



Multiple/Mass Casualty Capability in Plymouth County, Massachusetts

An Assessment of Current Capabilities

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Executive Summary

Following a low-scale, multiple casualty incident, within a Plymouth County community, members of the Plymouth County Fire Chiefs Association became concerned about the capability of local fire departments, the EMS system and the mutual aid system to provide adequate response and effective management of such events. In March of 2018, the Plymouth County Fire Chiefs Associations asked Blackthorne Services Group, LLC. to examine the capabilities of local systems and provide an assessment.

The following assessment was conducted over a six-month period and examined plans, training and equipment, as elements of capability. Within these broad headings, specific focus was made of published plans required by statute and regulation, medical communications regarding patient transportation, mutual aid and situational awareness.

This assessment makes twenty-eight, specific recommendations. These recommendations range from policy, to technical innovation, to training. Blackthorne Services Group, LLC., stands ready to assist the Plymouth County Fire Chiefs in pursuing those recommendations that it accepts as objectives for future capability development.

While this assessment, and its recommendations are focused on Plymouth County. The Blackthorne Services Group, LLC, believes that a larger, statewide, capability gap exists, which must be addressed as part of an overall matter of state preparedness.

Managing public safety in modern America has become a terrific challenge, complicated by complex and dynamic threats which emerge and evolve constantly. The conflict of increasing priorities and decreasing resources requires that public safety leaders make choices about what risks will be addressed and what risks will be ignored.

Almost regardless of the threat; terrorism, active shooter, school violence, or natural or man-made disaster, the management of multiple or mass casualties is a core capability. As such, an appropriate priority in the planning and capability development should exist at all levels. However, throughout this assessment of mass casualty capabilities in Plymouth County, Massachusetts, it was evident that many who hold, or claim authority for such planning had placed a low priority on it or ignored it altogether.

The Plymouth County Fire Chief's Association, wisely recognized the need to conduct an overall assessment and to use it to guide a program of improvement for mass casualty response in Plymouth County. The following assessment seeks to identify existing capabilities and needs, and to recommend a path forward. Much of what is examined, herein, will reach more broadly than the specific subject of casualty management, and into the mutual aid system in Plymouth County. As the terms "mass casualty" and "multiple casualty" are often interchanged, the abbreviation of MCI will be used for both, except where quoting another source.

Authorities and Responsibilities

“There is no power or authority without responsibility, and he who accepts the one cannot escape the other.” Haile Selassie

Identifying the agencies with authority and responsibility to conduct MCI planning and preparedness is an important first step in the assessment of capabilities. Progression of authority runs from state agency, authorized under statute, to the local authority of the political subdivisions. However, Massachusetts statute and regulations interject the non-governmental “regional councils” and delegates authority and responsibility for aspects of public health and safety to them, above the political subdivisions. As such, this assessment treats these entities as having both the authority and, more importantly the responsibility, granted to them by statute and regulation in MCI planning and preparedness.

Emergency Medical Services in Massachusetts is enabled through Part 1, Title XVI, Chapter 111c (Ch. 111c) of the Massachusetts General Laws (M.G.L.). Section 1 of this statute contains definitions and defines “the department,” as further referenced in this chapter as being the Massachusetts Department of Public Health. Overarching authority and responsibility is expressed, as follows:

“Section 3. (a) It shall be the duty of the department to plan, guide, assist, coordinate and regulate the development of a unified statewide EMS system and to coordinate the system with similar systems in neighboring states.

(b) The department shall be the state lead agency for EMS in this state. The department shall have authority to ...”

Section 2 of this statute, defines the EMS system “expose,” as follows:

“Section 2. The department, with the assistance of interested parties that are part of the state's EMS system, including, without limitation, the regional EMS councils, shall plan, guide and coordinate programs to ensure that the state's EMS system shall ...

(9) provide for a medical communications subsystem within the statewide EMS communications system, to provide without limitation:

- (i) EMS-vehicles-to-hospital communications linkage;
- (ii) on-line medical direction;
- (iii) mass casualty incident resource management; and
- (iv) inter-agency coordination;

(11) provide for planning and coordination and implementation of planning and coordination to ensure that the EMS system in each region will be capable of providing coordinated EMS in that region during mass casualty incidents, natural disasters, mass meetings and other large scale events and declared states of emergency. Each such plan shall address, at a minimum, uniform terminology; training requirements; interaction and integration with other relevant local, state and federal agencies and health care providers; and transportation to health care facilities that can provide definitive care;

(14) provide for: ...

- (i) periodic comprehensive review and evaluation of the EMS provided in each region, including, without limitation, annual reports by each regional EMS council which reports shall include the projected costs of

performing the services in each region pursuant to this chapter;”

Regulatory authority, granted in M.G.L. Ch.111c is contained in the Code of Massachusetts Regulations (CMR) 105, expressed 105 CMR. The, pertinent, regulatory reference to MCI is contained as follows:

“170.050: The State EMS Plan

(B) The components to be addressed in the state EMS plan include, but are not limited to, the following: ...

(10) Mass casualty incidents, natural disasters, large scale events and declared states of emergency;”

and

“170.355: Responsibility to Dispatch, Treat and Transport

(E) Each service whose regular operating area includes all or part of the service zone in which a mass casualty incident occurs must immediately dispatch available EMS resources upon request by the primary ambulance service.”

and

“170.520: The Regional Service Zone Plan

Each Regional EMS Council shall adopt a regional service zone plan, subject to the approval of the Department, which includes: ...

(B) Regional plans for the following: ...

(2) accessing specialty services, such as air ambulance services; and

(3) responding to special situations, such as mass casualty incidents.”

Allowable categories for use of funds, provided to regional councils by DPH, do not include mass casualty training or planning and only include support of CMED center as an optional use.

Thus, there is no indication that use of or compliance with the state plan is mandated, nor that any statute or regulation grants any enforcement authority to DPH or the regions for compliance or even inclusion. As such, mass casualty preparedness is little more than an objective in the state’s priorities for its EMS system capabilities.”

The department of public health, primarily, carried out its MCI planning duties through the management of a statewide committee. The product of this committee was published as “The Massachusetts Emergency Medical Services Mass Casualty Incident (MCI) Plan.” The last publishing date of this document is January 11, 2016.

Of note; the statewide mass casualty committee was originally a sub-committee of the Emergency Medical Care Advisory Board, has not been staffed, nor assembled for “several” years. This committee is not required under M.G.L. Ch. 111c, Section 13, which defined the Board and its requirements.

Upon promulgation of the new Massachusetts Fire Code, 527 CMR 1, the Massachusetts Fire Code, the “Duties of the Head of the Fire Department” no longer exists. The authorities, granted the “head of the fire department,” under that regulation now appear as authorized to the authority having jurisdiction (AHJ) in 527 CMR 1.7.16.1, as follows:

“1.7.16 Imminent Dangers and Evacuation.

1.7.16.1 Whenever the maintenance, operation, or use of any land, building, structure, material or other object, or any part thereof, including vehicles used in the transport of hazardous materials, constitutes an imminent danger or a fire or explosion hazard which is dangerous or unsafe, or a menace to the public safety (including, but not limited to, fires, explosions, hazardous material incidents, motor vehicle accidents, structural collapses, **mass casualty incidents** and emergency extrication incidents) and the action to be taken to eliminate such dangerous or unsafe condition which create, or tend to create, the same is not specifically provided for in this Code, and unless otherwise prohibited by law, ordinance, by-law, or regulation, the AHJ is hereby authorized and empowered to take such action as may be necessary to abate such dangerous or unsafe conditions (directing employees of other city or town departments and agencies), including the evacuation of buildings and/or the transport of hazardous materials, the speed, routes, amounts, and hours of transport through the city, town or district shall also be regulated.” (emphasis added)

Assessment – The, generally vague, nature of statutory and regulatory responsibility that exists, provides little leverage to cause resources at the state or regional level to be expended. While MCI planning is an obvious responsibility of all levels of government, laws and regulations fail to set a mandate, or benchmark, against which performance can be judged. MGL Ch. 111c, Section 2(11), provides specific requirements of planning to be conducted by the department of public health. It is not evident that these “minimum” requirements under the law have been met.

Recommendations - The power of this statute should be used to its maximum effectiveness to cause resources to be expended to meet the requirements.

"Plans are nothing; planning is everything." Dwight D. Eisenhower

The Merriam-Webster Dictionary defines a plan as:

- 1:** a drawing or diagram drawn on a [plane](#): such as
 - a :** a top or horizontal view of an object
 - b :** a large-scale map of a small area
- 2 a :** a method for achieving an end
 - b :** an often customary method of doing something : [procedure](#)
 - c :** a detailed formulation of a program of action
 - d :** [goal](#), [aim](#)
- 3:** an orderly arrangement of parts of an overall design or objective
- 4:** a detailed program (as for payment or the provision of some service) pension *plan*

Much is made about MCI Plans, but it is difficult to define one. Ultimately, it seems that a MCI plan should not seek to be one document, but a series of planning efforts resulting in coordinated and complimentary doctrine; response plans, mutual aid plans, point-of-entry plans, standard operating procedures, policies and standards (including training). Definition #3 of the above.

A review of "plans" proceeding from state to local, where they existed at all, revealed that each often deferred to the other. No plan was so comprehensive as to serve as a guide to an incident commander amid an incident.

State

Massachusetts Department of Public Health - The Massachusetts Emergency Medical Services (EMS) Mass Casualty Incident Plan.

The current version of this plan is 50 pages in length. Information regarding MCIs begins on page 5, with “General Provisions of State MCI Plan,” and concludes on page 11 with “Demobilization.” The remainder of the pages contain definitions and forms that are suggested, but not required. Within the six pages of actual information, there is little that can be considered a planning document, being more of instructional in points, directive in others, and making suggestions in still others.

Of the matters of concern regarding Plymouth County capabilities, the most important passage of this plan is Section 10, “C-MED Functions.” This section reads as follows;

10. CMED FUNCTIONS

- Assist in coordinating deployment of mutual aid ambulances and EMS assets to the scene upon exhaustion of local jurisdictions primary and mutual aid EMS assets.
- Contact hospitals to determine bed status
- **Assign patients to be transported to the medical facilities which can provide the appropriate levels of emergency care.** (emphasis added)¹
- Notify appropriate Regional Directors to respond to any declared MCI or potential MCI incident.
- Notify local fire district control center of MCI
- Place MCI Trailers on standby
- Place regional communication mobile assets on standby, where available
- Activate RMCC where available
- Notify OEMS / DPH or after hours duty officer using the 800 number if not already done

¹ Note: This subject will be specifically discussed later in this assessment.

- Notify MEMA Operations of an incident if not already done

As the primary tool to fulfill its responsibilities, as required under MGL Ch. 111c, Section 2 (11), the department of public health has published its Massachusetts Emergency Medical Services (EMS) Mass Casualty Incident Plan. The following table illustrates a crosswalk between the elements required under law and those met by this effort.

Required in MGL Ch. 111c, Section 2 (11)	Addressed in The Massachusetts Emergency Medical Services (EMS) Mass Casualty Incident Plan	Comment
uniform terminology	Appendix A - Definitions	This appendix does not satisfy the requirement of the statute. Uniform terminology in emergency operations refers to key terms that define actions, conditions, etc. The definitions provided in the state plan fall well short of what could be considered for this intent.
training requirements	No reference or requirements	This is a failure throughout the system

interaction and integration with other relevant local, state and federal agencies and health care providers	Marginal, at best.	The plan may be said to address some of this requirement as it sites service zone statute requiring dispatch and has sections on accessing task forces, air ambulances and MCI supply trailers. These passages fail to provide meaningful planning effort and are more of a directory
transportation to health care facilities that can provide definitive care	No	As previously highlighted, a single bullet point in a list of C-MED functions.

The “plan” also dictates levels of MCI incident escalation in Section 5, “Levels and Categories.” However, nowhere in this plan, or any other plan do these levels set forth specific, automatic, and corresponding actions. Nor can anyone cite the basis of the numbers used, or how other factors, such as; injury severity, complexity of rescue or other complicating factors are considered in these levels. This method of delineating incident severity will be further discussed in the “Mutual Aid” sections of this assessment.

Regional Plans

Despite being required the EMS regions as part of the “Regional Service Zone Plan” requirement of 105 CMR 170.520 (B)(3), there is no MCI Plan for EMS Region 5, wherein most of Plymouth County is located. There is also no MCI Plan for EMS Region 4, where some of the northern most Plymouth County communities fall into. There are also no specific MCI planning activities or plan development bodies engaged in either EMS region.

Region 4 has a “Disaster/MCI CMED Communications Policy and Protocols” that is of value to this effort and MCI capabilities. This document, in its entirety, is contained as Appendix A of this assessment. It should be adopted as an interim solution in Plymouth County, as a minimum.

County Plans

Within the communications center at the Plymouth County Sheriff’s Department, there is a three-ring binder, which serves as the reference for communications operations for Plymouth County Control and Plymouth County C-MED, for MCIs. A review of these pages revealed some effort to develop standard operating guidelines for the two entities.

However, there were pages inserted that appeared to be from other documents, and worse, handwritten changes without date or attribution (See figure 1 & 2) As such, it is impossible to determine if the changes were

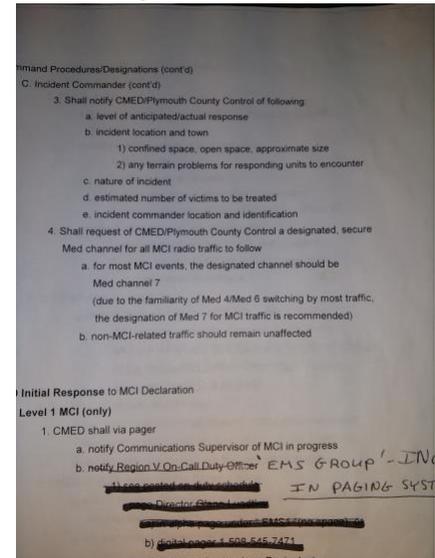


Figure 1 - Annotated Instructions

also reflected in the copies of this plan being used by others within the Plymouth County System. The most consistent date of original issue was 2005.

This represents a fundamental failure in plan maintenance. Documents that establish how operations will be conducted, particularly when they involve multiple agencies require a tight revision control. Absent such controls, plans rapidly lose all semblance of coordination and a dangerous condition is set up, wherein agencies are following different instruction and believing that they are following “the plan.”

It was also evident that there were vastly different interpretations of the duties and responsibilities within the plan. Fully opposing understandings of the role of C-MED in coordinating the dispersal, or “regulation,” of patients exists between the fire chiefs and the communications staff of the Plymouth County Sheriff’s department. This is a **critical fail-point** in the existing capabilities and **requires immediate correction**.

While the patient regulation responsibilities pose a critical risk, it is easy to understand how this confusion exists, based on the language used in the “plan.” Such confusion points clearly to the Eisenhower quote used in opening this section of the assessment.

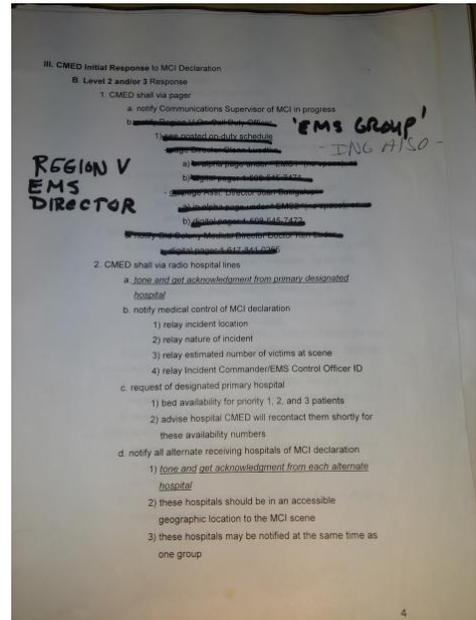


Figure 2 - Annotated Plans

During this review, it was revealed that a revised Plymouth County Fire Chiefs, Mass Casualty Plan was in existence. This plan was revised by Chief Nord and had not been officially accepted or distributed. The plan was forwarded to BSG for review.

The revised plan completed in March of 2016, it is 84 pages long. This plan hits upon many of the necessary elements of capability, sought by the Plymouth County Fire Chiefs. However, at 85 pages it has too much information to be operational. In this way, it exemplifies one of the great challenges that has impeded successful MCI planning; the belief that the, one plan, must be all things.

Typical of the many plans viewed in this process, the 2016 revision is part educational, part standard operating procedure, part planning. To be effective, these must be different, but well-coordinated documents. In deference to the effort already put forth, however, a substantial amount of content should come from this 2016 revision.

Assessment – In part, because of the belief that an MCI plan is one document that must incorporate, rule and set standards for all whom are involved in the various aspects, MCI planning has suffered, terribly. The various stake holders have sought to protect their organizations, positions and authorities, all of which are somehow threatened by the perception of putting everyone in the same box. As expressed to me by the Region V Executive Director, such concerns led to disbanding the regional MCI committee, which has allowed the continued absence of a plan in this region.

Recommendations – as follows:

1. Gain an understanding and acceptance of a plan as a series of coordinated efforts.
2. Establish, re-energize, or reorganize planning efforts like the following:

Plan Type	Lead Agency/Discipline	Involvement
MCI Point-of-Entry	Regional EMS Council(s)	Hospitals, EMS Care Committees
Mutual Aid	Fire Chiefs (existing committee)	Fire Departments, 3 rd service EMS, Private EMS, Regional Comms. centers, Plymouth County

"Situational awareness is knowing what's going on so you can figure out what to do. It involves perceiving, processing and predicting. Then doing something about it." - Rom Duckworth

Situational awareness, or a lack of it, is identified, herein, as among the key weaknesses of the Plymouth County MCI capability, and of its mutual aid system. As area fire departments have seen a decline in volunteers and transitioned from sizable organizations to smaller combination departments, with exclusively or nearly exclusively career fire fighting forces, dependency upon mutual aid has become routine. However, the management of mutual aid has failed to evolve into a coordinated and effective collaboration at the point, prior to immediate need.

Absent situational awareness, and the ability to adjust to it, the county and its fire departments are left at a substantial disadvantage when a major incident or multiple significant events occur. Valuable time is lost in attempting to identify and deploy resources that are optimal to the event, but when requested are otherwise committed, or their personnel is responding in cross coverage on other units. The unavailability of these units only becoming known after valuable time is spent polling those departments. Personnel and resources that may have, otherwise, been held in an available status or expedited to return to an available condition are tasked and their availability is, then, lost or limited. Resources and personnel that may have been placed on an active standby and a prepared condition were not. The objective of situational awareness is to make provisions to dynamically account for activity. In emergency medical services systems, this has been called "system status management."

Plymouth County does not presently conduct any system status management, despite a very high interdependence upon its member fire departments and non-fire based EMS providers. The first step toward achieving system status management is situational awareness.

At its minimum, situational awareness should provide all users with an active, current resource status and situation status for all communities in Plymouth County. While it is beneficial to have this information available centrally, at county control for example, it is ideal to have this information available locally and even remotely to incident commanders.

Barnstable C-MED, currently manages a modicum of situational awareness for fire departments in that county. This is a very “manual” system, requiring that ambulances report all responses to the county control over the C-MED network when responding. This information is used to conduct system status management, called “regional coverage” by Barnstable County Control, specifically the repositioning of fire department EMS assets to maintain a relatively even and constant response capability, throughout the county. The resulting system status management aids in MCI response by preventing, or minimizing large gaps of geography with no available EMS.

The method used by Barnstable county, works for Barnstable County, but is not an ideal system. The manual nature of this system requires extra steps to be taken by all responders and communications officers. These extra steps risk becoming a fail point when the system is stressed and effective resource management is most likely to be needed.

Implementing the measures, used in Barnstable county, in Plymouth County may be difficult. As resistance to change is normal, obtaining compliance with directives to report all responses over a C-MED channel would likely be a challenge. The added workload on communications personnel at C-MED may be perceived as not achieving a cost benefit ratio.

Finally, it will be a challenge on several levels to get communities to move their resources, including movement out-of-town, to support a system status management balance.

The practices of situational awareness and system status management evolved over time in Barnstable county, so acceptance could come in small measures. While all are necessary, to a degree, in Plymouth County, a phased implementation would be required. However, a phased implementation does not address the immediate need to improve capability.

Technology exists now that can fully automate the situational awareness requirement. As fire departments complete the transition to computer aided dispatch (CAD), opportunities come that did not exist when Barnstable County built their system. So-called, CAD-to-CAD and CAD-fusion technology exists that will allow all CAD system in the network to share data into a common operating picture system (see Appendix B & C). As such, no additional steps would be required of responders or communicators to maintain an instant, and ready assessment of situations and resources in the county, and beyond if so desired.

Armed with this situational awareness, incident commanders can make informed decisions to escalate or modify

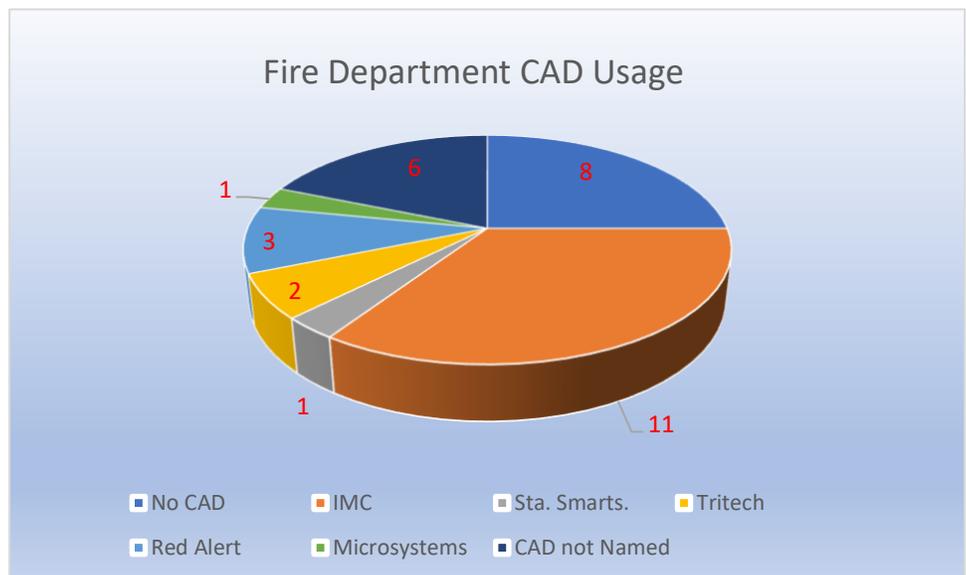


Figure 3 - CAD Use and Brand

responses. Communications centers will have immediate knowledge of the closest available resources to meet an emergency and simultaneously be aware of resource depletion across the entire county.

Assessment – A lack of situational awareness and global approach to resource management in Plymouth County is a critical fail point in emergency services to all communities. The impact of this lacking can effectively nullify the county mutual aid system and leave responders, on-scene, dangerously short-handed for prolonged periods.

Recommendations –

1. Evaluate “no-cost” measures for situational awareness in other counties, districts, regions, etc. for interim implementation
2. Seek grant funding to purchase, install, and train upon a robust CAD-to-CAD/CAD-fusion system.
3. Purchase the above system and transition from manual methods of situational awareness, to automated

Communications

“Communication is a skill that you can learn. It's like riding a bicycle or typing. If you're willing to work at it, you can rapidly improve the quality of every part of your life.” – Brian Tracy

Effective communications are critical to emergency operations. The more critical the operation, the more critical is communications. This assessment looked at two communications systems; Plymouth Central Medical Emergency Direction (C-MED) and Plymouth County Control. The assessment did not look at the technical infrastructure of these systems, it looked at the management, policies and inclusion of the communications centers into the overall operation.

There exists a, fundamental, underlying failure of communications in Plymouth County. That failure exists in the trust granted, or not granted to the county communications center within the Plymouth County Sheriff's Department. The May 2018 report of this project raised the alarm regarding the working relationship between the county fire chiefs and the communications division at the sheriff's department. This failure is not at a personal level, as relationships are presently cordial and professional. The relationship failure is the isolation or perceived isolation of communications professionals from the process of communication and managing the incident.

“Without trust we don't truly collaborate; we merely coordinate or, at best, cooperate. It is trust that transforms a group of people into a team.” – Stephen R. Covey, author of The 7 Habits of Highly Effective People

Plymouth County C-MED

Plymouth County C-MED operates as a function of the Plymouth County Sheriff's Department, Communications Division. It is staffed on a 24 - hour, seven day-a-week basis by professional communications operators. It is managed by a lieutenant. The center has modern communications equipment, with multiple redundancies.

The responsibility to provide for a medical communications system was delegated to the Massachusetts Department of Public Health in M.G.L. Chapter 111c, Section 2 (previously cited above). The department further delegate this responsibility to the regions in 105 CMR 170.106 (A) in providing for the financing of C-MED Centers as follows:

Distribution and Use of Department Funds by Regional EMS Councils

(A) Regional EMS Councils may distribute and use Department funds, consistent with their contracts with the Department, for purposes defined in 105 CMR 170.000, including:

1. (1) maintaining and operating the Regional EMS Councils;
2. **(2) maintaining and operating CMED centers;** or (emphasis added)
3. (3) carrying out their duties and functions under 105 CMR 170.104 and contracts with the Department.

However, the regulations states that the regions “may distribute” ... “for purposes” ... “including.” It does not mandate regional funding of C-MED centers.

When meeting with the Region V EMS Executive Director, BSG was informed that regional funds had been cut by 50% and that “C-MEDs are not state funded.” If statute and regulation are to be believed, the decision

not to fund is a regional one, not a state one. This being stated, of course the availability of adequate funds from DPH likely forced the decision not to fund the C-MED centers at the regional level.

In subsequent meetings with the Plymouth County Sheriffs Department, the funding mechanism to support C-MED in Plymouth county was explained, as follows:

- Hospitals are charged a fee per “patch,” of \$8.51.²
- Plymouth County C-MED initiates, approximately, 54,000 patches per year
- The fees total a revenue of \$459,540/year.

A recent addition to the market, TWIAGE (<http://www.twiagemed.com/ems/>), has begun to challenge this revenue stream as some hospitals opt to use it, requiring ambulance services to conduct notifications on this system, rather than by C-MED. This eliminates the C-MED charges and reduces revenue to support the continued operation of C-MED.

Accordingly, and while TWIAGE has not yet developed a MCI capability, its impact upon the revenue stream to support C-MED continues to threaten the MCI management provided by C-MEDs. While the staff of the Plymouth County Sheriff’s Department strongly voiced the commitment of the current sheriff to provide the current level of services, regardless of

² A patch is a hardwire connection to a radio link base station at the hospitals to the C-MED radio, allowing voice communication between ambulances and hospitals.

revenue stream, such is a political decision that may not be carried forward by future administrations.

The first threat, impacting MCI capability regarding C-MED, is that the Commonwealth of Massachusetts built an EMS system in statute and placed certain requirements to it. The Commonwealth, then, has failed to financially support the system that it mandated by law, by failing to provide for its sustainability. The department of public health delegated responsibility to maintain the system capabilities to regional councils through regulation, that it, the Commonwealth, finances. The Commonwealth then failed to provide sufficient and prioritized financing of these systems and has, thereby, left the infrastructure weakened. It is, by some accounts, to the point of a crumbling infrastructure where alternative financial support, by organizations who have no legal requirement to do so, have picked up the financial burden to manage this system.

M.G.L. Chapter 111c, Section 2 sets forth the requirement of EMS communications to support MCI operations. While the Plymouth County Sheriff's Department and the Plymouth County Fire Chiefs acknowledge that C-MED does participate, there is a substantial difference in the understanding of that role and function. The roles of C-MED are defined in the State MCI plan, as follows:

- “Assist in coordinating deployment of mutual aid ambulances and EMS assets to the scene upon exhaustion of local jurisdictions primary and mutual aid EMS assets.
- Contact hospitals to determine bed status
- Assign patients to be transported to the medical facilities which can provide the appropriate levels of emergency care.
- Notify appropriate Regional Directors to respond to any declared MCI or potential MCI incident.
- Notify local fire district control center of MCI
- Place MCI Trailers on standby

- Place regional communication mobile assets on standby, where available
- Activate RMCC where available
- Notify OEMS / DPH or after hours duty officer using the 800 number if not already done
- Notify MEMA Operations of an incident if not already done”

It is the roles, above, that the Fire Chiefs Association believe that C-MED is performing. The most critical of these functions: “Assign patients to be transported to the medical facilities which can provide the appropriate levels of emergency care,” cannot presently be conducted by Plymouth County C-MED as it has no understanding of the role, procedures to carry it out, nor training on the function.

The understanding of the Sheriff’s department is that they provide a much more passive function of simply providing channel assignment to the incident and obtain a “bed count.” As assessed, this attributable to three factors; oral tradition, poorly written standard operating procedures (County MCI Plan), and the failure to maintain plans and planning. No one has, yet, defined the true meaning or value of a bed count, as such references the number of admission beds, not the ability to manage or definitively treat the given injury type and severity of specific incident.

The ability of departments and EMS units of those departments to, realistically, carry out these functions from the field perspective is

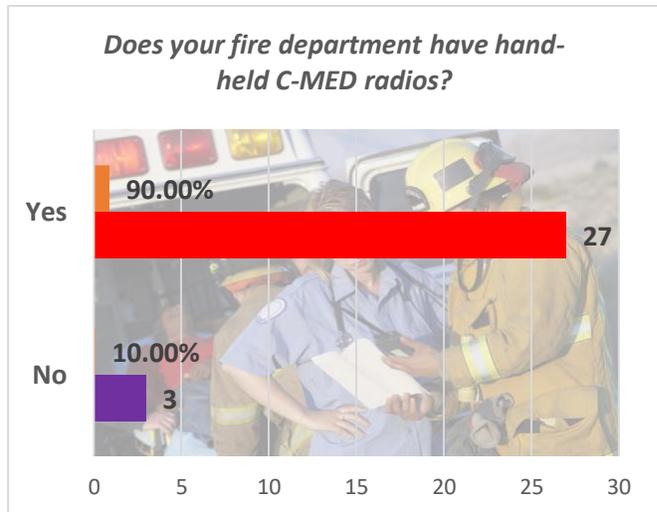


Figure 4 - Hand-Held Comms with C-MED

dependent upon hand-held communications with C-MED from the Transportation (also called loading) Officer of the incident. It is this position that reports the number, injury type, severity, tag number (if used) and ambulance identification to C-MED, and in turn receives the destination of that ambulance from C-MED.

This assessment sought to determine the ability of EMS personnel to assume the Transportation Officer role, and to communicate with C-MED, for the purposes of patient regulation. This function requires that the Transportation Officer have, hand-held, portable communications with C-MED. Most fire departments reported having this capability.

Plymouth County Control

The county fire, mutual aid communications system is operated by the Plymouth County Sheriff's Department, out of its communications center in Plymouth, Massachusetts. There are six (6) mutual aid radio frequencies in the system, three owned by the Sheriff's department and three owned by the county fire chiefs' association. The center, and its operating expenses are paid for by the Sheriffs' department. This network is operated to request and coordinate fire/EMS mutual aid between the fire departments within the county.

Technically, the county mutual aid radio system operates well. It is plagued by some of the same role and relationship issues that effect C-MED. Specifically, there is a several-year history of discussion to move county control from the Sheriffs' department to another location, such as one of the regional communications systems.

Such tension and uncertainty undermines the organization and the system. In interviews with BSG, representatives of the Sheriffs' department repeatedly answered questions regarding functions and activities that the department "just gives them what they ask for..."

An effective communications system does not simply pass messages or manage radio frequencies. A communications center can provide critical information to an incident commander and to responding units. It is essential that the communications operator be encouraged to share pertinent information, rather than feel constrained to "only speak when spoken to."

The uncertainty and "outsider" perception of the county mutual aid system is counterproductive and in need of improvement. While all parties expressed improved relations over those of a few years previous, it is evident that further progress is necessary.

The greatest challenge to the current system is the political nature of sustained funding. When the Commonwealth assumed the control and funding of the county sheriff's departments in Massachusetts, the services that these departments provide became part of a substantially larger state budget process. While the current Sheriff of Plymouth County has stated his commitment to the communications services that are provided by his department and are outside of his statutory mandate, there is no guarantee that a future sheriff, faced with budgetary pressures and a need to prioritize his/her budget to meeting the mandate duties, would not cut or eliminate funding for the county fire control network.

Several chiefs expressed varying degrees of concern for sustainment and growth of the system under county control. In total, the issues of trust, inclusion and stability combine to create a weakness, bordering on a threat. A concerted effort to resolve this condition is needed.

Regional Communications Centers

While BSG did not conduct a specific review of the three regional communications centers, providing services to Plymouth County fire departments, their role and impact upon the system and the two networks; C-MED and County Fire Control, bears mention.

A regional approach to communications is making it possible for smaller fire departments to improve their communications infrastructure and professional operation through shared resources and expenses. These regional communications centers can and have proven themselves to be highly effective.

However, to the degree that they may see themselves or may be seen as competing with the current county services, they exacerbate the weaknesses expressed regarding county services. Efforts to build a unified and mutually supportive relationship must be undertaken.

Fire chiefs and the Sheriffs department both reported instances where a failure to communicate has resulted in mutual aid assets, among the departments in a regional communications center, were dispatched and not communicated to county control. Subsequent, additional mutual aid, was then requested through county control without its knowledge of the movements that has already taken place.

The resulting confusion and delay caused frustration among all and posed the opportunity for danger. While no one has stated that a lack of communication in the above anecdote was intentional, it points to the emphasis on a “whole system” approach and for an automated system of situational awareness.

Assessment – The Communications Division of the Plymouth County Sheriff’s Department is a modern, well equipped and professional communications center. However, it operates as an “outsider” to the Plymouth County fire and EMS system. The tenuous nature of the relationship that results is, at best, a weakness to the system and may qualify as a threat.

Recommendations:

1. The stakeholders of C-MED services must determine the long-term future and operator of C-MED in Plymouth County, and commit to its success.
2. The stakeholders of C-MED services in Plymouth County must determine the mission, methods and objectives of those services and work collaboratively to develop clear plans, training and equipment to allow C-MED to meet those expectations. This must include competency based training in those functions necessary to support MCI operations.
3. The Plymouth County Fire Chiefs must determine the long-term future and operator of Plymouth County Fire Control, and commit to its success.
4. The Plymouth County Fire Control, communications center must be developed into a full and equal partner in the mutual aid system, that is both comfortable in their authority to do their job and accountable for it.
5. The Plymouth County Fire Chiefs should convene a communications working group with participation, at a minimum from the Chiefs Association, the County Control and the regional communications centers, for the purposes of coordination plans and policies, for

resolving issues and for working toward continued quality improvement.

6. The Plymouth County Fire Chiefs and FCAM should take the lead in securing a sustainable and assured financial support for critical communications systems, specifically fire mutual aid systems and C-MED centers, throughout the state by legislatively creating a state budgeted line item, perhaps through the Statewide Emergency Telecommunications Board.

“We have had in our nation a well-celebrated Declaration of Independence. But our success as a country will depend upon a new 'Declaration of Inter-dependence.' A belief in how much we need each other, how much we share one common destiny.”

Cory Booker

As local fire departments, and the nature of their work have evolved, mutual aid has become a common and important part of managing everyday emergencies. Fire departments have become so interdependent as to be, almost, regionalized. Mutual aid needs to evolve to reflect its true role as an integral part of the system.

One of the primary concerns expressed by the Plymouth County Fire Chiefs in pursuing this project, arose out of the impact upon mutual aid, and MCI response, when an MCI also had a fire component. Difficulties resulted from the fact that the mutual aid plans for each situation, separately drew resources from the same departments and as such, could not be supported.

To better understand this issue, it is helpful to look at staffing patterns, resource levels and staffing augmentation. BSG asked the fire departments within Plymouth County to provide information on these topics, through an on-line survey

Staffing type indicates how staff is drawn or augmented. Full career departments have a fixed staffing³ pattern that correlates to immediately available apparatus. Combination departments staff some apparatus and then augment with recall and call member activation. Call departments have no assurance of apparatus availability and rely upon a larger total workforce to seek an adequate availability.

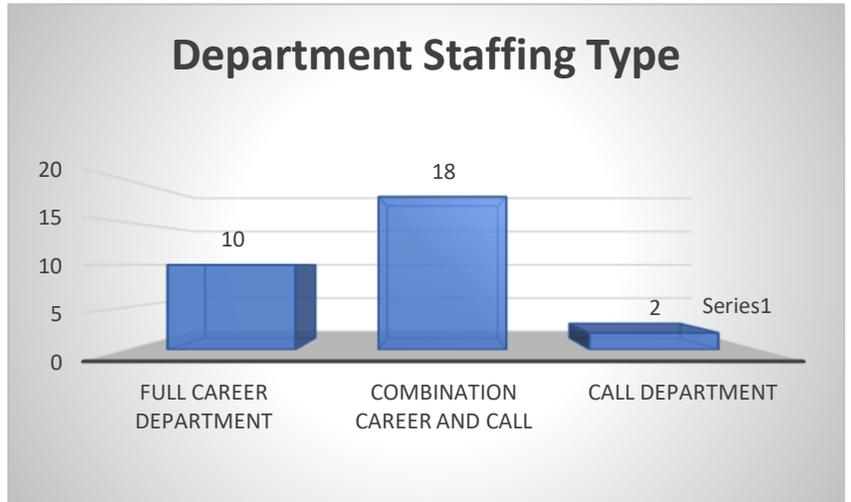


Figure 5 - Breakdown of staffing type

Most fire departments in Plymouth County, 60%, are combination departments. One third of the departments are full career only, and just over 6% are call departments. For most of the county, a relatively reliable pattern of availability can be then illustrated.

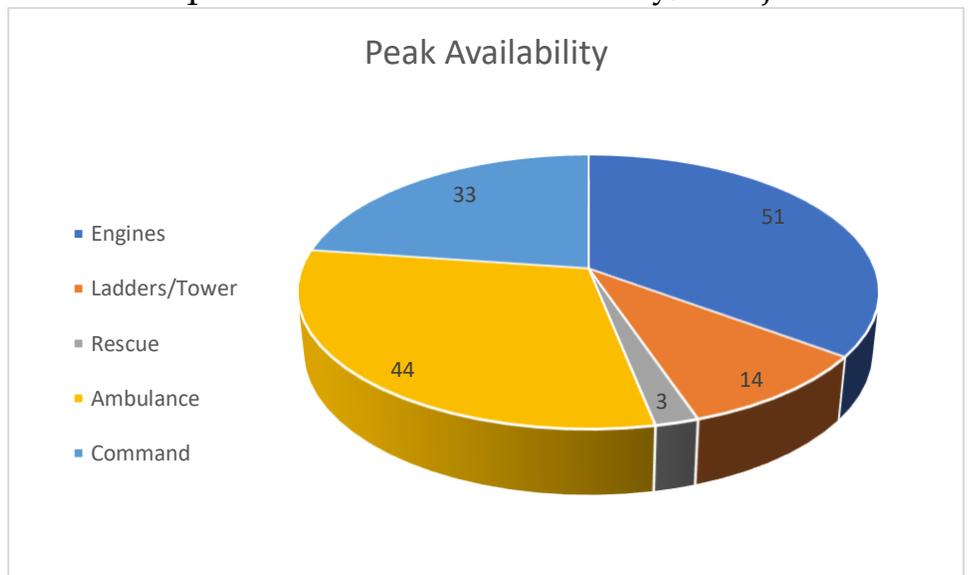


Figure 6 - Peak Apparatus availability

BSG also asked fire departments to list

available apparatus. Generally, available is assumed to mean that the apparatus is staffed and immediately able to respond. However, BSG found that the “Peak Availability” (Fig. 5) is misleading.

Many Plymouth County communities employ a staffing management plan utilizing “cross-staffing.” Cross-staffing implies that a scheduled number of personnel are on duty and will selectively staff apparatus types based upon the first call.⁴ This type of staffing produces conditions of availability, referred to herein as “provisional” availability or “assured” availability, without the specific and requested resource being otherwise committed.

The impacts of provisional staffing upon mutual aid are three-fold:

1. Requested capability may have been rendered unavailable, based upon resources for that capability already being committed in mutual aid to an incident in another resource.
1. Requested capability may be unavailable because all or part of

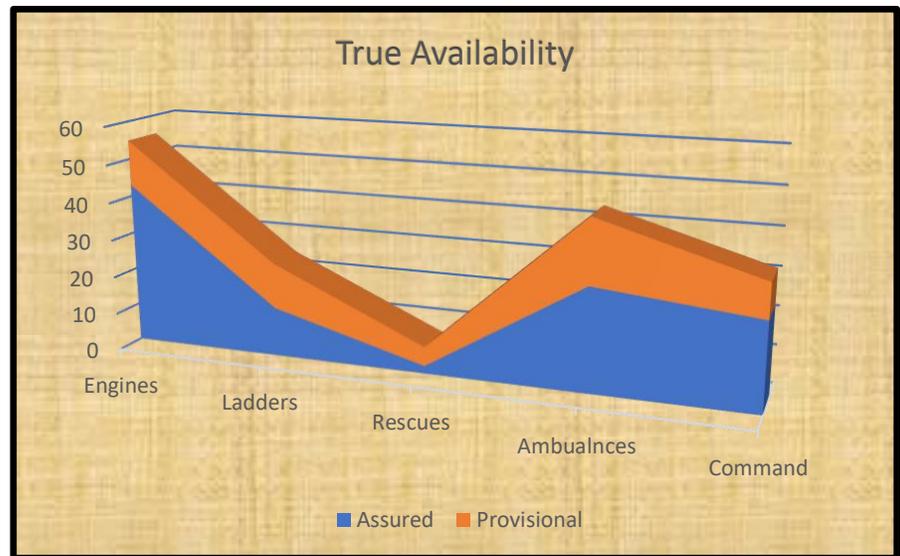


Figure 7 - True vs reported apparatus availability

⁴ First call is used to refer to an emergency response which is initiated when all on duty personnel are in the station and available. In contrast, a subsequent call would occur when part or all of the on-duty staff are committed in specific vehicle types.

the staff for that resource are otherwise active in another type of vehicle.

2. Requested capability may be rendered inoperable because available staff do not have the proper qualifications for the requested resource.

The impacts of provisional availability reduce the reliable level of resources. Thus, mutual aid plans must consider this variability. While provisionally staffed resources should not be completely discounted, or eliminated from mutual aid plans, the relative resource levels (Fig. 6) must be considered.

These impacts can be mitigated in several ways, including:

- Identify provisional availability when selecting apparatus for mutual aid running cards and reduce dependence upon them, or
- Build an algorithm into the CAD Fusion system, previously recommended, that updates the impacts of provisional staffing, in real time, such that when staff are assigned to a specific apparatus type and it impacts the ability to staff another apparatus type, the effected apparatus is not listed as an available resource.

Planners should also take note of the consistently higher numbers of assured availability apparatus types, specifically engines and command. These resources should be included, in larger numbers as part of any EMS mutual aid plan. The BSG survey revealed the assured availability of 43 engines and 23 command vehicles. Of that number, 17 engines and 2 command vehicles are licensed as class V ambulances. These resources should be considered to strengthen EMS mutual aid.

A BSG review of fire mutual aid plans also revealed a generally insufficient inclusion of EMS in the advancing alarm levels of mutual aid request. Mutual Aid plans should increase EMS in fire responses for several reasons:

1. Because fires are a frequent cause of multiple casualty incidents.
2. Because utilization of provisionally staffed fire apparatus has a corresponding impact upon the availability of EMS in the county.
3. Because EMS resources should be employed to implement and manage firefighter rehabilitation.

In, again, considering the impacts of provisional staffing upon resource availability, a greater pool of EMS resources must be identified to achieve this objective. Non-fire based EMS resources should be considered as additional resources to meet an adequate presence where fire based EMS resources may be stretched. There are four sources of EMS that can be accessed to increase the EMS availability:

- Third Service EMS (i.e. Wareham and Carver EMS)
- Healthcare institution provided (South Shore Hospital and Med-Flight)
- Private Ambulance Services
- Expanded out-of-county inclusion in mutual aid.

Each of these potential sources for additional assistance carries its own set of complications, though none are believed to be insurmountable.

Third service EMS operates like private services in that their ability to operate is largely or completely funded by revenues from transports. Accordingly, responses to fires may not generate transports, creating a situation of no cost recovery for response staffing.

One of the concerns for this class of EMS, and others, will be the preferential use for transport. With multiple ambulances on-scene, someone will need to select which ambulance will be utilized, in some sort of priority, for transport of patients. As it is the transport of patients that generates revenue, non-fire based EMS services will have concerns that they will be preferentially not selected for transport until or unless all fire

based transporting units have been utilized. The fire service also depends upon transport revenues to support their EMS programs, so answers to this dilemma should be considered, prior to entering into discussions.

The degree to which these services can and are willing to absorb the risks/costs, are subject for discussion between the fire chiefs and these services. Out of a concern for setting premature expectations or conditions, BSG did not contact these services to discuss such willingness or ability.

Healthcare institution provided EMS is also a private, for profit venture, and so to some degree, the same issues and concerns exist in their utilization, with some major differences. Healthcare provided EMS has a strong financial infrastructure that it serves and so, can more easily absorb unprofitable activities. Activities which tend to display community support are good for these large institutions, who occasionally face pushback on expansion, etc. Accordingly, the fire chiefs may find a willing partner, that can provide some level of services as part of an MCI or fire mutual aid plan.

Conversely, healthcare based EMS was created to move the cost/benefit of private ambulance service in their institutions in house. These services tend to run a lower resource reserve and may have a limited ability to commit to a plan. They may be more amenable to a ready reserve role, rather than be written into a running card. More on this later.

Private EMS has long been viewed with a jaundiced eye by the fire service. On the one hand, there is a belief of vast reserves of available resources, while on the other hand a fear of privatization by “letting the fox into the henhouse” has been long held.

BSG was unable to identify a single episode of the privatization of a fire department run EMS in the past 30 years in Massachusetts. In fact, since the advent of fire-base ALS and the implementation of service zone

planning under the M.G.L Chapter 111c, the trend has been for towns to abandon private EMS contracts in favor of a municipal services. Marshfield Fire Department EMS is a successful example of this trend.

The, actually available, reserve, of private EMS may be overestimated. Private ambulances do not make money sitting still, and services generally seek to operate a sufficient, but cost effective level of reserve. These services are willing to tap into their reserves, and even re-arrange non-critical transports where possible, but are not the panacea of available ambulances that they are thought to be. They, too, share concerns about actual use for transport if fire department ambulances are also available, on-scene.

The question arises as to methods of efficiently making use of these resources. BSG suggests looking at the Boston Ambulance Mutual Aid (BAMA) network as a possible solution.

Plymouth County has 6 county fire radio channels can designate one of the six as a resource hailing and coordination channel. The present channels are VHF. To make a more effective system, a UHF channel should be purchased, licensed and patched, allowing a more widespread access by various agencies. Additionally, this network should be Radio-over-Internet-Protocol (ROIP) enabled, allowing dispatch centers of various response partners to incorporate the system, without a costly infrastructure addition.

The question may be fairly asked; "Does this become an everybody comes" solution? Unless it is properly managed, it does run that risk, and the associated risk of scene convergence. The mitigation of that risk lies in the designation of a staging location and staging officer as an integral part of the plan. Units hailed by this system should be required, unless specifically directed otherwise, to only respond to the designated staging location.

Once in staging, units can be directed to the primary incident, or to cover geography as part of a system status management program to protect the affected areas of the county. Employment of this process will also help in mitigating the effects of provisional staffing on local capabilities, pending recall and backfill.

The fourth source of resources to improve EMS response to fires, lies in the expansion of fire based resources included in multiple alarm running cards. This is likely the easiest and most reliable method, but carries with it a compounding of the effects of provisional staffing to a wider and wider area. Using this approach also may involve longer response time, as apparatus come from some distance and often, out-of-county.

The solution, as is generally the case, will likely come from some blend of the above resource locations and types. This blend will also vary from community-to-community across the county.

Ambulance Strike Teams

As an intermediary measure, to fill requirements between routine mutual aid and the task forces of the Statewide Fire Mobilization Plan, the fire chiefs created ambulance strike teams. These strike teams provide a simple means of requesting a block of resources for a MCI. Each is comprised of 6 ambulances and a leader, generally a chief of department from a neighboring community.

One common flaw with MCI management is failing to account for on-scene workloads for functions of triage, treatment and loading. While the tendency is to think of these positions in terms of a single function leader or officer, they generally require a sizeable workforce. Absent other resources, these on-scene will be assumed by EMS personnel who are

staffing ambulances, resulting in a number of ambulances, possibly quite large, being parked at the scene and not able to transport patients.

Adding one, or more engine companies to each strike team would provide a personnel pool, able to assume on-scene roles, and/or aid in transporting patients by driving the ambulances. These engines may be, but do not have to be selected out of companies where the department has an EMT requirement for all personnel, may be registered as class 5 ambulances and may even be ALS engines.

Statewide Fire and Ambulance Mobilization Plan

Following the February 20, 2003, Station Night Club Fire in Rhode Island, the Massachusetts Department of Public Health began, in earnest to develop a mutual aid system for EMS in Massachusetts. After substantial wrangling and posturing by non-fire EMS organizations, it was determined that the Statewide Fire Mobilization Plan was the most effective and sustainable method of managing large scale mutual aid for EMS.

This system, on paper, provides access to substantial resources in a coordinated and managed way. However, experience shows that task forces under the Statewide Fire Mobilization Plan (SFMP) are not a rapid response asset. Task forces and the operating methods were derived from forest fire experience and are heavy on Incident Command System (ICS) doctrine. Specifically, these SFMP task forces are assembled in district and travel as a caravan and are very tight on span-of-control. To adhere to this doctrine, a significant delay takes place before the task forces are en route to the emergency. These delays are counterproductive in a MCI.

Furthermore, SFMP task forces are requested by the IC when it is realized that resources at the local and district levels are insufficient, thus putting the request well behind the power curve of impacting the response. To be effective, task forces must become part of an overall prospective management system. They should be activated based upon an overall picture of availability and requirement within the district, including the needs of the MCI.

Assessment: Fire department mutual aid in Massachusetts is far more robust than in many other states, but its approaches to resource management are antiquated and ineffective. The methods employed, including the running cards become a game of roulette when an emergency arises and precious minutes are lost in finding available resources. These factors are magnified for EMS needs and by the necessary practice of cross-coverage, employed in many departments.

The infrastructure, relationship and interoperability are well established in Plymouth County, and in fact, throughout Massachusetts. What is necessary is a more effective means of resource management, coupled with situational awareness and delegated system status management authority.

Recommendations:

1. Prioritize the development of improved situational awareness across all fire departments and control centers in Plymouth County of controlling fire department assets of communities in Plymouth County (see recommendations in "Situational Awareness")
2. Reconsider mutual aid running cards to address "provisional availability" as described herein.
3. Restructure county EMS strike teams to include non-transporting assets, such as ALS Engines, or other non-provisionally staffed apparatus
4. Develop a communications network to hail EMS assistance, like the BAMA network.
5. Expand the use of non-fire EMS assets and out-of-county EMS assets earlier and in higher numbers for multiple alarm fires and MCIs
6. Authorize Plymouth County Control to make mutual aid requests, including Statewide Fire Mobilization requests to maintain unit availability, countywide and for an ongoing

“We find that the Romans owed the conquest of the world to no other cause than continual military training, exact observance of discipline in their camps, and unwearied cultivation of the other arts of war.” Publius Vegetius Renatus, Roman Writer

When all the best equipment is bought, the best plans written and the best people hired, it is training that will keep them safe. In the vast breadth of topics that firefighters must be trained and proficient in, MCI management is often low on the priority list because, though it is high consequence, it is low frequency. It is also true, that many of the past incidents show that, though correct methods are not employed, the incident is ultimately, resolved.

Some after action reports (e.g. 1989 Sioux City plane crash) have suggested eliminating practices such as triage tagging as “they” were successful without it. Actually, “they” simply forgot to employ triage tagging because “they” hadn’t sufficiently trained in it. But one must ask, how much more efficient operations could be and how many more lives could be saved if responders are confident and competent at managing these incidents.

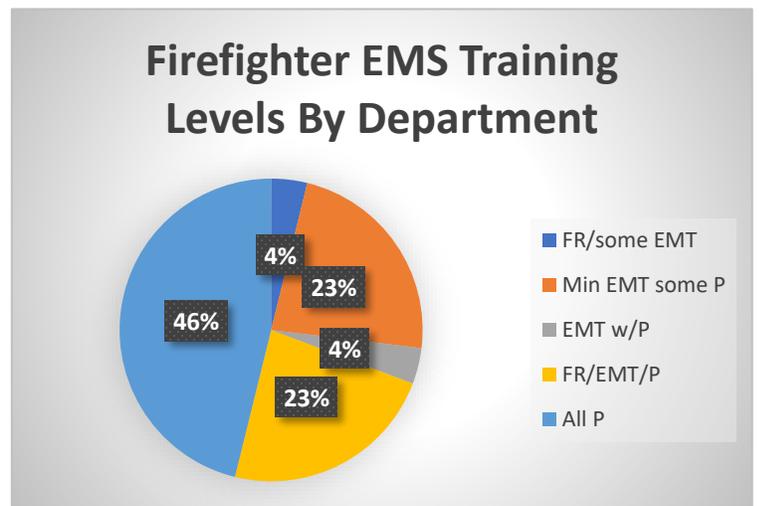


Figure 8 - EMS training of firefighters

In Plymouth County, most firefighters are certified to the minimum of Emergency Medical Technician, many are paramedics, all are at least first

responder trained. This means that all firefighters should have had some exposure to the concepts employed in MCI management. However, interviews revealed a somewhat astonishing lack of this training in EMS programs, at the primary training level and at the annual or continuing education level.

A paradox seemed to exist that EMS trainers feel that MCI management training is Incident Management Training, and therefore not EMS continuing education, and incident management trainers feel that MCI is EMS training and does not belong, for example, in Fire Academy programs. The net result is that no one is training our firefighter and EMS providers in MCI management. In the BSG survey, 40 % of departments reported conducting training and/or drills on MCI in the past twelve months.

In an interview with the EMS Region V Executive Director, he reported only three applications for MCI training, continuing education credit in 2017; Whitman in May, Marshfield in August, and Kingston in December. None of the fire departments interviewed reported participating in full scale exercises with hospitals, a practice that used to be routine.

The condition of MCI training is made worse by the absence of standards for training and a standard curriculum. In such absence, responders working together are highly likely to have differences in their training, what little of it that they may have had, leading to greater confusion.

Fortunately, it appears that a solution is within easy reach for Plymouth County. Through the Plymouth County Training Committee, a standardized MCI training can be delivered to the fire department and non-fire based EMS providers in Plymouth County. One would also hope

that the success of such a program would lead to its expansion, at least throughout the fire service in Massachusetts.

BSG recommends a multi-level program with a basic training delivered to all fire fighters and EMS providers. Such a program should provide a common baseline understanding and allow for common practices, terminology and methods.

Basic training should be conducted annually and should be supported by exercises. Exercises should follow a Homeland Security Exercise Evaluation Program (HSEEP) format, progressing from tabletop, through functional to full-scale. While not all individuals need all levels of exercise, annually, all individuals should be put into a position to exercise the thought processes on an annual basis, at a minimum.

Advanced training should also be developed with a designation upon completion, like “red carding” that qualifies the individual for leadership positions, such as Triage Officer, Treatment Officer, and Transportation Officer. Advanced, position trained, individuals can be preferentially assigned when and as available and on larger incidents.

MCI training should be further supported by improved Incident Management training within Plymouth County. Resulting from the 2017 Mob-Ex, conducted for technical rescue, the Plymouth County Fire Chiefs identified a critical need for training in the Planning and Logistics functions. BSG has provide a separate proposal to provide this training.

Assessment: MCI training is, effectively, non-existent in Massachusetts. Where it exists, it is a seemingly minor topic and is not the subject of standards for training and competence.

For Plymouth County, the infrastructure exists to correct this for the county. A larger problem, statewide, remains and should be of concerns as expanded mutual aid responders will continue to lack adequate training.

Recommendations:

1. Develop a standardized MCI training program with minimum competencies for all levels of EMS responder.
2. Hand-off the training program to the Plymouth County Training Committee and contract the committee to train all Plymouth County EMS responders
3. Develop, position specific training for identified lead positions, complete with demonstrated competencies and a credentialing process. This program should also be delivered by the County Training Committee.
4. Develop and conduct an exercise series system. Importantly, this needs to be a standing program that is sustainable as a permanent fixture.
5. Advocate for statewide adoption, such that mutual aid responders will be equally trained.

Conclusion

The fire departments of Plymouth County, Massachusetts, like most Massachusetts fire departments, have an active system of mutual aid that enhances their ability to meet the needs of the communities that they serve. However, these mutual aid systems have been in place, and effectively unchanged, for decades.

Advances in situational awareness and resource management exist that can greatly improve the ability of these fire departments to effectively utilize their combined capabilities to meet the collective needs of their communities. A comprehensive and forward looking effort is necessary to meet existing capabilities gaps and, thereby, maximize resource effectiveness.

Concurrently, the fire chiefs must demand performance by those entities who have sought and won statutory and regulatory authority, and thereby responsibility, for MCI planning and preparedness. The public should not, and likely will not, tolerate the failure of such a core capability after billions in homeland security preparedness investments have been granted in good faith.

While MCI events are high consequence and low frequency, preparing for them will improve overall system performance for the everyday workload of public safety. In asking the questions, the Plymouth County Fire Chiefs have taken a leadership position. At issue, now, is what you will do with it.



The purpose of this policy and protocols is to establish a uniform EMS regional communications method for all ambulance services utilizing the Metro-Boston CMED during a disaster/MCI. Currently, many services utilize different terminology and definitions during disaster/MCI incidents within their communities. These different definitions and terminology can be confusing and often lead to miscommunications. The standardization of terminology will provide greater efficiency of CMED for the purpose of coordinating patient transport activities.

Definitions:

Types of Patients:

Formal Term	Radio Term	Definition
IMMEDIATE	Red	Critical; life threatening; likely to survive if care is received within thirty minutes (30)
DELAYED	Yellow	Serious; may be life threatening; likely to survive if care is received in thirty minutes (30) to several hours
MINOR	Green	Not considered life threatening; care may be delayed hours or days; this group may be referred to as the walking wounded
DECEASED	Black	Mortally wounded or clinically dead are not transported from the scene. They are marked with a black tag by scene personnel

Medical Communications: Communications between the EMS Commander or Transport Officer and the coordinating CMED center from the scene of a disaster/MCI.

Care Capability: (Acuity is based on the triage color of patients.) The number of patients of varying degrees of acuity who can be cared for by each hospital.

Hospital Notification: Request from appropriate EMS Branch officer to CMED for hospital notification. It is the process of notifying all hospitals by CMED that will be impacted by the disaster/MCI as well as the transfer of details of the incident to the hospitals.

Incident Commander: The person who has overall responsibility for the management of incident activities. This is carried out through either single command or unified command.

EMS Branch Director: The first EMS responder at the scene who is responsible for the initial overall management of the EMS operation. Command can be transitioned when more experienced personnel arrive.

Patient Distribution: The process of matching patient needs with the appropriate receiving hospitals. The objective is to prevent the overloading of hospitals, and to ensure that patients are transported to the appropriate facilities.

1.0 Role of Provider

1.1. The first EMS responder(s) on scene is responsible for identifying themselves to CMED as well as identifying the incident.

1.2. First EMS responder on the scene of a declared disaster/MCI is responsible for establishing EMS Branch, in coordination with the Incident Commander.

1.2.1. Requests for additional resources will go through the Incident Command structure as has been established in the provider services local area.

1.3. The EMS responder who has assumed the initial EMS Branch Director position in a disaster/MCI will size-up the incident and determine the following:

- Using the mnemonic **METHANE** relay the following information;
 - **Major incident declared**

- Exact Location - The precise location of the incident, staging area, if applicable
- Type - The nature of the incident, including how many vehicles, buildings etc. are involved
- Hazards - Both present and potential
- Access - Best route for emergency services to access the site, or obstructions and bottlenecks to avoid
- Numbers - Numbers of casualties, dead and uninjured on scene
- Emergency Services - Which services are already on scene, and which others are required (MCI Trailer, Regional Staff, Task Force...)
- Request that the surrounding hospitals be advised of incident
- Request CMED to acquire the ED Care Capabilities

1.4. Once the scene has been sized up, it is the responsibility of EMS Branch Director or designee to, contact Metro-Boston CMED on MED 4 upon determining an MCI – (the EMS Region in which the event occurs manages the event)

1.4.1. EMS Branch Director, or designee, will inform Metro-Boston that there is a declared MCI

1.4.2. All details regarding the incident will be relayed to Metro-Boston CMED

1.4.3. EMS Branch Director, or designee, will request a CMED Channel assignment for the duration of the incident

1.4.4. EMS Branch Director, or designee, will request the care capabilities of the possible impacted facilities

1.4.5. EMS Branch Director, or designee, will request cached equipment or ambulance strike teams through Metro-Boston CMED

1.5. Patient Loading

1.5.1. Once patients have been deemed ready to transport, EMS Branch Director or Transport Officer, shall contact CMED

1.5.1.1. This individual shall contact CMED for every ambulance that is transporting a patient from the incident

1.5.2. The individual contacting CMED will relay the following:

1.5.2.1.1. Priority

1.5.2.1.2. Patient Triage Tag Number

- 1.5.2.1.3. Chief Complaint
- 1.5.2.1.4. Adult or Pediatric
- 1.5.2.1.5. Ambulance number
- 1.5.2.1.6. This will be done for every patient being transported

1.6. Patient Transport

- 1.6.1. CMED will determine (as per 2.1.8) the destination of patients being transported from an incident
- 1.6.2. CMED will inform the incident command structure the destination of patients just prior to transport

1.7. Recovery

- 1.7.1. EMS Command structure (i.e. EMS Branch Director or designee) informs CMED when all patients have been transported from the scene
- 1.7.2. EMS Command structure (i.e. EMS Branch Director or designee) will inform CMED when medical operations have terminated

1.8. Other Responsibilities

- 1.8.1. Request updates on local care capabilities
- 1.8.2. Provide situation updates to CMED as needed

2.0 Role of CMED

2.1 When CMED receives a report of a disaster/MCI it will:

- Notify the area hospitals of the extent, nature, severity and spread of the incident, special hazards (radiological, chemical) the information will be based on the mnemonic **METHANE**
 - **Major incident declared**
 - **Exact Location** - The precise location of the incident, staging area, if applicable
 - **Type** - The nature of the incident, including how many vehicles, buildings etc. are involved
 - **Hazards** - Both present and potential

- Access - Best route for emergency services to access the site, or obstructions and bottlenecks to avoid
 - Numbers - Numbers of casualties, dead and uninjured on scene
 - Emergency Services - Which services are already on scene, and which others are required (MCI Trailer, Regional Staff, Task Force...)
 - Request that the surrounding hospitals be advised of incident
- 2.1.1 Notify additional ambulance services or support resources if requested by EMS Branch Director and or Incident Command
 - 2.1.2 Notify CMED supervisory staff and Regional Council Staff
 - 2.1.3 Determine ED care capabilities of area hospitals
 - 2.1.4 Assign ED point-of-entry for all ambulance transported
 - 2.1.5 CMED broadcasts an announcement stating “This is a multiple casualty incident...” where appropriate to notify other providers of the increased radio traffic in accordance with Metro Boston CMED policies
 - 2.1.6 Contact other CMEDs and request assistance as needed
 - 2.1.7 Determine from EMS Branch structure (i.e. EMS Branch Director or designee), the disaster tag number, priority and chief complaint only for each patient being loaded for transport
 - 2.1.8 Assign destinations for transporting ambulances to EMS Structure prior to transport
 - 2.1.9 Notify receiving hospitals of number of patients enroute, priority, and chief complaints
 - 2.1.10 Provide additional EMS resources if requested by hospitals to transfer patients
 - 2.1.11 Receive periodic updates from EMS Branch structure (i.e. EMS Branch Director or designee)
 - 2.1.12 Relay periodic updates on care capabilities to EMS Branch structure (i.e. EMS Branch Director or designee)
 - 2.1.13 Provide regular Situation Status reports to EMS Branch and Hospitals
 - 2.1.14 Provide any additional EMS resources as requested
 - 2.1.15 After ensuring that all patients have been transported and that no further EMS need exists, coordinate with EMS Branch the de-escalation and securing of the incident

2.1.16 Notify hospitals and EMS providers of the de-escalation and securing of the incident

Pre-Hospital Systems Coordination Committee: Recommended Updates December 17, 2008

Executive Committee: Recommended Updates January 8, 2009

Board of Directors: Recommended Updates March 20, 2009

Massachusetts Department of Public Health/Office of EMS: Approved February 3, 2010



**Developed by FATPOT Technologies
with input from the Brookline MA
Police Department**

FATPOT & Data Sharing & During the Boston Marathon Bombing

A review of the Boston region's CAD data sharing platform in operation during the Marathon Bombing incident and how it enabled better and faster emergency response from the perspective of the Brookline MA Command Post

December 10, 2013!

Use of ATPOT Technology During the Boston Marathon Bombing!

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Background!

The Boston Marathon is the world's oldest annual marathon, an event hosted by several cities in the greater Boston area. It is always held on the third Monday in April, called Patriots Day. Managed by the Boston Athletic Association since 1897, the event attracts 500,000 spectators and about 20,000 registered participants plus about 1,000 media members from more than 100 outlets. The course is 26 miles 385 yards, and runs through eight Massachusetts cities and towns: Hopkinton, Ashland, Framingham, Natick, Wellesley, Newton, Brookline, and Boston. The official finish line is located at Copley Square, alongside the Boston Public Library.!



On April 15, 2013, there were 26,839 people entered in the event. At 12:50 p.m. EDT, nearly three hours after the winners crossed the finish line, two explosions occurred about 200 yards apart on Boylston Street, in approximately the last 225 yards of the course. The race was halted, preventing many from finishing. Three spectators were killed and 264 people were injured and treated at 27 local hospitals.!

Terrorism"



According to internet research, Boston has been the 14th most frequently targeted U.S. city by terrorists in the past 40 years, with New York and Los Angeles being first and second respectively. Globally, 12 percent of the more than 100,000 terrorist attacks that have occurred since 1970 have been part of a coordinated attack, where the perpetrators have targeted multiple targets within a short period of time. The most common weapons used in these attacks were incendiary devices and explosives, accounting for 81% of all weapons used. There have been other attacks over the years protesting!

marathon events: 2008 Sri Lanka, 2006 Pakistan, 2005 Northern Ireland, 2003 Northern Ireland, 1998 Northern Ireland, and 1994 Bahrain.!

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Brookline Command Post

The Brookline Command Post (CP) was located in the MEMA trailer, in the area of 1481 Beacon Street, outside Coolidge Corner in Brookline. This was about 2 ½ miles from the finish line. The CP was staffed by 2 MEMA personnel, 1 Deputy Fire Chief from Brookline Fire, 1 Deputy from Fallon ambulance, 1 Captain from Brookline Police and the Director of Technology and Communications from Brookline Police. The Director of Technology and Communications is Officer Scott Wilder and the following is his first person account of the technology used during the bombing incident.

Eyewitness Report

The following report is from Officer Scott Wilder.

The day of the Marathon, I was in the Brookline CP and was tasked with monitoring:

- › Cameras feeds - 16 Brookline and shared Boston cameras
- › Brookline CAD – a view of all Brookline calls
- › FATPOT data sharing application (CADfusion) - with feeds from 8 other cities CAD applications, involving 5 vendors

FATPOT data sharing technology gave my command post (CP) a total view of incidents happening along the entire Marathon route, in Brookline and Boston. The CADfusion software linked the disparate CAD systems together so that I and other system users could see all the calls and unit locations from all the CAD's in a common view.



Early that morning, I set up a **geo-fence** around Beacon Street using a publically available internet map so we could monitor just the calls that were specific to the Marathon. The geo-fence made things easier



to view, and I had used the geo-fence feature and mapping last year during the Marathon so I knew how useful of a tool it is. I was concerned about having to rely on publically available internet maps, and FATPOT had recommended that we procure their GEOfusion that would integrate all regional maps, but due to budgetary constraints the procurement was pushed out to the next phase.

When we got word at our CP from the Command Center at MEMA headquarters that there were reported **possible explosions perhaps in the area of the finish line**, I was able to see all locations where Boston EMS and Fire were responding through FATPOT CADfusion, **nearly 5 minutes** before we were notified and confirmed of the actual location by phone or by radio.

Unfortunately, the publically available internet maps were not as helpful as they might have been as they were up and down most of the day. Our plans post-Marathon are to engage FATPOT and procure their GEOfusion application so that we will not have to rely public maps. This will also enable us to add

Use of FATPOT Technology During the Boston Marathon Bombing

the map layers that we know will be very helpful to public safety (such as hazard, premise, hydrant info etc.)

One key benefit of the mapping component is that it gives you the visual “big picture” you need to see of the calls, especially when dealing with other agency calls. When you see the name of the street on a call, and then are able to see it on a map, it’s a totally different perspective – the viewer may not know a particular street but seeing the location on the map pulls it together.

To balance the wireless load I placed the cameras on our 4.9 mesh network, and had FATPOT and Brookline CAD running off of air cards. When the cell network got flooded and the air card connections started to fail, I plugged those laptops into the 4.9 mesh switch, and remained connected to our databases. The cruisers on the street had no issues since they were also on the 4.9 system.

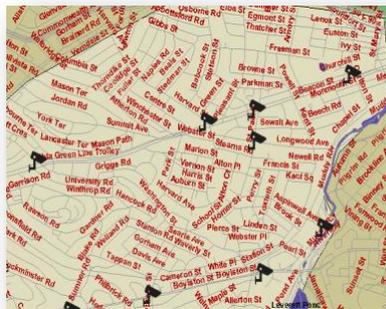
Having a separate ‘alternate path’ network(s), like 4.9 mesh and PSnet, has enormous value to public safety during crunch time. The local wireless networks cannot be relied upon; it is not their fault, and it is just a fact that has been proven out, time and time again. You have to have an alternative or back-up plan when the wireless carriers go down, especially after catastrophic events when a flood of calls came into all agencies regarding suspicious devices, suspicious people, suspicious vehicles, etc.

“

Future Plans

The upcoming FATPOT enhancements, in the next 3 phases, will be a big benefit for situational awareness and data sharing in the region. The first phase, now underway, will bring in the mapping components discussed above as well as bring in additional camera feeds viewable on the map.

The following phase will further enhance mapping components with personnel tracking to be utilized during any kind of canvas or search (such as crime scenes, as happened during the search for the Bombing suspects; mentally impaired persons, missing children etc.). This app would track search activities and color code the map for areas searched, by whom, when and results.



The next phase will feed data into the Boston Regional Information Center (BRIC) to enable region wide analysis of CAD data.

I highly recommend that FATPOT should be deployed as a resource whenever a command post is set up, or for planned events, like 4th of July, First Night, etc.

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Need to "Involve Other Stakeholders"

I think the real keys moving forward with FATPOT’s regional information sharing system is getting other key partners involved. They need to see what is happening, but are currently “in the dark” because of

Use of FATPOT Technology During the Boston Marathon Bombing

the inability to see the common situational picture during major events, disasters, attacks etc. These stakeholders include various state agencies, hospitals and local colleges and universities. Because of this, we have reached out to the Boston Medical Center, who has started a pilot project with the Boston UASI stakeholders to share data. They in turn plan to write up suggestions on the best way hospital emergency rooms can use this technology, and communicate among themselves. We are planning to use this experience as a template to reach out to the other main hospitals.

In addition we also want to explore getting the State Police 9-1-1 centers plugged into FATPOT. The majorities of 9-1-1 calls coming from cell phones default to the State 9-1-1 call center, and the call-takers have to determine where the call is coming from and then manually transfer each caller to the appropriate agency. This transfer can take several minutes depending on the nature of the call and the caller. If there was a way these calls could go into a FATPOT mapping feature the agencies that are going to have these calls passed onto them would have an immediate idea of the location. The idea is simple, the solution may be complicated, but it is worth looking into.



Other Communication Technologies

FATPOT also offers bi-directional data sharing which can automatically deliver call to the correct recipient agency. FATPOT has the ability to link disparate CAD systems regardless of vendor, what version or how old the system is. Utilizing this technology would enable the delivery of request for service into the native CAD using the codes the agency is used to seeing. The time savings using the bi-directional application saves crucial minutes for Fire, EMS and Police. Procuring this enhancement is currently in the "seeking funding" stage.

A great help would be having the ability to use FATPOT as a radio resource. Since a majority of the radio systems are now or soon will be IP based systems, having this ability would be incredible. Simply, out of one application you can have CAD and radio communications. Also, pulling in camera feeds to the FATPOT application would be another huge enhancement. All of these applications would be like a command center in a box. Everything you need would be in one application; just logistically this would be a big win!

FATPOT Support

Before, during and after the attacks I had continuous support from FATPOT's Technical Sales Engineer and local Sales Manager. These two individuals spent a lot of time with us, either on the phone and or on location. I had to ask a few times on how to change things within FATPOT application, and the Sales Manager was right there helping us out. Big thanks go out to both of these individuals. Their total support allowed us to focus our energies on the situation at hand.

Conclusion

A lot about radio interoperability has been discussed over the past few years; the next gap to be addressed is data interoperability. FATPOT is a good example a progressive company what understands public safety, and that offers the ability to fuse various data systems from disparate vendors together to provide a regional situational awareness. They have worked closely with Brookline and the agencies in the UASI area on a variety of projects, and are truly a trusted partner in our efforts to protect and serve.

Scott Wilder Biography

Director of Technology and Communications, Brookline Ma, Police Department

For over 27 years, Officer Scott Wilder has served as a police officer for the Brookline Police Department. Officer Wilder is currently Director of Technology and Communications for the Brookline Police Department. In this capacity, Officer Wilder is responsible for designing, installing, and maintaining the software/hardware and communications networks for the Public Safety systems, serving a metropolitan Town with a population of 58,000.

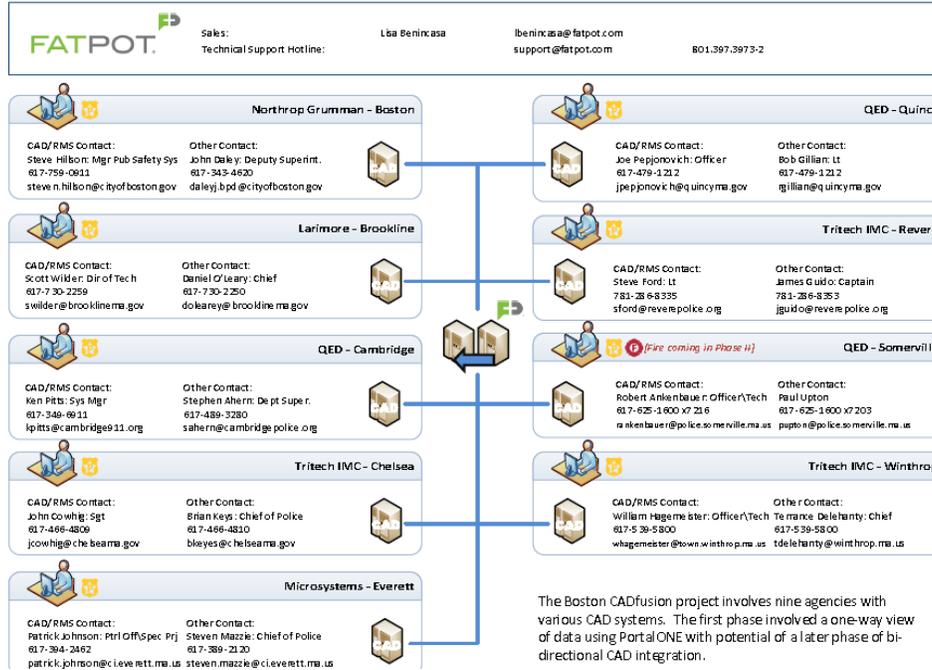
Officer Wilder currently serves as the Vice Chair, Metro Boston Homeland Security Region's Interoperability Committee, Chairmen for the PSnet Executive Committee, and Chairmen for the Technology and Wireless Data Subcommittee, for the Boston UASI-Region, member of the Regional Catastrophic Planning Team-Cyber Working Group, and a member of Technology Working Group for the National Institute of Justice. Officer Wilder holds a B.S. degree in criminal justice from Western New England College.

December 10, 2013!

Use of FATPOT Technology During the Boston Marathon Bombing!

Boston CADfusion Project

Revision: 07-29-2013



The Boston CADfusion project involves nine agencies with various CAD systems. The first phase involved a one-way view of data using Portal ONE with potential of a later phase of bi-directional CAD integration.



MIT Officer Killed Cambridge!

SUV highjacked Cambridge!

December 10, 2013

Use of FATPOT Technology During the Boston Marathon Bombing

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SUV owner escaped Cambridge!

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Firefight with police chase into Watertown and in Watertown!

!

SUV abandoned - Not sure !

!

Dzokhar found Watertown!

!

!

!

!

!



**Developed by FATPOT Technologies
with input from Orange County Fire
region.**

**More than
just
information
sharing**

**A historical perspective on Orange
County's Fire and EMS agencies'
decision to undertake CAD-to-CAD
interoperability in order to better
meet emergency response
demands, conserve tax-payer
dollars, and ultimately save more
lives and property**

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Background – The Players, Challenges and Opportunities

Orange County CA was created as a separate political entity from Los Angeles County on March 11, 1889. With a current population of over 3,000,000, it is bordered by Los Angeles County on the north and west, San Bernardino County on the northeast, Riverside County on the east and San Diego County on the southeast. It has a land area of 789 square miles.



The county includes 34 incorporated cities, the county seat being Santa Ana.

<i>City</i>	<i>Year of incorporation</i>
Aliso Viejo	2001
Anaheim	1870
Brea	1917
Buena Park	1953
Costa Mesa	1953
Cypress	1956
Dana Point	1989
Fountain Valley	1957
Fullerton	1904
Garden Grove	1956
Huntington Beach	1909
Irvine	1971
La Habra	1925
La Palma	1955
Laguna Beach	1927
Laguna Hills	1991
Laguna Niguel	1989
Laguna Woods	1999
Lake Forest	1991
Los Alamitos	1960
Mission Viejo	1988
Newport Beach	1906
Orange	1888
Placentia	1926
Rancho Santa Margarita	2000
San Clemente	1928
San Juan Capistrano	1961
Santa Ana	1886
Seal Beach	1915
Stanton	1956
Tustin	1927
Villa Park	1962
Westminster	1957
Yorba Linda	1967

Orange County is subject to significantly higher than average (for California) tornado activity, and above average earthquake activity. The area regularly experiences severe storms, landslides, flooding, debris and mudflows, and wildfires. In fact, the number of natural disasters in Orange County is more than double the national average.

The County is geographically small but densely populated and congested which presents unique challenges for emergency response. In 2006, a County-hired consultant recommended implementation of a county-wide situational awareness solution for public safety assets to aid in response emergencies and incidents. The Orange County Fire Chiefs Association collaborated to apply for a grant to fund deploying Automatic Vehicle Location (AVL) technology for all fire apparatus.

Initially six stakeholders - - Orange County Fire Authority, Metro Cities Fire Authority, Costa Mesa, Brea, Laguna Beach and Santa Ana - - participated. The project goals were defined and agreed to by all: “To provide a common view of the assets of all participating agencies in real time.” To accomplish this, FATPOT Technologies was contracted to implement a data fusion system. FATPOT integrated county-wide data using their CADfusion™ technology platform and displayed it in a common view shared by all participating agencies.

THE PLAYERS

OCFA Dispatches for:
Aliso Viejo, Buena Park, Cypress, Dana Point, Irvine, Laguna Hills, Laguna Woods, Laguna Niguel, Laguna Woods, Lake Forest, La Palma, Los Alamitos, Mission Viejo, Placentia, Rancho Santa Margarita, San Clemente, San Juan Capistrano, Santa Ana, Seal Beach, Stanton, Tustin, Villa Park, Westminster, Yorba Linda and the unincorporated areas of Orange County

Metro Net Dispatches for:
Anaheim, Brea, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, Newport Beach, and Orange.

Laguna Beach Dispatches for:
Laguna Beach

Costa Mesa Dispatches for:
Costa Mesa

The project took approximately 18 months to implement because of the complex requirements and interesting, but expected, challenges:

- **Selection Process**—Pre-qualification criteria were not employed which would have eliminated less qualified vendors from consideration early in the process and saved time.
- **Disparate CAD Vendors** – Four CAD vendors were involved with systems that varied in age and capabilities.
- **Dissimilar AVL methodologies** – 2 different AVL providers were involved, plus 2 agencies without AVL. Some systems housed AVL data while others had to be pulled from other locations.
- **Funding** – Department of Homeland Security Urban Area Security Initiative (UASI) grants imposed usage and reporting restrictions that took time to manage. Orange County cities were then part of the select pool of jurisdictions eligible to use this funding. The funding had specific requirements to address building and sustaining capabilities to prevent, protect against, respond to and recover from threats or acts of terrorism.
- **Automatic Aid Agreements** – had to be reassessed to ensure that technology was taken into account.

Decision - CAD-to-CAD Resource Sharing Solution Provided Best ROI

The stakeholders determined that the biggest return on their investment (ROI) would come from the FATPOT proposed solution. The AVL technology was part of the long-term plan to implement full bi-directional CAD-to-CAD. Real time dispatch of closest unit across jurisdictional boundaries requires real time location of all assets. While there was no specific impetus that made the procurement a “must to have”, there were plenty of stories in the press about agencies nationwide that detailed the human and financial costs for not employing this technology.

Some agencies in the US solved their data sharing challenges by consolidating into one vendor platform. The

County stakeholders determined that this was politically untenable, expensive and had many hidden costs. Not only did agencies give up control and all their prior investments, but retraining on the new platform was calculated to be very high.

Other agencies tried some simple point-to-point interfaces between a limited number of systems. Ultimately, when the political climate changed in the County in 2009, and the County was able to move forward with the CAD-to-CAD project, the point-to-point approach was taken. Three agencies, Costa Mesa, OCFA and Metro Net elected to participate, and one of the CAD vendors was chosen to write the interfaces. After three iterations and upgrades over two years, it was decided that this architecture was fundamentally unsound and lacked the scalability needed by the County. The stakeholders determined that this solution required a huge amount of effort to build and maintain the interfaces at each agency.

The leadership team therefore decided that neither consolidation nor point-to-point interfaces were acceptable. They needed a solution that was scalable, highly configurable, and allowed each participant to maintain local control of the data being shared. That left a “message broker” or hub type of architecture. After reviewing the offerings, it was determined that there was only limited functionality available from most vendors: too few filters in the hub, no code table translation, and no rules based engines or basic business intelligence that could mimic mutual and automatic aid agreements...except for FATPOT.

FATPOT Technologies was awarded the contract to implement the CAD-to-CAD resource sharing initiative in Orange County, using its CADfusion™ product. The project began in 2010 and involved connecting a Northrup Grumman CAD at OCFA (itself a consolidated group of agencies), a TriTech CAD at Santa Ana, an Intergraph CAD at Laguna Beach, a Motorola CAD at Costa Mesa, and finally a Keystone CAD at Metro Net (another consolidated group of municipalities). The project also implemented AVL information sharing across all of the above CAD systems and agencies using the FATPOT framework.

CADfusion maintains real-time information about active CAD incidents in each connected CAD system, and when incidents and resources need to be shared between the separate jurisdictions, CADfusion translates and exchanges the information in real-time. A common code set is used for translation between systems, and CADfusion includes configuration utilities to allow administrators to modify the common codes, mappings for resource sharing, and rules for triggering incident sharing.

The flexibility of CADfusion has allowed Orange County to realize their vision and objectives of CAD-to-CAD interoperability and resource sharing. CADfusion is a platform, not just a custom built interface. It is capable of automating processes and protocols, translating behavior and nomenclature, providing information and recommendations, and empowering dispatchers and first responders to make better-informed decisions. FATPOT’s dedication and innovation has established CADfusion as the premier CAD-to-CAD interoperability platform in the world.

REGIONAL DATA

- Transfer 30-40 calls a day
- Estimate saving over 2 minutes on each call
- Used primarily for serious accidents, working structure fire or medical emergencies
- Conclusion: FATPOT’s CADfusion product has met expectations and given Orange County a platform for continuously improving interoperability

CAD Data Sharing - No Longer a “Nice to Have” but Rather a “Must Have”

The following scenarios are real and provide information as to how the technology is used in daily routine operations, as well as larger more complex events. Key to the success of the initiative is daily usage: not only does it significantly impact the return on investment, but it also creates the environment where familiarity enhances operational efficiency and routinely successful outcomes.

Scenario 1 – A typical multi-agency incident involving automated call transfer

Orange County Fire Authority has three main types of apparatus: Paramedic engines, trucks and vans. Most of their responses involve working structure fires and freeway accidents. They handle 30-40 call transfers a day to and from the partner agencies, and estimate that they save over 2 minutes on each call transfer. The time savings has undoubtedly lives when first responders arrive more quickly, especially to structure fire (*structure fires can double in size every minute*) or a heart attack (*a person’s chance of survival from a heart attack decreases by 10% for every minute help is delayed*).

Scenario 2 – A larger scale multi-agency resource sharing incident

These types of incidents are very frequent for the County and represent the bulk of sharing requests. Almost everything the agencies do involve many resources handling complicated events. CADfusion is relied upon to assist all the partner agencies to respond to the right location with the right resources as quickly as possible. Moreover, CADfusion systematizes processes and procedures to provide repeatable, successful actions and reduce dispatcher stress and workload.

Scenario 3 – An atypical multi-agency, multi-jurisdiction large-scale incident

Thankfully, these are not very frequent, but when they happen they are pretty intense for all regional partners. In Orange County these most often involve wildland fires. For example, if Laguna Beach takes a call, they hand it off to OCFA and the County takes over. OCFA then pushes it to the other partner agencies as needed until sufficient resources have been dispatched. Tactically, it’s very helpful when one agency is directing the response, and CADfusion enables the desired control.

Best Practices

The following paragraphs contain suggestions for leaders of data sharing initiatives. These “best practices” are actions that can be taken before, during and after the project to ensure project success by securing a strong commitment from all stakeholder leaders to overcome barriers and maintain focus on the goal. Many discussions were conducted by FATPOT with the regional partners’ project managers, trainers, thought leaders, public safety administrators and managers, engineers and others in the Orange County region. Many common themes emerged.

Have a Shared Vision

The success that has been achieved in Orange County has not come because they selected the best technology although this is very important. It is because of the ongoing commitment by agency leaders to work together for a common goal. Information silos are most often a result of communication barriers and lack of trust. Orange County emergency response leaders have a shared vision and have dedicated the necessary resources to eliminate barriers and find the best solutions.

Create Strong Governance

The effort to create a governance organization has not only provided a means to resolve problems that arise, but it has also helped establish an attitude of cooperation and trust across the entire organization. Strong governance provides a framework of understanding all the relevant decisions affecting the common goal. Of particular help was a white paper published by the IJIS Institute entitled "Governance Agreements in Public Safety Data Sharing Projects" which is available on the IJIS Institute web site: http://www.ijis.org/?page=Reference_Papers

Establishing and maintaining an empowered governance process is critical to the success of a multi-agency, multi-system, information and resource sharing solution. A governance organization, sponsored by agency leaders, accountable for meeting established objectives, reporting and measuring performance regularly is indispensable. The results are measured in saved lives and reduced property damage.

Obtain Stakeholder Buy-In and Commitment Early On

Getting buy-in from all parties and the agreement that this project is a priority is critical to success. This includes the commitment that they will dedicate the people as needed to get the job done in a timely manner. Agencies often underestimate their needed contributions, that is, people who are knowledgeable enough to make decisions and have the time to do so.

Beware of the unrealistic expectation that the data sharing company will come in, wave a magic wand and your project is miraculously all done. Also, partner stakeholders have to make the investment of time to understand the product they have purchased and its capabilities. Without understanding the art of the possible, data sharing will be limited and not fully utilized.

Choose the Right Architecture

There are several architectural issues that should be addressed early on. This will impact scalability and the ability to add new agency partners to the systems in the ensuing months and years. It is often challenging to get cooperation between CAD service providers, so coordination and cooperation between all participants is enhanced by having a neutral third party hub provider in the middle. The hub needs to have strong capabilities to be able to work with differences between the CAD systems and the CAD providers. Technical decisions related to such things as how often the data is updated, what initiates the data transfer, what is supposed to happen to the transferred data, as well as file, network, and error processing must be addressed. All of these decisions and the related complexity is greatly simplified by having a centralized intelligent hub at the center. Be sure to carefully define your needs and expectations. Pre-defining use cases up front can be very helpful in answering these questions.

Be Open Minded to Using the Technology

In the early period of implementing and using the system in Orange County, the attitude of the separate agencies towards sharing of resources was controlled by manual approval of the automated request. Each

sharing agency desired to manually review and approve the automated request before allowing CADfusion to dispatch a shared resource to a shared incident.

After a year of operating in this mode, it was determined that no request for an available resource was ever denied, so the agencies elected to extend automation and forego the manual approval and dispatch process. Chief Jeff LaTendresse of Laguna Beach stated, "Let's just make the assignment of the requested resource automatic. We are not going to reject a resource request if it is available, so let the system make the assignment automatically."

Learn all You Can from Similar Projects

While there are many good books on project and change management that offer excellent insights, an often overlooked resource are others who have undertaken similar projects. Orange County reached out to leaders of other data sharing projects and asked for their lessons learned. Below are some of the best practices they learned:

- Create and communicate a sense of urgency – letting others know why you are doing this project needs to be communicated broadly and deeply throughout all partner organizations. Failure to communicate the right message to the right people, and failure to communicate often enough throughout the project seem to be common mistakes.
- Get executive buy-in and assemble a strong leadership team - failure to get the buy-in from executive and middle management, and to have their sustained commitment, is always a challenge. Anticipate that it will happen and take appropriate steps. Make sure that your vision (how the future will be better) and strategy is conveyed to all stakeholders.
- Don't let up on communication and messaging – communication within and among all stakeholders must be constant and consistent. You must plan to reach out to all appropriate players, much more than you think, so that your message will be heard, understood, and internalized. Also, plan to communicate your project's early successes and do not let up on these communications. This will improve the value both internally and externally (among the community).
- Change the culture – this is where daily usage becomes the new norm that users demand. In essence, they cannot conceive of working without the new solution.

Summary

CAD-to-CAD interoperability has **helped** Orange County emergency responders to achieve their objective of effective and efficient resource sharing.

The County's visionary approach to effective resource sharing has improved response times, conserved taxpayer dollars, and saved lives and property. The availability of neighboring agency resources is now visible and usable in emergency situations when local resources are busy or too distant to respond effectively.

CAD-to-CAD interoperability through FATPOT's CADfusion is a lower cost alternative to CAD system consolidation. Autonomy and critical decision making is maintained by local agencies while retaining the ability to share with or receive aid from neighboring agencies. The results have been greater effectiveness and cost savings while being able to meet increased demands.

Ongoing communication that maintains trust is key to achieving this level of success, enabled by the right technology and the right governance. The Orange County region has affirmed that FATPOT understands how CAD systems work and has developed the best architecture for CAD-to-CAD interoperability. The flexibility of the CADfusion system has allowed the agencies to evolve their operating procedures when faced with changing requirements without incurring expensive modifications typical of custom point-to-point interface projects.

Anyone considering implementing a CAD-to-CAD interoperability solution should seriously investigate the FATPOT CADfusion platform and the benefits that it provides.

