffing. The staff is City of Revere employees. Revere is responsible for training, dispatch and operations, center maintenance, and other duties as agreed between Revere and its oversight board.

Governance of the Revere Center is a Board of Directors. Each municipality has three seats on the board. These members are the Chief Executive Officer (CEO) of the municipality, and the police and fire chiefs. Each community takes turns appointing a seventh member of the board, who is chosen by the CEO of the community whose turn it is based on a yearly rotation between the participating municipalities.

- Officers & Auditors of the Board
The Board officers are the Chairman, Vice Chairman, Treasurer and Secretary. Chairman rotates annually at first meeting of the fiscal year.
- Auditor – Board shall hire an independent auditor annually.

- Center Director
The Center Director attends all the meetings of the Board as an advisory member. The Center Director is an employee of Revere but shall be hired, suspended or terminated by the recommendation of the Board. The Center Director is responsible for all operational and personnel matters.
- Authority of Revere
Delegate to Revere, subject to authority and approval of the Board – the power to construct, equip, staff, maintain, operate, and all other normal and customary acts necessary for effective and orderly operation.
- Authority of the Board of Directors includes
 - Budget approval
 - Review expenditures
 - Consider recommendations of member communities
 - Approve appointment of all center employees
 - Approve provision of communications services to entities not a party to this agreement
 - Develop and recommend cost sharing formulae for annual operating expenses. Current formula:
 - One-half based on percentage of population of each party to the total population
 - Variable charge based on percentage of total estimated calls per community. Reconciled to actual call total each quarter. The total of the parts of the formula shall equal the actual budget for the current fiscal year.
 - Establish standard operating procedures (SOPs) for the center and review procedures, programs and situations and make necessary recommendations for daily operation of the center.

The duration of the InterMunicipal Agreement is five years. In order to get leave the IMA, municipality must notify the Board in writing one year prior to expiration of the agreement.

8.2 Nashoba Valley Regional Dispatch District

The Dispatch District includes Devens Regional Enterprise Zone, and the towns of Harvard, Lancaster, and Lunenburg. The term of the IMA is one year to twenty-five years or until terminated by mutual agreement.

- Governance
 - Board of Directors for Administration and Finance (Admin Board)
 - Operations Committee

Each member of above Board serves without pay. Re-imbursement for necessary expenses is allowed.

Board of Directors for Administration and Finance (Administrative Board) consists of the Board of Selectman from each town and Board of Directors of Mass Development. Each appoints one representative and may also appoint alternate representative. Each member of the Board of Directors has one vote.

Operations Committee consists of one person appointed by the chief administrative officer for each community. The appointee shall be from public safety, police, fire or an equivalent title. He/she may also appoint an alternate. Each member community has one vote.

Administrative Board may appoint an executive director. The Executive Director will be an employee of the NVEDD. The director is responsible for day-to-day operations and maintenance of the dispatch district, subject to the specific authority and general supervisory authority retained by the Administrative Board. Specific job qualifications, duties, and responsibility shall be established by the Operations Committee. He/she shall report to the Operations Board.

The Administrative Board is responsible for all matters regarding overall administration of the Dispatch District and for all human resource matters. Board may by majority vote delegate to the Operations Committee administrative & budgetary matters as deemed appropriate.

Operations Committee is responsible for effective and orderly operations of the Dispatch District, including communication equipment and systems, maintenance, operations, protocols and policies and procedures, facilities, personnel, training, billing and making budgets recommendations to the Administrative Board.

Committee shall coordinate with each community all local protocols and SOPs required for implementing regional dispatch services. The Committee may by majority vote to delegate operational matters to the executive director.

Board and Committee Actions require the presence of a quorum and a majority vote of those present. A quorum is three of four members.

- Designation of Officers
Administrative Board and Operations Committee shall have a Chairman and Vice Chairman. The First Chairman is from Devens and the Vice Chairman is from Harvard. Chairman and Vice Chairman rotate to other communities in order each fiscal year. Vice Chairman will be Chairman in the following year. They meet regularly each year, but must have at least two regular meetings. Minutes are required; an attendee is designated to keep minutes.

8.3 Proposed Senate Bill #02037

The Massachusetts 911 Department has submitted Senate Bill # 02037⁹ in order to assist communities who are considering forming a regional 9-1-1 center. This would allow two or more communities to create a Regional 911 Emergency Communications District. The provisions of the bill would deem that regional 911 emergency communication districts would be a public employer and shall be a body politic and corporate with the following powers and duties:

- Adopt a name and corporate seal
- To sue and be sued
- To purchase, lease or take eminent domain under chapter 79 land within in communities, to enter into contracts

⁹ H<http://www.malegislature.gov/Bills/187/Senate/S02037>

- To incur debt
- To issue bonds and notes
- To receive and disburse funds
- To incur short-term debt
- To assess member cities and towns for any expenses
- To apply for and receive grants
- To engage legal counsel
- To submit an annual report
- To employ staff to operate and to establish terms and conditions of employment
- To adopt an annual operating budget
- To enter into contract with non-member cities and towns

Preliminary analysis from the Christine Sheridan of the State 911 Department was based on the regional models that L.R. Kimball proposed. The Code of Massachusetts Regulations (CMR) 560 dictates the number of E9-1-1 positions based on call volume and population. Tables 9 through 11 indicate the number of positions for the proposed scenarios.

Table 9 – 8-Town Regional Center

Community	2011 Call Volume	Population 2010 Census	E911 Positions
Sudbury (LS)	2,770 (2010)	17,659	2
Lincoln	1,008	6,362	2
Wayland	2,073 (2010)	12,994	2
Weston (LS)	2,426 (2010)	11,261	2
Boxborough	840	4,996	2
Concord	3,949 (2010)	17,688	3
Acton (LS)	4,213	21,924	3
Maynard	1,543	10,106	2
Totals	18,822	102,990	5 (populations over 100K will be evaluated individually)

Table 10 – Lincoln, Sudbury, Wayland, and Weston

Community	2011 Call Volume	Population 2010 Census	E911 Positions
Sudbury (LS)	2,770 (2010)	17,659	2
Lincoln	1,008	6,362	2
Wayland	2,073 (2010)	12,994	2
Weston (LS)	2,426 (2010)	11,261	2
Totals	8,277	48,276	3

Table 11 – Acton, Boxborough, Concord, and Maynard

Community	2011 Call Volume	Population 2010 Census	E911 Positions
Boxborough	840	4,996	2
Concord	3,949 (2010)	17,688	3
Acton (LS)	4,213	21,924	3
Maynard	1,543	10,106	2
Totals	10,545	54,714	4

Based on the above tables, the State 911 Department may provide 9-1-1 equipment to five of the recommended seven positions in an eight-town regional PSAP configuration. A four town regional PSAP configuration including Sudbury, Lincoln, Wayland and Weston, would receive three of the recommended five positions. A four town PSAP configuration including Boxborough, Concord, Acton and Maynard would receive four of the recommended five positions. The number of recommended console positions in the initial report is based on providing each position with the capabilities of taking calls and dispatching personnel and providing EMD.

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APPENDIX – 10-YEAR COST PROJECTIONS

The cost projections for each model may be found on the following pages.

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10-Year Cost Estimates - 8 Towns

Total Cost by Year	Year 1*	Year 2**	Year 3***	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	\$1,600,000	\$1,726,000	\$4,893,000	\$3,311,500	\$3,374,740	\$3,439,245	\$3,505,040	\$3,580,150	\$3,640,603	\$3,710,426

Year 1* - Personnel Costs and Equipment Costs = Current Municipal Costs

Year 2** - Personnel Costs - no change, Equipment = Dispatch Furniture purchased

Year 3*** - Regional Center operational

Staffing	Year 1	Year 2	Year 3	Year 4*	Year 5*	Year 6*	Year 7*	Year 8*	Year 9*	Year 10*
Salary			\$ 2,015,000	\$ 2,055,300	\$ 2,096,406	\$ 2,138,334	\$ 2,181,101	\$ 2,224,723	\$ 2,269,217	\$ 2,314,602
Benefits			\$ 1,085,000	\$ 1,106,700	\$ 1,128,834	\$ 1,151,411	\$ 1,174,439	\$ 1,197,928	\$ 1,221,886	\$ 1,246,324
Staffing Total	\$ -	\$ -	\$ 3,100,000	\$ 3,162,000	\$ 3,225,240	\$ 3,289,745	\$ 3,355,540	\$ 3,422,650	\$ 3,491,103	\$ 3,560,926

* Salary and Benefits includes 2% cost of living increase

Equipment	Unit Cost	Units	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CAD	\$90,000	7			\$630,000	\$63,000	\$63,000	\$63,000	\$63,000	\$63,000	\$63,000	\$63,000
Radio Consoles	\$70,000	7			\$490,000	\$49,000	\$49,000	\$49,000	\$49,000	\$49,000	\$49,000	\$49,000
Radio Consoles (Transition Costs)*	\$5,000	0			\$0	0	Replace					
Ergonomic Dispatch Furniture Consoles	\$18,000	7		\$126,000			\$0					
Ergonomic Dispatch Furniture Consoles (Transition Costs)*	\$2,000	0			\$0		Replace					
Dispatch Chairs	\$1,000	8			\$8,000					\$8,000		
Redundant Master Clock Solution	\$15,000	1			\$15,000	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
Equipment Total			\$0	\$126,000	\$1,143,000	\$113,500	\$113,500	\$113,500	\$113,500	\$121,500	\$113,500	\$113,500

* Transition Costs apply to any current equipment that can be used in new Regional 911 Center - for each Radio Console and/or Furniture Console that can be re-used the number of new units can be reduced.

[illegible]

10-Year Cost Estimates - Acton, Boxborough, Concord and Maynard

Total Cost by Year	Year 1*	Year 2**	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	\$ 1,565,000	\$ 2,396,000	\$ 2,138,500	\$ 2,179,100	\$ 2,220,512	\$ 2,262,752	\$ 2,311,837	\$ 2,349,784	\$ 2,394,610	\$ 2,440,332

Year 1* - Personnel Costs - no change, Equipment = Dispatch Furniture purchased

Year 2** - Personnel Costs reflect new Director acting as a facilitator. Individual PSAP costs continue, Regional Center operational at end of year,

Staffing	Year 1	Year 2	Year 3	Year 4*	Year 5*	Year 6*	Year 7*	Year 8*	Year 9*	Year 10*
Salary		\$ 65,000	\$ 1,319,500	\$ 1,345,890	\$ 1,372,808	\$ 1,400,264	\$ 1,428,269	\$ 1,456,835	\$ 1,485,971	\$ 1,515,691
Benefits		\$ 35,000	\$ 710,500	\$ 724,710	\$ 739,204	\$ 753,988	\$ 769,068	\$ 784,449	\$ 800,138	\$ 816,141
Staffing Total	\$ -	\$ 100,000	\$ 2,030,000	\$ 2,070,600	\$ 2,112,012	\$ 2,154,252	\$ 2,197,337	\$ 2,241,284	\$ 2,286,110	\$ 2,331,832

Year 1 & 2 - Current PSAP costs continue, in year 2 PSAP director hired to act as facilitator

* Salary and Benefits includes 2% cost of living increase

Equipment	Unit Cost	Units	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CAD	\$90,000	5		\$450,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000
Radio Consoles	\$70,000	5		\$350,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Radio Consoles (Transition Costs)*	\$5,000	0		\$0			Replace					
Ergonomic Dispatch Furniture Consoles	\$18,000	5	\$90,000				\$0					
Ergonomic Dispatch Furniture Consoles (Transition Costs)*	\$2,000	0		\$0			Replace					
Dispatch Chairs	\$1,000	6		\$6,000					\$6,000			
Redundant Master Clock Solution	\$15,000	1		\$15,000	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
Equipment Total			\$90,000	\$821,000	\$81,500	\$81,500	\$81,500	\$81,500	\$87,500	\$81,500	\$81,500	\$81,500

* Transition Costs apply to any current equipment that can be used in new Regional 911 Center - for each Radio Console and/or Furniture Console that can be re-used the number of new units can be reduced.

Year 1 - Dispatch Furniture purchased

[illegible]

10-Year Cost Estimates - Lincoln, Sudbury, Wayland and Weston

Total Cost by Year	Year 1*	Year 2**	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	\$ 1,565,000	\$ 2,396,000	\$ 2,088,500	\$ 2,128,100	\$ 2,168,492	\$ 2,209,692	\$ 2,257,716	\$ 2,294,580	\$ 2,338,302	\$ 2,382,898

Year 1* - Personnel Costs - no change, Equipment = Dispatch Furniture purchased

Year 2** - Personnel Costs reflect new Director acting as a facilitator. Individual PSAP costs continue, Regional Center operational at end of year,

Staffing	Year 1	Year 2	Year 3	Year 4*	Year 5*	Year 6*	Year 7*	Year 8*	Year 9*	Year 10*
Salary		\$ 65,000	\$ 1,287,000	\$ 1,312,740	\$ 1,338,995	\$ 1,365,775	\$ 1,393,090	\$ 1,420,952	\$ 1,449,371	\$ 1,478,358
Benefits		\$ 35,000	\$ 693,000	\$ 706,860	\$ 720,997	\$ 735,417	\$ 750,125	\$ 765,128	\$ 780,431	\$ 796,039
Staffing Total	\$ -	\$ 100,000	\$ 1,980,000	\$ 2,019,600	\$ 2,059,992	\$ 2,101,192	\$ 2,143,216	\$ 2,186,080	\$ 2,229,802	\$ 2,274,398

Year 1 & 2 - Current PSAP costs continue, in year 2 PSAP director hired to act as facilitator

* Salary and Benefits includes 2% cost of living increase

Equipment	Unit Cost	Units	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
CAD	\$90,000	5		\$450,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000
Radio Consoles	\$70,000	5		\$350,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Radio Consoles (Transition Costs)*	\$5,000	0		\$0			Replace					
Ergonomic Dispatch Furniture Consoles	\$18,000	5	\$90,000				\$0					
Ergonomic Dispatch Furniture Consoles (Transition Costs)*	\$2,000	0		\$0			Replace					
Dispatch Chairs	\$1,000	6		\$6,000					\$6,000			
Redundant Master Clock Solution	\$15,000	1		\$15,000	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
Equipment Total			\$90,000	\$821,000	\$81,500	\$81,500	\$81,500	\$81,500	\$87,500	\$81,500	\$81,500	\$81,500

* Transition Costs apply to any current equipment that can be used in new Regional 911 Center - for each Radio Console and/or Furniture Console that can be re-used the number of new units can be reduced.

Year 1 - Dispatch Furniture purchased

[illegible]