HSMM | AECOM

Springfield Finance Control Board

Centralized Dispatch Feasibility Analysis and Assessment

Final Report

August 18, 2008

CTA COMM # 20170A

CTA Communications

... providing innovative and reliable solutions for the future

Table of Contents

Executive Summary 4

1.0 Introduction 12

2.0 Current Communications Center Environment 14
2.1 Current Community Environment 14
2.2 Springfield Police Department 15
2.2.1 Springfield Police Department Dispatch Center 16
2.3 Springfield Fire Department 16
2.3.1 Springfield Fire Department Alarm Headquarters 17
2.3.2 Emergency Preparedness Division 18
2.4 American Medical Response 18
2.4.1 Central Medical Emergency Direction (CMED) Network 19
2.4.2 American Medical Response Dispatch Center 20
Table 2-1 Population Projections 21
Table 2-2 Metrics 22

3.0 Requirements of a Consolidated Dispatch Center 23
3.1 Communications Center Systems 23
3.1.1 Operations 23
3.1.2 9-1-1 Technology 26
3.1.3 Computer Aided Dispatch (CAD) 28
3.1.4 Support Systems 30
3.1.5 System Integration 30
3.1.6 Additional Considerations 30
3.2 9-1-1 Consolidation 31
3.2.1 Consolidation 31
3.2.2 Co-Location 31
3.2.3 9-1-1 Center Design 31
3.2.4 9-1-1 Position Descriptions 33
3.2.5 9-1-1 Space Characteristics 33
3.2.6 Dispatch Protocols 34

4.0 Problems and Concerns 35
4.1 Standard Operating Procedures 35
4.2 Support a Trained and Qualified Work Forces 36
4.2.1 Job Task Analysis/Job Descriptions 36
4.2.2 Hiring Standards 37
4.2.3 New Employee Training 37
4.2.4 Continuing Education 38
4.2.5 Career Path 38
4.2.6 Staffing Levels 38
4.3 Maintain Adequate Communications and Network Equipment 40
4.3.1 Dispatch Center Size 41
4.3.2 Dispatch Center Condition 41
4.3.3 Equipment Area Size 42
4.3.4 Equipment Area Condition 42
4.3.5 Expansion Capacity 43
4.3.6 Radio Console System 43
4.3.7 CAD System 43
4.3.8 CPE System 44
4.3.9 PBX/Admin Telephones 44
4.3.10 Furniture 44
4.3.11 Lighting 45

4.3.12 HVAC ... 45
4.3.13 Reliability ... 45
4.3.14 Generator ... 45
4.3.15 UPS ... 46
4.3.16 Back-Up Provisions ... 46
4.3.17 Maintainability ... 46
4.3.18 Parking ... 46
4.3.19 Internal Facilities ... 47
4.3.20 Security ... 47
4.4 Consider Opportunities for Coordinating the Use of Dispatching Equipment and Cooperative Dispatching ... 47
4.5 Keep Records and Measure Performance ... 48
4.6 Promote Information Exchanges Among Public Safety Response Agencies ... 49
4.7 Educate The Public On The 9-1-1 System And Services ... 49
Table 4-1 Dispatch Performance ... 51
Table 4-2 Dispatch Center Assessment ... 52

5.0 Alternative Solutions ... 53
5.1 Technological Assumptions ... 53
5.1.1 Radio Systems ... 53
5.1.2 Computer Aided Dispatch System (CAD) ... 53
5.1.3 Records Management System ... 54
5.1.4 9-1-1 System ... 54
5.1.5 Space ... 55
5.1.6 Staffing ... 55
5.2 Option 1 – No Consolidation ... 55
5.2.1 Organization ... 55
5.2.2 Staffing Requirements ... 55
5.2.3 Technology ... 55
5.2.4 Space ... 56
5.3 Option 2 - Consolidate or Co-Locate Governmental Dispatch Centers ... 56
5.3.1 Organization ... 56
5.3.2 Staffing ... 57
5.3.3 Technology ... 57
5.3.4 Space ... 58
5.4 Option 3 – Consolidate or Co-Locate All Three Dispatch Centers ... 59
5.4.1 Organization ... 59
5.4.2 Staffing ... 59
5.4.3 Technology ... 60
5.4.4 Space ... 60
5.5 Emergency Operation Center ... 60
Table 5-1 Staffing Requirements No Consolidation ... 61
Table 5-2 Staffing Requirements Police and Fire Consolidations ... 62
Table 5-3 Full Consolidation ... 63

6.0 Opinion of Probable Costs ... 64
6.1 Option 1 –No Consolidation ... 64
6.1.1 Staffing ... 64
6.1.2 Maintenance and Operations ... 64
6.1.3 CAD ... 64
6.1.4 9-1-1 Equipment ... 65
6.1.5 Console Equipment and Furniture ... 65
6.1.6 Total ... 65
6.2 Option 2 Consolidate Springfield Police and Fire Dispatch Centers ... 65
6.2.1 Staffing ... 65
6.2.2 Maintenance and Operations ... 65
6.2.3 CAD ... 65
6.2.4 9-1-1 Equipment ... 65

6.2.5 Consoles and Furniture 65
6.2.6 Total 65
6.3 Option 3 Full Consolidation 66
6.3.1 Staffing 66
6.3.2 Maintenance and Operations 66
6.3.3 CAD 66
6.3.4 9-1-1 Equipment 66
6.3.5 Consoles and Furniture 66
6.3.6 Total 66
Table 6-1 Comparative Budgets – First Year of Operation 67

7.0 Conclusions and Recommendations 68
7.1 Should a Consolidation Take Place? 68
7.2 What actions should be taken immediately before consolidation occurs? 69
7.3 How should it be organized, governed and staffed? 70
7.3.1 Dispatch Commission 71
7.3.2 Dispatch User Advisory Committee 71
7.3.3 Emergency Communications Center Director 71
7.4 How should policies be made and changed? 72
7.5 What services should it perform? 72
7.6 What equipment, systems, software and hardware are needed to in the combined center? 73
7.6.1 9-1-1 Customer Premises Equipment (CPE) 73
7.6.2 Computer Aided Dispatch/Records Management 73
7.6.3 Radio Consoles 74
7.6.4 Logging Recorder 74
7.6.5 Dispatch Workstation Furniture 74
7.7 Where should a consolidated center be located? 74
7.8 How Should the Consolidated Communications Center Be Financed? 75
7.9 What is the timetable for the consolidation to occur? 76
7.10 Additional Considerations 76

Appendix A Budget and No Merger

Appendix B Staffing

Appendix C Site Evaluation

Appendix D Interview Records

Appendix E Site Surveys

Executive Summary

The City of Springfield, Massachusetts currently operates a primary Public Safety Answering Point (PSAP) and police dispatch center, and a separate secondary PSAP and fire dispatch center. In addition, American Medical Response (AMR) operates a secondary PSAP, Central Medical Emergency Direction (CMED) center and Emergency Medical Services (EMS) dispatch center in Springfield. The Springfield Finance Control Board selected CTA Communications of Lynchburg, Virginia to conduct an analysis of the feasibility of consolidating two or more of these PSAPs/dispatch centers.

The feasibility analysis was designed to:

1. Assist in the identification and resolution of all issues related to the development, planning, and implementation of a combined (police and fire) dispatch center, including organizational structure, governance, staffing, technology, training, the need to provide a back-up dispatch facility, and licensing and waivers required to operate a centralized facility.

2. Identify and assess up to three locations that could house the City's combined dispatch center which will meet the City's current needs as well as provide expansion potential for the site to host a regional central dispatch in the future, if appropriate.

3. Identify and recommend equipment, systems, software, and hardware to be used in the combined dispatch center which will meet the center's operational and communications needs and integrate with records management and other support systems.

4. Provide cost estimates for the capital and yearly operational costs associated with a single consolidated center.

CTA Communications conducted more than twenty interviews. The three existing dispatch centers were surveyed and detailed information was gathered on the systems and facilities currently in use.

This report contains:

- An operational design for a consolidated center. This includes the number of positions to be included.

- Identifies and recommends equipment, systems, software, and hardware to be used in the combined dispatch center.

- Proposes an organizational structure, management staffing, and training structure for the consolidated structure.

- Provides detailed estimates for the capital project costs to renovate an existing facility to become the combined center.

- Provide detailed estimates for the yearly operational costs of the combined center.

- Analyzes two possible locations for the central dispatch center and provides our recommendations on steps needed to determine the location of the consolidated center

CTA is now providing this final report and providing a formal presentation.

Problem Assessment Summary

In 1998 the Minnesota Office of the Legislative Auditor published a review of best practices in 9-1-1 public safety dispatching. That report identified seven "Best Practices" based on ideas and standards in the public safety communications industry. These seven actions provide a framework to evaluate public safety dispatching in the City of Springfield. The seven actions include:

- Develop and use standard operating procedures
- Support a trained and qualified work force
- Maintain adequate communications and network equipment
- Consider opportunities for coordinating the use of dispatching equipment and cooperative dispatching
- Keep records and measure performance
- Promote information exchanges among public safety response agencies
- Educate the public on the 9-1-1 system and services

We found that there were significant variances between the operations in Springfield and these recommended best practices.

- Develop and use standard operating procedures

Neither the Springfield Police Computer Aided Dispatch (CAD) center nor the Springfield Fire Alarm Headquarters have comprehensive written standard operating procedures. The written guidance that does exist is woefully outdated and obsolete.

- Support a trained and qualified work force

In Springfield, there has been no systematic review of the knowledge, skills, abilities, and personal characteristics needed to perform the job of dispatcher. A job analysis is needed as the first step in the process. Job Analysis is the process of identifying essential job tasks and the essential knowledge, skills, abilities, personal characteristics and physical abilities that are essential for performing these tasks successfully. The analysis can become the basis for employee recruitment and selection. The Job Analysis also provides the basis for development of performance appraisal systems and standards, as well as other objectives such as the development of new hire training programs.

The Springfield Police Department 9-1-1 Center is understaffed. Not only are there not enough people on duty to comply with SETB and national standards, there are not enough total staff members to maintain current staffing levels without significant use of overtime. A review of the available statistics indicates that the center answers considerably more calls per employee than national averages based on studies by the National Emergency Number Association and others. In addition, the statistics show that the center does not comply with the SETB requirement that ninety percent of incoming calls be answered within ten seconds. Using the SETB guidelines, three dedicated 9-1-1 call takers are required to handle the busy hour. The dispatch center is also responsible for answering incoming administrative calls for the police department. In 2007, approximately two administrative calls were received for every three 9-1-1 calls. This creates a significant additional workload. Two dispatchers are assigned to radio dispatch positions. Each employee receives one forty-five minute and two fifteen minute breaks during his or her shift. Normal staffing is eight people (one supervisor, two radio

dispatchers, and five call takers). With the required breaks, no more than seven people are actually in the center during most of the shift.

In addition to the chronic understaffing of the dispatcher position at the Springfield Police Department, there is an accompanying lack of dispatch center management and supervision staffing at the police department. While the City has negotiated the creation of a lead dispatcher position to provide leadership and supervision on each shift, these positions still had not been implemented at the time of our visit. Police Sergeants were assigned to be dispatch supervisors three days a week. On other days, a dispatcher is made an acting lead dispatcher. This overall lack of consistency, combined with the chronic understaffing, means that there is little effective supervision in the center.

- Maintain adequate communications and network equipment

Public safety communications centers utilize a significant amount of communications equipment and systems in their daily operations. The Springfield Police and Fire Department dispatch centers each employ multiple systems. These include Computer Aided Dispatch Systems (CAD), Records Management Systems (RMS), and Geographic Information Systems (GIS), the 9-1-1 system, the radio system, and the recording system. These systems must be housed in appropriate facilities. Neither the police dispatch center nor the fire alarm headquarters are adequate for current needs.

- Consider opportunities for coordinating the use of dispatching equipment and cooperative dispatching

While considerable effort has been made, especially through the Western Massachusetts Law Enforcement Consortium (WMLEC), there are still a number of issues with inter-agency coordination. Within the City of Springfield, the communications and coordination between the police, fire and EMS dispatch centers is often lacking. In addition, there is limited coordination and interoperability between police units, fire apparatus, and ambulances.

The interoperability between the three services is further limited by the fact that each of the centers operates its own computer aided dispatch (CAD) system. There is no interchange of information between the three systems. With the exception of wireline 9-1-1 information, information entered into one system is only captured by another system if that information is verbally relayed to the other dispatch center and entered by the operator. This can lead to responding units being unnecessarily exposed to hazardous situations because the information was relayed from one center to another.

- Keep records and measure performance

The best public safety dispatch centers are performance driven. Performance goals are established and progress in meeting those goals is regularly and routinely evaluated. Performance measurement should provide accurate, timely, accurate, and useful information about the quality and efficiency of the delivery of service by each of the centers. Very limited records are kept by the centers.

Organizational integrity is an essential element in restoring and maintaining the public's confidence in their public safety agencies. It was noted during our interview and survey process that frequent complaints are received about the services rendered especially by the Springfield Police Communications Center. One of the problematic aspects of this issue is that there are no clearly defined guidelines about which categories or complaints are to be handled by the internal investigation function and which are part of routine discipline. As a result, all complaints go to the Police Commissioner's Office for resolution. Not only does this result in increased workload on the Commissioner's Office,

it also dulls the effects of discipline in many cases because of the time between the incident and the imposition of the resulting discipline. In addition to establishing procedures for handling the lesser complaints at a lower level, a tracking system needs to be established to identify trends and possible need for policy and procedure revision.

- Promote information exchanges among public safety response agencies

As described above, the Springfield Police Department, the Springfield Fire Department, and American Medical Response (the EMS provider) each operate their own, independent dispatch center. Not only are interagency coordination and interoperability problematic during incidents, there is limited communications between the three centers on a routine basis.

- Educate the public on the 9-1-1 system and services

The Springfield 9-1-1 system receives a higher volume of calls per citizen that the national average. Not only does this strain the dispatch center, it puts a significant burden on the public safety agencies, especially the police department because they must respond to numerous calls that could better be handled by other means. The dispatch center, the police department, the fire department, and AMR need to develop a coordinated, on-going public education campaign. In addition, the City needs to develop a means to handle many of the minor, nuisance type calls by alternative means.

Alternative Solutions

CTA Communications identified three possible solutions for the consolidation effort. The possible choices included:

1. No consolidation
2. Consolidate Springfield Police Dispatch and Springfield Fire Dispatch
3. Consolidate Springfield Police and Fire Dispatches and American Medical Response's Dispatch Center.

The organizational aspects, staffing requirements, technology needs and space requirements for reach were reviewed:

1. No Consolidation

This option would continue the status-quo with each of the three centers continuing to operate independently. There is a need for additional staff for the Springfield Police Department dispatch center. While the Springfield Police have 26 employees currently assigned, CTA's estimate of the number of staff required to meet the current needs for the Springfield Police Department would include assigned 5 shift supervision, 16 added call taker/dispatchers, an Operations Manager, and a Technical Support Coordinator. This should bring the required number up to 49 employees. In addition 4 more dispatchers are needed at Fire Alarm Headquarters in order to provide coverage for all shifts and vacations without incurring overtime. A total of 64 people would be needed to adequately staff the two centers. The space used by both the existing PSAP/police dispatch and Fire Alarm Headquarters is inadequate. The space at police headquarters is overcrowded and does not provide room for needed expansion. The center is currently configured for 8 positions. Based on the call volume 9 positions are needed to be staffed during the busiest shift. At least three overflow positions should be provided. The Fire Alarm Headquarters building is in poor condition and will require considerable renovation to bring it into compliance with existing codes and standards.

2. Consolidate Police and Fire Dispatch Centers

This scenario would consolidate the Springfield Police and Fire Department dispatch centers into a single center. American Medical Response would continue to operate its existing dispatch center. The combined police and fire dispatch center would need a total of 61 people. This includes 4 administrative personnel and 57 dispatch personnel. All personnel should be fully trained and capable of working any of the positions (call-taking, police dispatch, and fire dispatch). They should rotate between positions in order to maintain proficiency. Standard operating procedures should require that, if an individual is assigned to one position and not busy, he should assist another position that is busy. Consolidation or co-location will provide significant improvements to the coordination between the agencies participating in the shared dispatch center. Technology enhancements have the potential to further the benefits. Neither of the existing centers is adequate for housing a combined dispatch operation. In addition to the positions that are required for day-to-day operations, there is a need for additional positions to handle overflow situations. These are situations that occur as a result of events that cause a spike in public safety activity. There should be 10 people on duty in the combined center during the busiest shift of each day. A minimum of four additional positions should be provided for handling “overflow” situations those circumstances when the call volume exceeds the capability of the primary positions. In addition, there should be a minimum of six positions for use as both the back-up for AMR and for “live training”. Ideally, these positions will be separated from the primary dispatch area by a moveable wall. When being used for training, the wall would be in place to separate the trainees from the dispatch center in order to allow the trainees to focus fully on their training. A twenty position dispatch center would require approximately 3,600 square feet of space along with raised flooring, redundant routing of 9-1-1 and emergency telephone circuits, back-up power, and redundant HVAC systems. If the facility is not located in an existing building additional space will be needed for staff support (locker rooms, break room, etc.) and for building services and systems (HVAC, etc.) CTA estimates that approximately 5,300 square feet of space would be needed for a stand-alone facility.

The creation of a shared emergency communications center will result in significant changes in the operations of each of the participating public safety agencies. It is critically important that the process of creating the shared center be focused on making positive improvements to all aspects of the delivery of public safety services to all of the citizens and visitors of the City of Springfield. There are two underlying structures for a shared center. The first is a consolidated center, where a single agency provides the dispatch services for all of the participating agencies. The second involves co-location of dispatch centers. Each co-located center operates independently of the other co-located centers. Facilities are shared, but operations are separate.

3. Consolidate Springfield Police and Fire Dispatches and American Medical Response’s Dispatch Center.

This scenario would consolidate the Springfield Police, Fire Department, and American Medical Response dispatch centers into a single center. As with Option 2, there are several different governance options for this scenario. They include: (1) co-location where the dispatch centers would be located in the same facility, but operate independently; (2) consolidation into one of the existing agencies; and (3) create of a separate department or agency to oversee the department or agency to oversee the dispatch operation. A fourth governance alternative is to consolidate the two governmental dispatch operations and then co-locate AMR’s operation. A total of 68 people would be required to staff a fully consolidated operation. There should be nine to thirteen people on duty in the combined center, depending on the time of day. The space requirements would be similar to the requirements outlined above. Several additional

administrative offices would be required to accommodate the AMR dispatch management staff.

Opinion of Probable Costs

Current budgeting practices for the City of Springfield do not identify the current costs associated with either the Springfield Police Department or the Springfield Fire Department as separate line items in the budget. As noted above, there is a critical need for additional staff in the Springfield Police Department's dispatch center. The estimated cost of the first year of operation of the upgraded police facility is $2,040,732. We estimate the first year costs for fire alarm headquarters to be $1,008,266. The combined costs for operating the two municipal dispatch centers at the recommended staffing levels would be $3,048,998. We estimate the first year cost of the consolidated dispatch center to be $3,632,145. We estimate the first year cost of the consolidated dispatch center to be $3,839.798.

On July 31, 2008, Governor Patrick signed into law "An Act to Create a State 9-1-1 Department, Single 9-1-1 Surcharge, and an Enhanced 9-1-1 Fund" (Chapter 223 of the Acts of 2008). The law makes significant changes to the way 9-1-1 is funded in the state. A uniform surcharge of $0.75 will be levied on each subscriber or end user whose communication services are capable of accessing and utilizing an enhanced 911 system. The act also provides for grants to PSAPs for operational costs. Previously the SETB funded the cost of the 9-1-1 network and 9-1-1 equipment at the Primary PSAP. Under the Act, funding can be used to cover personnel costs, dispatch workstations, and other related items. While the exact amount has not yet been determined, the City of Springfield can anticipate receiving significant funding through this act. This should help reduce the burden on the City's general fund.

Recommendations

CTA Communications recommends that a shared public safety Emergency Communication Center be created. Participants in the shared center should initially include:

- Springfield Police Department
- Springfield Fire Department

A shared communications center, with proper implementation, offers significant service improvements both to the participating public safety agencies and to the citizens and visitors to the City of Springfield. By establishing high standards of performance and then consistently assuring that those standards are achieved and that the center is properly organized, adequately staffed, responsive to the public safety providers and citizens, and well managed, the service level provided will be significantly enhanced for the levels currently being provided. The goal must be the creation of an efficient, customer-friendly organization.

We recommend that an independent department of City government focused on the provision of public safety communications be created. It would be governed by a Dispatch Commission consisting of the Springfield Police Commissioner, the Springfield Fire Commissioner, a representative of the Springfield Emergency Medical Services Commission, the Director of Public Works and a representative of the Mayor's Office. The Dispatch Commission should be the general policy making authority for dispatch operations. It functions should include:

- Providing recommendations to the Mayor on the dispatch annual budget and expenditures

- Establishment of dispatch center organizational goals, objectives and policies
- Adopt and revise bylaws for its operation, as well as the operation of the user advisory committee.
- Provide recommendations of the hiring, employing, and terminating of the dispatch management staff
- Periodic performance evaluations of dispatch management staff

The second part of the governance structure is the Dispatch User Advisory Committee. The User Advisory Committee should consist of representatives of the agencies service. At a minimum, we recommend that the User Advisory committee include the following:

- Springfield Police Department Division Commander
- Springfield Fire Department Deputy Chief – Operations
- American Medical Response Regional Manager

The function of the User Advisory Committee is to provide guidance and input to the Dispatch Commission and the Emergency Communications Center Manager on operational and other appropriate issues. The Emergency Communications Center Director should be appointed in a similar manner as other department heads in the City of Springfield. The Commission should recommend the appointment of the Director of the Emergency Communications Center.

We recommend that, at least initially, AMR's dispatch operations remain separate from the consolidated center. Once the consolidated center becomes operational, the matter should be reviewed and consideration given to co-locating AMR's dispatch operations with the City's.

Neither of the existing facilities is suitable for housing the consolidated center. There is insufficient space available in both facilities. In addition, the Fire Alarm Headquarters facility would need considerable renovation in order to comply with existing codes and standards, most notably the American's With Disabilities Act. We evaluated that location as well as the Raymond Sullivan Public Safety Complex for possible location of a new facility. Based on our evaluation, CTA recommends that the City find a suitable parcel that is approximately five to six acres in area rather than try to reuse or use one of the suggested sites. With the large number of vacant industrial and commercial properties, there should be suitable redevelopment space available.

We recommend that the City consider including both the Emergency Operations Center and the City's Data Center in the new facility. Both existing facilities do not meet the current and projected future needs. There are significant advantages to co-locating the facilities. Both functions require the same type of flexible space that can meet a variety of needs. Both require sustainability and survivability- the ability to both sustain the effectives of a potential disaster and continue operations for an extended period of time without interruption and potentially isolated from commercial utility sources. The shared use of the space will allow all three functions to have improved facilities and reduced costs.

Fire Alarm Headquarters currently serves as the alternate PSAP for the primary PSAP at police headquarters. If the primary PSAP is unable to answer incoming 9-1-1 calls, the calls are rerouted to the alternate PSAP. With the consolidation, that option will not be available. We recommend that, immediately after the completion of the consolidation, the existing PSAP at the Springfield Police Department and that serve as the alternate or back-up dispatch center. In addition, we strongly recommend that the Police Commissioner contact the Commissioner of the Massachusetts State Police and request that the MSP Dispatch Center in Northampton serve as the interim alternate PSAP. The While the new Springfield ECC would be designed to remain functional until the alternate

center was staffed, the MSP would answer incoming calls in the event the primary PSAP was incapacitated before the alternate PSAP was activated.

Immediate Actions

It will take approximately twenty four to thirty six months for the consolidated center to become fully operational. In the interim, there are a number of actions the City should take to both improve existing operations and to facilitate the consolidation. These include:

- **The first step towards improving public safety communications is to bring both the dispatcher and dispatch administrative staffing up to recommended levels.**
- **Initiate the development of comprehensive job task analysis, updated job descriptions, and employee selection procedures for all dispatch positions**
- **Begin dispatch staff augmentation and training process**
- **Develop Comprehensive Policy and Procedure Manual**
- **Recruit, select, and hire the Emergency Communications Center Director**

Timetable

• Commitment to Consolidate	October 31, 2008
• Complete Job Task Analysis/ Job Description Development	December 31,2008
• Add Additional Dispatch Staff	January 1, 2009
• Begin Development of Comprehensive Policy & Procedures	January 1, 2009
• Select Architect/Design Consultant for New Facility	December 1, 2008
• Select Location for New Dispatch Center	January 1, 2009
• Hire Emergency Communications Center Director	March 1, 2009
• Complete Dispatch Center Design	June 30, 2009
• Begin Dispatch Center Construction	July 1, 2009
• Dispatch Center Substantial Completion	December 31, 2010
• Cutover to Consolidated Center	April 4, 2011

1.0 Introduction

The City of Springfield, Massachusetts currently operates a primary Public Safety Answering Point (PSAP) and police dispatch center, and a separate secondary PSAP and fire dispatch center. In addition, American Medical Response (AMR) operates a secondary PSAP, Central Medical Emergency Direction (CMED) center and Emergency Medical Services (EMS) dispatch center in Springfield. The Springfield Finance Control Board selected CTA Communications of Lynchburg, Virginia to conduct an analysis of the feasibility of consolidating two or more of these PSAPs/dispatch centers.

The feasibility analysis was designed to:

1. Assist in the identification and resolution of all issues related to the development, planning, and implementation of a combined (police and fire) dispatch center, including organizational structure, governance, staffing, technology, training, the need to provide a back-up dispatch facility, and licensing and waivers required to operate a centralized facility.

2. Identify and assess up to three locations that could house the City's combined dispatch center which will meet the City's current needs as well as provide expansion potential for the site to host a regional central dispatch in the future, if appropriate.

3. Identify and recommend equipment, systems, software, and hardware to be used in the combined dispatch center which will meet the center's operational and communications needs and integrate with records management and other support systems.

4. Provide cost estimates for the capital and yearly operational costs associated with a single consolidated center.

A team of personnel from CTA Communications conducted interviews and dispatch center surveys during the first two weeks of April 2008. Approximately fifteen in-person interviews were conducted in Springfield. Three additional interviews were conducted by telephone. The three existing dispatch centers were surveyed and detailed information was gathered on the systems and facilities currently in use.

CTA Communications was tasked with providing a written report which:

- Analyzes up to three possible locations for the central dispatch center and justify a single recommended site.

- Identifies and recommends equipment, systems, software, and hardware to be used in the combined dispatch center.

- Proposes an organizational structure, management staffing, and training structure for the consolidated structure.

- Provides detailed estimates for the capital project costs to renovate an existing facility to become the combined center.

- Provide detailed estimates for the yearly operational costs of the combined center.

- If requested, develop and /or submit for the City license and waiver applications to permit the use of a central dispatch center.

This report addresses those tasks.

SECTION 2 of this report covers the Current Dispatch Center Environment. SECTION 3 describes the functional attributes that a consolidated public safety communications center should have. SECTION 4 discusses the current communications center problems and concerns. SECTION 5 analyzes alternative designs. SECTION 6 presents CTA's Opinion of Probable Costs or cost estimates. Our conclusions and recommendations are in SECTION 7.

2.0 Current Communications Center Environment

This section defines the current dispatch center operations and communications environment as they exist in each of the three existing centers participating in the study. A brief description of the overall community environment and the project changes in population are reviewed. Descriptions of the current operations for each of the three entities involved in this study (Springfield Police, Springfield Fire, and AMR) are given and the duties performed by the staff of the centers are reviewed.

2.1 Current Community Environment

The City of Springfield sits on the banks of the Connecticut River only a few miles north of the Massachusetts and Connecticut border. The City is approximately 33.2 square miles and sits on the east-bank of the River. It is bounded by the Connecticut River on the West, the City of Chicopee and the Town of Ludlow on the North, the Town of Wilbraham on the east, and the towns of East Longmeadow and Longmeadow on the south. The City is 6.4 miles at the widest point running north-south and 8.9 wide at the widest point on an east-west axis. The topography of the City slopes upward from the Connecticut River for approximately a mile to form a plateau, which in turn is laced with a series of lakes and streams and small river beds. The City is for all practical considerations completely developed. The industrial uses are concentrated along the railroad tracks and in industrial parks located in the East Springfield neighborhood. The housing stock is characterized primarily by single family structures. Multi-family structures are found in the inner City neighborhoods and garden apartment structures are found throughout the City. The central business district is located on the western edge of City and contains a number of high rise office and commercial structures. The 2000 Census counted over 4,000 vacant housing units in the City of Springfield. By 2006, that number had increased to more than 7,000 according to the U.S. Census Bureau. Approximately 12% of the housing units are vacant.

The City of Springfield is chartered under the Commonwealth of Massachusetts Constitution with the Plan A form of government, commonly known as the "Strong Mayor" system, comprised of the following elective offices: The Mayor who is elected every two years; the City Council comprised of nine members all elected at large every two years. The Mayor is the chief executive and financial officer of the City. The City council serves in a monitoring and review capacity over the chief executive in addition to a number of legislative functions, including passage of local ordinances and financial orders. The City has been experiencing serious financial stress over the several years and by the end of FY2004 faced a financial crisis. It was determined that the City needed the Commonwealth to provide short and long term financial resources in order to avoid a financial collapse. On July 9, 2004, the Massachusetts legislature enacted Chapter 169 of the Acts of 2004 entitled “An Act Relative to The Financial Stability of Springfield.” Under Chapter 169, a Finance Control Board (FCB) was established and vested with comprehensive authority over all of the City’s finances, including appropriations, borrowings, transfers of funds, and municipal spending authorizations.

Springfield is located in Hampden County. As with a number of the six other Massachusetts counties, Hampden County exists today only as a historical geographic region, and has no County government. All former County functions were assumed by state agencies in 1998. The population of Springfield and the surrounding Hampden County area has been essentially unchanged since the 1990s. Projections are that the City and Hampden County’s population will change little over the next twenty years.

TABLE 2-1 shows the population since 1990 and the anticipated population through 2030.

2.2 Springfield Police Department

The Springfield Police Department provides primary law enforcement services for the City of Springfield. The department has an authorized strength of 583 positions (both sworn and civilian). This is an increase of eight positions from 2007. However there are seventy-six fewer police officers than in 2004. The result is a twenty percent reduction in the patrol division.

The department is currently structured with five divisions. Three of the divisions are geographic (North, Central, and South). The fourth division is the Operational Support Division. Each of these four divisions is commanded by a Deputy Chief. The fifth Division, Business and Technology, is led by a civilian director. The dispatch center is part of the Business and Technology Division

The geographic divisions perform the patrol function for the police department. Officers assigned to the geographic divisions respond to calls for police service, conduct traffic enforcement as well as performing both preventative and high-visibility patrols. The officers assigned to the geographic division are assigned to one of three shifts (12:00 a.m. to 8:00 am; 8:00 am to 4:00 pm; and 4:00 pm to 12:00 am. Typically there are between seventy and one hundred twenty units on duty, depending on the time of day. In addition to the Springfield Police Department units, three days a week a task force from the Massachusetts State Police patrols in the City of Springfield. They use Springfield PD radios.

The Springfield Police Department uses eight repeated UHF channels in the conventional (non-trunked) mode and one UHF simplex channel. Satellite receivers are used on the repeated channels. One of the repeated channels is used for dispatch; one is used for data-base (LEAPS/NCIC) traffic, and the third is used for car-to-car traffic. The fourth is for narcotics, fifth for special operations, the sixth is for the Tactical Response Unit, the seventh for community policing, and the eight is for surveillance.

The Western Massachusetts Law Enforcement Consortium (WMLEC) is a consortium of over 100 communities in Hampden, Hampshire, Franklin and Berkshire Counties. Its member agencies cover about 608 square miles from the Vermont to the Connecticut and New York borders. WMLEC operates radio system for regional public safety communications. The WMLEC system has been a two channel system and is now a twelve channels system and includes fire and EMS agencies as well. One of the new channels (WMLEC 2) is for inter-service communications. The remaining channels are for law enforcement use. WMLEC 1 is a wide area police channel. Both WMLEC 1 and 2 are simulcast channels. The remaining channels are assigned to one of the five WMLEC regions. Two of the channels are used in Springfield and the immediate surrounding region for law enforcement and FIRE/EMS interagency communications.

Springfield PD has a mobile data network. Patrol and other vehicles have been equipped with laptop computers. The laptop computers use Biokey (formerly Packet Cluster) software over the Verizon wireless data network. The vehicles are equipped with separate radios and modems on the Verizon network. Springfield is working on switching from the Verizon network with its own network.

The police department is implementing a shot detection system and adding significant numbers of cameras. There are currently eight cameras. Ten to fifteen cameras are expected to be installed in the central business district initially. The eight cameras already operating in that area will be integrated into the new system. Within a year, an additional forty cameras will be installed in locations throughout the City as a result of this project.

A high speed fiber network ("Spring Net") is being implemented by the Springfield Media and Telecommunications Group. The project receives funding from the Cable Endowment Fund.

2.2.1 Springfield Police Department Dispatch Center

The Springfield Police Department Computer Aided Dispatch Center (CAD) is the primary Public Safety Answering Point for the City of Springfield. The center also dispatches the Springfield Police Department. 9-1-1 fire calls are transferred to the Springfield Fire Department Fire Alarm Headquarters. Emergency medical calls are transferred to AMR's regional dispatch center in Springfield. Wireless 9-1-1 calls are answered by the Massachusetts State Police in Northampton and then transferred to the Springfield PSAP. Wireless 9-1-1 calls can be transferred to either the Fire Department or AMR. The Springfield 9-1-1 Center is located in Police Headquarters at 130 Pearl Street. The building was constructed in 1968. There are five call-taker positions, two radio dispatch positions, and a shift supervisor position. Both the radio and supervisor positions are also equipped with 9-1-1 workstations.

There are currently twenty-six people on the dispatch staff. The dispatch staff works eight-hour shifts (0800-1600; 1600-2400; 2400-0800). Dispatch employees are represented by AFSCME. They are in the same bargaining unit as all City civilian personnel. Typical staffing is 1 supervisor, 2 radio dispatchers and 5 call takers. Based on Statewide Emergency Telecommunications Board Standards for Enhanced 9-1-1, there must be a minimum of three call takers on duty. The dispatch staff works a five on-two off schedule.

New Plant/CML VESTA 9-1-1 CPE was installed in 2007. The 9-1-1 CPE also includes Plant/CML's mapping system. A Logistic Systems Computer Aided Dispatch (CAD) system was installed in 1998. Motorola Centracom Elite radio consoles were installed in 1996. A Nice logging record was installed in 2008. NICE instant recall recorders were installed in 2007. The police department uses an Information Management Corporation (IMC) Records Management System (RMS). The RMS is not interfaced with the CAD.

The CAD center is responsible for answering the Springfield Police Department administrative number twenty-four hours a day. In addition to eight wireline 9-1-1 trunks and 12 wireless 9-1-1 trunks, there are two City administrative trunks and 3 business lines that are answered in the center.

TABLE 2-2 shows the available metrics for the Springfield Police Department Dispatch Center.

2.3 Springfield Fire Department

The Springfield Fire Department provides fire prevention, fire suppression, and fire investigation services to the City of Springfield. In addition, the fire department provides emergency medical "first-responder" service within the City of Springfield. The department organized into three bureaus: Prevention; Operations; and Administration. It is a "career" department with an authorized strength of 290 personnel. Fire department response is provided from eight stations located throughout the City.

The Operations Bureau includes three divisions: Suppression; Emergency Preparedness; and Training. The Suppression Division consists of two fire districts with a District Chief in charge of each district. There are four work groups each of which works a rotating schedule of two ten-hour day shifts, two fourteen-hour night shifts followed by four days off. Currently there are eight engine companies, five ladder companies, and one rescue squad operating from eight stations. In addition, the department has a hazardous materials team, three boats, and a bomb squad. The Bomb Squad is jointly

staffed by the fire department and the police department. The department currently has 279 personnel. Since 1989 there has been a significant decrease in the number of fire apparatus and personnel in the City.

The Administration Bureau consists of four divisions: Public Information; Administration; Communications; and Repair. The Fire Prevention Bureau consists of four divisions: Inspection; Juvenile Fire Setter; Public Education; and the Arson & Bomb Squad. The Fire Prevention Bureau is responsible for enforcing City and State fire ordinances, laws, rules and regulations as well as applicable National Fire Protection Association (NFPA) codes and standards. The division is also responsible for cause and origin determination and issues permits for special events. Fire Prevention was recently elevated from division status to bureau status.

The Springfield Fire Department currently has an Insurance Services Office (ISO) Public Protection Classification of 2. The Fire Suppression Rating Schedule (FSRS) considers three main areas of a community's fire-protection program: Fire Alarm and Communications (10%); the Fire Department (50%), and Water Supply (40%). The department is preparing for a periodic ISO revaluation.

The department has three State-provided decontamination units. In addition, the hazardous materials team works with the Commonwealth of Massachusetts District 4 Hazmat Team. There is a regional bulk mail distribution center located in Springfield. It is equipped with sophisticated biological detection systems, one of which is Anthrax oriented.

The fire department uses six VHF channels. Channels 1 & 2 are repeated channels and used for communications with dispatch. Fire calls are dispatched via the fire alarm cable system. For fire responses, channel 2 is used to communicate with dispatch. Medical calls as well as fire prevention and investigation traffic are supposed to use channel 1. Channel 3 is a simplex channel used in the field and not monitored by dispatch. Channel 4 is the intercity channel. Channels 5 and 6 are simplex fireground channels.

2.3.1 Springfield Fire Department Alarm Headquarters

The Fire Alarm Headquarters is the central location that receives all emergency and service calls to the Springfield Fire Department. 9-1-1 calls, telephone alarms, telegraphic alarms and wireless radio box alarms are all received at Fire Alarm. The Fire Alarm in-house maintenance team provides preventative maintenance of all equipment.

The Springfield Fire Department operates a municipal fire alarm system. The system originally included fire alarm pull boxes and auxiliary alarms connected to commercial and industrial facilities. There are between 250 and 300 subscribers on the system. The system is also used to alert the fire stations on calls. All of the street fire alarm boxes have been removed from the system. The Springfield City Council recently enacted a City Ordinance that the alarm system be converted to a wireless system. Springfield has selected a system from Signal Communications Company. The facilities that have been connected to the alarm system must purchase an alarm reporting device to be installed on their premise by December 31, 2008.

Approximately one year ago, the Fire Fighter/Dispatchers were replaced with civilian dispatchers. There are nine civilian fire dispatchers. A minimum of two dispatchers are on duty at all times. The dispatchers work a four on-two off schedule.

Fire Alarm (Dispatch) is a secondary PSAP. Incoming wireline 9-1-1 calls are answered by the Springfield Police Department and then transferred to Fire Alarm if the call is a fire call. Medical calls are transferred to AMR. If the fire department is needed as medical

first responders, AMR then notifies fire alarm. Wireless 9-1-1 calls are answered by the Massachusetts State Police in Northampton and then transferred to Springfield PD.

An Interact Computer Aided Dispatch (CAD) system was installed in 2005. The center is equipped with Motorola Centracomm Gold Elite Radio Consoles, and a Dynamic Instruments Digital logging recorder. The 9-1-1 Customer Premises Equipment is Plant MAARS. Wrightline dispatch furniture was installed in 2004.

TABLE 2-2 shows the available metrics for the Springfield Fire Alarm Headquarters.

2.3.2 Emergency Preparedness Division

The Office of Emergency Preparedness is responsible for developing and maintaining comprehensive emergency management mitigation and operations plans for responding to natural and manmade disasters as well as coordinating the City's implementation of the Federal Superfund Amendment Reauthorization Act provisions concerning hazardous materials. The office also provides staff support to the City's Emergency Medical Services Commission which contracts for ambulance services and oversees the operation of the Central Medical Emergency Direction (CMED) network in Springfield. The Office of Emergency Preparedness is part of the Springfield Fire Department. It previously had been a stand-alone department.

The office is responsible for coordinating the Western Massachusetts Metropolitan Medical Response System (MMRS). The MMRS Program was created in 1996 to enhance the capabilities of existing systems for public health emergencies that create mass casualties or casualties requiring unique care capabilities. There are three MMRS units in Massachusetts. The MMRS program required the development of a number of specific response plans for the various medical and public health providers in the twenty-nine communities that comprise the Western Massachusetts Region.

The City is susceptible to a variety of natural hazards in part due its location and climate. The most damaging hazards historically have been hurricanes and resulting floods. The City's mix of industrial and commercial uses in addition to the transportation lines located within its boundaries creates a number of high probability and risk situations.

The designated Emergency Operating Center (EOC) for the city is located at in a multi-purpose room at the Raymond Sullivan Safety Complex. The building also includes a fire station. The multi-purpose room is also used as a meeting room for various community groups.

The City of Springfield Emergency Operations Plan provides for up to sixteen different functional positions at the EOC. Depending on the nature of the situation, some of the positions may not be activated.

The EOC has limited communications capabilities. A number of control station radios are available to be set up in the operations room and can be used by the various agencies at the EOC. There is also the availability of telephone and internet service.

2.4 American Medical Response

American Medical Response (AMR) is a private medical transportation company. The AMR Western Massachusetts Region is part of AMR's Northeast Division, headquartered in New Haven, Connecticut. The AMR facility in Springfield is the Western Massachusetts Regional Headquarters for AMR. The AMR regional communications center is located at the facility.

AMR utilizes System Status Management. Field units are mobile rather than station-based and are assigned posts based on anticipated workload. During peak hours there are as many as 20-22 units deployed in the region. The minimum number is 8-9.

The Springfield Emergency Medical Services Commission is charged with EMS awarding and oversight. The Commission consists of a representative from the fire department, and representative of the police department, one medical doctor from each of the two hospitals with emergency departments, and an appointee of the mayor.

The City of Springfield contracts with AMR to be the provider of emergency medical response to calls received through the 9-1-1 system in the City. The contract with AMR was a five year contract and is in its second one-year extension. The contract costs the City nothing. The contract establishes performance standards. During peak periods, AMR must have nine Advanced Life Support Units on duty in the City during peak call periods, six during the second busiest period, and three during the slowest times of the day. They must respond to ninety-five percent of Priority 1 (highest priority) calls within ten minutes and ninety percent of the priority two calls within twenty minutes. Under the terms of the contract, AMR is required to maintain a dispatch center in the City of Springfield.

In addition to provision of 911 EMS service to the City of Springfield, AMR's Western Massachusetts operation provides 911 EMS service to Hampden, Holyoke, and East Longmeadow.

2.4.1 Central Medical Emergency Direction (CMED) Network

Massachusetts law assigns responsibility for oversight of emergency medical services in the Commonwealth to the Department of Public Health through its Office of Emergency Medical Services. It also requires the establishment of regional EMS councils. The EMS councils are non-profit corporations funded by the State. There are currently 5 EMS Regional Councils. Region 1, the Western Massachusetts Emergency Medical Services Committee (WMEMS), includes the four western-most Counties in the State.

In the late 1970's, the Massachusetts Department of Public Health, through the Office of Emergency Medical Services (OEMS), adopted the federal model of the Central Medical Emergency Direction (CMED) network as its method for EMS communications. The standard CMED configuration requires capability to patch EMS units to area Emergency Departments over a suite of 8 paired UHF "MED" channels and, at least, one VHF channel (155.340). There are two additional UHF pairs (MEDs 9, 10) which are available for local dispatch or scene coordination.

There are now 7 CMED centers in Massachusetts. The western-most CMED is in Springfield and is owned by the City of Springfield and operated by the City's contracted EMS provider (currently American Medical Response). The Springfield CMED manages EMS communications for 50 EMS services in 56 communities of 2 counties; linking them to 6 different area hospitals. CMED also provides service to numerous Connecticut services as they come across the State line to Springfield area hospitals.

Currently the Springfield CMED control console is housed within the AMR Communications Division at 595 Cottage Street. A part of the EMS contract with the City requires AMR to staff the CMED console around the clock. There are 9 remote transmitters operating from 4 sites (Shelburne Mountain in Franklin County, Chestnut Towers in downtown Springfield, Roosevelt Avenue in Springfield, and Bald Peak in Monson). CMED is linked to the other 6 Massachusetts CMEDs (as well as Hartford CMED) via normal telephone.

The day-to-day function of CMED is to provide communications patches between inbound EMS units and the Medical Control Physicians (MedCon) at the destination hospitals. CMED manages the large volume of traffic over the various channels with regard to geographical location and available channel space. CMED Operators "triage" incoming by priority and will, as needed, break patches to route more serious cases into the system. CMED Operators also manage hospital "Diversions" where overloaded Emergency Departments divert incoming ambulances to other hospitals. CMED enforces Regional Diversion Guidelines and notifies all appropriate EMS dispatch centers of changes in hospital status.

2.4.2 American Medical Response Dispatch Center

The AMR regional communications center has a total of eleven positions. Four of the positions are dispatch positions; two are CMED positions, and five are call taking only. The dispatch positions are also equipped to answer incoming telephone calls. One of the dispatch positions is equipped with a Plant/CML 9-1-1 answering position to receive 9-1-1 call wireline information. Wireless 9-1-1 calls are answered by the Massachusetts State Police and transferred to the Springfield 9-1-1 center. State law prohibits transferring the calls a second time.

The center is equipped with six 9-1-1 trunks for receiving transferred calls (2 Springfield, 2 Holyoke, 1 East Longmeadow, and 1 Hampden) as well as six business lines. The dispatch center answers the business lines when the receptionist is not there.

Dispatch is normally staffed with four or five personnel plus a Supervisor on days and two or three on nights. One position is always dedicated to CMED.

The AMR Communications Center utilizes the Medical Priority Dispatch Emergency Medical Dispatch (EMD) program. The EMD program includes medically approved emergency medical dispatch triage guidelines for telecommunicators; criteria based dispatch of resources, and the provision of approved pre-arrival instructions. It also includes a comprehensive EMD training program, quality improvement measures and ongoing research. Criteria Based Dispatch (CBD) is based on the recognition that the level of care (ALS vs. BLS) needed by the patient and the urgency of patient care should be the determining factors in the level of response.

A GEAC Computer Aided Dispatch (CAD) system is in use. It was installed in 1996. Mapping is included with the system. A Baker Integrated Technologies integrated radio and telephone system is installed in the communications center. That system was also installed in 1996. A Dictaphone logging record is also in use. The GEAC CAD provides an interface to the mobile data system.

TABLE 2-2 shows the available metrics for AMR.

Table 2-1
Population Projections

Area	1990 Census	2000 Census	% Change 1990-2005	2010 Estimate	2020 Estimate	2030 Estimate	% Change 2000-2030
Springfield	156,983	152,082	-3%	151,967	153901	157,832	4%
Hampden County	456,310	456,228	0%	456,367	463,767	476,557	4%
Springfield MSA	602,878	608,479	1%	611,898	620,805	627,013	3%
Massachusetts	6,016,425	6,349,097	5%	6,649,441	6,855,546	7,012,009	9%

Table 2-2
Metrics

2007	Springfield PD	Springfield FD	AMR
Wireline 9-1-1 Calls Received	72,199		
Wireless 9-1-1 Calls Received	41,020		
Total 9-1-1 Calls	113,219		
Wireless Call %	36%		
9-1-1 Transfer Calls Received		2,013	35,000
Other Incoming Calls Received	71,333	12,222	unknown
Total Calls Received	184,552	14,235	
Police Calls for Service	183,367		
Fire/EMS Calls Dispatched (FD)		3,927	
EMS Calls Dispatched (AMR) Springfield			32,064
EMS Calls Dispatched (AMR) Holyoke			10,000
EMS Calls Dispatched (AMR) East Longmeadow			2,000
EMS Calls Dispatched (AMR) Hamden			1,000
EMS Transfers Dispatched (AMR)			11,000
Wheelchair Van Transports			10,000
C-MED Patches (AMR)			5,199

3.0 Requirements of a Consolidated Dispatch Center

The 9-1-1/dispatch consolidation project that the City of Springfield is considering will have wide reaching effects on public safety operations in the City. This would not just be an improvement in dispatch operations but a profound realignment of how the departments and communications operations relate to one another.

As background information, this section will describe some of the complex issues involved. Then, recommendations can be made and applied. Here we will also discuss some effective means of managing the communications operations that have worked in other places.

Modern public safety communications systems have developed to support the operations of the public safety agencies they serve. The public safety communications system in the community typically performs four basic functions: receive & classify calls for assistance; support agency operations (dispatch); interagency communications; and data systems access. In order to perform these functions, a variety of systems and procedures are employed. Here we describe the operation of the most critical of these systems.

3.1 Communications Center Systems

A modern communications center is comprised of at least two separate functions: Operations and Technology. Since its inception forty years ago, the 9-1-1 system has become the primary means of communications from the public to the public safety agencies. Communications center operations involve dispatch protocols, very intensive personnel scheduling and management issues, and statistical and records release maintenance. Communications center technology involves the management of the 9-1-1 telephone technology, computer assisted dispatch systems, recording systems, radio systems, and other ancillary support systems.

3.1.1 Operations

Communications center operations personnel typically receive little recognition and are asked to function in one of the most complex and stress filled work environments in existence. Included in 9-1-1 operations management are dispatch functions for all of the agencies involved in the center. This normally means that center personnel must be proficient in police, fire and emergency medical protocols. The differing disciplines have their own characteristics that create scheduling and staffing challenges.

- Police - An extremely high volume of calls typically characterizes police dispatch. Most traffic involves small numbers of units sent to a large number of incidents. Most police agencies do not have sufficient units; therefore many times police calls for service are held and prioritized. The officers in the field, rather than the dispatcher, originate a large percentage of the dispatch activity. The dispatch work is largely reactive to field operations. This creates a constant, unrelenting requirement for dispatch attention.

- Fire - Fire dispatch normally has less call volume than police, however the calls that are dispatched are much more complex and time consuming. Fire radio traffic has a smaller number of calls involved with a larger number of units sent to each incident. Workload for the dispatcher is generally driven by complaints received over the telephone rather than from the field. By definition, fire calls are considered emergency calls unless otherwise specified.

- EMS - Medical dispatch also has a lesser number of calls for service than police. These incidents also normally involve multiple agencies. With the advent of medical pre-arrival protocols, medical incidents have become the most time consuming of all for dispatchers. Again, workload is driven by complaints received over the telephone rather than from the field. Transfers from one medical facility to another are another important component of medical dispatch.

The results are that while police will have the preponderance of calls statistically, the actual workload for fire and medical can easily equal that of police. In essence, the dispatchers in the various dispatch disciplines are restricted in how they can assist each other. 9-1-1 management must balance the conflicting needs of these disciplines while attempting to meet differing dispatch procedures for each agency.

In general, persons calling 9-1-1 and requesting a response from a public safety agency are in stressful situations. Many times these situations are literally a matter of life and death. Other situations may cause significant emotional distress. People under stress frequently do not communicate as effectively as when they are not under that stress. In addition, callers may make demands that are not possible to meet. The 9-1-1 operations personnel who deal with these callers may be impacted by the emotional state of the callers. In turn, this may impact the community's perception about the level of service being provided.

The quality of service provided through consolidation depends upon numerous factors; accuracy and reliability are two of the key factors. Other factors include personnel selection, training, shift personnel, supervisory and operational procedures, and telecommunicator workload. Much more than E-9-1-1 dispatching must be considered.

Providing accurate and reliable communications depends on a number of factors. One of the most critical is providing a communications system that is adequately staffed with highly trained and experienced personnel. Over the past thirty years there have been significant changes in public safety communications centers. The centers have become much more dependent on technology. The infusion of technology has not only improved the quality and capabilities of the service being provided, it has increased both the complexity of the job of the public safety telecommunicators and the scope of the training required to perform the required duties. What cannot be overlooked is the fact that the required basic job knowledge, skills, and abilities are as important now as they ever were. The job essentially remains one of receiving and communicating information to and from people. All of the technology that is in use is there to assist the communications process. Careful planning and attention to detail is required to assure that the technology assists rather than hinders that process. Now not only do communications personnel need to be skilled in communicating, they must also be proficient in the use of all of the different systems and equipment used in the center.

Many emergency communications centers struggle to attract and retain trained staff. A number of centers are effectively working with half of their authorized staff. Not only are they lacking in the number of people on staff, but, in some centers, a large number of those on staff are still in training and not yet capable of filling a position. Turnover is frequently cited as a problem as well. Conversely, there are centers that report that they are fully-staffed, have little turnover, and have eligible candidates on the waiting list. There are a number of factors that affect the ability of an ECC to attract and retain staff. The work environment is often a major factor.

A number of studies have shown that there is a correlation between the employees' perception of the adequacy of the physical environmental factors of the workplace and their productivity. Employee perception that the workplace environment is inadequate can result in increased absenteeism, lowered employee satisfaction, decreased productivity, and reduced quality. All of these can contribute to decreased customer satisfaction. An emergency communications center has at least two sets of customers,

the public and the public-safety agencies and departments served by the center. The perception that the workplace is inadequate can lead to both psychologically unhealthy employees and a psychologically unhealthy organization.

Dispatchers may have non-emergency dispatch related duties to perform for their agency, including record keeping, administrative telephone duties and dispatch for agencies outside of public safety. Staffing for such collateral duties must be considered when operations are moved to a centralized dispatch center. Once resolved, efforts must then focus on improving dispatch service quality.

Personnel scheduling and management are full-time vocations in themselves. With a national average of 20% per year turnover in staff, employee selection, retention, and training become serious concerns. Often times, it is necessary that new employee training is ongoing. This requires staffing and management attention as well.

Operational procedures and standards are an equally important aspect of any public safety communications center. Public safety in each community has evolved based in large measure by the standard of service demanded by the community being served. This is especially true of the operations of public safety communications centers. There are a number of "national" standards that can be used as guidelines by governing bodies in establishing the level of service being provided to the community. The National Fire Protection Association is an international nonprofit membership organization which develops consensus codes and standards, research, training, and education on fire prevention and public safety. The NFPA's *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems* (NFPA 1221) provides guidance on many public safety communications matters including communications center design and operations. Public safety communications centers and systems must function under all conditions. They must provide the highest degree of reliability feasible in order to assure continuous functionality. The provisions contained in NFPA 1221 when implemented are key aspects of having a reliable, continuously functioning center. NFPA 1221 establishes that:

- Ninety-five percent of alarms shall be answered within 15 seconds and 99 percent of alarms shall be answered within 40 seconds.(SECTION 7.4.1)

- Ninety-five percent of emergency dispatching shall be completed within 60 seconds. (SECTION 7.4.2)

In a clarification from previous editions, the 2007 edition of the standard indicates that the sixty second time period begins when the call is answered at the dispatch center and ends with the commencement of the dispatch.

In situations, such as in Springfield, where calls are transferred from the primary public safety answering point, NFPA 1221 stipulates:

- Where alarms are transferred from the primary Public Safety Answering Point (PSAP) to a secondary answering point, the transfer procedure shall not exceed 30 seconds for ninety-five percent of all alarms processed. (SECTION 7.4.4)

A centralized communications center by its nature also becomes the point where the preponderance of public safety statistics are created and compiled. Basic statistics are the numbers of calls for service and response times. Also, because of the recording systems, the center receives many requests for news releases and investigatory tapes. In a combined agency center, the various procedures and authorizations to release such information create a supporting specialty of records management. An important element to assuring that the system operates as it should is the on-going collection and analysis of system metrics.

3.1.2 9-1-1 Technology

A complex and multifaceted technology supports any centralized communications center. One of the primary subsystems is the Enhanced 9-1-1 telephone technology. Each 9-1-1 Center or PSAP (public safety answering point) is normally equipped with its own 9-1-1 switch. Also known as an ANI/ALI controller, this is the equipment that provides the Automatic Number Identification (ANI) and Automatic Location Information (ALI) to the dispatchers. There is an extensive database for wireline telephones, the Master Street Address Guide (MSAG) maintained to ensure that this ANI & ALI information is correct. It includes a listing of all valid address ranges within the jurisdiction.

In the past few years, 9-1-1 Customer Premises Equipment (CPE) has featured the integration of the telephone and computer. Modern 9-1-1 customer premise equipment is computer based and integrates several different applications. Most suppliers of the integrated workstation include “instant recall recorders” and integrated TDD for communications with hearing and speech impaired callers as standardized options. Depending on the option and the vendor, some of the options are included at no additional charge, and some are relatively low cost. By using the replay recorder and TDD included with the telephone, the 9-1-1 center can avoid having to purchase separate, expensive pieces of equipment. In addition to the integration of the functions, operation is significantly easier. The US Department of Justice has interpreted the Americans with Disabilities Act (ADA) legislation to mean that each 9-1-1 position must be equipped with a device capable of communicating with the hearing and speech impaired 9-1-1 caller.

Depending upon the age and manufacturer of this equipment, the existing system in any municipality may have very limited expansion and adaptation capacity. For example, first generation 9-1-1 switches generally do not provide abandoned call notifications. In this current litigious environment, abandoned call notification is a necessity. An abandoned call occurs when the caller has disconnected prior to the dispatcher answering. The caller’s number and location are known to a center via ANI and ALI. But, if a center does not attempt to reconnect the caller or recognize a need to do so, then the center could face extreme liability and bad publicity.

In first generation 9-1-1 equipment, the operators could only discern an abandoned call by realizing that the ANI and ALI printers were activated. The abandoned call notification system presents an alarm to dispatchers and supervisors.

As 9-1-1 CPE becomes increasingly computer-based, the use of a standard digital protocol has become more important. The Transmission Control Protocol/Internet Protocol (TCP/IP) or IP has become the standard for digital communications. Many commercial telephone systems now are IP-based. Newer 9-1-1 CPE uses IP for communications between the 9-1-1 switch and the answering positions. The 9-1-1 network however still uses analog communications between the selective router and the PSAP.

When the 9-1-1 system was developed in the 1970’s, the digital technology now in use didn’t exist. In order to provide the highest degree of reliability, it was necessary to separate the 9-1-1 system from the remainder of the telephone network. Separate, dedicated circuits were installed between the local telephone company wire centers or central offices to the selective router and then from the selective router to the PSAP. In order to provide the telephone number of the caller, the Centralized Automatic Message Accounting system (CAMA) which was the long distance message accounting system was adapted for use by the 9-1-1 network. The CAMA system operates using analog signaling techniques. By today’s standards, CAMA is slow and very limited. There is a concerted effort to develop the standards for the next generation of the 9-1-1 network. That network will be able to accept and deliver to the PSAP inputs from a wide variety of devices. While the definition of the next generation is still a work in progress, it is known

that it will be IP based. For that reason, it is critical that new 9-1-1 CPE be IP capable so that it is ready for the change when it occurs. Fortunately for the City of Springfield, the Massachusetts Statewide Emergency Telecommunications Board (SETB) has provided updated 9-1-1 CPE that is IP capable.

The Master Street Address Guide (MSAG) is a critical element in any wireline Enhanced 9-1-1 system. The primary purpose of the MSAG is to assist in routing 9-1-1 calls to the proper PSAP. Telephone exchange boundaries and political boundaries are often different. The MSAG is used to direct calls originating in a jurisdiction to the PSAP that answers calls for that jurisdiction. There is a fair amount of work required to keep the MSAG current, especially in areas where there is new development. The MSAG can also be used to indicate which agency has jurisdiction for a particular location.

Beginning in the late 1990's, wireless enhanced 9-1-1 began to be deployed throughout the country. Because wireless callers are by definition not in a fixed location, a different technology was needed to provide the location of wireless callers in an emergency. This has placed additional demands on the PSAPS. Wireless 9-1-1 calls require that the 9-1-1 equipment be capable of receiving two ten digit telephone numbers as well as location information expressed as latitude and longitude. Many older 9-1-1 systems are not capable of fulfilling that requirement. In addition, the PSAP needs some form of computer-based mapping system to be able to rapidly convert the location information to a dispatchable address. In addition, the 9-1-1 equipment must allow the telecommunicator to refresh or rebid the ALI information in order to obtain the wireless callers location.

Wireless enhanced 9-1-1 service has presented significant challenges to the communications industry. Not only are there the PSAP equipment issues noted above, the provision of accurate caller location information within acceptable ranges has been especially controversial. Federal Communications Commission (FCC) Rules and Regulations provide for the use of two different technologies in providing caller location information. The technology deployed by most of the wireless service providers uses the Global Positioning System. The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 24 satellites. A GPS receiver is placed in each handset and uses the signals from the satellites to calculate the handset's location. A GPS receiver must be locked on to the signal of at least three satellites to calculate a two dimensional position (latitude and longitude) and track movement. With four or more satellites in view, the receiver can determine the user's three dimensional position (latitude, longitude and altitude). Currently, the technology deployed in wireless networks only determines the latitude and longitude. Currently FCC Rules and Regulations require that the location information be within fifty meters (50) for sixty-seven percent (67%) of calls and one hundred fifty meters (150) for ninety-five (95%) percent of calls.

The other method of providing location data uses network-based technology. There are several different ways that the network-based technology works. The essence is that the location of the caller is determined by differences in the signal at multiple towers. The more towers that receive the signal, the more accurate the location information will be. For network-based solutions, the FCC Rules stipulate one hundred (100) meters for sixty-seven percent (67%) of the calls, 300 meters for 95 percent of calls.

The Cellular Telephone Industry Association (CTIA) estimates that as of December 2007 approximately eighty-four percent of the population of the United States has a wireless communications device. The CTIA further estimates that those 255,400,000 devices generate 106,215,000 9-1-1 calls each year. The most recent estimates by the CTIA also indicate that approximately sixteen percent of households in the United States only have a wireless telephone.

The exponential increase in wireless devices has significantly impacted public safety communications centers. As noted above, over one million wireless 9-1-1 calls are received nationwide each year. For the most part, there has been little, if any, reduction in wireline 9-1-1 calls received at the PSAP. In many cases, the influx of incoming calls has not resulted in any increase in the staff in the communications center. In addition to the increased total number of calls, PSAPs receive many more calls about the same incident than before. Often these calls take longer to process since the mobile caller may be uncertain of his or her location, and it takes thirty seconds or more to retrieve the location information from the wireless carrier.

Voice over the Internet (VoIP) telephony is another new technology that is creating additional requirements for the 9-1-1 system. As the need for greater capacity and improved reliability has grown, telecommunications are moving to use digital rather than analog signaling methods. Internet Protocol (IP) is a common format for digital communications. Digitized voice messages can be transmitted using IP or VoIP. VoIP impacts the 9-1-1 system three different ways. First, many newer 9-1-1 systems use IP technology between the telephone switch and the individual workstations. Secondly, VoIP is being viewed as the favored technology to replace the CAMA trunks between the 9-1-1 selective router and the 9-1-1 center. Thirdly, callers using VoIP technology make telephone calls over the internet. VoIP calls interface with the conventional telephone network at the VoIP service provider's points of presence, which may or may not be in the local community. There are significant issues that must be resolved in order to assure that a 9-1-1 call is routed to the correct PSAP. Current VoIP technology may not provide for the transmission of the caller's physical location along with the voice call. Some VoIP telecommunications service provider networks, however, are not compatible with the existing E-9-1-1 infrastructure. The Federal Communications Commission has ordered that VoIP service providers provide 9-1-1 service. Three phases have been identified for the transition to a fully-E-9-1-1 capable system for VoIP calls:

- **I1** - routing to 10-digit administrative numbers allowed, stationary (fixed) service only, no caller location transmitted, but no modifications required by PSAPs to handle incoming calls

- **I2** - no routing to 10-digit numbers, stationary and nomadic service, caller location transmitted, ALI database modification required, no modification required by PSAPs

- **I3 -** no routing to 10-digit numbers, stationary, nomadic and mobile service, caller location transmitted, PSAP modifications required, ALI database replaced by domain name server

Because this is a new and rapidly evolving technology, many of the details have yet to be resolved. As with wireless 9-1-1, several different phases have been identified for VoIP 9-1-1 service. Some VoIP providers are able to provide a level of service similar to enhanced 9-1-1. Others are not able to provide the enhanced features at this time. The telephone hardware must also be sized to accommodate a centralized center's workload. Often this limitation will require an expansion of the 9-1-1 switch subsystem or replacement of the entire 9-1-1-switch subsystem.

3.1.3 Computer Aided Dispatch (CAD)

Currently each of the three centers uses a different CAD system. There is no interoperability between the various systems. An integrated, full -featured computer aided dispatch subsystem would certainly be a necessity in a centralized communications center with the volume of activity anticipated in the consolidated center. In addition, each of the agencies utilized a computerized records management system. The CAD system will need to be capable of transferring data from the CAD system to these RMS systems.

Incident information is entered into the CAD system by the call-taker. The system verifies the address in the geographic data base and may provide recommendations on response based on the location and nature of the incident. Currently incident information must be entered by each center that will be dispatching resources. Three separate databases are must maintained.

The geographic database (GEOFILE) can become quite complex as well, due to the differing service disciplines (police, fire, and medical) often with differing jurisdictional boundaries. This results in multiple agencies of similar type within one system. This will sometimes require the CAD to generate different case and run numbers for the same incident. The MSAG will show which jurisdiction covers a given address range. The CAD GEOFILE typically recommends specific units to respond to a given location whereas the MSAG only indicates the jurisdiction. The GEOFILE and the MSAG must remain coordinated. The CAD must also interface with all computer and records systems that reside downstream from it. Agency records systems should receive direct input from the CAD system for basic elements, such as incident numbers, date and time, location, and investigating officer.

As it is a part of the system, the mobile data system must also interface with the CAD in order to package and transfer information over the air. There is also the National Crime Information Center (NCIC), the Massachusetts Criminal Justice Information System), and local criminal justice databases, as well as the 9-1-1 switch itself with which the CAD must communicate.

As noted above, location information for wireless 9-1-1 callers is expressed in latitude/longitude coordinates. The CAD must, therefore, be adaptable to latitude/longitude points and translating that to a location in the CAD system.

Generally, a computer aided dispatch system should allow for easy entry of incident information, recommend the resources to be dispatched to the call, track the status of the units both in relation to the incident and otherwise, maintain records of those calls and time related to it, and provide assorted records and reports for analysis and documentation.

A number of the systems being marketed as CAD systems are more focused on the records management and incident reporting aspects rather than on the dispatch aspects. While they may be suitable for use in smaller agencies, these systems may not be suitable for use in busier centers.

Agencies looking to implement or upgrade their CAD system should focus on the functionality as it pertains to dispatch operations. Common CAD functions include:

- Event Entry
- Event Prioritization
- Unit Recommendation for Assignment to Calls
- Time-stamping
- Address Verification
- Unit Status Monitoring/Recording
- Alert Timers
- Call History
- 9-1-1 Interface
- Paging Interface
- Radio System Interface
- Mobile Data Interface
- Mapping System Interface

These are just a few of the more common features and functions of a modern CAD system. It is important during the procurement to define what functions and features are required. As prospective systems are reviewed, there needs to be appropriate assurances that the system will have adequate capacity to handle the anticipated workload. This should not be just the normal workload, but must focus on estimated peak workloads. What happens when a major event adds extra units to the system? What happens when an unusual occurrence results in a call volume several times larger than the normal call volume? Does the system have sufficient capacity to handle the demand?

3.1.4 Support Systems

Within any 9-1-1 center, there are ancillary subsystems that also require technical management. For example, the logging recorder subsystem must be sized to the needs of the 9-1-1 center and also to the recording needs of the agencies that require their radio traffic recorded. Other examples of ancillary systems include: generators, uninterruptible power supplies, and internal security subsystems.

3.1.5 System Integration

Intelligent Workstation is the term that has been applied to computer based 9-1-1 answering position equipment that includes computer telephony integration. These workstations help resolve many of the issues facing PSAP's. There are several integration levels available. Basic integration allows the use of the same keyboard to access multiple computers. A manual switch is used to switch between the computers. A second level of integration allows the use of one computer, serving as a workstation to switch between multiple applications running on multiple host computers. The third and highest level of integration allows for a more complete interface between the various applications. An example of this is an interface between the 9-1-1 system and a CAD system. Through the use of a programmed interface, caller information is transferred from the 9-1-1 system and reformatted so that it is displayed in the appropriate fields in the calls for service screen in the CAD screen.

While the use of intelligent workstations solves a number of issues, there are also a number of potential concerns with their implementation that must be dealt with. First is the possibility that the applications are incompatible. Even when applications use the same operating systems, problems can occur when similar commands between applications cause undesired results. Often what is called multi-tasking actually refers to the ability to do multiple tasks in rapid succession. This may create problems when applications compete for priority. Even when the operating system of the workstation does permit true multi-tasking, problems may occur when two or more applications try to use the same portion of a computer's memory at the same time. Another potential problem involves human factors. A telecommunicator may need to view multiple applications at the same time. For example, a call-taker may need to see the 9-1-1 display screen, the CAD call-taking screen, and a digitized map. It may become difficult to view all three applications at the same time on one screen. Multiple monitors may be needed. Integration of multiple applications is not only possible; in many cases it is desirable. Because of the potential problems involved, any integration effort must be done with a great deal of care and caution.

3.1.6 Additional Considerations

In addition to the number of computer monitors, cabling requirements have changed dramatically. Previously, with the older analog technology, several multiple-pair cables were needed between each position and the connection point. New digital communications techniques have dramatically changed that. The new trend is to use computer networking techniques to interconnect the various terminals with the "back-room". This has greatly reduced the amount of cabling that must be run. However, as

more applications become networked, the capacity of the network must expand. To that end, TIA/ANSI/NEMA Category 6 or 7 cabling is recommended for all new installations. These new categories of cabling permit data transfer speeds of up 600 Mb.

3.2 9-1-1 Consolidation

A change in the 9-1-1, or dispatch system, will not affect the number of calls for service, but it will impact how they are handled.

Even major leaps in technology can only reduce processing time by minimal amounts, and certainly not enough to produce a reduction in staff. The most dramatic cost savings in personnel will be in areas where personnel were used for activities other than dispatch. Most public safety dispatchers perform a multitude of administrative tasks in support of their employer. While consolidation in a centralized center may remove these non-9-1-1 functions from the dispatchers, the functions must be satisfied in some other fashion. Estimating how these tasks impact workload and staffing levels can be very difficult, especially because these duties are largely non-quantifiable.

3.2.1 Consolidation

A consolidated center requires diverse centers to be brought together under one management with common operating platforms. A consolidated center offers many advantages. The consolidated center can take advantage of common electrical, HVAC, and emergency power subsystems. The employees can be cross-trained and the schedules can be combined for added personnel efficiency. A consolidated center would create an arrangement that is more flexible, and amplifies the commonalties in fire and medical dispatch. The technical issues here become the 9-1-1 equipment, administrative telephones, computer-aided dispatch, and recording equipment. The 9-1-1 equipment must be sized for the consolidated dispatch operation. The telephone sets themselves must also accommodate the new larger number of non-9-1-1 lines. One operating platform for the consolidated 9-1-1 operation would be a necessity. Any new CAD could feed multiple records management systems. This single CAD must be able to upload into the various records management systems. A consolidated Center would require a single recording system.

3.2.2 Co-Location

If various 9-1-1 centers are co-located, then they will remain separate operations in the same building. This presents an entirely different set of issues. In this scenario, there would be different management of the multiple operations and equipment could be different as well. In a co-located operation there would be multiple 9-1-1 switches. Because of the equipment that routes the 9-1-1 calls from the provider to the center, the calls cannot be divided any other way. The CAD and recorder systems in this scenario could remain separate.

The most challenging issues involve personnel, resulting from two complete staffs with their own schedules and supervision. This would be the least efficient use of personnel.

3.2.3 9-1-1 Center Design

Because of the critical functions performed at public safety communications centers, considerable care is required in the location, design and construction of a center. The location should be chosen carefully and be as far from known hazards as feasible. For example, the lowest floor in a communications center should be above the 100 year flood elevation. There also needs to be adequate drainage so that localized flooding will not occur. Facilities that use hazardous chemicals should not be close to the center. Careful consideration is needed when considering a location near a rail line or major highway that is used to transport hazardous chemicals. The Federal Emergency Management Agency

recommends that a ten-mile radius around a critical facility be thoroughly investigated. A significant leak of an Extremely Hazardous Substance (EHS), such as chlorine, could necessitate the need for protective actions including evacuation as far as ten miles from the incident. Possible terrorist actions could expand that emergency action zone. A hazard analysis should result in a threat rating – how likely is the facility to face the particular threat(s).

It is important that the site has adequate drainage. Even though it may be above the flood level, there must be adequate drainage and provisions for storm water runoff so that localized flooding won't occur during heavy rains or rapid snow melt.

A quiet area with low surface traffic is recommended. Multiple access routes are also advisable so that the center is always accessible. Caution is advised to avoid locating the center in a high crime area. Typically dispatch staffs are predominately female. It is not unusual for employees to be coming and going from work individually or in small groups. It is strongly recommended that secure parking be provided for employees.

The availability of communications facilities is another key concern. The 9-1-1 system requires numerous circuits from the 9-1-1 service provider (Verizon). Ideally fiber and other high capacity communications facilities from multiple providers will be available as well. Many of the communications systems, including 9-1-1, are migrating to Internet Protocol based systems and will need the availability of high capacity cabling suych as fiber optic.

Terrorism is real, evolving, and continues to increase in frequency and lethality throughout the world. Critical facilities, such as an Emergency Communications Center are frequently the target of attack by those seeking to disrupt government, avenge a perceived wrong, or other, similar reasons. The Department of Defense has developed guidelines to minimize the likelihood of mass casualties from terrorist attacks. While mandatory for DoD facilities, they are highly recommended for use in critical facilities such as the ECC. One of the key provisions is to maximize standoff distances.to keep those intent on doing harm as far away from the building as possible. The recommendation is to that vehicles should be kept away from the building. Cleared vehicles, such as employee's personal vehicle should be allowed to get no closer than twenty-five meters (eighty-two feet) from the building. All other traffic should be kept at least fifty meters (one hundred sixty-four feet) away.

Access to utilities is another important consideration. Ideally the site will have access to multiple power grids so that diverse feeds can be installed. Availability of high capacity telecommunications circuits, including fiber optic cables, from multiple vendors is highly desirable. Critical circuits should be routed to the facility using diverse routing.

The design of critical communications facilities is a complex field. Public safety communications systems and public safety communications facilities should function under <u>all</u> conditions. The facility should be designed to withstand the anticipated hazards. Any effort to enhance the security and survivability of critical communications facilities should consider all of the hazards that the facility may face. The impact of technology on emergency communication systems and facilities is becoming increasingly significant. Technological advances have affected the way public safety agencies and corresponding centers operate daily. Technology affects every aspect of doing business directly and indirectly. In order to meet future needs over the next 15 to 20 years, a critical communications center should be designed with the following considerations in mind:

- Avoiding fixed objects (walls, furniture, etc.) when practical
- Selecting equipment and peripherals such as displays, keyboards, and computers that can change and move as much as possible

- The infrastructure (data and power cables, etc.) needs to be moveable and reconfigurable
- The space should be as open as possible, and raised flooring and high ceilings should be used
- Adequate equipment room space must be provided
- Extra attention must be focused on electrical grounding

The PSAP must also comply with other requirements of the ADA concerning requirements that facilities and equipment be readily accessible and useable by persons with disabilities.

As the equipment in critical communications centers become more integrated and computer-based, there is a definite trend towards equipping them with more ergonomic furniture. A number of manufacturers offer adjustable furniture so personnel can raise or lower a chair or work surface to a comfortable position. Many new models allow adjustments from sitting to standing. This amenity is especially helpful when dispatchers and call takers are expected to spend prolonged periods at a workstation.

The consolidation/co-location issue has profound effects on the room design. It will directly impact the number of console positions in the center. In the equipment room, this will dictate the size and quantity of CAD processors, 9-1-1 switching equipment, and recorder processors. These requirements, in turn, will be carried out to determine the floor space, electrical, and HVAC needs.

3.2.4 9-1-1 Position Descriptions

Dispatcher - A dispatch position will normally contain radio controls, a 9-1-1 telephone with associated screens, and two CAD screens (one call taking and one unit status). A fourth screen is often used to display the computerized map.

Call Taker - A call taker only requires a 9-1-1 telephone with associated screens, a map display, and a call taking CAD screen.

At least one call taker should also be equipped with the commercial alarm terminations. In a co-located center, call takers would have to be replicated for the differing CADs and 9-1-1 equipment. This would require twice as many call takers.

Supervisor – A typical supervisor's position would have at least one more computer display. The position would have additional controls for internal alarms, system controls, and console override access.

In all but the largest centers, all of the positions, except for the supervisor's position, are typically set up as dispatch positions so that all positions can do all of the functions. This permits the maximum flexibility as staffing and workload changes.

3.2.5 9-1-1 Space Characteristics

The dispatch area should be characterized by these features:

- ADA compliant
- Raised flooring
- Bookshelves, or other storage, for ready access to manual reference materials
- Lighting should have a wide range of adjustments. Individual lighting at each position is most preferred
- Lockers – dispatcher should have available personal storage space for coats, headsets, reference texts, and other materials
- Adequate restrooms for male and female employees
- Equipment room for electrical, HVAC, generator, and UPS

- Storage
- Break/common area nearby
- Training and administrative office space
- Adequate automobile parking

3.2.6 Dispatch Protocols

Consolidation of dispatch operations also requires consolidation of dispatch protocols. Much discussion is required before operations commence to resolve service level issues. Some centers have chosen to have all agencies follow the same protocol, while others have chosen to permit differences between the agencies. Advances in computer aided dispatch systems have facilitated allowing different protocols. There is still a need to establish common call classes and recommendation tables in the CAD.

This may require participating agencies adopting the same set of signals and codes. They would have to agree on the number of units assigned to a particular call class and the priority level. Consolidation, therefore, involves a great deal of cooperation between all agencies.

4.0 Problems and Concerns

Both of the City of Springfield dispatch centers as well as AMR have operated as self-sufficient entities for a long time. This has been necessary to serve the needs of the departments and citizens of the communities. The dispatch centers have followed diverse paths to meet the needs of their respective departments. This diversity presents some challenges in consolidating services. This section will explore the major issues with the current situation and concerns we have identified in moving towards a consolidated 9-1-1 operations.

In 1998 the Minnesota Office of the Legislative Auditor published a review of best practices in 9-1-1 public safety dispatching. That report identified seven "Best Practices" based on ideas and standards in the public safety communications industry. These seven actions provide a framework to evaluate public safety dispatching in the City of Springfield. The seven actions include:

- Develop and use standard operating procedures
- Support a trained and qualified work force
- Maintain adequate communications and network equipment
- Consider opportunities for coordinating the use of dispatching equipment and cooperative dispatching
- Keep records and measure performance
- Promote information exchanges among public safety response agencies
- Educate the public on the 9-1-1 system and services

4.1 Standard Operating Procedures

Written directives are an essential element of managing a public safety agency, especially a public safety communications center. Comprehensive directives establish the means by which administrative and operational goals are to be met as well as provide direction to agency personnel.

Neither the Springfield Police Computer Aided Dispatch (CAD) center nor the Springfield Fire Alarm Headquarters have comprehensive written standard operating procedures. The written guidance that does exist is woefully outdated and obsolete.

Written directives also provide benchmarks to use when evaluating the performance of the public safety communications system. A comprehensive quality assurance (QA) and quality improvement (QI) program is an important part of system performance measurement, discussed in SECTION 4.5 below. An aspect of any QA/QI program is comparing actual performance against the stated goals and objectives. For example, if the City of Springfield established the goal that ninety percent of all 9-1-1 calls would be answered in ten seconds or less, the QA portion of the portion of the program would review available data to analyze the actual performance and the QI portion would evaluate if there was a need to modify the goal. In this example, perhaps suggesting modifying the goal to be to answer ninety-five percent of the calls in ten seconds would be appropriate.

As our society becomes increasingly litigious, it is even more important to have comprehensive policies and procedures and to vigorously make certain that the policies and procedures are followed. In general, the courts have held that government is immune from liability when performing discretionary functions, but not immune when performing ministerial duties. Discretion is interpreted as the judgmental or policy

decisions rather than the operational decisions. These operational decisions, generally implementing or executing policy decisions, are known as ministerial duties and are not immune from liability. The courts have further found that if a governmental employee is acting within the scope of his or her duties and following established policies and procedures, the employee is also immune from liability. There are six exceptions to the general rule. These exceptions include:

- Claims brought against a governmental entity for the negligent operation of an automobile,
- Claims arising out of the operation of any public hospital, correctional facility or jail,
- Claims arising out of a dangerous condition of any public building,
- Injuries caused by a dangerous condition of a public highway, road or street which physically interferes with the movement of traffic on the paved portion of the roadway,
- Injuries caused by a dangerous condition of any public hospital, jail, public facility located in a park or recreation area, or any public water, gas, sanitation, electrical, power or swimming facility, and
- Claims arising out of the operation and maintenance of any public water facility, gas facility, sanitation facility, electrical facility, power facility or swimming facility.

The facts in a specific case may result in a different decision, but the general interpretation of immunity may be summarized being that if a governmental agency has a policy on a specific issue and the governmental employee is following that policy, then both are immune from liability. Further, the policy must be in writing in order for it to be considered to exist.

4.2 Support a Trained and Qualified Work Forces

The Springfield Police Department's dispatch center is understaffed. As will be discussed in more detail in SECTION 4.2.6, the lack of adequate staff contributes to center performance that is not consistent with established standards.

This practice area involves a number of elements:

- Job Task Analysis/Job Descriptions
- Hiring Standards
- Initial or New Hire Training
- Continuing Education
- Career Path
- Staffing

4.2.1 Job Task Analysis/Job Descriptions

The job of a dispatcher has changed significantly over the past few years. While the basic function of the position remains the same (receive and process incoming calls for assistance, dispatch and coordination of public safety resources, coordination with other public safety services, and maintaining records), the way the work is performed is significantly different. It has become significantly more technology based, and the volume of calls being received has increased dramatically. Accuracy and reliability remain the two primary goals of public safety communications. A number of sophisticated, computerized support systems have been implemented to help improve their accuracy and reliability. These systems include Computer Aided Dispatch Systems (CAD), Records Management Systems (RMS), and Geographic Information Systems (GIS). In addition, there is the 9-1-1 system, the radio system, the recording system, and so on.

The dispatch center is a unique environment. *Martino V. di (2003) Workplace violence in the health sector; Relationship between work stress and workplace violence in the health*

sector. There are many factors that make working in the center very stressful. Stress is defined as "*the physical and emotional response that occurs when the requirements of the job do not match the capabilities, resources or needs of the employee."* Key sources of stress include ambiguity, work overload, lack of control, and dealing with death and dying. Another factor can be called the "*fishbowl factor.*" Dispatch employees are subjected to a closer supervision than many other workplaces. Frequently supervisors are monitoring the telephone and radio traffic. Telephone and radio traffic is recorded and subject to extensive review. The psychological demands of the position (many calls truly are a matter of life or death) coupled with significant limitations in the decision making latitude of the employee can increase the perception that the situation is stressful. All too often, the organizational structure and culture of the center do not provide the social support necessary to counter those perceptions. Adding to the problems are other factors such as shift work, schedules and overtime.

As noted in SECTION 3, there is a direct correlation between the employees' perception of staffing adequacy and their performance. As discussed further in APPENDIX B, APCO *Project RETAINS* identified it as the leading causes of employee turnover.

In Springfield, there has been no systematic review of the knowledge, skills, abilities, and personal characteristics needed to perform the job of dispatcher. A job analysis is needed as the first step in the process. Job Analysis is the process of identifying essential job tasks and the essential knowledge, skills, abilities, personal characteristics and physical abilities that are essential for performing these tasks successfully. The analysis can become the basis for employee recruitment and selection. The Job Analysis also provides the basis for development of performance appraisal systems and standards, as well as other objectives such as the development of new hire training programs.

4.2.2 Hiring Standards

In many instances, newly hired dispatchers do not complete their training period. Sometimes it is because they don't perform adequately, but more frequently, they leave because they find the job is not what they expected. Frequently this is because the nature of the job does not meet the qualifications of the candidate. A number of communications centers have found improved new employee retention by focusing on matching the prospective employee's personality characteristics with the demands of the job. For example, the job is one with very low recognition for good performance. An individual who needs constant reinforcement is not a good match for a dispatcher position. The City is in the process of implementing the *CritiCall* pre-employment testing system. This is an important first-step in improving the hiring and employee retention process. By using a validated pre-employment testing program such as *CritiCall*, the City should be able to reduce employee turnover early in the employment process.

4.2.3 New Employee Training

As noted above, the employee's perception of adequacy greatly impacts his or her stress levels. A comprehensive, well planned training program is another essential element. Currently newly hired dispatchers at both the police and fire dispatch centers complete the Basic Telecommunicator Training Course developed by the Association of Public-Safety Communications Officials, International (APCO) and an additional forty hours of class room training covering first aid, cardio-pulmonary resuscitation, dealing with hearing and speech impaired callers, the CAD system, and department organization and procedures. APCO is the largest public safety communications user group. The basic training course is just that. It provides the entry level generic training to provide preliminary knowledge about the job to new hires. The additional forty hours of class room training covers some of the details of operations in Springfield. Currently, after completion of the classroom portion of the training, newly hired employees are assigned to a Communications Training Officer (CTO) for two weeks. The concept used with the

CTO program is "progressive empowerment". With this method, the program starts with the trainee observing while the trainer does everything. As time passes and experience builds, the trainee does more of the tasks and the trainer observes. Based on established programs, such as the APCO Communications Training Officer Program, two weeks is not an adequate amount of time for an inexperienced trainee to gain the knowledge and skills needed to perform the job with confidence. Typically, a trainee spends from sixty to ninety days with a trainer under most CTO programs.

A comprehensive training program, based on the job tasks identified in the job task analysis, is required to produce competent employees prepared to perform the duties and responsibilities of the position with confidence and ability. Rather than focus on the hours of instruction or time with a trainer, the training program should focus instead on the candidate's demonstration of the required competencies. As noted earlier, the dispatcher's job is complex and requires prompt action in many cases. The training must be consistently provided to all employees.

4.2.4 Continuing Education

Change is a constant today. Our communities continue to change as the population and the environment change. Since our public safety agencies and systems have developed in response to the situation in the community, it is only logical that they change as well. Employees need to be trained in the changes, and they need to be provided with the opportunity to maintain and increase their skills and proficiency. The Massachusetts State Emergency Telecommunications Board (SETB) provides grants for approved training courses. The program began in FY2008. Springfield received $101,000 under the program for the first year and is eligible for $98,588 this fiscal year. The grants cover the cost of the class as well as the cost of the attendees' wages and the cost of overtime to cover for their absence. Significant difficulty was reported by several parties in using the grant funding during the 2008 fiscal year. Training plans need to be developed to assure the provision of the best qualified workforce possible. The provision of adequate training is an important element in measuring employee satisfaction. This includes both initial and in-service training.

4.2.5 Career Path

In most organizations, new employees can progress through a number of steps as their proficiency improves. The steps generally are time based. In addition, many agencies have different classification levels reflecting the skill level of the incumbents. For example, entry level employees would be a Dispatcher I, fully qualified employees would be a Dispatcher 2, lead dispatchers would be a Dispatcher 3. This provides an incentive for employees to continue to grow and progress and rewards them for that. The existing collective bargaining agreement provides only two steps. All new employees at police dispatch are first assigned as call-takers. Some employees become radio operators and are capable of both taking calls and working one of the dispatch positions. There is no requirement that all employees be capable of being radio operators and there is no additional compensation for those that do become radio operators. Not only does this limit the ability to staff the center, it creates interpersonal conflict within the center.

4.2.6 Staffing Levels

The Springfield Police Department 9-1-1 Center is understaffed. Not only are there not enough people on duty to comply with SETB and national standards, there are not enough total staff members to maintain current staffing levels without significant use overtime. As shown in TABLE 4-1, a review of the available statistics indicates that the center answers considerably more calls per employee than national averages based on studies by the National Emergency Number Association and others. In addition, the statistics show that the center does not comply with the SETB requirement that ninety percent of incoming calls be answered within ten seconds. Using the SETB guidelines,

three dedicated 9-1-1 call takers are required to handle the busy hour. The dispatch center is also responsible for answering incoming administrative calls for the police department. In 2007, approximately two administrative calls were received for every three 9-1-1 calls. This creates a significant additional workload. Two dispatchers are assigned to radio dispatch positions. Each employee receives one forty-five minute and two fifteen minute breaks during his or her shift. Normal staffing is eight people (one supervisor, two radio dispatchers, and five call takers). With the required breaks, no more than seven people are actually in the center during most of the shift. It is easy to see why the center doesn't comply with the SETB standards.

In addition, approximately seventeen percent of 9-1-1 callers hung up or abandoned their call before it was answered. By comparison, the State of Connecticut reports an abandoned call rate of six percent, and the State of California reports an abandoned call rate of approximately twelve percent.

Excluding the lead dispatcher or supervisor position, thirty people are required to fill seven positions twenty-four hours a day. There are currently twenty-six dispatchers on staff. While not all seven positions are filled on all shifts, there is a chronic staffing problem. This results in there being numerous hours of overtime that must be filled. The Police Department is in the process of hiring eight additional dispatchers. At the same time, the Lead Dispatcher position is being created and filled. It will take four people to fill the Lead Dispatcher slot on an around the clock basis. At least one additional person will be needed as a Lead Dispatcher to cover for time off. The net gain of these eight positions will be three additional dispatchers. This will help with the understaffing problems, but there still will not be sufficient dispatchers to provide adequate staffing. While a certain amount of overtime is inevitable in a twenty-four hour a day operation, the amount of scheduled overtime should be minimal in a properly staffed organization. Excessive overtime has a number of negative impacts on communications center operation. First and foremost is a staff that is physically and emotionally exhausted. When staff members are exhausted, the number of errors made increases. Interpersonal relations tend to deteriorate, and the attitude towards both the public safety personnel and the public also tends to be degraded.

A study sponsored by the Association of Public-Safety Communications Officials, International in 2005 as reported by *Mary Jean Taylor in Staffing and Retention in Public Safety Communications Center*, found that the employees' perception that the center was fully staffed was the most significant factor in predicting employee retention rates. In interviews with dispatch personnel, the amount of overtime and the lack of staffing were cited as being problems by those interviewed. The problem contributes both to the ability to attract and retain new employees as well as keeping those fully qualified.

A third aspect of the understaffing issue is the impact on the interaction between the public safety agencies and dispatch, between the public and dispatch, and between the public safety agencies and dispatch. All of the parties tend to get angry because of the failure of the system to meet their expectations. As noted in interviews with selected members of the police dispatch staff, the dispatch staff feels overworked because of the large number of calls they are expected to handle and all of the overtime they must work. They feel they have to fight with the police officers to get the officers to take calls. The public becomes more hostile towards the dispatchers because their calls to 9-1-1 aren't answered as quickly as they thing they should be and because the officers don't arrive as quickly as the callers think they should, and the officers are angry because of the volume of calls that dispatch tries to dispatch. The comments of the dispatch staff are commonly heard in other centers with similar staffing issues.

For the first nine months of fiscal 2008, a total of $191,713 has been spent on dispatch overtime. That equals approximately 7,500 hours of overtime divided among the twenty-six employees or an average of 289 hours of overtime per employee assuming all

employees worked an equal amount of overtime. That is the equivalent of seven full-time dispatchers. For the first nine months, only sixty-one percent of the amount allocated for salaries and wages had been expended. Taken together, the budgetary numbers indicate a chronic understaffing and a large amount of overtime.

In addition to the chronic understaffing of the dispatcher position at the Springfield Police Department, there is an accompanying lack of dispatch center management and supervision staffing at the police department. While the City has negotiated the creation of a lead dispatcher position to provide leadership and supervision on each shift, these positions still had not been implemented at the time of our visit. Police Sergeants were assigned to be dispatch supervisors three days a week. On other days, a dispatcher is made an acting lead dispatcher. This overall lack of consistency, combined with the chronic understaffing, means that there is little effective supervision in the center.

There is a critical need for additional administrative support at the Springfield Police Department Dispatch Center. The 9-1-1 Dispatch Administrator is currently performing the functions that in many centers, of similar size and complexity, occupy three or more people. Typically, modern, technologically complex communications systems will have a computer system administrator, training coordinator, and an operations manager in addition to the center manager. Many centers also have a full-time quality assurance coordinator. There needs to be adequate administrative staff to ensure that a sufficient management, administration, and technical maintenance structure is in place and able to address CAD and RMS computer system operations, 9-1-1 and dispatch operations and computer system and database maintenance issues.

At the Springfield Fire Department, staffing issues are much less of an issue with the relatively recent civilianization of dispatch operations. With most of the dispatch staff being relatively inexperienced, there is a need for increased support, especially during non-business hours.

We did not assess the AMR staff since our charge was focused on the police and fire dispatch operations.

4.3 Maintain Adequate Communications and Network Equipment

9-1-1 call answering and public safety dispatching retain many elements of an “art” in lieu of being a science. The key factor in every 9-1-1/dispatch operation is that the requirements and technology must be applied to each community. In this way each community evolves a unique approach and solution for their dispatching needs. This is not to say that there are no standards. One primary national guideline is contained in the National Fire Prevention Association’s Standard 1221. The Federal Emergency Management Administration’s Guideline 426 also implies requirements for 9-1-1 Centers. The Department of Transportation has entered the dispatching environment for Emergency Medical Services and Medical pre-arrival procedures. Also, several vendors have applied internal standards to many areas of dispatch centers; these are procedural for their product (Medical Priorities and Insurance Services Organization) and the TIA/ EIA 222 installation grounding standards. Therefore while there may be no true standards to meet; all of the factors above are brought together to create a recommended 9-11/dispatch environment. These factors create in essence a “grade of service” or “standard of care” that is applicable to all dispatch centers. They are brought together in a common body of knowledge that defines what “should” be in 9-1-1/dispatch design and operations.

As noted in SECTION 4.2.1 above, public safety communications centers utilize a significant amount of communications equipment and systems in their daily operations. The Springfield Police and Fire Department dispatch centers each employ multiple systems. These include Computer Aided Dispatch Systems (CAD), Records Management Systems (RMS), and Geographic Information Systems (GIS), the 9-1-1

system, the radio system, and the recording system. These systems must be housed in appropriate facilities. Neither the police dispatch center nor the fire alarm headquarters are adequate for current needs. As part of our interview and survey process we assessed each of the dispatch centers. Each of the 9-1-1/dispatch centers is assessed for several characteristics. Twenty different elements were evaluated. Each of these is scored using the following rating scale:

G – Good: Needs no improvement, meets CTA's recommendation
F – Fair: Usable but falls short of CTA's recommendation
P – Poor: Requires significant improvement
N – None: Not present
U – Unknown

The results are summarized in TABLE 4.2.

Application of the rating scale varies for each of the listed characteristics. For example, for the dispatch center size, good would indicate that the size of the center is adequate for the next fifteen to twenty years; fair means that the center size may meet the current needs but does not have sufficient needs to meet the requirements for the next fifteen to twenty years; and poor would indicate that the center is not adequately sized for current operations.

Dispatch Center Assessment

4.3.1 Dispatch Center Size

By this we mean that the dispatch center has sufficient space to house comfortably the dispatchers, call-takers, management and supervision, technical support for the current dispatch operation as well as space for expected growth.

- Springfield Police Department – Poor - While there are eight positions (five call-taking, two radio, and one supervisor) in the center, the positions are crowded together and smaller than typically found. Not only is there no room for expansion, there is no room for additional positions for adding additional people in high volume times. The lack of space has also resulted in a less than efficient room layout. In addition, there is insufficient office space for dispatch administration.

- Springfield Fire Alarm Headquarters – Good -There is sufficient space for the dispatch center. There is room for anticipated growth of fire dispatch. There is not adequate space to accommodate a consolidated center.

- American Medical Response – Good – There is adequate space for current operations as well as room for expansion

4.3.2 Dispatch Center Condition

The Dispatch Center is neat and clean. The area is organized.

- Springfield Police Department – Poor – The furniture is in overall poor condition. Routine cleaning and maintenance of the center is sporadic at best. The lighting is a major issue. The lighting problem is exacerbated by the insistence by one of the police department watch commanders that all of the lights be turned on. This creates very harsh lighting unpleasant working conditions. It is also a major source of friction between the police officers and the dispatch staff.

- Springfield Fire Alarm Headquarters – Poor- Fire Alarm Headquarters was constructed in 1952. Over the life of the building, much of the routine maintenance has been deferred. As a result the building is in generally poor condition. The

building is in the process of having its HVAC system renovated. The duct work and heating system has been installed. The cooling system has not been updated and has caused numerous problems in the past. Because the equipment room gets over heated during the summer months, the staff has had to open windows in order to create a thermal heat sink. This has allowed birds and rodents to enter the building. There have been complaints about the existing electrical system being inadequate and may need updating in the near future. The electrical circuits are becoming overloaded and causing the circuit breakers to trip. In addition, there is a lack of adequate restroom facilities and the building does not comply with American's with Disabilities Act accessibility standards. Windows are cracking and not sealed tight. Paint on the walls is cracking and chipping off.

- American Medical Response –Fair- The center is clean. While the facility does not appear to be a hardened facility, it is adequate for existing AMR operations.

4.3.3 Equipment Area Size

Meaning that the dispatch center has sufficient space to house comfortably the equipment used to support the current dispatch operation as well as space for expected growth. There is sufficient space for radios and telephones and computers.

- Springfield Police Department –Fair- Generally there is sufficient room to house the radio and telephone equipment. The computer equipment is currently located in the 9-1-1 Dispatch Administrator's shared office.

- Springfield Fire Alarm Headquarters -Fair- With the removal of the wired fire alarm system, there is space available for equipment. However, the equipment is somewhat scattered in the same room as the dispatch center.

- American Medical Response -Good- Generally adequate space for the equipment is available.

4.3.4 Equipment Area Condition

The equipment area is neat and clean. The equipment is installed in a professional manner.

- Springfield Police Department –Poor- While the equipment has been generally installed in a professional manner, the equipment room and the Dispatch Administrator's office are cluttered. In the equipment room, boxes are stacked on the radio equipment cabinets.

- Springfield Fire Alarm Headquarters –Poor- As noted above, much maintenance has been deferred. Because the equipment room gets over heated during the summer months, the staff has had to open windows for ventilation. This has allowed birds and rodents to enter the building. There have been complaints about the existing electrical system being inadequate and may need updating in the near future.

- American Medical Response – Good- The equipment room is in generally good condition. Some improvements to the grounding system may be required.

4.3.5 Expansion Capacity

The Center has sufficient unused space or the facility is designed in such a way as to be expandable both in aspects of dispatching area and equipment space.

- Springfield Police Department – Poor- There is no room for expansion of the existing dispatch space.
- Springfield Fire Alarm Headquarters –Fair- Some additional positions and equipment could be added. However, there is insufficient space as it exists currently to house a consolidated police and fire dispatch.
- American Medical Response –Fair- Additional positions could be accommodated.

4.3.6 Radio Console System

The Console system adequately interfaces with and supports the radio system. Dispatchers easily operate the console system features. All controls and information readouts shall be clear and easily understood. The system supports headsets, foot controls, select and unselect audio, and other modern features.

- Springfield Police Department – Good- A Motorola Centracomm Elite radio console system is in use. While the manufacturer has recently introduced a new model, the Elite model is still provided full support.
- Springfield Fire Alarm Headquarters –Good- A Motorola Centracomm Elite radio console system is in use. While the manufacturer has recently introduced a new model, the Elite model is still provided full support.
- American Medical Response –Fair- While a Motorola Centracomm Elite console system is used by the C-Med position, AMR uses Baker Integrated Technologies System that, while functional, is not as fully featured as the Motorola system.

4.3.7 CAD System

The CAD system adequately interfaces and supports the records management system. The dispatchers easily operate the system features. All controls and information readouts are clear and easily understood. The technology makes the dispatch and call taking easier not more difficult. The system aids the dispatcher and call takers in answering calls, event locations, unit selection, report and incident numbering, and associative needs. Systems shall be designed for single entry and automation when possible to reduce work activities.

- Springfield Police Department –Poor- The Logistics Systems CAD system was installed in 1998. It is configured as a peer-to-peer network. There are a total of 11 computers used for the CAD network. Eight (8) computers are located in the ECC, one (1) in the Captain's office, one (1) in Records, one (1) in the IT Room, and one (1) in the 9-1-1 manager's office. The system uses IBM's AIX language. The system is not interfaced with the police department's Records Management System (RMS). It is the only computer system using AIX in the City.
- Springfield Fire Alarm Headquarters –Fair- An Interact Computer Aided Dispatch (CAD) system was installed in 2005. It is interfaced to the Firehouse Records Management System so that closed incidents are transferred from the CAD system to the RMS system. However users of the RMS cannot initiate CAD inquiries through the RMS. In addition, the CAD mapping is not interfaced with the City's GIS. As a result, fire dispatch does not receive regular updates to the mapping system.

Changes to response districts must be initiated by the software vendor. As a result, much of the response recommendations are obsolete and unusable.

- American Medical Response –Good- AMR uses a GEAC CAD system. It adequately meets AMR's needs. AMR has standardized on GEAC for their operations in the eastern half of the country.

4.3.8 CPE System

The 9-1-1 telephone system (CPE) operates seamlessly all in-coming 9-1-1 calls and out-going transfers. All controls and information shall be easy to read and understandable. The system requires few buttons pushes in operations.

- Springfield Police Department –Good- New Plant Vesta Meridian 9-1-1 CPE was installed in 2007. The equipment is current state-of-the-art and functions well.

- Springfield Fire Alarm Headquarters –Poor- The 9-1-1 CPE was not upgraded when the primary PSAP was upgraded. As a result, the capabilities are limited at Fire Alarm Headquarters. They cannot receive Wireless Phase II information.

- American Medical Response – Fair – AMR has one Plant Vesta answering position unit. It does provide full functionality on transferred calls. At least one additional position is needed.

4.3.9 PBX/Admin Telephones

The PBX telephone system operates seamlessly all in-coming administrative calls and all out-going telephone lines. All controls and information are easy to read and understandable. The system requires few buttons pushes in operations.

- Springfield Police Department –Good-The Plant 9-1-1 CPE includes the integration of the administrative telephone lines.

- Springfield Fire Alarm Headquarters –Fair- The separate administrative telephone lines are not integrated with the 9-1-1 system.

- American Medical Response – Good- The Baker Integrated Technologies systems adequate for AMR's needs.

4.3.10 Furniture

The furniture is a full featured design. The design allows raising and lowering the work positions, tilting work surfaces, management of the required cables and power cords. The design of the furniture assists the dispatcher and call takers with a convenient and comfortable layout.

- Springfield Police Department – Poor- The console furniture is in poor condition and needs to be replaced.

- Springfield Fire Alarm Headquarters – Fair – Wrightline dispatch furniture was installed in 2005.

- American Medical Response –Fair- Baker Integrated Technologies is used. The furniture is nearing the time for replacement.

4.3.11 Lighting

The dispatch center is lighted in such a manner as to improve the operating environment. This includes individual controlled task lighting, natural light and/or windows, non-glare, and in-direct lighting.

- Springfield Police Department –Poor- Room lighting is less than desired and causes problems with glare on computer screens when all lights are turned on.
- Springfield Fire Alarm Headquarters –Good- The dispatch room has direct fluorescent lighting overhead and has windows (non-bullet resistant) located around the room.
- American Medical Response –Fair- While the lighting is generally adequate, there is no natural lighting in the dispatch center.

4.3.12 HVAC

The dispatch center has an effective heat and air conditioning system that provides for a wide range of conditions, from chilly nights to hot days. Humidity is controlled. There is sufficient movement of air and infusion of fresh air to allow the dispatch area to have a non-stuffy atmosphere.

- Springfield Police Department – Poor- The HVAC is less than adequate.
- Springfield Fire Alarm Headquarters –Poor- At the time of our visit, a new HVAC system was being installed. The existing system's problems are described above.
- American Medical Response – Fair- The system is generally adequate. A back-up system does not exist.

4.3.13 Reliability

The systems that support the dispatch operation shall be reliable. Failures shall be far between and the dispatcher shall have a sense of confidence that the systems will be running when needed.

- Springfield Police Department – Fair- The systems are generally reliable although some outages do occur.
- Springfield Fire Alarm Headquarters –Fair- The systems are generally reliable although some outages have been reported.
- American Medical Response – Fair-
- As with the other two centers, the systems are generally reliable.

4.3.14 Generator

The emergency generator for the dispatch center provides adequate support for the operations including the HVAC system. The fuel is sufficient for 168 hours of operation at full load.

- Springfield Police Department –Poor-The generator was reported to be unreliable.
- Springfield Fire Alarm Headquarters –Good- A forty-five kilowatt generator has been installed and functions well.
- American Medical Response – Poor- The generator needs to be upgraded

4.3.15 UPS

The uninterruptible power supply for the dispatch center provides adequate support for the emergency operations. The capacity is sufficient for 1 hour of operation at full load.

- Springfield Police Department –Poor- All of the 9-1-1 CPE equipment, radio console equipment, and RMS/Messaging equipment are on individual UPS. The radio equipment is not connected to a UPS. The smaller individual UPS units are generally less reliable than the larger, higher capacity units.

- Springfield Fire Alarm Headquarters –Fair- a 3 KVa UPS has been installed. It may be undersized.

- American Medical Response –Fair- A larger UPS is in use. Capacity information was not available at the time of our visit.

4.3.16 Back-Up Provisions

An alternative dispatch center is maintained that is capable, when staffed, of performing the emergency functions performed at the primary center. The alternate center is separated sufficiently from the primary center to ensure the survivability of the alternate center.

- Springfield Police Department – Poor- While backup provisions have been made at Fire Alarm Headquarters, there is very limited functionality. In addition, police dispatch does not routinely operate from the backup location so that personnel develop familiarity with the operations.

- Fire Alarm Headquarters –Poor- No backup center exists. Fire dispatch would move to one of the fire stations where limited functionality exists.

- American Medical Response –Poor- No backup center exists. Dispatching would be done be a portable radio from the police dispatch center if the need arose.

4.3.17 Maintainability

In the rare occasions when a system or device fails the repairs are quickly begun and performed. Overall there is a high confidence level that the system will be kept running.

- Springfield Police Department –Fair- Overall most of the equipment is still currently supported by the manufacturer and parts are available.

- Springfield Fire Alarm Headquarters –Fair-With the phasing out of the wired fire alarm boxes, the system is more maintainable.

- American Medical Response –Fair- AMR uses equipment and systems from Baker Integrated Technologies. The product is still available.

4.3.18 Parking

The Dispatch center has easy outside parking access with mass transit and traffic access. The parking lot shall be well lighted and secure.

- Springfield Police Department –Fair-Parking is available in the lot next to police headquarters. The lot is open parking and is used by police officers, squad cars as well as the general public. There is no security in the lot.

- Springfield Fire Alarm Headquarters –Good – While the parking lot is not secure, there is adequate parking which is generally not used by others.

- American Medical Response – Good- Adequate parking is provided, although it is not secured.

4.3.19 Internal Facilities

The dispatch center is designed with adequate break areas, restrooms, and quiet rooms. The restrooms are located near to but not in the dispatch area. There are un-recorded telephones for personal use.

- Springfield Police Department – Poor- There are not adequate break rooms, locker rooms, or restrooms in the immediate vicinity of the dispatch center.

- Springfield Fire Alarm Headquarters – Poor- The restrooms are not clearly designated as men's and women's restrooms. It is asked that all male staff use the restrooms on the 1st floor and allow the women to use the restroom on the 2nd floor. There is a kitchen / break area located on the second floor next to the dispatch center. The space is not ADA compliant.

- American Medical Response –Fair- Restroom and break room facilities are accessible from the dispatch center.

4.3.20 Security

The Dispatch center is designed with controlled access to the Center using locked doors and closed circuit cameras for entrance controls. The exterior of the facility is well lighted and secure.

- Springfield Police Department –Poor- While there are electronic locks on several doors between the street and dispatch, most of those locks are inoperative. During our visit to Springfield, we were able to enter and leave the facility through several different entrances at will.

- Springfield Fire Alarm Headquarters –Poor- The building is unsecure. Certain doors are locked throughout the building with a key that is kept by the fire alarm supervisor. The dispatch center doors are locked most of the time and require personnel and/or visitors to knock on the door for entry. There is a window slot in the door covered by paper that the dispatcher looks through to identify person's wanting to enter into the center. There has been an incident in the past where an individual being chased by another individual has ran into the fire alarm building, up the stairs into the dispatch center, and causing his/her pursuer to also enter the facilities and putting the dispatch staff in danger.

- American Medical Response –Good- Doors are locked with key cards required for access. A visitor must go through several different secured doors before gaining access to dispatch.

4.4 Consider Opportunities for Coordinating the Use of Dispatching Equipment and Cooperative Dispatching

While considerable effort has been made, especially through the Western Massachusetts Law Enforcement Consortium (WMLEC), there are still a number of issues with inter-agency coordination. Within the City of Springfield, the communications and coordination between the police, fire and EMS dispatch centers is often lacking. In addition, there is limited coordination and interoperability between police units, fire apparatus, and ambulances.

The interoperability between the three services is further limited by the fact that each of the centers operates its own computer aided dispatch (CAD) system. There is no interchange of information between the three systems. With the exception of wireline 9-1-1 information, Information entered into one system is only captured by another system if that information is verbally relayed to the other dispatch center and entered by the operator. This can lead to responding units being unnecessarily exposed to hazardous situations because the information was relayed from one center to another.

It was also noted during our interview and survey process that incidents near the municipal boundaries are especially problematic. There are several multi-jurisdiction responses that generally occur along the Connecticut River, City and town boundary lines, and Interstate 91 & 291. In these cases, conflicting information about the actual location of incident may result in multiple jurisdictions being dispatched. While there are designated channels for interagency communications, it was noted that the situations are challenging at times. Another aspect of the situation, especially on limited access highways such as the interstates, units from one jurisdiction may have better access to an incident located within another jurisdiction's service area. Close coordination is required.

4.5 Keep Records and Measure Performance

The best public safety dispatch centers are performance driven. Performance goals are established and progress in meeting those goals is regularly and routinely evaluated. Performance measurement should provide accurate, timely, accurate, and useful information about the quality and efficiency of the delivery of service by each of the centers. As has been noted previously, the State of Massachusetts has an established performance goal for 9-1-1 call answering. Dispatch center managers need to use this metric and others to assure that the centers are providing consistent, high quality services. The standards need to be consistent with established state and national standards. NFPA 1221 stipulates that "*Ninety-five percent of emergency call processing and dispatching be completed within sixty seconds and ninety-nine percent of call processing and dispatching shall be completed within ninety seconds.*" Springfield Fire Alarm has a performance objective to maintain average dispatch time for all emergencies at four minutes or less. This is clearly outside of all established standards and needs to be revised. Fires can double in size every sixty seconds. For every seven seconds that a heart stops beating, a person looses a one percent chance of survival. The three minute difference in dispatch time can result in serious consequences. NFPA 1221 also recommends that a dispatch centers performance be evaluated on at least a monthly basis.

An important part of evaluating the performance of a dispatch center is the implementation of a comprehensive Quality Assurance (QA)/Quality Improvement (QI) program. At the time of our surveys and interviews, only AMR had a QA program in place. As noted in the Minnesota Best Practices Summary, a Quality Assurance program typically contains three components:

- Setting standards or practices that both define a high quality of service and instruct dispatchers on correct procedures.
- Monitoring the performance of PSAP employees for compliance with the standards.
- Making changes or encouraging actions that improve operations with the intent of consistently meeting the standards.

Without a QA/QI program, PSAP performance tends to be erratic at best. Often issues and problems do not come to management's attention until they become significant. A QA/QI program can identify and correct problems and issues before they become major. The QA/QI program involves routine monitoring of a percentage of calls handled by each

dispatcher. Using an evaluation form, essential elements are reviewed to assure compliance with existing policies and procedures. The QA/QI program should not be used as a means of imposing discipline. Instead it should be used to identify areas where additional training may be required or changes made to procedures. A sufficient sample of calls needs to be reviewed to assure that a valid picture is obtained.

Organizational integrity is an essential element in restoring and maintaining the public's confidence in their public safety agencies. It was noted during our interview and survey process that frequent complaints are received about the services rendered especially by the Springfield Police Communications Center. One of the problematic aspects of this issue is that there are no clearly defined guidelines about which categories or complaints are to be handled by the internal investigation function and which are part of routine discipline. As a result, all complaints go to the Police Commissioner's Office for resolution. Not only does this result in increased workload on the Commissioner's Office, it also dulls the effects of discipline in many cases because of the time between the incident and the imposition of the resulting discipline. In addition to establishing procedures for handling the lesser complaints at a lower level, a tracking system needs to be established to identify trends and possible need for policy and procedure revision.

4.6 Promote Information Exchanges Among Public Safety Response Agencies

As described above, the Springfield Police Department, the Springfield Fire Department, and American Medical Response (the EMS provider) each operate their own, independent dispatch center. Not only are interagency coordination and interoperability problematic during incidents, there is limited communications between the three centers on a routine basis. It is easy to understand that, with the press of day-to-day activities, the need for regular meetings between the management personnel of the centers is often overlooked. In addition, regular meetings between center personnel and user agency personnel should be established to solicit feedback and develop ways to improve performance. We note that there has been some limited interchange of personnel between police dispatch and fire dispatch. We encourage that to become routinized and expanded.

Administrative personnel should be encourages to attend appropriate meetings of regional, state, and national public safety communications organizations. These meetings present an invaluable opportunity to learn from the experience of others as well as to gain exposure to new technological developments.

4.7 Educate The Public On The 9-1-1 System And Services

As noted in SECTION 4.2 above, the Springfield 9-1-1 system receives a higher volume of calls per citizen that the national average. Not only does this strain the dispatch center, it puts a significant burden on the public safety agencies, especially the police department because they must respond to numerous calls that could better be handled by other means. The dispatch center, the police department, the fire department, and AMR need to develop a coordinated, on-going public education campaign. In addition, the City needs to develop a means to handle many of the minor, nuisance type calls by alternative means.

Springfield is in the process of implementing a 3-1-1 program. It is initially intended as a means for citizens to access City services. 3-1-1 was originally promoted as a non-emergency number for police services. For police services, a number of agencies use 3-1-1 for citizens to file police reports on minor incidents by telephone to alleviate the need for a police unit to respond. A number of locations have found that a 3-1-1 system is most effective when it is all inclusive. That is that it is not only an access number for municipal services, but also a non-emergency contact number for the police department. All of the City agencies need to work together to take full advantage of the opportunity.

A unified approach needs to be developed and implemented. We noted for example that some neighborhood groups were being instructed to call repeatedly for the same incident if a police unit hadn't been seen. These repeat calls are unnecessary and further clog the overloaded system.

The public education function should also include periodic surveys of citizen attitudes and opinions in order to gauge its effectiveness.

Table 4-1
Dispatch Performance

	Wireline 9-1-1	Wireless 9-1-1	Other
# Calls	72,199	41,481	71,333
% Abandoned	17%	1%	0.36%
Average Talk Time	73	96	58
% Answered w/i 10 secs	71%	70%	46%
% Answered w/i 15 secs	95%	95%	62%

NENA Standard 90% of 9-1-1 Calls answered within 10 seconds
NFPA 1221 95% of 911 calls answered within 15 seconds

Table 4-2
Dispatch Center Assessment

Dispatch Center	Reference	Dispatch Center Size	Dispatch Center Condition	Equipment Room Condition	Expansion Capacity	Radio Console System	CAD System	CPE System	PBX/Admin Tlephones	Furniture	Lighting	HVAC	Reliability	Generator	UPS	Back-Up Provision	Maintainability	Parking	Internal Facilities	Security
Springfield Police Department		P	P	P	P	G	P	G	G	P	P	P	F	P	P	P	F	F	P	P
Springfield Fire Department		G	P	P	F	G	F	P	F	F	G	P	F	G	F	P	F	G	P	P
AMR - Springfield		G	F	G	F	F	G	F	G	F	F	F	G	P	F	P	F	G	F	G

5.0 Alternative Solutions

This section of the study presents three possible solutions and several different governance models for a consolidation effort that satisfy the objectives of the project. The alternatives include:

1. Option 1 - Continue as 3 separate dispatch centers
2. Option 2- Consolidate or Co-locate Governmental Dispatch Centers
    a. Consolidation
        i. In existing agency (Police, Fire, AMR)
        ii. Independent Agency
    b. Co-location
3. Option 3 – Consolidate or Co-locate All Three Dispatch Centers
    a. Full Consolidation
        i. In existing agency (Police, Fire, AMR)
        ii. Independent Agency
    b. Consolidate Police and Fire, Co-locate AMR

Previous sections of this report addressed the current situation, the requirements for a consolidated center, and the issues and problems currently being encountered.

5.1 Technological Assumptions

In developing and analyzing the alternatives, certain assumptions have been made.

5.1.1 Radio Systems

We assume that all three agencies (Springfield Police Department, Springfield Fire Department, and American Medical Response) will continue to operate on the same, separate radio systems as they currently do. While this limits the ability for full interoperability among the agencies, any modifications to the radio systems are beyond the scope of this project.

5.1.2 Computer Aided Dispatch System (CAD)

Computer-Aided Dispatch (CAD) systems allow public safety operations and communications to be augmented, assisted, or partially controlled by an automated system. It can include, among other capabilities, computer controlled emergency vehicle dispatching, vehicle status, incident reporting, and management information. Most importantly the CAD will track the status of public safety units and recommend which units to assign to a call. All aspects of a CAD system must be optimized for rapid response time and system reliability. Since time is of the essence, the CAD system must

accurately provide a data and time stamp for every activity. Call processing time is reduced. Case and assignment numbers are created and tracked automatically. CAD systems collect the initial information for an incident and then provide the information to one or more RMS systems. The CAD system also supports other activities that assist in the effective use of public safety resources, including shift change roll call, "Be on the lookout" (BOLO) files, and the ability to schedule a call in the future. Currently there are three separate CAD systems in use among the three agencies. We assume that a single CAD system will be installed in a consolidated center and that all agencies operating from the consolidated center will use that CAD system.

5.1.3 Records Management System

A Records Management System (RMS) is an agency-wide system that provides for the storage, retrieval, retention, manipulation, archiving, and viewing of information, records, documents, or files pertaining to department operations. The RMS covers the entire life span of records development, from initial generation until the process to which it is complete. An important part of a Records Management System is a comprehensive computer program designed to enter and track appropriate statistical data and provide the agency management staff with the information needed to manage the agency. The RMS system also must interface with appropriate state and federal databases so that automated reporting can occur. Statistics are gathered on City, State, and federal levels and, ultimately, provide a nationwide view of activity as it is reported by public safety agencies throughout the country. The data is used to indicate the levels and nature of crime, fires, and, soon, emergency medical activity and to provide a reliable management tool for decision makers of the criminal justice community. NIBRS provides law enforcement with the tool to fight crime by producing detailed, accurate, and meaningful data. NIFRS does the same for the fire service and the National EMS Information System Dataset (NEMSIS) will do the same for emergency medical services. An effective RMS allows single entry of data while supporting multiple reporting mechanisms. Frequently the RMS is interfaced with the CAD so that when calls are closed in CAD, the call record is transferred to the RMS to facilitate the capture of all relevant information without having to re-key the data into the RMS. Currently there are three separate RMS systems in use in the three agencies. We assume that each of the agencies will continue to utilize its existing system and the CAD system will interface with each agency's RMS.

5.1.4 9-1-1 System

In 1990 Massachusetts enacted legislation providing for Enhanced 9-1-1 on a statewide basis in the Commonwealth. This legislation established the Statewide Emergency Telecommunications Board (SETB) as the state agency responsible for coordinating and administering the implementation of Enhanced 9-1-1 and for promulgating standards to ensure a consistent statewide approach for Enhanced 9-1-1. The Enhanced 9-1-1 program in Massachusetts is funded by a surcharge on all wire-line and wireless telephones. The SETB provides funding for the 9-1-1 network as well as the Customer Premises Equipment (CPE). The SETB also provides training grants. Legislation has been proposed (Senate Bill 2665) that would provide for grants for allowable expenses related to enhanced 9-1-1 telecommunicator personnel costs, and the acquisition and maintenance of heat, ventilation and air-conditioning equipment and other environmental control equipment, computer-aided dispatch systems, console furniture, dispatcher chairs, radio consoles, and fire alarm receipt and alert equipment associated with providing enhanced 9-1-1 service. In addition, the grant shall reimburse regional public safety answering points and regional emergency communication centers for allowable expenses related to the acquisition and maintenance of public safety radio systems. We assume that the SETB or its successor will continue to fund the 9-1-1 CPE and the 9-1-1 network.

5.1.5 Space

Fire Alarm Headquarters was suggested as a possible site for a consolidated center. As noted elsewhere in this report, the building was constructed in 1952 and is generally in poor condition. The cost of renovating the existing building would be considerable. These actions are described in SECTION 7 of this report.

5.1.6 Staffing

CTA's staffing recommendations for each of the alternatives are based on the staffing analysis detailed in APPENDIX B. CTA Communications uses a method that analysis the various elements of the center's workload and estimates the staff needed to handle that workload within the established performance estimates. The specific tasks that are performed in the center must be identified first. Some of the tasks, such as answering incoming 9-1-1 lines, are easily quantifiable based on available statistics. Others, such as handling traffic on the Criminal Justice Information System (CJIS), and various supervisory tasks are not easily measured in terms of the time commitment involved. Each of the tasks takes a certain amount of time. While individual occurrences of the same task may take more or less time, an acceptable average time can be established.

5.2 Option 1 – No Consolidation

This option would continue the status-quo with each of the three centers continuing to operate independently.

5.2.1 Organization

Since each center would continue to operate independently, no organizational changes would occur.

5.2.2 Staffing Requirements

There is a need for additional staff for the Springfield Police Department dispatch center. In order to meet the current workload, we recommend that the staffing be increased as shown in TABLE 5-1. TABLE 5-1 shows the current staffing and the staffing required if the centers do not consolidate. While the Springfield Police have 26 employees currently assigned, CTA's estimate of the number of staff required to meet the current needs for the Springfield Police Department would include assigned 5 shift supervision, 16 added call taker/dispatchers, an Operations Manager, and a Technical Support Coordinator. This should bring the required number up to 49 employees. In addition 4 more dispatchers are needed at Fire Alarm Headquarters in order to provide coverage for all shifts and vacations without incurring overtime.

5.2.3 Technology

Not consolidating will reduce the benefits that will be realized. The Springfield Police Department has received grant to replace its CAD system. Consideration should be given to including at least an interface to both the CAD system at Fire Alarm Headquarters and the CAD system at AMR. This will allow improved information interchange between the separate dispatch centers. The 9-1-1 CPE at Fire Alarm Headquarters needs to be upgraded so that it is capable of receiving Wireless 9-1-1 call information. Additional positions need to be installed so that Fire Alarm Headquarters can more adequately function as the back-up for the primary PSAP/police dispatch. AMR will need to consider adding additional 9-1-1 capacity. Because it is a secondary PSAP, the SETB will not fund the additional equipment.

5.2.4 Space

As noted in SECTION 4, the space used by both the existing PSAP/police dispatch and Fire Alarm Headquarters is inadequate. The space at police headquarters is overcrowded and does not provide room for needed expansion. The center is currently configured for 8 positions. Based on the call volume 9 positions are needed to be staffed during the busiest shift. At least three overflow positions should be provided. The Fire Alarm Headquarters building is in poor condition and will require considerable renovation to bring it into compliance with existing codes and standards.

5.3 Option 2 - Consolidate or Co-Locate Governmental Dispatch Centers

This scenario would consolidate the Springfield Police and Fire Department dispatch centers into a single center. American Medical Response would continue to operate its existing dispatch center. There are several different governance options for this scenario. They include: (1) co-location where the dispatch centers would be located in the same facility, but operate independently; (2) consolidation into one of the existing agencies; and (3) create of a separate department or agency to oversee the dispatch operation. These governance options are discussed in SECTION 5.3.1 below.

5.3.1 Organization

The creation of a shared emergency communications center will result in significant changes in the operations of each of the participating public safety agencies. It is critically important that the process of creating the shared center be focused on making positive improvements to all aspects of the delivery of public safety services to all of the citizens and visitors of the City of Springfield.

One of the first issues that must be resolved is the organizational structure of the center. There are two underlying structures for a shared center. The first is a consolidated center, where a single agency provides the dispatch services for all of the participating agencies. The second involves co-location of dispatch centers. Each co-located center operates independently of the other co-located centers. Facilities are shared, but operations are separate. There are advantages and disadvantages to each form.

A consolidated center offers the following advantages and disadvantages:

Advantages	Disadvantages
Single Agency	Single Agency
Reduced management costs	Major Organizational Restructuring
Reduced employment competition	Loss of Agency Identity
More flexible use of staff	Loss of Agency
More efficient use of technology	Multi-agency management
	Loss of non-dispatch functions

A co-located center offers the following advantages and disadvantages:

Advantages	Disadvantages
Maintain agency control	Differences in policies/procedures
Improved Operational Awareness	Competition for employees
Least disruptive	Greater facility requirements
Maintain agency identity	No service delivery improvement
	Greater management overhead

If consolidation is chosen, the decision will need to be made about how the consolidated center fits into the City of Springfield's organization. One option is to have one agency (either the police department or the fire department) absorb the dispatch function of the other agency. The second option would create an independent department focused on dispatch. Under the first option, the dispatch function would remain a function of the one of the departments. While the other agency would have some input on policy and procedure matters, the final decision would be the host agency's. Under the independent agency concept, an oversight board or committee could be established to assure adequate input and operational oversight from the user agencies.

5.3.2 Staffing

As shown in APPENDIX B, there should be eight to twelve people on duty in the combined center. If the center is a consolidated center, at least one of the people on-duty should be a Lead Dispatcher or Shift Supervisor. If the dispatch functions are co-located, there will need to be a lead position for both police and fire dispatch.

In addition to the dispatch and shift supervisor positions, there is a need for management and administrative staff. Currently, there are three administrative positions between the two centers. In a co-located scenario, there will need to be at least three additional police dispatch administrative positions. One of the positions would be a database administrator. The primary purpose of the position is to administer the various databases used in the center (MSAG, CAD Geofile, etc.). This function is currently being performed by the 9-1-1 Dispatch Administrator. The second position would be a Training/Quality Assurance Coordinator. The third position would be a Dispatch Operations Manager. This assumes that the 9-1-1 Dispatch Administrator and the Fire Alarm Supervisor and Assistant positions would continue. In a consolidated scenario, there would need to be a total of four administrative positions: Dispatch Director, Operations Manager, Training/Quality Assurance Coordinator, and Database Administrator.

TABLE 5-2 displays the estimated staffing.

All personnel should be fully trained and capable of working any of the positions (call-taking, police dispatch, and fire dispatch). They should rotate between positions in order to maintain proficiency. Standard operating procedures should require that, if an individual is assigned to one position and not busy, he should assist another position that is busy. For example, if a fire dispatcher is not busy with fire radio traffic, he or she should assist with call taking. Similarly, if a fire dispatcher is busy with fire radio traffic, and another fire call comes in, an available call-taker or police dispatcher should assist so that there is no delay in dispatching the call. Our staffing recommendations for the consolidated center are based on the assumption that the operation will function as described above.

5.3.3 Technology

Consolidation or co-location will provide significant improvements to the coordination between the agencies participating in the shared dispatch center. Technology enhancements have the potential to further the benefits. First, all positions will be equipped with fully functional 9-1-1 answering position units. This will both eliminate the need to transfer 9-1-1 calls for fire service and provide full information on wireless callers. Secondly, an integrated CAD system will improve the dispatch process, improve the accuracy and reliability of operations, and expedite the process of dispatching resources to emergency calls. Based on a preliminary examination, it appears that the Information Management Corporation CAD system being considered by the Springfield Police Department under grant funding may have sufficient functionality to meet the needs of a shared dispatch center in Springfield. A CAD to CAD interface will allow improved information transfer to AMR. The radio consoles currently used can either be refreshed

or upgraded to improve the ability of the dispatchers to assist in providing interoperable communications.

5.3.4 Space

As discussed in SECTION 4, neither of the existing centers is adequate for housing a combined dispatch operation. In addition to the positions that are required for day-to-day operations, there is a need for additional positions to handle overflow situations. These are situations that occur as a result of events that cause a spike in public safety activity. Examples include planned events, such as a major political rally, and unplanned events, such as severe weather events or a major hazardous materials incident. There is also a need for positions that can be used for training. Properly configured and located, the training positions can also function as overflow positions.

Currently none of the three centers have adequate back-up. We recommend that the new dispatch space be large enough to function as the back-up for AMR's dispatch operation.

As noted above, there should be 10 people on duty in the combined center during the busiest shift of each day. A minimum of four additional positions should be provided for handling "overflow" situations those circumstances when the call volume exceeds the capability of the primary positions. A minimum of three of the overflow positions should be equipped for both call-taking and radio dispatching. The dispatch positions should be capable of handling both police and fire radio traffic in order to provide the maximum flexibility.

In addition to the positions noted above, there should be a minimum of six positions for use as both the back-up for AMR and for "live training". Ideally, these positions will be separated from the primary dispatch area by a moveable wall. When being used for training, the wall would be in place to separate the trainees from the dispatch center in order to allow the trainees to focus fully on their training. When used as AMR's back-up, the walls would be retracted in order to maximize inter-agency coordination. These positions could also be used for handling a special event as well. With the state of technology today, the difference between where the position was being used for training or for actual operations is solely dependent on the log-in used at the position.

A twenty position dispatch center would require approximately 3,600 square feet of space along with raised flooring, redundant routing of 9-1-1 and emergency telephone circuits, back-up power, and redundant HVAC systems. The space would be allocated as follows:

Dispatch Center (20 positions)	2,000 square feet
Equipment Room	600 square feet
Administrative Space	1,000 square feet

If the facility is not located in an existing building additional space will be needed for staff support (locker rooms, break room, etc.) and for building services and systems (HVAC, etc.) CTA estimates that approximately 5,300 square feet of space would be needed for a stand-alone facility.

It has also been suggested that the Emergency Operations Center for the City be co-located with the consolidated dispatch center. This would involve the provision of a large room, which could also be used for training and meetings, several smaller conference rooms, and some additional administrative space. The requirements for the Emergency Operations Center are discussed in SECTION 5.5 below.

5.4 Option 3 – Consolidate or Co-Locate All Three Dispatch Centers

This scenario would consolidate the Springfield Police, Fire Department, and American Medical Response dispatch centers into a single center. As with Option 2, there are several different governance options for this scenario. They include: (1) co-location where the dispatch centers would be located in the same facility, but operate independently; (2) consolidation into one of the existing agencies; and (3) create of a separate department or agency to oversee the department or agency to oversee the dispatch operation. A fourth governance alternative is to consolidate the two governmental dispatch operations and then co-locate AMR's operation.

5.4.1 Organization

The differences between a consolidation and co-location are discussed in SECTION 5.3.1 above. The major difference between this option and Option 2 is that, under this option, AMR's dispatch operations would be at the same location as the City of Springfield's all of the time rather than just when they were operating from their back-up center. The advantages and disadvantages of consolidation and co-location are discussed in SECTION 5.3.1 above. Consolidating a private, for profit company with a governmental entity adds complexity to the situation. An alternative to actual consolidate is to have AMR contract with the City for dispatch services or the City to contract with AMR for dispatch services. The State of Massachusetts views the provision of 9-1-1 service as a governmental function. The current SETB Standards 560 CMR 2.00 APPENDIX A Operational Standards 1 (f).

Only municipal public safety agencies or groups of municipalities may operate Enhanced 9-1-1 PSAPs or authorize Enhanced 9-1-1 PSAPs to be operated, with the approval of the Board.

If AMR were to contract with the City for the provision of dispatch services, there are numerous details that would need to be resolved. This includes such things as cost, AMR input into the process, the impact of this change on the C-MED operation, among others. Another variation of the combination would be for the two municipal dispatch centers to consolidate and then AMR to co-locate with the consolidated dispatch operation.

5.4.2 Staffing

As shown in APPENDIX B, there should be nine to thirteen people on duty in the combined center, depending on the time of day. If the center is a consolidated center, at least one of the people on-duty should be a Lead Dispatcher or Shift Supervisor. If the dispatch functions are co-located, there will need to be a lead or shift supervisor position for both the consolidated municipal dispatch and AMR.

In addition to the dispatch and shift supervisor positions, there is a need for management and administrative staff. There will need to be at least four dispatch administrative positions. These are the same positions as described in SECTION 5.3.2 above (Dispatch Director, Operations Manager, Training/Quality Assurance Coordinator, and Database Administrator). If AMR co-located with the dispatch, the two existing AMR dispatch management positions would continue.

TABLE 5-3 displays the estimated staffing.

As discussed in SECTION 5.2 above, all dispatch personnel should be trained and capable of handling all of the functions of the dispatch center (call-taking, police dispatch, fire dispatch). If AMR were to consolidate, then all dispatch personnel should be trained in emergency medical dispatch.

5.4.3 Technology

As with Option 2 above, consolidation or co-location will provide significant improvements to the coordination between the agencies participating in the shared dispatch center. Technology enhancements have the potential to further the benefits. All of the technology enhancements recommend under Option 2 would apply under Option 3 as well.

5.4.4 Space

The space requirements would be similar to the requirements outlined in SECTION 5.2.4 above. Several additional administrative offices would be required to accommodate the AMR dispatch management staff.

5.5 Emergency Operation Center

The current City of Springfield Emergency Operations Center is located at the Raymond Sullivan Public Safety Complex. There is limited space available. The space designated for the operations room is a shared multipurpose room that is used for community group meetings and other purposes. As a result, the room can not be pre-configured for EOC usage. A minimum of an hour must be spent setting the room up when the EOC is activated. There has been discussion about co-locating the EOC with the consolidated dispatch center. Both functions require space that provides sustainability, security, and survivability. For the most part, the space requirements for the EOC would be multi-purpose space. The operations center would be useable as a training room when the EOC was not activated. Conference rooms would be needed by both agencies. The staff support facilities (rest rooms, kitchen, etc needed for the dispatch center would generally be adequate for use by the EOC staff when the EOC is activated. The exclusive space needs for the Emergency Management Agency would include office space for the administrative staff and a communications room for use for the supplemental communications used to support emergency operations. CTA recommends that these communications be separated for the dispatch center so that communications in a difficult period of time are not compromised. The co-location of the EOC with a consolidated dispatch center will result in improved coordination of emergency response efforts while minimizing the costs. CTA estimates that 1,500 to 2,000 feet of space would be required for the EOC functions in addition to the space provided for the consolidated dispatch center.

Table 5-1
Staffing Requirements No Consolidation

	Current Staffing				Required			
	Police	Fire	AMR		Police	Fire	AMR	
				Total				Total
Manager	1	1	1	3	1	1	1	3
Operations Manager		1		1	1	1		2
Traning Manager			1	1			1	1
Tech Support Coordinator					1			1
Admin Assistant								
Sub-Total	**1**	**2**	**2**	**5**	**3**	**2**	**2**	**7**
Shift Supervisors			4	4	5		4	8
Call-Takers	25			25	41			
Dispatchers		10	8	18		13	8	62
CMED			4	4			4	4
Sub-Total (FTE)	**25**	**10**	**16**	**51**	**46**	**13**	**16**	**75**
Total	**26**	**11**	**18**	**55**	**49**	**15**	**18**	**82**

Table 5-2
Staffing Requirements Police and Fire Consolidation

	Consolidated	AMR	Total Staff
Total Employees			
Manager	1	1	2
Operations Manager	1		1
Traning Manager	1	1	2
Tech Support Coordinator	1		1
Admin Assistant			0
Sub-Total	**4**	**2**	**6**
Shift Supervisors	5	4	9
Call-Takers	52		52
Dispatchers		8	8
CMED		4	4
Sub-Total (FTE)	**57**	**16**	**73**
Total	**61**	**18**	**79**
	Consolidated	**AMR**	**Total Staff**
On-Duty Employees			
Manager			
Operations Manager			
Traning Manager			
Tech Support Coordinator			
Admin Assistant			
Sub-Total			
Shift Supervisors	1	1	2
Call-Takers	4-9		4-9
Dispatchers	3	2-3	4-6
CMED		1	
Sub-Total (FTE)	**7-11**	**2-4**	**9-16**
Total	**8-12**	**3-5**	**11-17**

Table 5-3
Full Consolidation

	Total Staff	
	On-Duty	**Total**
Manager		1
Operations Manager		1
Traning Manager		1
Tech Support Coordinator		1
Admin Assistant		1
Sub-Total		**5**
Shift Supervisors	1	5
Call-Takers	3-5	38
Dispatchers	4	15
CMED	1	5
Sub-Total (FTE)	**9-11**	**63**
Total	**9-11**	**68**

6.0 Opinion of Probable Costs

Estimates were developed for the major categories of equipment as they apply to the general design for the four consolidation scenarios that are described in this study. The cost information is obtained from historical CTA cost files and vendor pricing of comparable projects. The various costs are compared and weighted in order to derive an average type of estimate. Estimates reflect expected pricing. The prices are recommended for planning and budgetary purposes. Although CTA cannot guarantee price levels, successful competitive bidding typically results in savings on the list price costs.

Current budgeting practices for the City of Springfield do not identify the current costs associated with either the Springfield Police Department or the Springfield Fire Department as separate line items in the budget. While we were able to obtain some cost data with the assistance of the Springfield Finance Control Board, we have chosen not to include the information in this report because it would provide an inaccurate picture of current expenditures. We herein present our estimates of the cost of each of the three options. It must be noted that the personnel costs do not include the costs of fringe benefits. Health Insurance and Retirement are carried as separate City-wide items in the City of Springfield's budget rather than being included in each department's budget. For 2009, the fringe benefit costs are approximately eighteen percent of the costs of wages and overtime. That does not include the federal payroll taxes.

6.1 Option 1 –No Consolidation

6.1.1 Staffing

As noted in SECTION 4 of this report there is a critical need for additional staff in the Springfield Police Department's dispatch center. CTA recommends that, if a consolidation does not occur, the Springfield Police Department dispatch staff should include forty-six dispatchers and lead dispatchers, and three dispatch administrative staff. We estimate the cost of salaries and wages to be $1,820,732. In order to provide the required staffing at Fire Alarm Headquarters without excessive overtime, the dispatch staff needs to be increased to thirteen. We estimate the cost of salaries and wages for fire dispatch would be $575,291. These figures do not include the wages and salaries of the Fire Alarm Supervisor or Assistant.

6.1.2 Maintenance and Operations

Based on information supplied by the Control Board, we estimate that maintenance and operational costs will continue at the same level as they are currently. We estimate this to be approximately $100,000 per year. The Fire Department does not break out costs for dispatch in their budget and was unable to supply current maintenance and operations costs.

6.1.3 CAD

The City of Springfield has received a grant from the Bureau of Justice Assistance to replace the existing Computer Aided Dispatch Systems. It is assumed that the new CAD system will continue to be used.

6.1.4 9-1-1 Equipment

The 9-1-1 equipment and network costs are paid by the State Emergency Telecommunications Board. It is assumed that the SETB will continue to fund the 9-1-1 system.

6.1.5 Console Equipment and Furniture

New workstation furniture will be required to replace the existing furniture. We estimate the cost to be $91,000. Additional workstations will need to be provided. The number of workstations at Fire Alarm Headquarters must be increased to provide more adequate back-up facilities. Additional radio consoles will be required. We estimate the total cost of the needed equipment for both facilities to be $737,305.

6.1.6 Total

The estimated cost of the first year of operation of the upgraded police facility is $2,040,732. We estimate the first year costs for fire alarm headquarters to be $1,008,266. This does not include the cost of operating AMR's dispatch center. The combined costs for operating the two municipal dispatch centers at the recommended staffing levels would be $3,048,998. The budgetary estimates are shown in TABLE 6-1.

6.2 Option 2 Consolidate Springfield Police and Fire Dispatch Centers

In our cost estimates for this option, we include the cost of the equipment for both the consolidated dispatch center and for the back-up police and fire dispatch equipment at AMR's dispatch center.

6.2.1 Staffing

The estimated yearly salary costs for the consolidated center will be $2,305,163.

6.2.2 Maintenance and Operations

Estimated costs for the maintenance and operation of the consolidated center will be $200,000.

6.2.3 CAD

The City of Springfield has received a grant from the Bureau of Justice Assistance to replace the existing Computer Aided Dispatch Systems. It is assumed that the new CAD system will continue to be used. New servers and position hardware will be purchased for both the primary and back-up centers. The estimated cost is $100,500.

6.2.4 9-1-1 Equipment

The 9-1-1 equipment and network costs are paid by the State Emergency Telecommunications Board. It is assumed that the SETB will continue to fund the 9-1-1 system.

6.2.5 Consoles and Furniture

New consoles and full-featured workstation furniture will be purchased for the primary center. The existing consoles will be used at the back-up center. Grounding services are included for both centers. It is estimated the cost will be $676,030.00

6.2.6 Total

We estimate the first year cost of the consolidated dispatch center to be $3,632,145

6.3 Option 3 Full Consolidation

In our cost estimates for this option, we include the cost of the equipment for both the consolidated dispatch center and for the back-up police and fire dispatch equipment at AMR's dispatch center.

6.3.1 Staffing

The estimated yearly salary costs for the consolidated center will be $2,792,968.

6.3.2 Maintenance and Operations

Estimated costs for the maintenance and operation of the consolidated center will be $200,000.

6.3.3 CAD

The City of Springfield has received a grant from the Bureau of Justice Assistance to replace the existing Computer Aided Dispatch Systems. It is assumed that the new CAD system will continue to be used. New servers and position hardware will be purchased for both the primary and back-up centers. The estimated cost is $167.000.

6.3.4 9-1-1 Equipment

The 9-1-1 equipment and network costs are paid by the State Emergency Telecommunications Board. It is assumed that the SETB will continue to fund the 9-1-1 system.

6.3.5 Consoles and Furniture

New consoles and full-featured workstation furniture will be purchased for the primary center. The existing consoles will be used at the back-up center. Grounding services are included for both centers. It is estimated the cost will be $676,030

6.3.6 Total

We estimate the first year cost of the consolidated dispatch center to be $3,839.798.

TABLE 6-1 summarizes the costs for the three options. APPENDIX A then projects the costs for the anticipated project life (twenty years) for the consolidation of the police and fire dispatch centers. APPENDIX A shows that over the twenty year estimated project life, the City of Springfield would save approximately 3.9 million dollars. These figures do not include the cost of constructing a new Emergency Communications Center.

Table 6-1
Comparative Budgets - First Year of Operation

	Current		No Consolidation		Governmental	Full
	Police	Fire	Police	Fire		
Salaries & Wages	$996,326	$296,885	$1,820,732	$575,291	$2,305,163	$2,487,968
Holiday Pay	$21,232	$14,076	$40,000	$20,000	$130,152	$150,000
Overtime	$182,707	$18,000	$30,000	$20,000	$50,000	$50,000
Court time	$48,067		$50,000		$50,000	$50,000
Shift Differential	$16,459	$10,001	$40,000	$10,000	$50,000	$55,000
Employee Benefits						
Total Personnel Costs	$1,264,791	$338,962	$1,980,732	$625,291	$2,585,315	$2,792,968
Operational Expenses	$59,163		$60,000		$200,000	$200,000
Capital Outlay			$354,330	$382,975	$846,830	$846,830
Total Costs	$1,323,954	$338,962	$2,395,062	$1,008,266	$3,632,145	$3,839,798
# Full Time Dispatch Employees	26	9	49	15	26	63
#Part Time Dispatch Employees						
On duty staff	5-8	2		2		9-11

7.0 Conclusions and Recommendations

As has been described in the preceding sections, the City of Springfield is facing complex decisions as to how to proceed with its public safety dispatching operations. During the course of this study, we examined several different alternatives. This section of the report is designed to present CTA Communications recommendations concerning the following questions:

- Should a consolidation take place?
- What actions should be taken immediately before consolidation occurs?
- How should it be organized, governed, and staffed?
- How should policies be made and changed?
- What services should it perform?
- What equipment, systems, software and hardware are needed to in the combined center?
- Where should a consolidated center be located?
- What are the estimated start-up and operational costs associated with a consolidated center?
- How should it be funded?
- What is the timetable for the consolidation to occur?

7.1 Should a Consolidation Take Place?

A public safety Emergency Communications Center (ECC) functions as both the interface between the public and the public safety agencies of the community and provides coordination and support to those public safety agencies. An important part of the coordination and support an ECC provides to a given public safety agency is coordination with other agencies and responders. Any situation requiring more than one public safety responder requires coordination. That is true whether the responders are from the same or different agencies. More responders require more coordination. Coordination cannot occur without communications. Bringing the existing dispatch centers into the same room will result in significant enhancements to the interagency coordination that is required when more than one agency is responding to an emergency.

A shared communications center, with proper implementation, also offers significant service improvements to all of the participants. By establishing high standards of performance, consistently assuring that those standards of service are achieved and also assuring that the center is properly organized, adequately staffed, responsive to the public safety providers and citizens, and well managed, the service provided to the citizens of Springfield will improve significantly. The goal must the creation of an efficient, high-performing, customer-friendly organization.

A shared ECC will also allow improved, specialized support. Currently, support of the various systems used in the dispatch centers is provided by a number of individuals at each center. These support duties are only a part of their duties. The same is true for training ands quality assurance. The proposed staffing for the shared ECC will provide improved systems support as well as coordinated and improved training and quality assurance.

CTA Communications recommends that a shared emergency communications center be created. Initially, the shared center should consist of the Springfield Police and Fire Departments' dispatch operations as well as the primary Public Safety

Answering Point (PSAP) functions. Because the challenges in moving from the current state of dispatch to a properly organized, adequately staffed, responsive, and well managed emergency communications center are many, we recommend that AMR's primary dispatch operation not be initially included in the shared ECC.

Two of the dispatch centers are part of a governmental agency. The third is a for-profit company. While that in and of itself does not present insurmountable obstacles to consolidation, there are other factors that should be considered. The Springfield Police Department and the Springfield Fire Department only serve the City of Springfield; AMR's provides service outside the boundaries of the City of Springfield. In addition to providing service in response to 9-1-1 calls, AMR also provides a significant amount of service for such things as inter-hospital transports, and so forth. As required under the existing contract, AMR also operates C-MED providing coordination and communications between pre-hospital emergency medical services and the hospital emergency departments. Currently, AMR personnel are trained in emergency medical dispatch and provide pre-arrival instructions. AMR also utilizes systems status management where units are positioned based on current and anticipated service demand. As noted above, because of the amount of effort required to consolidate operations, an incremental approach be employed with AMR's participation being reassessed after the new center has been in operations for two to three years. As discussed in SECTION 5, the shared center should be constructed with sufficient space to function as the back-up center for AMR's current operation.

7.2 What actions should be taken immediately before consolidation occurs?

The first step towards improving public safety communications is to bring both the dispatcher and dispatch administrative staffing up to recommended levels.

As noted in both SECTION 4, 5 and APPENDIX B of this report, the Springfield Police Department Dispatch Center is significantly understaffed. Because of the understaffing, the costs for providing dispatch services will not decrease. However, recently adopted legislation in the Massachusetts Legislation offers the potential for significant new funding for the consolidated operation. This should greatly reduce the financial burden of providing emergency dispatch services on the City of Springfield's general fund.

Initiate the development of comprehensive job task analysis, updated job descriptions, and employee selection procedures for all dispatch positions

The police department is in the process of implementing the "Lead Dispatcher" position. The City should immediately conduct a job analysis as a starting point for updating the job descriptions as well as the hiring and training standards. This study should be comprehensive for all of the positions existing and planned at both dispatch centers.

Begin dispatch staff augmentation and training process

As noted in SECTION 4 above, the Springfield Police Dispatch Center is understaffed both in respect to dispatchers and to dispatch administrative personnel. Even with the addition of eight positions in dispatch more are needed. It also frequently takes at least six months for a new employee without any previous experience to become competent in the skills needed to perform the dispatch job.

In addition, a comprehensive training program should be developed to assure that all of the dispatch staff becomes adequately trained before the cutover to the new center. As part of that training, personnel should rotate between the two centers so that they are thoroughly familiar with all operations.

Develop Comprehensive Policy and Procedure Manual

As noted in SECTION 4, there is a lack of written directives at both centers. There is a critical need for a comprehensive, well thought out uniform set of written directives, including standard operating procedures and policies. Work to develop these directives should begin immediately with the goal of having them completed well before cutover. Many of the directives will be able to be implemented prior to the consolidation. The remaining directives will need to be in place sufficiently prior to cutover to allow the staff to be trained.

As quickly as possible, the City should develop and implement a Quality Assurance/Quality Improvement program. A comprehensive QA/QI program is an important component of the creation of an emergency communications center that delivers exemplary service to the citizens and public safety agencies.

Recruit, select, and hire the Emergency Communications Center Director

The consolidation of the two PSAPs is a challenging undertaking. Finding the right person to lead that consolidation is a critical early step in the consolidation process. It should begin as soon as the job task analysis and job description development is complete. It is important that the director be brought on board as early in the process as feasible. The additional dispatch administrative positions recommended should be phased in over the next twelve months.

The administrative staff will have much to do in order to get the new facility and consolidated dispatch center in operation. It may be advisable to augment the staff with outside assistance.

7.3 How should it be organized, governed and staffed?

No two public safety agencies are identical. This is true not just in Springfield, but nationwide and worldwide as well. While there are many similarities, each agency has evolved based on its own, local situation. There are many factors that have contributed to the current state of each agency. The creation of a shared emergency communications center will result in significant changes in the operations of each of the participating public safety agencies. It is critically important that the process of creating the shared center be focused on making positive improvements to all aspects of the delivery of public safety services to all of the citizens and visitors of Springfield.

One of the first issues that must be resolved is the governance structure of the shared center. There are a number of models for the governance of a consolidated center. One possibility is for one of the existing agencies to absorb the dispatch operations of the other participants. Another model would be for two of the agencies to contract with the third agency. The third involves co-location of dispatch centers. Each co-located center operates independently of the other co-located centers. Facilities are shared, but operations are separate. The fourth alternative is an independent center, where a single department or agency provides the dispatch services for all of the participating agencies.

The model that makes the most sense initially is to create an independent department focused on the provision of public safety communications services for the City of Springfield. The separate entity has been the model of choice in most successful consolidations that we have studied. When AMR decides to more fully participate, it could either be as a co-location or AMR could decide to contract with the City for the provision of dispatch service.

We envision that the Emergency Communications Center would be a separate City department with a reporting relationship similar to existing City departments we

recommend that a two-tiered governance structure be established to provide oversight of the agency. This would be a Springfield Dispatch Commission and a Dispatch User Advisory Committee.

7.3.1 Dispatch Commission

The Springfield Dispatch Commission should consist of the Springfield Police Commissioner, the Springfield Fire Commissioner, a representative of the Springfield Emergency Medical Services Commission, the Director of Public Works and a representative of the Mayor's Office. The City may wish to consider adding a citizen representative appointed by the Mayor.

The Dispatch Commission should be the general policy making authority for dispatch operations. It functions should include:

- Providing recommendations to the Mayor on the dispatch annual budget and expenditures
- Establishment of dispatch center organizational goals, objectives and policies
- Adopt and revise bylaws for its operation, as well as the operation of the user advisory committee.
- Provide recommendations of the hiring, employing, and terminating of the dispatch management staff
- Periodic performance evaluations of dispatch management staff

7.3.2 Dispatch User Advisory Committee

The second part of the governance structure is the Dispatch User Advisory Committee. The User Advisory Committee should consist of representatives of the agencies service. At a minimum, we recommend that the User Advisory committee include the following:

- Springfield Police Department Division Commander
- Springfield Fire Department Deputy Chief – Operations
- American Medical Response Regional Manager

The function of the User Advisory Committee is to provide guidance and input to the Dispatch Commission and the Emergency Communications Center Manager on operational and other appropriate issues. It is envisioned that the User Advisory Committee would work with the dispatch manager to develop appropriate standards and procedures concerning ECC performance, personnel selection and training, and other technical and operational issues as directed by the Dispatch Commission.

7.3.3 Emergency Communications Center Director

The Emergency Communications Center Director should be appointed in a similar manner as other department heads in the City of Springfield. The Commission should recommend the appointment of the Director of the Emergency Communications Center. The Director should be responsible for many of the above duties initially established for the Board. For purposes of efficiency and consistency in management, many of the duties are outlined to the Board should be delegated to the Director. However, the Board should reserve the right of appellant review and oversight.

The Director should be subject to the following standards:

- The Director should be responsible for managing the day-to-day operations of the center. The bylaws written by the Board should outline the powers bestowed upon the Director.

- Those powers should include, but not be limited to, the rights to hire, terminate, discipline, and manage personnel. However, the Board should reserve the right of review to overrule a decision by the Director for serious personnel actions.

- The bylaws should specify when the Director may be involuntarily dismissed.

7.4 How should policies be made and changed?

The rules governing the ECC should be laid out in a set of Standard Operating Procedures (SOP). The ECC Director and the User Advisory Committee should develop the SOP jointly. The SOP should be subordinate to any contradictory local ordinance, Massachusetts Statutes, the Board bylaws or any current labor agreement or one subsequently adopted. The Commission on Accreditation of Law Enforcement Agencies (CALEA) in conjunction with the Association of Public Safety Communications Officials (APCO) has developed an accreditation program for communications centers. Two hundred eighteen standards have been developed as a part of the program. These standards are organized into six topic areas:

- Organization
- Direction and Authority
- Human Resources
- Recruitment and Selection
- Training
- Operations

The standards represent the best professional requirements and practices and describe what the agency should be doing, not how they should be doing it. While we recommend that the ECC pursue CALEA Communications Center Accreditation, the standards are a useful guide to the establishment of policies and procedures regardless of whether accreditation is sought or not.

7.5 What services should it perform?

Initially, the ECC should function as the primary Public Safety Answering Point (PSAP) for the City of Springfield, dispatch and coordination resources for the Springfield Police Department and the Springfield Fire Department, coordinate with other public safety services, and maintain appropriate records of its operations.

All dispatch personnel should be fully trained and capable of performing all of these functions. Once the center becomes operational, all dispatch personnel should be trained in Emergency Medical Dispatch (EMD). Once that is accomplished, it will be appropriate to evaluate whether it is more effective for the ECC to assume responsibility for providing pre-arrival instructions or if that function should remain with AMR.

As noted in SECTION 4, much friction is generated between police dispatch, the citizens and the police officers concerning the response to police calls for service. We strongly recommend that the Springfield Police Department develop and implement systems and procedures as appropriate to effectively handle receiving information by alternative means in lieu of an on-scene response. A number of cities have had success in deploying 3-1-1. Some cities have used 3-1-1 only as it was originally intended as a non-emergency means to contact the police. Others have used 3-1-1 as a contact number of all City services. A review of the various deployments indicates that the most success 3-1-1 systems are ones that both the contact number of all City services and an alternative contact number for the police department. We recommend that the City consider including non-emergency police reporting as part of its 3-1-1 system that is being implemented.

7.6 What equipment, systems, software and hardware are needed to in the combined center?

The five major equipment systems in a modern emergency communications center include the 9-1-1 system, the Computer Aided Dispatch (CAD)/Records Management System (RMS), the radio consoles, the logging recorder, and the workstation furniture. The following contains CTA's recommendations for each of these key items:

7.6.1 9-1-1 Customer Premises Equipment (CPE)

The 9-1-1 CPE is provided through the Massachusetts State Emergency Telecommunications Board. The equipment currently being used at the police department is current and functional. It will be nearly time to upgrade the equipment when the consolidated ECC becomes operational. We recommend that new CPE be obtained through the SETB for the new center. The equipment currently in use at the police department could then be used at the back-up center to provide full functionality.

7.6.2 Computer Aided Dispatch/Records Management

A single CAD is recommended for this center. The Springfield Police Department has received a grant to replace the existing CAD system. Their preference is to use the Information Management Corporation's CAD system in order to ensure compatibility with their existing IMC record management system. While a preliminary investigation of the IMC CAD indicates it may provide sufficient functionality to meet the needs of the combined center, functional specifications need to be developed to define the capability and capacity needed. Since significant history exists in the systems currently in use, provisions must be included to either convert that data to run on the new system or to provide interfaces to the current systems so that history is not lost. CTA recommends that specifications be developed for the new CAD system. These specifications should focus on the functionality as it pertains to dispatch operations. As noted in SECTION 3 of this report, common CAD functions include:

- Event Entry
- Event Prioritization
- Unit Recommendation for Assignment to Calls
- Time-stamping
- Address Verification
- Unit Status Monitoring/Recording
- Alert Timers
- Call History
- 9-1-1 Interface
- Paging Interface
- Radio System Interface
- Mobile Data Interface
- Mapping System Interface

These are just a few of the more common features and functions of a modern CAD system. It is important to define what functions and features are required. As prospective systems are reviewed, there needs to be appropriate assurances that the system will have adequate capacity to handle the anticipated workload. This should not be just the normal workload, but must focus on estimated peak workloads. What happens when a major event adds extra units to the system? What happens when an unusual occurrence results in a call volume several times large than the normal call volume? Does the system have sufficient capacity to handle the demand?

7.6.3 Radio Consoles

The radio console serves as the interface between the telecommunicator or dispatcher and the radio system. As with the other systems in the ECC, radio consoles are increasingly computer-based. The use of computer based radio consoles provides the same benefits as noted under the 9-1-1 systems. Both the Springfield Police Department and the Springfield Fire Department use Motorola Gold Elite Consoles. We recommend that a new compatible console system be purchased and installed in the consolidated center. The existing consoles should then be used to equip the back-up center.

7.6.4 Logging Recorder

In recent years the technology used in recording the telephone and radio traffic in dispatch centers has also changed significantly. Digital Voice Recorders, using computer based system are the standard in the industry. Both centers have relatively new recording systems that may be suitable for the combined center. If not, a new digital voice recording system with sufficient capacity to record and store the appropriate radio and telephone messages will be needed. There are a number of vendors who offer suitable equipment. We recommend that specifications be developed to obtain a new recording system.

7.6.5 Dispatch Workstation Furniture

As with the evolution of the various systems used in the Emergency Communications Centers, significant changes have occurred in the furniture used in the dispatch center. Gone is the traditional desk with radios sitting on top. Gone too are the massive metal cabinets replete with switches and buttons. Now the typical dispatch position is equipped with multiple large monitors, multiple keyboards, and multiple computer mice. Each workstation typical has three or more personal computers. Cable management is a significant issue. Electrical requirements are extensive. Heat dissipation has significant impact on the heating ventilating, and cooling systems. These changes have lead to a redefinition of the workstation. The change in the way work is done, has also led to increased attention to ergonomics or human factors engineering. Most dispatch workstation furniture is user adjustable to accommodate the differences in sizes of the personnel using it. In addition, the workstations must be capable of withstanding the around the clock usage by a variety of users. Experience has shown that even top-of-the-line office furniture cannot withstand the around-the-clock usage.

CTA Communications recommends that specifications be developed for the purchase of the specialized dispatch workstations.

7.7 Where should a consolidated center be located?

Two sites were reviewed for potential use for the consolidated center. They are the existing Fire Alarm Headquarters and the Raymond Sullivan Public Safety Complex. The existing Fire Alarm Headquarters was constructed in 1952. The building is in poor condition. The costs of upgrading the facility to be compliant with existing codes and standards and to be suitable for use by the consolidated center would be excessive. There is not sufficient available space at the Raymond Sullivan complex to house the consolidated center. An addition would be required to the building. We believe this would have to be located in some of the green space that is part of the watershed management area adjacent to the building. This may not be acceptable.

Initially it appeared that the existing Fire Alarm Headquarters site would be an acceptable site, if a completely new facility was constructed adjacent to the existing building and then the existing building demolished. This site is relatively removed from known hazards. In addition, the elevation is comparatively high to facilitate radio communications. There is

already extensive communications infrastructure in place to support the new center. On further review, we do not believe there is sufficient space available to construct a new dispatch center in conformance with available guidance for set-backs from public rights-of-way. The parcel where Fire Alarm Headquarters is located is just under two acres. The Department of Defense has developed criteria for critical facilities. They stipulate that vehicles be kept away from the building. Cleared vehicles, such as employee's personal vehicle should be allowed to get no closer than twenty-five meters (eighty-two feet) from the building. All other traffic should be kept at least fifty meters (one hundred sixty-four feet) away.

CTA Communications recommends that the City find a suitable parcel that is approximately five to six acres in area rather than try to reuse or use one of the suggested sites. With the large number of vacant industrial and commercial properties, there should be suitable redevelopment space available.

At a minimum, the building would need to meet the building code requirements for "Essential Facilities" which requires the building resist higher loads from wind, snow, and earthquakes. Snow loads are 20 percent greater, seismic loads are 50 percent greater, and wind loads are 15 percent greater or winds of about 140 miles per hour.

The building must remain operational so it is recommended that it be designed to resist tornados and other high winds. While Springfield hasn't experienced a tornado in recent history, they have occurred in the area.

In our interview and survey process, interest was expressed in co-locating the County's Emergency Operations Center with the new facility. There are significant advantages to co-locating the facilities. Both functions require the same type of flexible space that can meet a variety of needs. Both require sustainability and survivability- the ability to both sustain the effectives of a potential disaster and continue operations for an extended period of time without interruption and potentially isolated from commercial utility sources. The shared use of the space will allow both functions to have improved facilities and reduced costs. The operations area can function as a training room for the ECC. Conference rooms can serve both agencies. The support facilities (restrooms, break rooms, etc.) can be used by both, and so forth. CTA Communications recommends that the ECC and EOC be co-located.

Also during the interview and survey process, it was indicated that there is a need to upgrade the City of Springfield's data center currently located in City Hall. Modern data centers and emergency communications centers share many of the same requirements for reliability and redundancy. Both have a requirement for more HVAC and conditioned electrical power than other locations. CTA Communications recommends that consideration be given to co-locating the City's data center with the Emergency Communications Center.

The design of Emergency Communications Centers and Emergency Operating Centers is a specialized field. Most architectural and engineering firms are not familiar with the unique requirements for a fully functioning ECC. We recommend that Springfield engage the services of an Architectural and Engineering firm specializing in ECC/EOC design early in the design process.

7.8 How Should the Consolidated Communications Center Be Financed?

Currently the two PSAPs are included in the budget of the police and fire departments. Most of the funding comes from the City's general fund. The State Emergency Telecommunications Board provides approximately $100,000 a year for training grants.

On July 31, 2008, Governor Patrick signed into law "An Act to Create a State 9-1-1 Department, Single 9-1-1 Surcharge, and an Enhanced 911 Fund" (Chapter 223 of the Acts of 2008). The law makes significant changes to the way 9-1-1 is funded in the state. A uniform surcharge of $0.75 will be levied on each subscriber or end user whose communication services are capable of accessing and utilizing an enhanced 9-1-1 system. The act also provides for grants to PSAPs for operational costs.

Previously the SETB funded the cost of the 9-1-1 network and 9-1-1 equipment at the Primary PSAP. Under the Act, funding can be used to cover personnel costs, dispatch workstations, and other related items.

While the exact amount has not yet been determined, the City of Springfield can anticipate receiving significant funding through this act. This should help reduce the burden on the City's general fund.

7.9 What is the timetable for the consolidation to occur?

CTA is pleased to present the following recommended action plan for the implementation of the consolidation.

- Commitment to Consolidate — October 31, 2008.
- Complete Job Task Analysis/ Job Description Development — December 31,2008
- Add Additional Dispatch Staff — January 1, 2009
- Begin Development of Comprehensive Policy & Procedures — January 1, 2009
- Select Architect/Design Consultant for New Facility — December 1, 2008
- Select Location for New Dispatch Center — January 1, 2009
- Hire Emergency Communications Center Director — March 1, 2009
- Complete Dispatch Center Design — June 30, 2009
- Begin Dispatch Center Construction — July 1, 2009
- Dispatch Center Substantial Completion — December 31, 2010
- Cutover to Consolidated Center — April 4, 2011

7.10 Additional Considerations

SETB regulations, as well as good industry practice, require the provision of an alternate routing for 9-1-1 calls. The SETB defines Alternate Routing as:

Alternate Routing: the capability of automatically rerouting 9-1-1 calls to a designated alternate location(s) if all 9-1-1 trunks from a central office or to a PSAP are in a "make busy" mode or out of service. May also be activated upon request, or automatically if detectable, when 9-1-1 equipment fails or the PSAP itself is disabled.

Fire Alarm Headquarters currently provides this function for the primary PSAP. With the consolidation that option will no longer be available. In many communities, neighboring communities serve as each other alternate PSAP. Unfortunately, none of the PSAPs in the area around Springfield are capable of handling the high call volume that Springfield

experiences. We recommend that, immediately after the completion of the consolidation, the existing PSAP at the Springfield Police Department and that serve as the alternate or back-up dispatch center. In addition, we strongly recommend that the Police Commissioner contact the Commissioner of the Massachusetts State Police and request that the MSP Dispatch Center in Northampton serve as the interim alternate PSAP. The While the Springfield ECC would be designed to remain functional until the alternate center was staffed, the MSP would answer incoming calls in the event the primary PSAP was incapacitated before the alternate PSAP was activated.

All of these changes will require modification of the existing 9-1-1 plan that is on file with the SETB. The City will need to coordinate with the SETB staff to assure that approvals are received in a timely manner.

Appendix A Budget and No Merger

Budget

Consolidated	2008	2009	2010	2012	2013	2014
Salaries & Wages	$ 2,305,163	$ 2,374,318	$ 2,469,291	$2,568,062	$ 2,670,785	$ 2,777,616
Overtime	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Holiday Pay	$ 130,152	$ 134,057	$ 138,078	$ 142,221	$ 146,487	$ 150,882
Court Time	$ 50,000	$ 51,500	$ 53,045	$ 54,636	$ 56,275	$ 57,964
Shift Differential	$ 50,000	$ 51,500	$ 53,045	$ 54,636	$ 56,275	$ 57,964
Total Personnel Costs	$ 2,585,315	$ 2,661,374	$ 2,763,459	$2,869,556	$ 2,979,823	$ 3,094,425
Operational Expenses	$ 200,000	$ 204,000	$ 208,080	$ 212,242	$ 216,486	$ 220,816
Operating Budget	$ 2,785,315	$ 2,865,374	$ 2,971,539	$3,081,797	$ 3,196,309	$ 3,315,242
Capital Outlay	$ 955,050			$ 63,670	$ 63,670	$ 63,670
Total Costs	$ 3,740,365	$ 2,865,374	$ 2,971,539	$3,145,467	$ 3,259,979	$ 3,378,912
# Full Time Dispatch Employees	49	49	49	49	49	49
#Part Time Dispatch Employees	0	0	0	0	0	0

Budget (Continued)

Consolidated	2015	2016	2017	2018	2019	2020	2021
Salaries & Wages	$ 2,888,721	$ 3,004,270	$ 3,124,440	$ 3,249,418	$ 3,379,395	$ 3,514,570	$ 3,655,153
Overtime	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Holiday Pay	$ 155,408	$ 160,071	$ 164,873	$ 169,819	$ 174,913	$ 180,161	$ 185,566
Court Time	$ 59,703	$ 61,494	$ 63,339	$ 65,239	$ 67,196	$ 69,212	$ 71,288
Shift Differential	$ 59,703	$ 61,494	$ 63,339	$ 65,239	$ 67,196	$ 69,212	$ 71,288
Total Personnel Costs	$ 3,213,534	$ 3,337,328	$ 3,465,990	$ 3,599,714	$ 3,738,700	$ 3,883,155	$ 4,033,295
Operational Expenses	$ 225,232	$ 229,737	$ 234,332	$ 239,019	$ 243,799	$ 248,675	$ 253,648
Operating Budget	$ 3,438,767	$ 3,567,065	$ 3,700,322	$ 3,838,733	$ 3,982,499	$ 4,131,830	$ 4,286,943
Capital Outlay	$ 63,670	$ 63,670	$ 63,670	$ 63,670	$ 63,670	$ 63,670	$ 63,670
Total Costs	$ 3,502,437	$ 3,630,735	$ 3,763,992	$ 3,902,403	$ 4,046,169	$ 4,195,500	$ 4,350,613
# Full Time Dispatch Employees	49	49	49	49	49	49	49
#Part Time Dispatch Employees	0	0	0	0	0	0	0

Budget (Continued)

Consolidated	2022	2023	2024	2025	2026	2027	2028	Total
Salaries & Wages	$ 3,801,359	$ 3,953,414	$ 4,111,550	$ 4,276,012	$ 4,447,053	$ 4,624,935	$ 4,809,932	
Overtime	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	
Holiday Pay	$ 191,133	$ 196,867	$ 202,773	$ 208,856	$ 215,121	$ 221,575	$ 228,222	
Court Time	$ 73,427	$ 75,629	$ 77,898	$ 80,235	$ 82,642	$ 85,122	$ 87,675	
Shift Differential	$ 73,427	$ 75,629	$ 77,898	$ 80,235	$ 82,642	$ 85,122	$ 87,675	
Total Personnel Costs	$ 4,189,345	$ 4,351,539	$ 4,520,120	$ 4,695,339	$ 4,877,459	$ 5,066,753	$ 5,263,505	
Operational Expenses	$ 258,721	$ 263,896	$ 269,174	$ 274,557	$ 280,048	$ 285,649	$ 291,362	
Operating Budget	$ 4,448,067	$ 4,615,435	$ 4,789,293	$ 4,969,896	$ 5,157,507	$ 5,352,403	$ 5,554,868	
Capital Outlay	$ 63,670	$ 63,670	$ 63,670	$ 63,670	$ 63,670	$ 63,670	$ 63,670	
Total Costs	$ 4,511,737	$ 4,679,105	$ 4,852,963	$ 5,033,566	$ 5,221,177	$ 5,416,073	$ 5,618,538	$ 82,086,642
# Full Time Dispatch Employees	49	49	49	49	49	49	49	
#Part Time Dispatch Employees	0	0	0	0	0	0	0	

No Merger

Not Consolidated	Current	2008	2009	2010	2011	2012	2013
Salaries & Wages	$ 1,293,211	$2,396,023	$2,491,864	$2,591,538	$2,695,200	$2,803,008	$2,915,128
Overtime	$ 200,707	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Holiday Pay	$ 35,308	$60,000	$61,800	$63,654	$65,564	$67,531	$69,556
Court Time	$ 48,067	$50,000	$51,500	$53,045	$54,636	$56,275	$57,964
Shift Differential	$ 26,460	$50,000	$51,500	$53,045	$54,636	$56,275	$57,964
Total Personnel Costs	$ 1,603,753	$ 2,606,023	$ 2,706,664	$ 2,811,282	$ 2,920,036	$ 3,033,089	$ 3,150,612
Operational Expenses	$ 59,163	$60,000	$61,800	$63,654	$65,564	$67,531	$69,556
Operating Budget	$ 1,662,916	$ 2,666,023	$ 2,768,464	$ 2,874,936	$ 2,985,600	$ 3,100,620	$ 3,220,169
Capital Outlay			$737,305				
Total Costs	$ 1,662,916.00	$ 2,666,023.00	$ 3,505,768.92	$ 2,874,936.48	$ 2,985,599.96	$ 3,100,619.95	$ 3,220,168.63
# Full Time Dispatch Employees	35						
#Part Time Dispatch Employees	-						
On duty staff	7-10						

CTA Communications

No Merger (Continued)

Not Consolidated	2014	2015	2016	2017	2018	2019	2020
Salaries & Wages	$3,031,733	$3,153,003	$3,279,123	$3,410,288	$3,546,699	$3,688,567	$3,836,110
Overtime	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Holiday Pay	$71,643	$73,792	$76,006	$78,286	$80,635	$83,054	$85,546
Court Time	$59,703	$61,494	$63,339	$65,239	$67,196	$69,212	$71,288
Shift Differential	$59,703	$61,494	$63,339	$65,239	$67,196	$69,212	$71,288
Total Personnel Costs	$ 3,272,782	$ 3,399,783	$ 3,531,806	$ 3,669,052	$ 3,811,726	$ 3,960,045	$ 4,114,232
Operational Expenses	$71,643	$73,792	$76,006	$78,286	$80,635	$83,054	$85,546
Operating Budget	$ 3,344,425	$ 3,473,575	$ 3,607,812	$ 3,747,338	$ 3,892,361	$ 4,043,099	$ 4,199,777
Capital Outlay	$100,500	$30,000		$363,750			$100,500
Total Costs	$ 3,444,924.98	$ 3,503,575.06	$ 3,607,812.34	$ 4,111,087.94	$ 3,892,360.96	$ 4,043,098.78	$ 4,300,277.41
# Full Time Dispatch Employees							
#Part Time Dispatch Employees							
On duty staff							

No Merger (Continued)

Not Consolidated	2021	2022	2023	2024
Salaries & Wages	$3,989,554	$4,149,137	$4,315,102	$4,487,706
Overtime	$50,000	$50,000	$50,000	$50,000
Holiday Pay	$88,112	$90,755	$93,478	$96,282
Court Time	$73,427	$75,629	$77,898	$80,235
Shift Differential	$73,427	$75,629	$77,898	$80,235
Total Personnel Costs	$ 4,274,520	$ 4,441,151	$ 4,614,377	$ 4,794,459
Operational Expenses	$88,112	$90,755	$93,478	$96,282
Operating Budget	$ 4,362,632	$ 4,531,906	$ 4,707,855	$ 4,890,742
Capital Outlay		$230,000		
Total Costs	$ 4,362,631.84	$ 4,761,906.34	$ 4,707,854.89	$ 4,890,741.56
# Full Time Dispatch Employees				
#Part Time Dispatch Employees				
On duty staff				

No Merger (Continued)

Not Consolidated	2025	2026	2027	2028	Total
Salaries & Wages	$4,667,214	$4,853,903	$5,048,059	$5,249,981	
Overtime	$50,000	$50,000	$50,000	$50,000	
Holiday Pay	$99,171	$102,146	$105,210	$108,367	
Court Time	$82,642	$85,122	$87,675	$90,306	
Shift Differential	$82,642	$85,122	$87,675	$90,306	
Total Personnel Costs	$ 4,981,670	$ 5,176,292	$ 5,378,620	$ 5,588,959	
Operational Expenses	$99,171	$102,146	$105,210	$108,367	
Operating Budget	$ 5,080,841	$ 5,278,438	$ 5,483,830	$ 5,697,326	
Capital Outlay			$100,500	$363,700	
Total Costs	$ 5,080,840.87	$ 5,278,438.24	$ 5,584,330.41	$ 6,061,025.92	$ 85,984,024.47
# Full Time Dispatch Employees					
#Part Time Dispatch Employees					
On duty staff					

Appendix B Staffing

Appendix B Staffing

B.1 Introduction

The staffing of public safety communications centers is a complex issue. Having the correct compliment of staff on duty when needed is a significant challenge to public safety communications managers in many locations. There are a number of aspects to staffing that need to be addressed. These not only include personnel issues such as the number of authorized positions, the actual staffing complement, employee turnover, training, amount of overtime, paid leave amounts, sick leave amounts and so forth, but also include things such as the technology employed and the nature of the duties of the personnel. The Appendix provides a brief overview of the various issues involved and then presents CTA Communications recommendations for staffing for each of the consolidation models. The recommendations are based on common formulas used to determine staffing as modified by the available data from the agencies participating in this study.

While each public safety dispatch center is unique, staffing is a common issue present at every center. Insufficient staffing of a dispatch operation promotes excessive stress and employee burnout which in turn leads to higher turnover. A 2005 study by the University of Denver Research Institute for the Association of Public Safety Communications Officials, International *Project RETAINS Research Report* identified five factors that predicted higher retention rates, in order of influence:

- Employees perception that the center was fully staffed
- Average overtime hours per month
- Job complexity
- Hourly base pay rate
- Employee satisfaction with working conditions

The study also identified eight factors that predicted higher employee satisfaction, in order of importance:

- Center performance
- Preparation and ongoing training
- Feeling appreciated by management
- Satisfaction with the shift selection process
- Satisfaction with the process for mentoring new trainees
- Feeling appreciated by their immediate supervisor;
- The perception that there was a thorough and extensive application and selection process
- Feeling appreciated by the media

Just as understaffing a dispatch center creates problems, overstaffing creates its own set of problems:

- Internal morale is affected by boredom during periods of little work
- Low activity does not allow for a feeling of accomplishment or achievement
- Personnel may become more interested in entertainment than operations during periods of low activity.

Finding the right staffing complement is an ever changing challenge. At best, they are only estimates based on assumptions and available data. There are several approaches

to determining the number of people needed on duty at any time. Most staffing formulas use queuing theories to estimate the number of call takers needed. Most calculations are based on either First In First Out (FIFO) or Last In First Out (LIFO) disciplines. As Church and Church note, in public safety communications, the discipline is almost never either FIFO or LIFO. One of the reasons for this is that no visible line forms. In addition, the varying priority of messages affects the order in which the messages are handled. CTA Communications uses a method that analyzes the various elements of the center's workload and estimates the staff needed to handle that workload within the established performance estimates. The specific tasks that are performed in the center must be identified first. Some of the tasks, such as answering incoming 9-1-1 lines, are easily quantifiable based on available statistics. Others, such as handling traffic on the Criminal Justice Information System (CJIS), and various supervisory tasks are not easily measured in terms of the time commitment involved. Each of the tasks takes a certain amount of time. While individual occurrences of the same task may take more or less time, an acceptable average time can be established.

Once the tasks have been identified and the average time requirements determined, there are two basic approaches to determining call volume and staff requirements. One involves a detailed data collection and analysis. The second approach uses an approximation approach. Since each of the centers involved in this study collect and measure data differently, we have used a modified approximation approach to estimate the workload for the center.

We have used the available data from the centers to modify the calculations. For example, one model suggests that two 9-1-1 calls per day per 1,000 population can be expected. Using the 2000 census data for Springfield (152,082), the PSAPs would have been expected to receive an average of 304 incoming 9-1-1 calls per day. In 2007, an average 311 calls per day were received by the Springfield 9-1-1 center. It must be noted that wireless 9-1-1 calls are first answered and screened by the Massachusetts State Police. In many centers that directly answer all 9-1-1 calls, the number of wireless calls 9-1-1 calls received exceeds the number of wireline 9-1-1 calls. 195 additional other incoming calls are received on the average day. Once a shared dispatch operation has been established, this type of analysis needs to be done on a routine basis to make sure the staffing is appropriate. The sampling period needs to be long enough to identify the differences caused by the hour of the day, day of the week, season and other factors such as a significant event. As a historical record is developed, changes in patterns, both on a seasonal and longer term basis, can be detected and adjustments made. In addition, should the City of Springfield begin receiving wireless 9-1-1 calls directly, adjustments will be required in staffing patterns. TABLEB-1 displays the calls-per-hour data. Unfortunately, it only shows the total incoming calls. We are not able to break-out the number of 9-1-1 calls received per-hour with the available data.

B.2 Emergency Communications Center Functions

The three communications centers involved in this study exist to support the public safety agencies in Springfield, Massachusetts. As such the centers receive and classify calls for assistance from the public, select the appropriate response and alert the appropriate responders of the incident, coordinate with other public safety resources, and maintain records of activities. Each of the centers tracks the status of responders they have responsibility for, provides access to various local, state, and national data bases, and provides coordination between various responders and agencies. In addition to answering the incoming emergency lines, each center also answers a number of non-emergency telephone phone calls. In addition, the police department receives requests from the field to run inquiries into the various systems when the field units aren't able to use their mobile terminals. They also call for tow trucks and make other calls in support of the officers in the field. Fire Alarm Headquarters provides similar support services for the fire department. American Medical Response Emergency provides Medical Dispatch (EMD) in addition to providing dispatch services for AMR units in Western

Massachusetts. EMD involves providing pre-arrival instructions to callers. In some cases, the dispatcher stays on the line with the caller until help arrives at the scene. AMR also operates the C-MED system for the Western Massachusetts region. This involves coordinating pre-hospital communications between medical responders and the hospitals. While data available indicates that there were 53,816 CMED patches in 2007, we do not have sufficient information to be able to quantify the time commitment for both EMD and CMED activities.

B.3 Task Analysis

Using studies done in other public safety communications centers, it is possible to develop reasonable estimates of the time used to support dispatch operations. Each of the agencies involved maintains some form of operational statistics. The agencies have provided the information to CTA for our use in conducting this study. Because there are differences in the definitions and the level of detail available, limited data sets are available for computing the workload in the consolidated center. TABLE B-2 contains the common statistics available from the three centers.

This activity data will be used to determine the workload generated and the staffing needed for the various combinations of centers discussed in the report.

The initial task in all three centers is the report of an incident. The majority of incident reports typically stem from 9-1-1 calls. The critical information needed includes:

- Location of the Incident
- Nature of the Incident
- Time Incident Occurred (In progress?)
- Other Hazards

Other information, which is not essential to initiate the dispatch, includes the following:

- Name of Person Reporting the Incident
- Names of Witnesses
- Name and Description of Parties Involved
- Other Descriptive Information

On calls reporting medical emergencies, additional information needs to be obtained. This includes:

- Chief Complaint or Symptom
- Patient's Age
- State of Consciousness
- Breathing Activity

The location verification process is essential to a timely and appropriate response to any emergency. The implementation of enhanced 9-1-1 for wireline telephone service provides some time-saving assistance. However studies have indicated that as many of forty percent of all incident reports made by wireline telephone do not originate from the address of the incident occurrence. In addition, wireless 9-1-1 calls do not initially provide location information. The dispatcher must request the location information from the system after they have answered the call. Generally, this request must be at least thirty seconds after the call has been initially answered. Many wireless callers are unable to provide accurate information on the location of the incident. Studies nationally have shown that typical call processing time for wireless 9-1-1 calls is approximately fifty percent greater than for wireline calls. A typical wireline 9-1-1 call is handled in sixty seconds. The average processing time for wireless calls is ninety seconds. Available data from the Springfield 9-1-1 system indicates that the average time spent processing a

wireline 9-1-1 call is seventy-three seconds, and the average time spent processing a wireless 9-1-1 call is ninety-six seconds.

Once the location of the incident is verified, it is entered into the Computer Aided Dispatch (CAD) system along with the nature of the incident and other appropriate information. Typically the information is entered as the dispatcher is taking the information. The call is also classified as to its severity. On some in-progress calls, the dispatch may be initiated while additional information is being obtained. This is usually done by one dispatcher remaining on the telephone while another dispatcher initiates the response.

In many cases, more than one telephone call is received reporting the same incident. These subsequent calls usually do not receive the full treatment once it is determined that the caller is reporting the same incident and does not have additional information that is needed.

Once the incident has been entered into the CAD system, the appropriate resources must be dispatched. This involves the selection of the proper resource based on the location and nature of the incident. The dispatcher must have an awareness of the availability of the resources under his or her control.

The CAD system provides a recommendation based on the resource. Police response is normally dependent on the availability of units to respond. When all units are busy, incidents are queued or stacked by severity and age. Frequently for incidents that are not high priority, the incident is stacked until the unit assigned to the area of the call is available.

A certain amount of time delay in response to non-emergency incidents is not considered unacceptable Fire and EMS incidents are almost always treated as emergencies requiring immediate response. Some prioritizing of calls is done through emergency medical dispatch. Most typically, the prioritizing of EMS calls involves determining if first responders should also be dispatched and if the responding units should respond using emergency lights and sirens.

The dispatcher must confirm the recommendations of the CAD system based on information that may not be in the system. This includes other events occurring, specific abilities needed for the incident response, upcoming shift changes, and so forth. In other words the dispatcher must independently develop a recommendation and then accept or modify any recommendation from the CAD system. While many of the police units are equipped with mobile computer terminals, most police and all fire and EMS calls are dispatched by voice since units are equipped with mobile computers and other units need to be aware of what the other units are doing.

For police calls, the dispatcher must first alert the unit or units to prepare to receive a message, be notified by the unit of its availability, broadcast the assignment and receive acknowledgement from the unit. Fire/EMS dispatch usually does not involve the availability reply. If the unit does not acknowledge the dispatch, the dispatcher must confirm receipt of the message, reinitiate the contact, or in the case of critical incidents, select other resources to respond.

Once the units have been dispatched, there will be radio messages from the unit to provide status changes (arrival, clear, etc.), to request additional information or resources and to provide information. The dispatcher may initiate additional messages as well to check the well-being to the responders, to provide or request additional information, and so forth.

In addition to the task related workload, typical operations involve three breaks away from the dispatch positions. Two of the breaks are typically fifteen minute breaks and the third is forty-five minutes.

The impact on the workload analysis needs to be taken into account when calculating the number of personnel needed on duty.

B.4 Dispatch Configuration

Receiving and dispatching of calls for assistance are the two primary tasks of each of the public safety communications centers in this study. Some agencies equip all of its primary positions to handle both functions simultaneously. These dispatch centers operate as *single-stage operations*. In other words, all of the dispatchers have the ability to efficiently control all units. This is typically the most efficient method of dispatching in smaller agencies or when the center has a lower call volume. Larger dispatch centers use a *two-stage operation*. In a two-stage operation, the call is taken by one person and the information is transferred to a second person who then dispatches the call. The two-stage operation becomes the model of choice when the number of incoming calls requires multiple call-takers and the number of units being controlled requires multiple channels and dispatcher. A third model, *three-stage operations*, is used in a few communities. Under this model, the 9-1-1 operator determines the location and nature of the call and transfers the call to the appropriate police, fire, or EMS call-taker. The call taker then enters the information into the system and transfers the information to the dispatcher. The dispatcher then transfers the call. All three centers in this study use the *two-stage* operation.

CTA recommends that the consolidated center use a modified single-stage operation. For most of the day, the single-stage model would be used. During peak times, however, supplemental personnel would be used in a call-taking capacity. The advantage to this method of operation is that there will be increased ability to communicate with field units and flexibility to meet rapidly changing situations.

B.5 Workload Analysis Assumptions

The workload analysis uses the activity data and task descriptions to estimate the time used support public safety operations. Based on available data, the typical 9-1-1 call as stated in "*An Introduction to the Theory of Waiting Times",* for law enforcement services occupies the call taker for approximately sixty seconds. The typical fire call occupies the call taker for forty-five seconds, and the typical emergency medical call occupies the call taker for one hundred ten seconds in centers where emergency medical dispatch protocols are used as stated in "*The Design and Costing of 9-1-1 Systems"*. It must be noted that the average time on a 9-1-1 call in Springfield is seventy-three seconds for a wireline 9-1-1 call and ninety-six seconds for a wireless 9-1-1 call. As noted in the report, a significant number of seven digit telephone calls are also received at the PSAP. The average time on these calls is fifty-eight seconds. Radio traffic adds to the center's workload. For the average law enforcement incident, there will be a minimum of three radio messages. These consist of the dispatch and the unit's arrival and clear status changes. EMS incidents involve those same messages as well as additional status changes for the unit calling enroute to the scene and to the hospital, arriving at the hospital and returning to quarters. Fire incidents also add additional messages.

Since many fire incidents involve multiple unit responses, the status change messages for calling enroute, arriving, clearing and returning to quarters are multiplied by the number of units arriving. In addition, incident command procedures commonly used by fire departments include additional messages concerning the status of the incident such as initial size-up report, fire loss stopped, and so forth. The messages are transmitted so that the times can be documented in the incident record.

The workload at a dispatch center is not evenly distributed. *"The Design and Costing of 9-1-1 Systems"*, have shown that the busy day call volume is approximately forty percent higher than the average call volume. Based on available 2007 data from the 9-1-1 system, forty-six percent of the activity occurs between the hours of 3 PM and 11 PM; thirty-four percent occurs between 7 AM and 3 PM, and twenty-one percent occurs between 11 PM and 7 AM. The percentages add up to more than 100 due to rounding. Yung and Dayharsh also noted that approximately ten percent of the days total call volume occurs during the busiest hour on the busiest shift; eight percent occurs during the busiest hour of the second busiest shift, and six percent of the daily call volume occurs during the busiest hour of the least busy shift. A review of the data for Springfield indicates that this estimate is reasonably accurate. We have taken the available data and computed the daily average, the average for the busiest day of the week and the average activity for the busiest hour of the busiest day. Those figures are shown in TABLE B-3.

Using the estimated busy day figures, we can begin to estimate the workload and, as a result, the staffing is required to meet the performance goals. Using the busy day statistics, TABLE B-4 shows the estimated workload in seconds for the center:

It is then possible to divide the total seconds required by the seconds that one dispatch position is available to work per shift and determine the number of staff needed each day. There are three thousand six hundred seconds in each hour. With contractually required breaks and assuming that a dispatcher works measured activities forty minutes in each hour that they work, one position is available to handle the above activities two hundred forty minutes in an eight hour shift. In order to handle the activity above, a total of twenty-three people are needed on duty each day.

Using the activity distribution described above, we recommended the following minimum on-duty staff for each of the three shifts:

- Day Shift 5
- Afternoon Shift 8
- Night Shift 4

In addition to the personnel needed to handle those volume-influence positions, four additional positions will be needed on each shift to cover the other activities. The four positions include, primary police dispatcher, fire dispatcher, secondary police dispatcher, and shift supervisor or lead operator. The staffing needed each day including these positions then becomes:

- Day Shift 9
- Afternoon Shift 12
- Night Shift 10

In order to staff the twenty-two shifts every day, a total of fifty-nine full-time telecommunicators and supervisors will be needed. This is based on each full-time employee's work year being based on 2,088 hours in a year. All of the time that the employee is unavailable to work (vacation, sick, and other leave as well as training time, breaks, and so forth) are subtracted from the 2,088 hours to provide the net available working hours per employee. For this project we estimated a total average of 560.5 unavailable hours leaving a net available work hour's figure of 1,527.5 hours per full-time employee. This number was then used to divide the total number of hours needing to be covered. The result is shown above.

We can not emphasize enough that these are estimates, based on the data provided to us. We highly recommend that detail data be collected between now and the actual consolidation. Among the data that should be collected are detailed 9-1-1 call and

dispatch data. Ideally, the information should be collected for each hour of each day for a year in order to facilitate a more complete analysis. Unfortunately some of the current systems in place do not provide this information in an automated manner. With the fact that all of the current dispatch employees have been guaranteed a position with the consolidated center, there will be more staff than our studies indicate is necessary. This will allow more detailed study and revision of the staffing levels as time progresses.

Table B-1
Calls By Hour of Day

Hour	Count	Average	% of all	Hour	Count	Average	% of all
00:00	6,789	18.6	6%	12:00	8,680	23.8	7%
01:00	5,357	14.7	4%	13:00	8,732	23.9	7%
02:00	5,264	14.4	4%	14:00	9,848	27.0	8%
03:00	3,811	10.4	3%	15:00	11,036	30.2	9%
04:00	2,823	7.7	2%	16:00	11,638	31.9	10%
05:00	2,632	7.2	2%	17:00	11,345	31.1	9%
06:00	3,417	9.4	3%	18:00	11,173	30.6	9%
07:00	5,219	14.3	4%	19:00	10,340	28.3	9%
08:00	6,223	17.0	5%	20:00	10,433	28.6	9%
09:00	7,128	19.5	6%	21:00	9,987	27.4	8%
10:00	7,612	20.9	6%	22:00	9,087	24.9	8%
11:00	8,204	22.5	7%	23:00	8,683	23.9	7%
Total					**120,982**	**331**	
Hourly Average						**13.8**	

Table B-2
Activity

2007	Springfield Police	Springfield Fire	AMR	Total
Wireline 9-1-1 Calls	72,199			
Wireless 9-1-1 Calls	41481			
Total 911 Calls Received	113,680			
9-1-1 Transfer Calls Received			50,000	
Administrative Calls	71,333			
Total Phone Calls	185,013			
Police Dispatches	183,367			
Police Officer Initiated				
Fire Events		6,600		
Medical Dispatches		4,400	63,000	
Transfers Dispatched (AMR)				
*Springfield Fire & AMR 911 calls are transfers from other PSAPS. This figure is not included in the total.				

Table B-3
Estimated Workload

	Daily Avg	Busy Day	Avg Busy Hour
Wireline 911 Calls Received	198	277	28
Wireless 911 Calls Received	114	159	16
Total 911 Calls Received	311	436	44
Wireless Call %			
Average 911 Answer Time			
Other Emergency Calls Received			
Administrative/Non-Emergency Calls	218	306	31
Total Incoming Calls	530	742	74
Police Calls Dispatched	502	703	70
Police Officer Initiated		0	0
Fire Events Dispatched	18	26	3
Emergency Medical Incidents	148	208	21
Number of 911 Transfers		0	0
		0	0
911 Calls Dispatched (AMR)	173	242	24
Transfers Dispatched (AMR)	116	162	16
Total NCIC Transactions	936	1311	131

Table B-4
Workload Estimates

				Full	Police-Fire Only
	Daily Avg	Busy Dav	Avg Busy Hour	Busy Day Activity (Seconds)	Busy Day Activity (Seconds)
Wireline 911 Calls Received	198	277		20216	20216
Wireless 911 Calls Received	114	159		15274	11615
Total 911 Calls Received	311	436	61	35490	31830
Wireless Call %					
Administrative/Non-Emergency Calls	218	306	31	17738	22325
Total Incoming Calls	530	742	74	53228	54156
Police Calls Dispatched	502	703	70	63299	51343
Police Officer Initiated	N/A				0
Fire Events Dispatched	45	62	6	5308	4559
Emergency Medical Incidents	33	47	5	3506	3412
Number of 911 Transfers		0	0		
		0	0		
911 Calls Dispatched (AMR)	173	242	24	14499	
Total Time Required (Seconds)				228557	199455

Appendix C Site Evaluation

Appendix C Site Evaluation

As part of the analysis of the feasibility of consolidating the PSAPs/dispatch centers, CTA Communications was to "Identify and assess up to three locations that could house the City's combined dispatch center which will meet the City's current needs as well as provide expansion potential for the site to host a regional central dispatch in the future, if appropriate." This survey reviewed known and potential vulnerabilities such as, but not limited to, the following:

- Flooding
- Chemical Plants and other industry locations region
- Railway potential hazards
- Interstate and highway potential hazards
- Transportation and access to and from the facility
- Elevation issues
- Available Infrastructure
- Condition of Existing Structure

Following are the results of CTA's Site Review:

Public safety communications systems must function under all conditions. In order to remain functional under all conditions, a public safety communications center needs to be constructed to withstand known hazards. In addition, the center should be separated from known hazards. Finding such a location in Springfield is challenging. The City is susceptible to a variety of natural hazards in part due its location and climate. The most damaging hazards historically have been hurricanes and resulting floods. The City's experiences with hurricanes during the past twenty years has been minimal, however, major winds as a result of hurricanes or storms is common. The City starts to experience major disruptions of utilities when winds reach over 55 mph. The City's mix of industrial and commercial uses in addition to the transportation lines located within its boundaries creates a number of high probability and risk situations. The mix of heavy industries (16 using reportable amounts of extremely hazardous materials) and numerous surface and rail transport route leaves the City susceptible to releases.

The City suggested several different possible locations for the consolidation dispatch center. Sufficient information was supplied on two of the locations – Fire Alarm Headquarters and the Raymond Sullivan Public Safety complex. CTA Communications, assisted by personnel from the City of Springfield, investigated both of the sites. The sites were evaluated based on the following criteria:

- Site Characteristics
- Location
- Suitability of Existing Building
- Availability of Adequate Electrical Power and Utilities
- Availability of Adequate Telecommunications Facilities
- Suitability of Existing HVAC/Mechanical Equipment
- Grounding
- Equipment Installation

There were a number of factors included in each category. Each of those factors was evaluated and assigned a point value between "0" and "5". "0" meant the location lacked the characteristic. "5" indicated the location was outstanding in the way it met the

characteristic. The point value (1-5) was multiplied by the weighting factor (1-3) to develop the score for each criterion. A total of 94 different criteria were evaluated for each site.

Following is a discussion of each of the sites.

Fire Alarm Headquarters 1535 Roosevelt Avenue

- Site Characteristics - Poor

The 1.3 acre site is owned by the City of Springfield. There are two primary structures and several supporting structures located on the property. One of the structures is Fire Alarm Headquarters; the other is the vehicle maintenance shop for the Springfield Fire Department. The property is generally higher than the surrounding area and there appears to be good drainage away from the property. Unfortunately, there is not sufficient space available to meet the guidance on set-back from public roadways. The Department of Defense has developed the criteria for critical facilities. They stipulate that vehicles be kept away from the building. Cleared vehicles, such as employee's personal vehicle should be allowed to get no closer than 25 meters or 82 feet from the building. All other traffic should be kept at least 50 meters or 164 feet away.

- Location - Good

The building is located in a commercial use area. Immediately adjacent to the property is the Massachusetts National Guard Armory. The location is directly across the street from Blunt Park. It is approximately three-quarters of a mile from the nearest rail line and from Interstate 291.

- Suitability of Existing Building - Poor

Fire Alarm Headquarters was constructed in 1952. The dispatch center is located on the second floor. The existing dispatch area is approximately 1,850 square feet. The fire alarm maintenance staff is located on the first floor / garage area of the building.

Over the life of the building, much of the routine maintenance has been deferred. As a result the building is in generally poor condition. The building is in the process of having its HVAC system renovated. The duct work and heating system has been installed. The cooling system has not been updated and has caused numerous problems in the past. Because the equipment room gets over heated during the summer months, the staff has had to open windows in order to create a thermal heat sink. This has allowed birds and rodents to enter the building. There have been complaints about the existing electrical system being inadequate and may need updating in the near future. The electrical circuits are becoming overloaded and causing the circuit breakers to trip. The battery room for all the batteries that supply power to the fire alarm boxes is not ventilated properly. All batteries are acid base. There is not an eye wash station available for personnel to use in case of emergency while working on the batteries. The window is opened slightly to allow for minimum ventilation and movement of the air in the room. Most of the battery connectors in the room are showing signs of corrosion and leakage. In addition, there is a lack of adequate restroom facilities and the building does not comply with American's with Disabilities Act accessibility standards. Windows are cracking and not sealed tight. Paint on the walls is cracking and chipping off.

At a minimum, the building would need to meet the building code requirements for "Essential Facilities" which requires the building resist higher loads from wind, snow, and earthquakes as well as the ADA requirements. The International Building Code defines essential facilities as ***Buildings and other structures that are intended to remain operational in the event of extreme environmental loading from flood, wind, snow***

or earthquakes." Snow loads are 20 percent greater, seismic loads are 50 percent greater, and wind loads are 15 percent greater or winds of about 104 miles per hour.

It is our professional opinion that any attempt to renovate the existing building may not be cost effective.

- Availability of Adequate Electrical Power and Utilities - Good

While some upgrading of the electrical service to the property might be required, it appears that the electrical power and other utilities are adequate.

- Availability of Adequate Telecommunications Facilities -Good

In addition to housing the primary fire radio transmitters, the site is also used for several police radio transmitters and serves as a link for the CMED system. The "head-end" for the City's previous CATV franchisee is located on the property. It was abandoned when the vendor was purchased by Comcast. The abandoned satellite antennas need to be removed. There is a separate building that houses all of the radio transmitters.

- Suitability of Existing HVAC/Mechanical Equipment - Fair

As noted above, the existing HVAC and mechanical systems are being replaced. However there is no redundant HVAC system as required by NFPA 1221.

- Grounding - Fair

Equipment with ground points are bonded to the cabinet via a #6 AWG green shielded copper cable. The cabinet is then connected to the Halo ground ring via another #6 AWG green shield copper cable with a compression crimp. A coaxial surge protector device is located at the coax cable entry point, but there is not a grounding conductor bonding the surge protector to a bus bar or any other device.

- Equipment Installation - Fair

While the equipment initially was installed in accordance with generally accepted industry practices, over time, modifications have been made. Not all of the modifications have followed the best practices guidelines. Because the equipment room gets over heated during the summer months, the staff has had to open windows in order to create a thermal heat sink. This has allowed birds and rodents to enter the building.

Raymond Sullivan Public Safety Complex 1212 Carew Street

- Site Characteristics - Poor

The .69 acre site is owned by the City of Springfield. The Raymond Sullivan Public Safety Complex serves several purposes. It is a fire station. A portion of the facility is used as a community meeting room. That space also serves as the City's Emergency Operations Center when needed. It also serves as the office for the City's Director of Emergency Preparedness. The property is generally higher than the surrounding area and there appears to be good drainage away from the property. Again, there is not sufficient space available on the existing property for a new center compliant with set back recommendations.

- Location - Fair

The building is located in a commercial use area. Immediately adjacent to the property is a large school complex. Also adjacent to the property is an open space area, part of the City's watershed. It is across the street from a residential neighborhood. It is approximately one half mile from the nearest rail line and from Interstate 291.

- Suitability of Existing Building - Fair

While the building is of recent construction, there is not sufficient room in the existing building to house the consolidated dispatch center. In addition, the structure would need additional hardening in order to meet the recommendations for a public safety communications facility.

At a minimum, the building would need to meet the building code requirements for "Essential Facilities" which requires the building resist higher loads from wind, snow, and earthquakes as well as the ADA requirements. The International Building Code defines essential facilities as ***Buildings and other structures that are intended to remain operational in the event of extreme environmental loading from flood, wind, snow or earthquakes."*** Snow loads are 20 percent greater, seismic loads are 50 percent greater, and wind loads are 15 percent greater or winds of about 104 miles per hour.

It may be feasible to expand the existing building to accommodate a consolidated center. This would necessitate the elimination of some of the parking that is used for various meetings.

- Availability of Adequate Electrical Power and Utilities - Good

While some upgrading of the electrical service to the property might be required, it appears that the electrical power and other utilities are adequate.

- Availability of Adequate Telecommunications Facilities - Fair

Because the facility is currently used as the EOC, some communications capability already exists. Additional capability would be required. It appears that it would be feasible to add the needed additional capabilities.

- Suitability of Existing HVAC/Mechanical Equipment – N/A

Since an addition would be needed to accommodate the consolidated facility, any evaluation of the existing HVAC system is irrelevant.

- Grounding – N/A

Since an addition would be needed to accommodate the consolidated facility, no specialized grounding has been installed.

- Equipment Installation – N/A

Since an addition would be needed to accommodate the consolidated facility, all equipment would be installed in the new addition.

Other locations mentioned include an addition to Police Headquarters, an Army Reserve complex, and a potential data center. We received insufficient information to evaluate these alternatives. Site selection for an emergency communications center is a challenging undertaking, not just in Springfield, but in many other locations as well. As our review and analysis shows, neither of the proposed sites is ideal. Both of the proposed sites has both advantages and disadvantages. It now becomes the community's challenge to select the site that best meets its needs.

Organization/Agency:	Western Massachusetts Emergency Medical Services Council
File Name:	WMEMS - Moriarty -Interview Record 041408 FINAL.doc
Date of Interview:	April 14, 2008
Location of Interview:	Telephone
Persons Interviewed:	Linda Moriarty
CTA Interviewers:	Nate McClure, CTA Public Safety Consultant

The following points were conveyed to CTA during this interview:

Organization and Responsibilities

1. Massachusetts law assigns responsibility for oversight of emergency medical services in the Commonwealth to the Department of Public Health through its Office of Emergency Medical Services. It also requires the establishment of regional EMS councils. The EMS councils are non-profit corporations chartered and funded by the state. There are currently 5 EMS Regional Councils. Region 1, the Western Massachusetts Emergency Medical Services Council (WMEMS), includes the four western-most counties in the State.

2. Linda Moriarty is the Executive Director of the Western Massachusetts EMS Council. She has been the Executive Director since 1983. Prior to that, she managed an ambulance service in the area. She has been actively involved in EMS since 1974.

3. The Springfield Emergency Medical Services Commission is charged with EMS awarding and oversight. The Commission consists of a representative from the fire department, and representative of the police department, one medical doctor from each of the two hospitals with emergency departments, and an appointee of the mayor. Linda is the Mayor's Appointee to the EMS Commission.

4. American Medical Response (AMR) currently holds the Springfield EMS contract. The contract means that they receive all EMS calls that originate through the 9-1-1 system in the City. As part of that contract AMR is required to operate the CMED network for Western Massachusetts.

Present Situation

1. The contract with AMR was a five year contract and is in its second one-year extension. The contract costs the City nothing. The contract establishes performance standards. During peak periods, AMR must have nine Advanced Life Support Units on duty in the City during peak call periods, six during the second busiest period, and three during the slowest times of the day. They must respond to ninety-five percent of Priority 1 (highest priority) calls within ten minutes and ninety percent of the priority two calls within twenty minutes.

2. Two of the hospitals in Springfield have emergency departments. Baystate Medical is a Level 1 Trauma Center. It has a 700 bed capacity. An estimated 100,000 emergency room visits occur each year. Mercy medical Center is a 200 bed hospital. Its emergency room receives approximately 45,000 visits each year. Both hospitals are designated as stroke centers. It is anticipated that Baystate will soon be designated as a primary cardiac care hospital in the near future.

3. Complaints from citizens about EMS system issues are received by the Emergency Management Coordinator who investigates them.

4. Under the City contract, AMR is required to have a written back-up plan for those times when they are unable to meet the requirements. They use the other three ambulance services in Springfield as well as the surrounding fire departments. All of the surrounding cities have full time fire departments. Several of those departments provide ambulance service.

5. Ambulances are required to notify the hospital on every patient they are bringing to the hospital. All of this radio traffic is coordinated through CMED.

Present Problems

1. While there are relative few problems given the high volume of calls, there are some response time issues.

2. Both the City's and AMR's CAD mapping is not up to date. In addition there are problems with duplicate and similar sounding street names.

3. With the high volume of radio traffic, a single CMED operate can be easily overwhelmed. In addition, with CMED often being staffed by the least experienced dispatcher, some problems do occur. There is a fairly high turnover at AMR's dispatch.

4. There is some friction perceived between the public and private EMS CMED users. A CMED users group has been formed and has reduced the problems.

5. Wireless 9-1-1 calls are routed to the Massachusetts State Police in Northampton. If the incident is in Springfield, the call is transferred to the police department. State Emergency Telecommunications Board standards prohibit a second transfer. As a result AMR does not the caller information and does not talk directly to the caller. In addition, if the call does not get answered in Northampton, it rolls over to one of the other State Police Dispatch Centers. AMR is secondary PSAP. There are some delays in transferring wireline and not all information may get transferred.

Future Requirements

1. Work towards full consolidation of the three dispatch centers. A separate agency is the preferred model.

2. Expanded radio coverage to include entire four county region.

The draft of this record was sent to Linda Moriarty on April 18, 2008.

Interviewee Name & Address: Linda Moriarty
Western Massachusetts EMS Council
168 Industrial Drive
Northampton, MA 01060-2327

Organization/Agency:	Springfield Police Department Community Police Liaison
File Name:	Springfield Police Kathleen Brown Interview Record 04-04-08 FINAL.doc
Date of Interview:	April 4, 2008
Location of Interview:	Springfield Police Department, 130 Pearl St
Persons Interviewed:	Kathleen Brown, Community Police
CTA Interviewers:	Nate McClure, CTA Public Safety Consultant

The following points were conveyed to CTA during this interview:

Organization and Responsibilities

1. The Springfield Police Department has adopted a community-based, problem oriented policing strategy. Community-based means the department tries to focus on neighborhoods as the basic building-block of its organizational structure and its policing strategy.

2. Kathleen Brown is the Community Police-Citizen Liaison. In addition to fielding complaints from citizens, her duties include organizing the Citizen Police Academy and Beat Management Team Meetings.

Present Situation

1. 9-1-1 is promoted as the number to call for all public safety services – not just for emergencies.

2. The published non-emergency number goes to an answering machine so it is not used.

Present Problems

1. The dispatchers need refresher training on customer service. Dispatchers frequently argue with the callers. The dynamics in the dispatch center are poor.

2. Many times the officers' reports are incomplete. As a result, a significant amount of time is spent researching the details.

3. Kathleen has no access to the CAD system so she must go to the dispatch center to research.

Future Requirements

1. There needs to be a clearly articulated procedure for handling non-emergency calls.

2. The dispatchers need to have a way to recognize repeat callers for on-going situations. They also need better training in the organizational structure and what other resources are available. They also need to tell the callers, "This is what I'm going to do".

The draft of this record was sent to Kathleen N. Brown on April 18, 2008.

Interviewee Name & Address: Kathleen N. Brown
Community Police Liaison
Springfield Police Department
Springfield, MA 01105

Organization/Agency:	Springfield Police Department – Business & Technology
File Name:	Springfield PD McDonald Interview Record 04-04-08 FINAL.doc
Date of Interview:	April 4, 2008
Location of Interview:	Springfield Police Department, 130 Pearl Street
Persons Interviewed:	Jamia McDonald, Director of Business and Technology Brian Elliot, Office of Grants and Planning
CTA Interviewers:	Nate McClure, CTA Public Safety Consultant

The following points were conveyed to CTA during this interview:

Organization and Responsibilities

1. The Division of Business and Technology is the administrative division of the SPD. The division houses the totality of the Fiscal and Personnel services, Information Technology, Training Section, and the Research and Standards Section. Training and data, as well as improved automation of the core functions as appropriate are among the responsibilities of the Division. Included are the Records and Customer Service Unit, Grants and Planning, Communications Center, and the Crime Analysis Unit as well as Fleet Services

2. Jamia McDonald is the Director of Business and Technology.

3. Brian Elliot is a police officer assigned to the Office of Grants and Planning.

Present Situation

1. The Springfield Police Department uses a Computer Aided Dispatch system **(CAD)** from Logistical Systems (Logisys). The system was installed in 1998 and uses AIX programming language.

2. The department uses a Records Management System (RMS) from Information Management Corporation (IMC). The system was installed in 1996 and is a Windows ™ based system.

3. Springfield PD also participates in the WMLEC mobile data network. Patrol and other vehicles have been equipped with laptop computers. The laptop computers use Biokey (formerly Packet Cluster) software over the Verizon wireless data network. The vehicles are equipped with separate radios and modems on the Verizon network. Units are able to access CAD, RMS, LEAPS (the Massachusetts law enforcement information network), and NCIC (the National Crime Information Center).

4. Officers use their in-car laptop computers to file their reports. While they can view the CAD data, it does not transfer into the RMS. As a result the officers have to enter all of the data.

5. The Springfield Police Department will be receiving a significant grant from the U.S. Bureau of Justice Assistance. Included in that grant are funds, which the SPD have identified to replace the CAD system. The grant was approved at the end of March.

6. Permission has just been received to implement the lead dispatcher position. The positions were negotiated into the contract in 2007, but have only been filed on an interim, rotating basis.