AECOM

Submitted to
Old Colony Planning Council

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Old Colony Planning Council Regional Emergency Communications Center Dispatch Feasibility Study

Final Report

Table of Contents

List of Tables

1 Introduction

The Old Colony Planning Council (OCPC) undertook a feasibility study for establishing a Regional Emergency Communication Center (RECC) in the area. The feasibility study included eight communities in the OCPC region: Bridgewater, East Bridgewater, Duxbury, Halifax, Kingston, Plympton, and Whitman; Plymouth later joined the study. Currently, seven of the eight communities operate their own public safety dispatch center or centers; Bridgewater, East Bridgewater, Plymouth, and Whitman operate separate police and fire dispatch centers. Plympton is dispatched by the State Police.

The OCPC is serving as the lead agency for this project. The Council and its member agencies have been exploring the concept of a shared dispatch center for a number of years. The OCPC successfully applied for a development grant from the Massachusetts State 9-1-1 Department to perform a consolidation study, and contracted with AECOM to conduct the study.

The study was designed to accomplish the following elements:

- Existing Conditions Analysis
- Consolidation/Regionalization Feasibility Assessment for:
  - Bridgewater, East Bridgewater, and Whitman and
  - Duxbury, Halifax, Kingston, Plympton, and later Plymouth or
  - A single RECC
- Financial Analysis of Alternatives.

There were a number of issues that needed to be addressed. These included:

- How do the current 9-1-1 systems and police/fire dispatch services work in each community and across the region?
- If 9-1-1 services were regionalized, what would it cost and where would the RECC(s) be located? What cost savings and service efficiencies, if any, would be realized if the service were regionalized and what collective bargaining issues would need to be addressed?
- What administrative entity would need to be established in order for all communities to feel their emergency needs would be addressed in an even-handed and equitable manner?
- What information systems would need to be upgraded, improved or replaced in order to ensure the rapid and compatible transmission of data, messages and information? What equipment would need to be replaced to ensure interoperability?

This report addresses those tasks and issues:

Section 2 of the report describes the current communications environment;

Section 3 describes the requirements consolidated public safety communications center should have;

Section 4 discusses the current communications problems and concerns;

Section 5 identifies and analyzes alternative designs for a RECC;

Section 6 presents AECOM’s opinion of probable cost for the selected alternatives; and

Section 7 contains AECOM’s conclusions and recommendations.

2 Current Communication Environment

This section defines the dispatch operations and communications environment as they exist today in each of the eight towns. A brief discussion of the overall community environment and the projected changes in population is also included. Descriptions of the current operations for each of the localities involved in this study (Bridgewater, Duxbury, East Bridgewater, Halifax, Kingston, Plymouth, Plympton, and Whitman) are provided and the duties performed by the dispatch staff of the centers are reviewed.

2.1 Current Community Environment

The Old Colony region consists of the sixteen communities in the southeastern area of Massachusetts. The towns in the area have experienced slow but steady population growth. The total Old Colony communities in this study had a total population of 123,881 in 2000, and a population of 149,340 in 2010, according to the U.S. Census. Table 2-1 shows the change rate in population since 2000 and the projected population for each town involved in the study through 2030.

Table 2-1
Population Projections

Locality	2010 Census	% Change 2000-2010 for Massachusetts	2020 Projection	2030 Projection	% Change 2010-2030
Duxbury	15,059	3.10%	15,526	16,007	6.30%
Halifax	7,518	3.10%	7,751	7,991	6.30%
Kingston	12,629	3.10%	13,020	13,424	6.30%
Plympton	2,820	3.10%	2,907	2,998	6.30%
Plymouth	56,468	3.10%	58,219	60,023	6.30%
Bridgewater	26,563	3.10%	27,386	28,235	6.30%
East Bridgewater	13,794	3.10%	14,222	14,662	6.30%
Whitman	14,489	3.10%	14,938	15,401	6.30%
Total	149,340		153,969	158,741	6.29%

U.S. Census Bureau for 2010 figures & Growth Ratios for the 2020, & 2030 projections.

2.2 Current Dispatch Environment

Seven of the eight localities involved in this study operate public safety dispatch centers. These dispatch centers function as primary public safety answering points (PSAP), directly receiving incoming wireline 9-1-1 calls; and as Secondary PSAP's receiving transferred wireline and wireless 9-1-1 calls. The Town of Plympton does not operate a dispatch center. Instead 9-1-1 calls for Plympton are answered by the Massachusetts State Police (MSP). Wireline calls for the Town of Whitman are answered initially by the Holbrook Regional Communications Center (HRCC) and then transferred to the Police or Fire Departments for dispatch. Wireless 9-1-1 calls originating in all of the localities are answered by the State Police, and then transferred to the locality as appropriate.

Each of the localities' dispatch centers dispatches their local police department. In Bridgewater, East Bridgewater, Whitman, and Plymouth the Town's Fire Department maintains and operates a separate dispatch center. Those dispatch centers function as secondary PSAPs, receiving 9-1-1 calls that are transferred from the primary PSAP. The Plympton Police Department and Fire Department are dispatched by the State Police. Each of the primary PSAPs are a part of that locality's police department. The dispatch centers also dispatch resources for non-public safety agencies, especially after normal business hours. Table 2-2 is a listing of the dispatch centers and the public safety departments and agencies they provide dispatch services for.

Table 2-2
Towns and Dispatched Agencies

Duxbury	Halifax	Kingston	Plympton	Plymouth	Bridgewater	East Bridgewater	Whitman
Duxbury Police	Halifax Police	Kingston Police		Plymouth Police	Bridgewater Police	East Bridgewater Police	Whitman Police
Duxbury Fire	Halifax Fire	Kingston Fire		Plymouth Fire	Bridgewater Fire	East Bridgewater Fire	Whitman Fire
Duxbury Water	Halifax Water	Harbor Master					Animal Control
	Halifax Highway	Animal Control					
	Animal Control						

2.3 Town of Bridgewater

Chartered in 1656, the Town of Bridgewater historically flourished as an industrial and agricultural center within Southeastern Massachusetts. The raising of livestock and crop cultivation on farms comprising several hundred acres were common in the outlying areas of the community. As early as the 18th century, foundries were operating along the northern periphery of the downtown where iron forgings for the Revolutionary and Civil Wars were produced. A century later, shoe, nail and brick manufacturing emerged in the area, employing hundreds of former agricultural workers from nearby farms or immigrants from distant lands. The historic character of the community is largely preserved in the Federal, Italianate and Greek revival commercial and civic structures surrounding the central common. The downtown remains a vital center of community life where such activities as autumn and Christmas holiday festivals are conducted each year.

Bridgewater today is a growing community of over 25,000. Its central location at the interchange of Route 24 and Interstate 495 provides convenient access to Boston, Providence and Cape Cod. The town also carries the distinction of hosting the oldest and largest state university in Massachusetts. This rich history and diversity of activities has made Bridgewater an attractive place to residents and businesses alike.

2.3.1 Bridgewater Police Department

The Bridgewater Police Department provides all law enforcement services for the Town of Bridgewater. The Department is comprised of thirty full-time officers, twelve Special Officers, and two civilians. The Department has a Tactical Team, participates in a regional Drug Task Force, and operates a Detective section. The Department also serves as the primary PSAP for the Town and answers all 9-1-1 calls originating within the Town.

The Department operates on a single analog UHF radio channel and the transmit site has recently been moved to provide better coverage. There is good radio coverage for most of the operational area. The Department interoperates most often with the Bridgewater State University Police, the MBTA, the Environmental Police, MSP and the Corrections operations. The officers have access to all surrounding area radio channels and are anticipating adding BAPERN.

Officers have a Laptop in each vehicle using a Verizon air-card. The CAD is IMC and records are done through the IMC CAD. Officers do their own filing of reports, citations, and arrest records.

The Department has capacity to house seven adult male, two adult female, one holding cell, and two juvenile prisoners.

2.3.2 Bridgewater Fire Department

Bridgewater Fire Department provides Fire and EMS services for the Town of Bridgewater and the Bridgewater State University campus. There are 12,000 resident students of the University. The Town is 28 square miles and the Department maintains its four to eight minute response times. The Department also serves as the Secondary PSAP for all 9-1-1 calls coming from within the Town of Bridgewater. Bridgewater State University calls are made through a University system and then transferred to the Fire Department. Bridgewater Fire is the primary answering point for the Pilgrim Nuclear Power Plant in Plymouth.

The Department responded to 3,900 incidents within Bridgewater with an added 16 in East Bridgewater, 5 in Halifax, 6 in Middleboro, 16 in Raynham, 6 in West Bridgewater, and 6 in other Mutual Aid responses.

The Department utilizes a single UHF radio channel. There are three radio sites connected by microwave mesh. The Department has adequate radio coverage within the operational boundaries. There is in-building coverage inside the State

prison and certain buildings within the Town and in the campus. Some BDA's are installed. All vehicles have the Fire channel, as well as the Police Department, the University channel, and Plymouth County Control mutual aid channels. Every Firefighter has an assigned portable with the same capabilities. Some radio equipment will require replacement for narrow-banding. Each truck and ambulance has mobile computer laptops. The Department uses IMC CAD. The fire dispatcher generates Run numbers from the CAD. This number and times are used to create the Department NIFRS reports and other activities.

The Department is the assigned "Baby Safe Haven" point for the Town.

2.3.3 Bridgewater Police Department Primary PSAP

The dispatch is handled by one on-duty police officer. There was a single civilian dispatch position but that has remained unfilled. The dispatch officer issues case numbers for reports and performs all CJIS/NCIC operations. The on-duty dispatch assigned officer also performs many functions. Walk-up traffic, issues forms to the public, handles security, inmate monitoring, and others. The Department and the Town would desire an officer in the facility even if dispatching were civilianized. The Department has recently added radio and 9-1-1 external speakers throughout the Police facility. The Department added EMD in April of 2012. This required training of the dispatching officers.

Table 2-3 shows the available metrics for the Bridgewater Police Department Communications Center.

Table 2-3
Bridgewater Call Volume

Activity	2011
Wire-line 9-1-1	5,440
Wireless 9-1-1	1,926
Total 9-1-1 Calls Received	7,366
Administrative/Non-Emergency Telephone Calls	50,000
Police Calls For Service Dispatched	9,400
Police Officer Initiated Calls	319
Fire Calls Dispatched	1,756
Emergency Medical Calls Dispatched	2,283

2.3.4 Bridgewater Fire Secondary PSAP

At present the Secondary PSAP (9-1-1 Center) is staffed by an on-duty firefighter. The Secondary is equipped with listening connections that allow all 9-1-1 calls to be overheard by the on-duty firefighter. Also all "2900" telephone number calls are received in the Secondary by the operator. The Firefighter dispatches by radio and tone outs. The operator can disconnect equipment in the Stations and override traffic signals as required. The Department has forty-two paid firefighters. There are two stations with EMS transport.

There are ten remaining copper wire telegraph fire alarm boxes that terminate in the Secondary. The Department is moving to radio alarms. There are approximately 300 alarms at this time

Table 2-4 shows the available metrics for the Bridgewater Fire Alarm Communications Office.

Table 2-4
Bridgewater Fire Call Volume

Activity	2011
Wire-line 9-1-1	5,440
Wireless 9-1-1	1,926
Total 9-1-1 Calls Received	7,366
Fire Calls Dispatched	1,756
Emergency Medical Calls Dispatched	2,283

2.4 Town of Duxbury

Duxbury is a coastal community thirty-three miles south of Boston in Plymouth County. The Town was a center of shipbuilding until the mid-nineteenth century when ships became too large for the shallow bay. Many historic and beautiful homes from Pilgrim times and the shipbuilding period still exist. Formerly a rural and summer community with an economic base of fishing and agriculture, Duxbury has become a residential suburb of Boston since Route 3 made daily commuting possible.

2.4.1 Duxbury Police Department

This organization provides all law enforcement services for the Town of Duxbury. The Duxbury 9-1-1 Center receives all 9-1-1 calls and administrative calls for the Police and Fire Department; and dispatches Police, Fire and EMS, and off hours Water Department for the Town. The Police Department has thirty-one sworn officers; one Chief, one Deputy Chief, two Lieutenants, Sergeants, Detectives, and Patrol Officers. There are two light duty positions.

The Department uses a single UHF radio channel with one repeater located on a cell tower and a receiver located on the Town water tower; the channel is voted at the repeater site; connection to headquarters is through an RF link. Console equipment is Zetron. In general radio coverage is good throughout the Town and in route to the County Jail and area hospitals. The Department has twenty mobiles. All equipment is narrow band capable, but has not yet been transitioned. The mobile and portable radios have all of the surrounding agencies' frequencies, the Town Fire Department, and Plymouth County channels.

The Department currently uses a PAMET CAD product, but has purchased an IMC product. The PAMET does not connect to the eight mobile computers in use. At present the mobile computers only have contact to the NCIC/CJIS network. When the IMC is in place the mobile computers will have full CAD access. Connection is through a Verizon air card.

The Department has capacity to house three male inmates and two female inmates.

2.4.2 Duxbury Fire Department

The Department provides all Fire protection and suppression services for the Town and all EMS services for the Town. The Department has a Chief, Deputy Chief, and Administrative Captain. Operationally the Department uses four groups of 5 or 6 fire fighters on-duty. There are twenty-four career firefighters and ten volunteers. There are two Stations, at Tremont Street and Franklin Street; with one ladder, three engines, two brush trucks, one forestry truck, one Dive Rescue vehicle, two boats, and four administrative vehicles. There are two ALS ambulances. The Department keeps 2-3 paramedics on duty at all times. The Department transports patients to Jordan Hospitals in Plymouth, South Shore Hospital in Weymouth. In 2011 the Department responded to 2,300 totals calls, 1,200 were EMS calls and 1,000 required transports.

The Department is currently using PAMNET to generate CAD and run numbers; incident data is entered into the RED ALERT system to support NIFRS. Ambulance and EMS reports are run through AMBUPRO. There are some lap-tops in use but they are not connected to the various data systems. The Department is moving to the IMC CAD product and at that time the lap-tops will be connected via over the air protocols.

The Department utilizes a UHF radio system with one repeater at Moduck Street. A back-up site is at the Miles Standish Historical marker. The system provides 90% in-building coverage within the Town. The system also provides coverage to the hospitals. There is no fire-ground channel. The Department has no mobile computers in the vehicles.
The Town and Department facilities are partially within the 10 miles radius zone for the Pilgrim Nuclear plant.

During the survey it was the current plan is the Town 9-1-1 operation will move to the second floor of the Tremont Street Fire Headquarters. There seems to be sufficient space for a three or possibly four position dispatch operation. The facility infrastructure appears to be capable of handling a center of that size.

2.4.3 Duxbury Police Department Primary PSAP

The 9-1-1 Center has five full-time dispatchers and uses two to six part-time dispatchers. The part-time dispatchers normally work 16 hours per week. During the summer tourist season the part-time hours will increase to 50 hours per week to accommodate the extra call volume. The Department is also currently hiring a Reserve dispatcher.

The dispatchers are currently undergoing EMD training but there are some implementation issues with the Town Health Officer and the protocol cards but they went live in June. All burglar and fire alarms are received through a call in telephone number. The 9-1-1 center answered in 2011: 5018 9-1-1 calls; dispatched 16,793 Police incidents with 4,519 traffic stops. The 9-1-1 Center in 2011 was answered over 45,000 administrative calls. Problems with the State certifying vendors have delayed implementing EMD in the Center.

The 9-1-1 Center dispatches Fire units via tone outs on the radio system and Minitor and alphanumeric pagers. The on-duty Fire Captain normally decides who respond to various calls. Mutual aid and second alarms are referred to Plymouth County Control (PCC). PCC has the run cards to handle the different scenarios. PCC will call for move-ups and coverage units. When the Department is operating through PCC they will use the PCC radio channels.

During the process of this project the Town of Duxbury has continued with a project of moving the existing PSAP to the second floor of the Tremont Street Fire Station. This new location is scheduled to be operational on January 15, 2013. The previous office space was completely redone with new floors, custom woodwork and painting. The space will be approximately 360 square feet in the main operational area. This area contains three console positions with possible expansion into the supervisor’s office adjacent to the operational area. The facility is also equipped with furniture, shelving, cabinets, and closets. Space is also provided for lockers, coat hangers, and other personal belongings. There is a small kitchenette available to the dispatchers in the Station below.

The dispatch center is secured with both proximity card access and 13 security cameras. This dispatch center is not accessible to the public; as the greeting of the public is handled by firefighters at the main entrance of the facility. There are large screen TV's monitoring all doors of the facility and the Duxbury police station.

The center is equipped with three Russ Basset consoles, with three C-soft dispatch computers. These consoles control eighteen 2-way radios covering VHF, UHF and 800 MHZ. Each radio is on UPS power and run on individual antennas off a new 110' antenna tower. The radios are programmed with system automatic backups in case of radio failure to allow back up radios to automatically switch to primary. There is a backup generator which is capable of running the entire facility. Parking is ample for all employees and many extras.

Table 2-5 shows the available metrics for the Duxbury Police Department Communications Center.

Table 2-5
Duxbury Call Volume

Activity	2011
Wire-line 9-1-1	2,584
Wireless 9-1-1	784
Total 9-1-1 Calls Received	3,368
Administrative/Non-Emergency Telephone Calls	45,000
Police Calls For Service Dispatched	16,793
Police Officer Initiated Calls	4,519
Fire Calls Dispatched	2,300
Emergency Medical Calls Dispatched	1,200

2.5 Town of East Bridgewater

The Town of East Bridgewater was an early industrial inland town located on the northern portion of the Taunton River system. Situated in Plymouth County, the town's European community had been heavily damaged in King Philip's war. Nine of the ten homes in the area were destroyed during the fighting. Its early economy was based on agriculture but the community did have both grist and saw mills, iron forges and tanneries. The Keith Brothers iron slitting mill is reportedly one of the earliest reported in southeastern Massachusetts. The first trip hammer to make scythes, axes and other edged tools was established in town in 1740, and cannons and muskets for the revolution were made in East Bridgewater. The late 19th and early 20th century saw residential development along the trolley lines in the community. The Bridgewater Branch Railroad from Whitman through East Bridgewater stimulated further industrial growth, and the town was the site of boot and shoe manufacturing and textile mills. The real population expansion, however, followed the Second World War, and the town now has a heavily residential population.

2.5.1 East Bridgewater Police Department

The Police Department provides all law enforcement services for the Town of East Bridgewater.
The Department's 9-1-1 Center serves as the 9-1-1 primary PSAP and police dispatch location for the Town. The Police Department has the Chief, four Sergeants, three detectives, and one Court liaison officer. There are three civilian dispatchers and one civilian Administrative Assistant. There are twenty full-time officers, eight part-time officers and the mentioned four civilians.

There are ten cars, two motorcycles, two SUV's and several unmarked cars. The three Bridgewater Towns have common detective bureaus, and SWAT operations. There is a SEMLEC SWAT van housed at the headquarters. Each patrol vehicle has mobile computers and the officers run their own tags and items. The system uses Verizon air-cards but recently has slowed down and is not as responsive as it once was.

The Department mobiles and portables have the Department channel (UHF), car-to-car, the County channels, tri-town channel, and the Fire Department and surrounding agencies. The system is narrowbanded. There are some weak coverage areas using the Highland Street site. The Department joined BAPERN in the summer of 2012.

The Department has a lock up facility of four cells with one being female/juvenile. The Plymouth County Sheriff's Office will pick up inmates when possible.

2.5.2 East Bridgewater Fire Department

East Bridgewater Fire Department provides all fire protection and suppression services for the Town of East Bridgewater. The Department also provides ALS, BLS and Transport EMS services for the Town. The Department serves as a secondary

dispatch point for the operation of Fire and EMS incidents. The Department is the primary dispatch point for Fire and EMS incidents. 9-1-1 calls are transferred from the PSAP.

The Department is comprised of twenty full-time firefighters, one Chief and one Deputy Chief, with six on-call firefighters. Equipment consists of one Station, three engines, one forest truck, one tower truck, three ambulances, an EMS chase SUV, a service truck, and the Chief's vehicle. The ambulances provide transport services on a 24/7 basis. Ambulance runs are normally transported to Brockton, Jordan, Morton, Good Samaritan and South Shore Hospitals.

The Department uses one radio channel in the 483MHz "T" Band with one repeater location on Highland Street, a back-up repeater at the Fire Department Headquarters and one non repeater location. The radio equipment is narrowband capable but not yet converted to narrowband operation. The Fire units and portables have the Police, all the surrounding areas, EMA, and Plymouth Control radio frequencies.

There is no CAD; there is a desk log computer – the Department uses Firehouse for NIFRS and Ambupro for EMS reports. The responses were 2,399 Total and 1,705 EMS in 2011 and 2,385 Total and 1,617 EMS in 2010.

EMD is being mandated by the State and will be handled by the Police Department.

2.5.3 East Bridgewater Police Primary PSAP

The PSAP operates twenty-seven operational shifts with fifteen being staffed by civilians; the others are staffed by police officers. The CAD product is IMC. Through the IMC the dispatchers can either issue case numbers, or the officers can obtain them via mobile computers. Otherwise the dispatchers perform the CJIS/NCIC activities, entries, etc. The dispatchers must respond to hit messages. The CAD does contain previous events and all special information fields on addresses.
There is a lot of walk-up traffic that the dispatch staff handles. This includes: "Baby Safe Haven" maintenance, Domestic violence 209A orders, Firearms permits, and Record activities. EMD must be initiated this summer.

Table 2-6 shows the available metrics for the East Bridgewater Police Department.

Table 2-6
East Bridgewater Police Call Volume

Activity	2011
Wire-line 9-1-1	2,833
Wireless 9-1-1	747
Total 9-1-1 Calls Received	3,580
Administrative/Non-Emergency Telephone Calls	
Police Calls For Service Dispatched	10,908
Police Officer Initiated Calls	2,647

2.5.4 East Bridgewater Fire Department Secondary PSAP

The Secondary PSAP receives all incoming phone calls; all 9-1-1 calls go directly to the printer and monitor. Administrative calls come to the Station 24/7 and can be answered anywhere in the facility. Business lines cannot be transferred out of the building. Walk-ins often come to the Headquarters and must be addressed by staff.

Calls are dispatched from the Station normally by firefighters; if there is no one in the Station the Commander in the field decides on dispatch protocols. Plymouth County Control is used during major events to dispatch mutual-aid apparatus. The Police PSAP is notified by phone or radio when responding to calls when the Fire Department will be temporarily un-manned.

Table 2-7 shows the available metrics for the East Bridgewater Fire Department.

Table 2-7
East Bridgewater Fire Call Volume

Activity	2011
Wire-line 9-1-1	2,833
Wireless 9-1-1	747
Total 9-1-1 Calls Received	3,580
Administrative/Non-Emergency Telephone Calls	
Fire Calls Dispatched	1,705
Emergency Medical Calls Dispatched	85

2.6 Town of Halifax

The Town of Halifax is a pastoral community located in the geographic center of Plymouth County and was first settled in 1669. Early colonists found extensive woods of white and pitch pine, cedar and oak and the first saw mill was built about 1728 to process this lumber. Agriculture and lumbering continued to be the basis of the community's economy and by 1794 there were five sawmills in operation. Lumber was sent south through the Taunton River system and east to the Jones River and North River shipyards. To the saw mills were added iron furnaces and a cotton factory by 1815 and a large woolen mill in 1822. Halifax was the site in 1795 of an early effort to construct a canal between Buzzards Bay and Massachusetts Bay by connecting the Taunton and North Rivers through the ponds of Halifax and Pembroke.

During the 19th century, as other communities became increasingly industrialized and Halifax's industries burned or closed, the town's economy shifted back to agriculture and substantial poultry and cranberry production was recorded. The residential character of the town became very pronounced as better roads like Routes 106 and 58 provided better access to the town. In addition, the scattered summer cottage colonies began conversions to year-round housing.

2.6.1 Halifax Police Department

Halifax Police Department provides all law enforcement service for the Town of Halifax. Halifax Police Department's 9-1-1 Center serves as the primary PSAP answering point for the Town of Halifax and dispatches calls for service for the Halifax Police, Halifax Fire, and Halifax Water Dept, Highway Dept. The budget is maintained through the Police Dept and Communications Committee

The Police Department is comprised of ten full-time officers and six part-time. The Department has three Sergeants and one Chief. The Officers work 8 hour shifts and normally at least two officers are on duty.

The Town has separate radio channels for the Police, Fire, Water, and Highway Depts. The transmitters are located on the Town Water tower. There are a few radio coverage dead spots in the Town coverage area. The Police cars are equipped with mobile computers using a Verizon aircard. Some officers normally run their own tags and other items.

There is an IMC CAD. The CAD system makes recommendations for Police and Fire response. The CAD is also used to issue, case and incident numbers, arrest numbers, and Fire run numbers for reporting.

Removing the dispatch operation from the Headquarters facility would cause major changes in the operation of the Town.

2.6.2 Halifax Fire Department

The Department provides fire protection and suppression services for the Town of Halifax. The Department also provides full ALS - EMS services including transport of patients. The Department has the Chief, eight full-time firefighters and twenty on-call personnel. There are two firefighters maintained on-duty at all times. The Department has eighteen EMT's. Medical transport is normally to South Shore, Brockton, Jordan, or Good Samaritan hospitals.

The Department maintains one station, two engines, one ladder truck, two ALS ambulances, two forestry trucks, one boat, and one staff car. The Department uses a single UHF frequency with transmitters at the Water tower and a backup transmit unit at Fire Headquarters located at 438 Plymouth Street. Radio coverage is generally good inside the Town and the Department's normal operating area, but extremely poor in surrounding towns. The EMS units have lap-tops for EMS reporting. Reports are done through the system NIFRS and the State Health reporting system through the laptops. There are workstations in the headquarters which are linked to the IMC CAD. In total there are three desk-top work stations, and three laptops. Times are kept by the dispatcher.

The Department uses Minitor 4's and 5's; these are backed up by the INFORAD text messaging system. Each full-time firefighters is equipped with a portable radio, also all vehicle seats have portables. On Call firefighters/EMTs are issued Motorola CP200's. On Call firefighters who are not EMT's are not issued radios. The Department desires to have portable radios with personal ID's for every Firefighter. The hospitals used in EMS service are out-of-range or at the limits of the Town's radio system.

Major events require interfacing to Plymouth County Control (PCC) who coordinates county resources and handles move-ups and coverage issues. The Department has all of the Plymouth County radio channels.

In general the Halifax dispatchers are not adequately familiar with fire dispatching protocols. A class was recently held to instruct on fire call policies and support documentation.

2.6.3 Halifax Police Primary PSAP

The Halifax Police Department 9-1-1 dispatchers receive all 9-1-1 calls originating within the Town and dispatch the appropriate units for the response. The dispatchers also answer administrative telephone calls for the Police, Fire and Town. The administrative call volume is approximately six times the number of 9-1-1 calls. The dispatchers are loosely supervised by the Police Sergeants. The dispatchers must rely on patrol officers or others for breaks. The 9-1-1 Center has three full-time civilian dispatchers and three part-time. The full-time dispatchers are in the AFL-CIO union.

The dispatchers serve various functions in addition to dispatching. Some of these are:

- Perform NCIC/CJIS actions such as entries, clears, locates, and others
- Respond to incoming faxes
- Run arrest report information for Court cases
- Respond to NCIC "10 Minute" responses and validations
- File protection orders and missing person reports
- Maintain "Baby Safe Haven" point for the Town
- Monitor internal cameras
- Observe any inmates via camera
- Recalls as matron for arrests requiring
- Notify wreckers for service calls
- Handle the release of towed vehicles
- Remotely open and close the Sally Port doors
- Maintain keys for Town
- Maintain the BOP Probation log
- Issue Accident report request forms to public
- Handle 3 to 4 walk-ups to the Department per shift

The Dispatchers use the "INFORAD" system to send out text message pages for Fire and Police calls, and other special groups including on-call personnel. Burglar and Fire alarms from the Town are routed through a seven digit number.

Normal dispatch training consists of 9-1-1 School – two days; APCO School – four days; EMD – four days; and CJIS/NCIC training. The PSAP currently performs EMD.

Table 2-8 shows the available metrics for the Halifax Police Department PSAP.

Table 2-8
Halifax Call Volume

Activity	2011
Wire-line 9-1-1	2,165
Wireless 9-1-1	527
Total 9-1-1 Calls Received	2,692
Administrative/Non-Emergency Telephone Calls	36000
Police Calls For Service Dispatched	6000
Fire Calls Dispatched	660
Emergency Medical Calls Dispatched	800

2.7 Town of Kingston

The Town of Kingston, a coastal community in Southeastern Massachusetts located about 35 miles from Boston, was established in 1726 and has an open town meeting form of government. It is principally a residential community with a small number of professional fishermen and cranberry growers. A large proportion of the residents are communicators on the MBTA train which has been in Kingston since the mid 1990's. Early industries in the town were iron casting, forging, ship building and woolen mills. Today, much of the town's commerce centers around retail business including the Independence Mall with its 100 stores located off Route 3. The town's early history as a part of the Plymouth Colony settled by the Pilgrims has spawned an active historical society that maintains the Major John Bradford House for public viewing and for summer brunches on its lawn. Public lands owned by the town on Kingston Bay and on Great Pond afford recreational opportunities, while summer programs for children are provided by the town's Recreation Commission.

2.7.1 Kingston Police Department

Kingston Police provides all law enforcement services for the Town of Kingston. Kingston 9-1-1 is part of the Police Department and answers all 9-1-1 calls for service and dispatches public safety units. The Kingston Police department has twenty-two full-time officers, with a Chief, two Lieutenants, six Sergeants and thirteen Patrolmen.

The Department has holding cells for four adult males and two females/juveniles; seventeen vehicles; eight are equipped with mobile computers. The Department has one UHF radio channel with a second back-up radio site. The mobile computers are connected via Verizon air-cards. The Department has access to all surrounding radio channels. The radios have been completely reprogrammed for narrowband.

Officers can access NCIC/CJIS through the mobile computers. Currently the CJIS operation is on two computers in the headquarters, but the Department is moving to a web based NCIC operation. The Department has had some cable cut problems with the Verizon connection.

Normally there are 2 or 3 Officers on duty. They use North and South beats and occasionally a central beat zone.

2.7.2 Kingston Fire Department

Kingston Fire provides Fire protection and suppression services as well as all EMS and transport services in the area. Kingston Fire operates out of two stations. It is equipped with one ladder truck, three engines, two brush trucks, two boats, one dive rescue truck, six services vehicles, and two ambulances.

Kingston Fire provides ALS service to the Town and provides patient transport. Normally the patients are transported to Jordan, Plymouth, South Shore, or Weymouth hospitals.

The Fire Department operates with normally one assigned duty squad organized into two groups. There are two UHF radio channels providing radio coverage for the North and South areas of Town.

2.7.3 Kingston Police Department Primary PSAP

Kingston Police 9-1-1 answers all 9-1-1 calls and all administrative calls for the Police Department. In 2010 the volume of administrative calls was 71,000. Kingston 9-1-1 has six civilian dispatchers with generally one on duty. The 9-1-1 Center dispatches the appropriate Police, Fire, and EMS units. Emergency Medical Dispatch (EMD) is contracted out to Fallon Ambulance. The center also dispatches Animal Control and the Harbormaster.

The PSAP personnel prepare paperwork for firearms permits, FOIA requests, report copies, accident reports. The Center facility has an open arrangement with public access directly to the Center via ballistic glass windows. The dispatchers perform NCIC/CJIS activities such as entries, clear, locates, etc. They also respond to hit messages and 10 minute responses. Burglar and Fire alarms are received through designated call in numbers. Dispatchers also monitor through cameras the facility and inmates in holding cells.

The dispatchers dispatch Police units directly and tone out Fire and EMS units. Often Fire Command officers decide which Fire Units will respond. The Departments use an IMC CAD. The dispatcher's issue all case numbers, Fire run numbers and times, and arrest numbers. Police records are in the IMC product, the Fire Department uses RED ALERT for record keeping.

The 9-1-1 Center is within the Pilgrim Emergency Nuclear Zone and dispatchers monitor ERZ warning equipment located in the Center.

Dispatchers also coordinate medical flights either on Plymouth Control or Kingston Fire channels. There are 5 med flight landing zones within the Town. Sprinklers and extinguishing equipment is in the basement of the station, located in the 9-1-1 Center.

Table 2-9 shows the available metrics for the Kingston Police Department Communications Center.

Table 2-9
Kingston Call Volume

Activity	2011
Wire-line 9-1-1	5,128
Wireless 9-1-1	1,111
Total 9-1-1 Calls Received	6,239
Administrative/Non-Emergency Telephone Calls	71,000
Police Calls For Service Dispatched	14,932
Police Officer Initiated Calls	6,833
Fire Calls Dispatched	697
Emergency Medical Calls Dispatched	1619

2.8 Plympton

Residents of Plympton say that driving into the center of this Plymouth County town is like taking a step back into simpler times and they wouldn't have it any other way. Two hundred year old houses share space on Route 58, the main street, with a gas station, a farm stand, a restaurant and a graveyard where the passing years have tilted the ancient slate headstones.

2.8.1 Plympton Police Department

Both Police and Fire Departments are currently dispatched by the Massachusetts State Police (MSP) dispatch operation in Middleboro. This dispatch center answers all 9-1-1 calls for the Plympton area. Administrative calls, which are not answered immediately at the Police Headquarters, also roll over to the MSP. The only response by the MSP is to dispatch a unit; there are no messages taken, or investigation into the call.

The Plympton Police Department provides law enforcement services for the Town of Plympton. The Department is comprised of eight full-time, six part-time officers, and one part-time administrative clerk. There is the Chief and one Sergeant in the organization. The Department maintains two officers on duty on most shifts. The Department also provides a DARE officer in the schools. The Department responded to 2,386 dispatches last year and performed 600 traffic stops. The Department facility is closed after three PM, a phone goes to an internal intercom and then to the MSP.

The Police Department has some capacity to hold arrestees; the Plymouth County Sheriff's Office will come and pick-up prisoners during evening hours; and as the PCSO has availability. The Police Department is asking for an additional officer and an additional Sergeant position. Added buildings and structures will require additional personnel and training for the Departments

Both Departments are using a common UHF radio channel. The channel radio equipment is narrow-band capable. The two departments have sole use of the single channel. There are two transmit sites, the primary, and the Back-up site at the Fire Headquarters. The Departments have acceptable radio coverage within the Town and to the Plymouth County Courthouse, the Plymouth and Weymouth Hospitals. The Police vehicles have all of the surrounding Town and mutual aid radio channels in the vehicles and portables. All Police vehicles are equipped with mobile computers that connect to the departments IMC computer (CAD). The officers enter their own CAD events, obtain their own case numbers, and do their own entries and clears into NCIC. The MSP does answer all NCIC hits and 10 minute response messages. MSP provides all voice recording.

Several incidents have occurred where officer safety was not provided by dispatching services from MSP. Basically the dispatch services offered are limited to giving out calls. The dispatchers do not have prior events histories; pre-plans; or local knowledge. Calls are simply given out without filtering or definition. Officer safety checks are seldom performed. Dispatchers have little knowledge of Fire protocols and dispatch procedures.

The Town management has no input into MSP dispatching or dispatchers; there is little or no accountability to the departments. Some dispatcher is markedly better than the others. The Town is expecting growth due to a new factory and warehouse coming to Town. The Town currently has no dispatching budget.

The Town is a passage path for evacuations due to the Emergency Planning Zone for the Plymouth Nuclear Power Station. Southeast portions of the Town are within the 10 miles radius of the plant. An evacuation caused by a nuclear incident or storm will route tens of thousands of evacuees through the Town.

2.8.2 Plympton Fire Department

As stated above the Fire Department is dispatched by the MSP operation in Middleboro.

Plympton Fire Department provides fire suppression and EMS/Ambulance service for the Town of Plympton. It is comprised of a Chief and thirty-four on-call fire and EMS members. The Department has one Station at 3 Palmer Road; and has one ambulance and seven engines, water trucks, and emergency cars. The Department handles approximately 600 calls per year with 200 being medical calls.

The Fire personnel are paged using existing Minitor 5 pagers. The Fire Department radios have access to the channels of the surrounding Towns and to all Mutual Aid Channels. Plymouth County Control acts as radio control for large fire events and

handles move-ups and second in units dispatch. Fire pre-plans are carried in a book located in the Station. The vehicles carry an additional radio for AMR contact. Medical calls are transferred to AMR in Framington for EMD processes.

Table 2-10 shows the available metrics for the Plympton Police and Fire Departments.

Table 2-10
Plympton Call Volume

Activity	2011
Wire-line 9-1-1	298
Wireless 9-1-1	
Total 9-1-1 Calls Received	
Police Calls For Service Dispatched	2,386
Fire Calls Dispatched	600
Emergency Medical Calls Dispatched	200

2.9 Plymouth

Americans are familiar with the story of the pilgrims' voyage across the Atlantic aboard the Mayflower, and their landing at Plymouth Rock. Today, Plymouth Rock is just one of the sites that tell the story of Plymouth. The Town now is a diverse and unique community. The Town of Plymouth continues to maintain its small town charm. We offer our visitors from across the globe a chance to experience part of the United States' early history and New England's seasonal charm.

2.9.1 Plymouth Police Department

The Department provides all law enforcement and animal control services for the Town of Plymouth. This is an area of 102 square miles with a population of 58,000.

The Department is comprised of 100 officers and 38 civilian employees. There is a Chief, 2 Captains, 6 Lieutenants, and 10 Sergeants. Generally there are 12 Patrolmen, 1 Detective, and 2 Dispatchers on duty. The Department uses an A – I patrol sector organization; Sectors A through E are considered the Town area and Sectors F thru I the South area. Due to vacationers the Department has created special scheduling for Summer and created special response zones within the Town; this establishes a higher minimum staffing with overlap shifts and innovative tiered staffing with as many as 12 to 18 on duty at times. The Police Department uses a Prosecution Lieutenant, audio tapes for court and other cases are produced by the Training Sgt. The Department uses 2 motorcycles, officer are assigned to the regional SWAT Team; there is also a BearCat armored vehicle stationed in the Town that is for regional use. Animal Control utilizes its own call-in number and radio channel. Animal normally performs its own operations and are not usually dispatched by the Department.

The Department uses 2 UHF T Band radio channels with 40 mobiles, 30 mobile data ruggedized computers with AVL on Airlink aircards; each officer has their own assigned portable. All radios have frequencies for surrounding agencies.

The Plymouth nuclear plant is within the area of responsibility for the Department. The Emergency Preparedness Zone (EPZ) provides some funding that is paid to support emergency preparedness. The Department enters the compound to investigate crimes but not for normal patrol duties.

The Department has just installed a new administrative phone system that covers the Department operations. Pagers are used by Detectives and Command Staff which are activated by the dispatchers. Town and other alarms are dialed into the Department on a separate call-in number.

2.9.2 Plymouth Fire Department

The Department provides all fire services for the Town of Plymouth as well as the Emergency Management Agency. There are 7 Fire Stations and the Town EOC is located in Station 6.

The Department is an all paid department with 125 firefighters and 6 civilians. The Department has 40 pieces of apparatus. Each apparatus has a UHF and VHF mobile radio; a portable for each seat on the apparatus. Command staff has assigned portables. Each station has radio control stations. 4 Engines and the Command vehicles have mobile data computers operating with Verizon aircards and AVL displays. The Department has 2 VHF and 2 UHF radio channels in the T Band. EMS transport service is provided by AMR

The secondary PSAP and fire dispatch operation is located on the ground floor of the Fire Headquarters building. It is manned by firefighters. There is a Town provided telephone PBX for the Department. The system uses a calling tree but approximately 100 calls per week are handled in the PSAP. In the summer this can rise to 100 calls per day. The Department uses Alpine software; this generates run numbers, run cards, and allows for dynamic adding of multiple alarms. Currently the Department is using Minitors for paging but is generally moving to cell phones for this function. Alpine software allows paging groups. The dispatchers tone out the units over a UHF channel. The Alpine software contains the pre-plans and hydrant locations. These are given out by the dispatcher as needed. Once on scene the firefighters switch to the second channel for fire ground operations.

In out of Town operations the units switch to the channel of the destination agency. The apparatus has the channels for all surrounding agencies and the Police Department. The department uses Plymouth County Control when appropriate and also the Command vehicles have access to the Barnstable County 800MHz system and can provide a bridge. Code enforcement operations are done separately and normally does not check in on the radio. The Stations provide all building inspections.

2.9.3 Plymouth Primary PSAP

The 9-1-1/dispatch center is part of the Police Department operation. There are 9 civilian dispatchers all in a flat pay grade. They are supervised by the on-duty police supervisor. The Records/IT section operates on a 9 to 5 schedule and provides the normal record keeping for the Department. Dispatchers perform the day-today NCIC functions. 10 minute responses are covered by the dispatchers. The materials are kept in a workbook on a turntable in the center.

The Department uses Pamet Police Server as a CAD. The officers perform their own tag checks etc through the MDT. The Patrol Shift Commander's office is located with an open door into the dispatch center. The Shift Commander provides assistance and supervision to the dispatchers. The Station Officer has a room attached to the dispatch area and handles walk-ins. The Dispatchers work 8 hour shifts and shift schedule every 4 months; they are in the AFFBME union; they have seniority but no rank structure. The dispatchers perform some work in associated duties such as observation of inmates, some running of tags, 258E Harassment Orders, and records work but these are not a major workload.

Table 2-11 and 2-12 show the available metrics for the Plymouth Police and Fire Departments.

Table 2-11
Plymouth Police Call Volume

Activity	2011
Wire-line 9-1-1	15,121
Wireless 9-1-1	6,053
Total 9-1-1 Calls Received	21,174
Administrative/Non-Emergency Telephone Calls	113,820
Police Calls For Service Dispatched	30,028
Police Officer Initiated Calls	8,728

Table 2-12
Plymouth Fire Call Volume

Activity	2011
Wire-line 9-1-1	
Wireless 9-1-1	
Total 9-1-1 Calls Received	
Administrative/Non-Emergency Telephone Calls	12,400
Fire Calls For Service Dispatched	6,242
Emergency Medical Calls Dispatched	3,672

2.10 Whitman

Whitman is a very small community, which was the home of the famous Toll House and the Toll House Cookie. A quiet and friendly community, Whitman has an outstanding youth organization that offers a variety of activities. The town is proud of their girls' soccer team who won the state championship, and its recreation program. The Town Park, home to the baseball field, also features an outdoor swimming pool. The bandstand from which summer concerts are held is a very popular attraction. Whitman hosts an annual Fourth of July Field Day at the park, with a road race, carriage or bike decorating, pie eating contests and other events. The town is a very rural community situated on the south shore and is mostly residential.

2.10.1 Whitman Police Department

Whitman Police Department handles all law enforcement functions for the Town of Whitman. This includes normal police duties as well as Animal Control. Whitman Police also acts as a Secondary PSAP answering all transferred 9-1-1 calls from the Holbrook Regional Communications Center (HRCC). The Department then dispatches and responds to each request for service.

Whitman Police is comprised of twenty-six full time officers, six reserve officers, and twenty-one volunteers. The Department has a Chief, Deputy Chief, Lieutenant, seven sergeants, three detectives, one civilian and a part-time matron. The Department normally has three officers on-duty deployed in an East/West zone with Washington Street as the dividing line.

The Department uses two UHF radio frequencies. Coverage of the Town and surrounding operational area is adequate; with in-building coverage for most of the Town. Each radio has the channels of the surrounding agencies for mutual aid. The radio channels are in the “T” Band and will require some flexibility in the future as the FCC makes changes to this spectrum.

The Department CAD is IMC. Each vehicle has a mobile computer using a Verizon air-card. Each officer generates their own case numbers and checks from the mobile computer connected to the IMC - CAD.

The Department has the facilities to handle seven inmates. The Sheriff’s Office will pick up arrestees when possible.

The facility is new and is well laid out. Generator and UPS equipment is adequate. There is some extra room that may be used in a consolidation if required.

2.10.2 Whitman Fire Department

The Whitman Fire Department provides fire services and emergency medical services to the Town of Whitman.

The Department is staffed by twenty fulltime firefighters and seven on-call firefighters. There is one civilian Administrative Assistant. The Department uses one station - Station 1, and has three engines, one ladder truck, one brush unit, and one rescue truck. The Department has three ambulances for EMS service and transport to the hospital. There are normally five Firefighters on-duty on any given day.

The Department has two radio channels which are UHF narrowband; there are three simulcast sites connected with Tait microwave and three satellite receiver sites. Coverage is adequate throughout the operational area; including in-building

coverage for most of the Town. The Department has radio contact with all surrounding Fire agencies and for larger incidents the operations goes to Plymouth County Control for mutual aid incidents, and move-ups.

The Town EOC is located in the second floor of Station 1.

2.10.3 Whitman Police Department Secondary PSAP

The Secondary PSAP operation is currently staffed by a police officer. This officer handles 9-1-1 telephone calls, dispatching units, CJIS/NCIC functions, and all walk-in traffic. It is important to the Town and the Department that an officer is on-duty at the station for security; to handle walk-in complaints, receive newborn babies that are voluntarily abandoned under the Baby Safe Haven law, supervise Custody transfers, and many other reasons. The old seven digit emergency number and new administrative numbers are routed through a telephone response tree.

Table 2-13 displays the available metrics for the Whitman Police Communications Center.

Table 2-13
Whitman Police Call Volume

Activity	2011
Wire-line 9-1-1	2,298
Wireless 9-1-1	
Total 9-1-1 Calls Received	2,298
Administrative/Non-Emergency Telephone Calls	38,752
Police Calls For Service Dispatched	8,985
Police Officer Initiated Calls	2,632

2.10.4 Whitman Fire Alarm Office

All Fire / EMS 9-1-1 calls are routed thru Holbrook Regional Communications Center and dispatched to Fire / Rescue thru a VOC Alert system. An on duty firefighter dispatches the units. The dispatch operation issues run numbers and logs times for the Fire and EMS incidents. The Department uses Firehouse and Filemaker Pro for RMS and reporting purposes. The administrative telephone calls are handled through an Avaya PBX system using a telephone tree.

The Department has a Gamewell alarm system that serves 100 pull box alarms and 80 fixed alarm positions. The Department maintains the cabling required.

The Department facilities while functional is showing some signs of age. If dispatch is to continue in Station 1, a space designed for communications should be developed. Also the space utilized for the dispatch operation is limited and was undergoing some renovation during the survey. The alarm equipment has terminals in the dispatch area but the main equipment is located in another area.

Table 2-14 displays the available metrics for the Whitman Fire Alarm Office.

Table 2-14
Whitman Fire Call Volume

Activity	2011
Wire-line 9-1-1	
Wireless 9-1-1	
Total 9-1-1 Calls Received	1,360
Fire Calls Dispatched	2,890
Emergency Medical Calls Dispatched	180

3 Requirement of an Emergency Communications Systems

The 9-1-1/dispatch consolidation project being considered could have wide reaching effects on public safety operations. This would not just be an improvement in dispatch operations, but a profound realignment of how the departments and communications operations relate to and intercommunicate with one another.

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

Modern public safety communications systems have developed to support the operations of the agencies they serve. Public safety communications systems must function under all conditions. The systems typically perform four basic functions:

- receive and classify calls for assistance;
- support agency operations;
- interagency coordination;
- data systems access.

In order to perform these functions, a variety of systems and procedures are employed. This involves at least two separate areas: Operations and Technology. Since its inception, the 9-1-1 telephone system has become the primary means of communications from the public to the public safety agencies.

Communications center operations involve dispatch protocols, intensive personnel scheduling and management issues, and statistical and records release maintenance. Communications center technology involves the management of the 9-1-1 telephone technology, computer aided dispatch systems, recording systems, radio systems, and other ancillary support systems.

In this section we will describe some of the complex issues involved and identify the requirements and existing standards in order to assure the provision of a high level of service that functions under all conditions. We will also discuss some effective means of managing the communications systems and operations that have been successfully implemented in other locations.

3.1 Communications Center Operations

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

- Police - An extremely high volume of calls typically characterizes police dispatch. Most traffic involves small numbers of units sent to a large number of incidents. There is also a significant amount of officer initiated activity, such as traffic stops, that must be tracked and documented.

Most police agencies do not have sufficient field units; therefore at times police calls for service are being held and prioritized. The officers in the field, rather than the dispatcher, originate a large percentage of the activity. The dispatch work is largely reactive to field operations. This creates a constant, unrelenting requirement for dispatch attention.

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

- EMS - Medical dispatch also usually has a lesser number of calls for service than police. These incidents often involve multiple agencies. While most of the dispatch centers involved in this study currently do not provide medical pre-arrival instructions, medical incidents have become the most time consuming of all for dispatchers. Again, workload is driven by complaints received over the telephone rather than from the field. Transfers from one medical facility to another are an important component of medical dispatch.

While police will have the preponderance of calls statistically, the actual workload for fire and medical can easily equal that of police. In essence, the dispatchers in each of the centers must balance the conflicting needs of these disciplines while attempting to meet differing dispatch procedures for each agency.

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

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

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

Turnover is frequently cited as a problem. The physical work environment is also often a major factor in turnover.

A number of studies have shown there is a correlation between the employees' perception of the adequacy of the physical environmental factors of the workplace and their productivity. Employee perception that the workplace environment is inadequate can result in increased absenteeism, lowered employee satisfaction, decreased productivity, and reduced quality. All of these can contribute to decreased customer satisfaction. The perception that the workplace is inadequate can lead to both psychologically unhealthy employees and a psychologically unhealthy organization.

Operational procedures and standards are an equally important aspect of any public safety communications center. Public safety in each community has evolved, based in large measure, by the standard of service demanded by the community being served. This is especially true of the operations of public safety communications centers. There are, however, a number of recognized standards that can be used as guidelines by governing bodies in establishing the level of service being provided to the community.

The Association of Public Safety Communications Officials, International (APCO); the National Emergency Number Association (NENA), the European Emergency Number Association (EENA) the Commission on Accreditation for Law Enforcement Agencies (CALEA); the National Fire Protection Association (NFPA); the Federal Emergency Management Agency (FEMA), and others have each established various standards and guidelines that provide guidance to public safety agencies on their communications systems and facilities.

The National Emergency Number Association (NENA) promotes research, planning, training and education as well as the technological advancement, availability and implementation of a universal emergency telephone number system (9-1-1). The European Emergency Number Association (EENA) serves as a discussion platform for emergency services, industry and informed citizens with the aim of getting efficient, interoperable and harmonized emergency telecommunications in accordance

with citizens' requirements. NENA has developed a series of technical and operational information and requirements documents focused on the public safety answering point (PSAP) aspects of a public safety communications center. The NENA standards have been adopted as recommendations as appropriate by EENA. One of these is NENA's *Call taking Operational Standard/Model Recommendation* (NENA 56-005).

Standard for answering 9-1-1 Calls Ninety percent (90%) of all 9-1-1 calls arriving at the Public Safety Answering Point (PSAP) shall be answered within ten (10) seconds during the busy hour (the hour each day with the greatest call volume, as defined in the NENA Master Glossary 00-001). Ninety-five (95%) of all 9-1-1 calls should be answered within twenty (20) seconds. The European Union surveys its member states monthly to learn the percentage of calls answered within twenty seconds.

The National Fire Protection Association is an international nonprofit membership organization which develops consensus codes and standards, research, training, and education on fire prevention and public safety. The NFPA's *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems* (NFPA 1221) provides guidance on many public safety communications matters including communications center design and operations. Public safety communications centers and systems must function under all conditions. They must provide the highest degree of reliability feasible in order to assure continuous functionality. The provisions contained in NFPA 1221 when implemented are key aspects of having a reliable, continuously functioning center.

NFPA 1221 establishes that:

- Ninety-five percent of alarms shall be answered within 15 seconds and 99 percent of alarms shall be answered within 40 seconds.
- Ninety-five percent of emergency dispatching shall be completed within 60 seconds.

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

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

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

The State of Massachusetts Standards for Enhanced 9-1-1 (560 CMR 2.0) stipulates:

- Each PSAP shall have sufficient 9-1-1equipped answering positions and staff to ensure that 90% of all 9-1-1 calls are answered in no more than ten seconds during normal peak operating periods.
- 90% of all transfers from primary PSAPs to appropriate secondary, limited secondary and ringing PSAPs shall be initiated within 15 seconds from receipt of call.

A centralized communications center by its nature also becomes the point where the preponderance of public safety statistics are created and compiled. Basic statistics are the numbers of calls for service and response times. An important element to assuring that the system operates as it should is the on-going collection and analysis of system metrics.

3.2 9-1-1 Systems

The concept of a common three digit emergency number (999) was first introduced in London, England in 1937. In the United States, the digits 9-1-1 were chosen by AT&T, then the largest telephone company, in 1968 and the first system was implemented several months later. In 2002, the European Parliament adopted a directive (2002/22/EC) requiring that all member states implement the single European emergency call number "112". There are several other numbers in use worldwide as emergency number reporting systems. A number of the European Union nations have implemented their own emergency number system in addition to 112. As noted above, the United Kingdom uses 999. In Australia, 999 is the number used. In Australia and the United Kingdom as well as a number of other countries, 999 calls are answered by telephone company operators who then connect the caller to the appropriate service. A review of the available data indicates that most emergency number reporting systems are enhanced systems providing information on the callers' number and location. Initially 9-1-1 was used for conventional wired telephone calls. Both 9-1-1 and 112 were expanded to include wireless devices. The first level of service, Basic 9-1-1 automatically connects a person dialing the digits 9-1-1 to an established public

safety answering point using normal telephone service facilities. In 1978 a more sophisticated system, known as Enhanced 9-1-1 was introduced. Enhanced 9-1-1 systems offer a variety of additional features. These features include:

- **Forced Disconnect.** Automatically or manual controls the disconnecting at the PSAP to avoid callers jamming the incoming lines.

- **Idle Trunk Tone.** Provides a tone to the answering operator if the caller has hung up before the call was answered, or if the caller is still on the line and either has not spoken or cannot speak.

- **Called Party Hold.** Enables the answering point to hold the line open even after the caller has hung up.

- **Ring Back.** Used with Called Party Hold, this allows the 9-1-1 operator to ring the number after the calling party has hung up.

- **Automatic Number Identification (ANI).** Displays the calling party's telephone number while the call is in progress. While similar to the Caller Identification Service offered by the telephone companies, ANI has two components, information digits, which identify the class of service], and the calling party telephone number. Because ANI is unrelated to caller ID, the caller's telephone number and line type are captured by ANI equipment even if caller ID blocking is activated.

- **Automatic Location Identification (ALI).** With ALI, the wireline telephone companies' subscriber database is queried using the ANI data and the subscriber name and the physical address for the wired telephones are provided. For wireless telephones, the location information is provided as latitude and longitude.

- **Selective Routing.** With Basic 9-1-1 all 9-1-1 calls from a telephone central office must be routed to the same answering point. With selective routing, calls are routed to the correct answering point based on the individual address. A database, called the Master Street Address Guide, is created and used to route the calls.

Depending on the particular telephone switch and other equipment in use, some of the advance features may not be available. Some of the features may not be required.

3.3 9-1-1 Technology

A complex and multifaceted technology supports any centralized communications center. One of the primary subsystems is the Enhanced 9-1-1 telephone system. The 9-1-1 system consists of two principal parts: the 9-1-1 network that transports the call from the caller to the 9-1-1 center, and the 9-1-1 equipment at the 9-1-1 center. The equipment at the 9-1-1 center or PSAP (Public Safety Answering Point) is commonly referred to as Customer Premises Equipment (CPE).

When the 9-1-1 system was initially developed, the public switched telephone network was circuit-based. In other words, a separate pair of wires was used to transport a call from its point of origin to the nearest telephone switching center or central office. From there, the call was routed to its destination. Depending on the location of the originating and end points, calls might have to be routed through other switching centers before reaching its final destination. This same network architecture is still in use today. In order to assure maximum reliability, separate, dedicated circuits were installed between each switching center and the telephone companies 9-1-1 switch. As the 9-1-1 network evolved, that switch, also known as the 9-1-1 Tandem, functioned as the selective router. The selective router's function is to route an incoming 9-1-1 call to the correct PSAP based on the location of the telephone. Since wired telephones stay in the same location, a specialized data base, known as the Master Street Address Guide (MSAG) is maintained.

The 9-1-1 network was developed more than forty years ago. Since that time, significant technological advances have occurred. Beginning in the late 1980's, wireless enhanced 9-1-1 began to be developed. Because wireless callers are by definition not in a fixed location, a different technology was needed to provide the location of wireless callers in an emergency. In addition, new technology needed to be developed to determine the location of the caller and deliver that information to the proper PSAP. In order to provide the wireless callers location additional data needed to be exchanged with the PSAP on each wireless 9-1-1 call. These new requirements severely strained the existing 9-1-1 network. Because the network was a dedicated network, the cost of replacing it was prohibitive. After extensive research, a network using commonly available data

communications technology was settled upon. The new concept has been labeled “Next Generation 9-1-1” or “NextGen9-1-1”. It will use a private internet, known as the Emergency Services Internet to deliver calls to the PSAP from a variety of sources. While the technology is still evolving and standards are not fully complete, the 9-1-1 network will use digital technology. Telecommunications systems are moving to use digital rather than analog signaling methods. Internet Protocol (IP) is a common format for digital communications. Digitized voice messages can be transmitted using IP or VoIP. VoIP impacts the 9-1-1 system three different ways. First, many newer 9-1-1 systems use IP technology between the telephone switch and the individual workstations. Secondly, VoIP is being viewed as the favored technology to replace the Centralized Automated Message Accounting (CAMA) trunks between the 9-1-1 switch and the 9-1-1 center.

Callers are using VoIP technology to make telephone calls over the internet. VoIP calls interface with the conventional telephone network at the VoIP service provider’s points of presence, which may or may not be in the local community. There are significant issues that must be resolved in order to assure that a 9-1-1 call is routed to the correct PSAP. Current VoIP technology may not provide for the transmission of the caller's physical location along with the voice call. Some VoIP telecommunications service provider networks, however, are not compatible with the existing E-9-1-1 infrastructure. Because this is a new and rapidly evolving technology, many of the details have yet to be resolved. Some VoIP providers are able to provide a level of service similar to enhanced 9-1-1. Others are not able to provide the enhanced features at this time. The Federal Communications Commission has mandated that VoIP telephony providers implement Enhanced 9-1-1 features.

Typically, each 9-1-1 center or PSAP (public safety answering point) is equipped with its own 9-1-1 switch. Also known as an ANI/ALI controller, this is the equipment that provides the Automatic Number Identification (ANI) and Automatic Location Information (ALI) to the dispatchers. Because the data is transmitted over the same channel as the voice call, there is inherent delay in connecting the voice portion of the call to the 9-1-1 operator.

In the past few years, 9-1-1 Customer Premises Equipment (CPE) has featured the integration of the telephone and computer. Modern 9-1-1 customer premise equipment is computer based and integrates several different applications. Most suppliers of the integrated workstation include “instant recall recorders” and integrated Telecommunications Device for the Deaf (TDD) for communications with hearing and speech impaired callers as standardized options. Depending on the option and the vendor, some of the options are included at no additional charge, and some are relatively low cost. By using the replay recorder and TDD included with the telephone, the 9-1-1 center can avoid having to purchase separate, expensive pieces of equipment. In addition to the integration of the functions, operation is significantly easier. The US Department of Justice has interpreted the Americans with Disabilities Act (ADA) legislation to mean that each 9-1-1 position must be equipped with a device capable of communicating with the hearing and speech impaired 9-1-1 caller. The Justice Department has further held that any silent 9-1-1 call arriving at a PSAP must be interrogated to make sure it is not a TDD call.

As 9-1-1 CPE becomes increasingly computer-based, the use of a standard digital protocol has become more important. The Transmission Control Protocol/Internet Protocol (TCP/IP) or IP has become the standard for digital communications. Many commercial telephone systems are now IP-based. There is a concerted effort to develop the standards for the next generation of the emergency number network, both in North America and Europe. That network will be able to accept and deliver to the PSAP inputs from a wide variety of devices. While the definition of the next generation is still a work in progress, it is known that it will be IP based. For that reason, it is critical that new 9-1-1 CPE be IP capable so that it is ready for the change when it occurs.

The development of wireless enhanced 9-1-1 has placed additional demands on the PSAP’s. Wireless 9-1-1 calls require that the 9-1-1 equipment be capable of receiving two ten digit telephone numbers as well as location information expressed as latitude and longitude. Many older 9-1-1 systems are not capable of fulfilling that requirement. In addition, the PSAP needs some form of computer-based mapping system to be able to rapidly convert the location information to a dispatchable address. In addition, the 9-1-1 equipment must allow the telecommunicator to refresh the ALI information in order to obtain the wireless callers location.

Wireless enhanced 9-1-1 service has presented significant challenges to the communications industry. Not only is there the PSAP equipment issues noted above, the provision of accurate caller location information within acceptable ranges has been especially controversial. Two different technologies are in use to provide caller location information. The technology deployed by the wireless service providers using CDMA technology uses the Global Positioning System. The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 24 satellites. A GPS receiver is placed in each handset and uses the signals from the satellites to calculate the handset’s location. A GPS receiver must be locked on to the signal of at least three satellites to calculate a two dimensional position (latitude and longitude) and track movement. With four or more

satellites in view, the receiver can determine the user's three dimensional position (latitude, longitude and altitude). Currently, the technology deployed in wireless networks only determines the latitude and longitude.

GPS location identification is not available for wireless systems using Global System for Mobile Communications (GSM). GSM systems must use network-based technology. There are several different ways that the network-based technology works. The essence is that the location of the caller is determined by differences in the signal at multiple towers. The more towers that receive the signal, the more accurate the location information will be.

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

The telephone hardware must also be sized to accommodate a centralized center's workload. Often this will require an expansion of the 9-1-1 switch subsystem or replacement of the entire 9-1-1-switch subsystem.

3.4 Geographic Information System (GIS)

Governmental entities are finding that computerized Geographic Information Systems (GIS) are a valuable tool to identify streets, boundaries, infrastructure elements, and property information, and other location based information. GIS is rapidly become a valuable tool for public safety agencies in general and public safety dispatch centers in particular.

While location information from wired telephones is typically provide in tabular form, location information from mobile devices, such as cellular telephones and automatic vehicle location systems, is typically provided as geographic coordinates (latitude and longitude). As noted above, there is a need for computerized mapping in order to convert the latitude and longitude information into a format that can be used by the dispatchers. While there are some relatively inexpensive mapping programs available, they generally are not suitable for public safety purposes. The accuracy of the programs can be problematic. In addition, the programs are generally not designed to work in a networked environment. The result is that these programs generally are not sufficiently reliable for public safety operations.

Integrating the dispatch centers' needs with a high quality GIS can provide many benefits for the public safety community. As noted above, many governmental agencies are finding multiple ways to use GIS. They also finding that sharing information between agencies can reap many benefits. For example, information on the public water supply can also be very useful to the fire departments. Jurisdictional boundary information is essential in determining the proper response. Information on new streets and developments is essential for a prompt emergency response. With a GIS, the data is shown in a series of selectively displayed layers. Only the relevant layers are displayed for the user. Since the creation of an accurate base map is an essential and time consuming activity, many communities are finding that the sharing of the base map to be an effective strategy.

The implementation of a shared GIS can significantly improve the accuracy and reliability of the dispatch process when combined with Enhanced 9-1-1 and other technology such as an Automatic Vehicle Location System. An interface between the Enhanced 9-1-1 system and the GIS sends the location information to the GIS. The GIS, functioning as the CAD Geofile, described later, quickly verifies the location and provides the recommended response. The map display feature can be especially helpful when the caller or the call taker is unfamiliar with the location. Because location information from wireless 9-1-1 callers is received as geographic coordinates, the map display is essential in converting that information into a dispatchable address.

The GIS can also be of great value in supporting crime and event analysis, especially if the GIS is also interfaced with the Records Management System (RMS). The GIS can correlate information on various types of incidents and provide a visual display, plotted on a map to improve analysis. Further discussion on Records Management Systems is included later in this section.

Many emergency communications centers must maintain multiple data bases in order to provide all of the required information. Keeping the various databases coordinated is a major challenge.

3.5 Computer Aided Dispatch (CAD)

Currently each of the centers operates its own, separate CAD system. The system verifies the address in the geographic data base and may provide recommendations on response based on the location and nature of the incident. Currently incident information must be entered by each center that will be dispatching resources. Separate databases are maintained.

The geographic database (GEOFILE) can become quite complex as well, due to the differing service disciplines (police, fire, and medical) often with differing jurisdictional boundaries. This results in multiple agencies of similar type within one system. This frequently requires the CAD system to generate different case and run numbers for the same incident. The CAD GEOFILE typically recommends specific units to respond to a given location whereas the MSAG, described earlier, only identifies the address ranges and jurisdictional responsibility. The GEOFILE must remain coordinated with other databases. The CAD must also interface with all computer and records systems that reside downstream from it. Agency records systems should receive direct input from the CAD system for basic elements, such as incident numbers, date and time, location, and investigating officer. More advance CAD systems integrate the GEOFILE with the GIS to reduce duplication and improve accuracy and reliability.

As noted above, location information for wireless 9-1-1 callers is expressed in latitude/longitude coordinates. The CAD must, therefore, be adaptable to latitude/longitude points and translating that to a location in the CAD system. As discussed above, a computerized mapping system is used to plot the location on a map and assist in converting the location information to a dispatchable address.

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

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

AECOM recommends focusing on the functionality as it pertains to dispatch operations. Common CAD functions include:

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

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

3.6 Records Management System (RMS)

The central records function is important to the effective delivery of law enforcement services. A Records Management System (RMS) is an agency-wide system that provides for the storage, retrieval, retention, manipulation, archiving, and viewing of information, records, documents, or files pertaining to law enforcement operations. RMS covers the entire life span of records development—from the initial generation to its completion. As we will discuss in Section 4, one of the identified best practices in emergency dispatch centers is to keep records and measure performance. Modern public safety systems include sophisticated management information systems that can provide invaluable information to officials on trends and historical information. Ideally, the CAD system is interfaced with the agencies RMS to facilitate the transfer of data from the CAD to the RMS and so that the data entered into one system does not have to be reentered into another system.

As it pertains to this report, the RMS is limited to records directly related to law enforcement operations. Such records include incident and accident reports, arrests, citations, warrants, case management, field contacts, and other operations-oriented records. RMS does not address the general business functions of a law enforcement agency, such as budget, finance, payroll, purchasing, and human resources functions. However, because of operational needs, such as the maintenance of a duty roster, law enforcement personnel records and vehicle fleet maintenance records are included within an RMS and ideally are transmitted to the other systems as appropriate. A fully featured RMS typically includes the following functions:

- Calls for service
- Incident reporting
- Investigative case management
- Traffic accident reporting
- Citations
- Field contact
- Civil process
- Orders and restraints
- Permits and licenses
- Equipment and asset management
- Fleet management
- Personnel
- Internal affairs
- Analytical support (crime analysis)

Modern records management systems include the transfer of the CAD information (location, event times, etc.) into the incident report, competed by the investigating officer(s). Information from that report is then entered automatically into a series of searchable indexes (names, addresses, offense type, property, etc.)

Many CAD software vendors offer integrated RMS as an additional product. Typically, the data from the CAD system drives the RMS. As a result, our experience has demonstrated that it is more effective to software from the same vendor or a vendor with a proven interface between the systems.

3.7 Radio System

Because public safety agencies are directly responsible for the protection of life and property, the communications systems they use must be designed with that requirement in mind. The risk elements of, and the danger to, public safety personnel are unpredictable factors that are never precisely foreseeable far in advance. As a result, the systems serving these agencies must be designed to satisfy both normal and peak requirements on an instantaneous, twenty-four hour a day basis. While the systems must maintain the required degree of performance at the least cost, they must guarantee that the system will work as needed to fulfill the agency's responsibilities under all reasonably foreseeable conditions.

Given the critical nature of the public safety function, public safety personnel are dependent on the speed and accuracy of the communications system. The system must have sufficient capacity to allow rapid access to the communications channel when the priority of the particular communications requires. The system must also have sufficient capacity so that, when assigning a detail or call for service, the dispatcher is able to provide all appropriate information to the responding units. This allows the responders to properly plan their actions upon arrival.

An important part of public safety communications, especially law enforcement communications, is the concept of mutual support. Typically each officer maintains awareness of developments in and near his or her assigned area of responsibility by monitoring the dispatch channel and can be prepared to assist other units as necessary.

The system must also have adequate coverage so that communications can occur in all areas as necessary. In urban areas, this includes coverage inside buildings. Because of their construction, coverage inside many larger buildings can be problematic.

A public safety communications system needs to satisfy these minimum functional requirements:

Certainty of communication - This includes requirements for the total coverage of the designated area of responsibility, reliability of equipment, intelligibility, and immediacy. The role of the communications system in the preservation of life and property places high emphasis on these characteristics of the system.

Multiple user monitoring capabilities - The operational procedures of most agencies require that all designated units in a given area monitor the designated communications within that area at all times. This is necessary to assure informed, flexible mutual support as needed.

Discrete, sub-unit channels - Various designated groups and/or activities require communications independent of the basic dispatch channel. Special units or special events require individualized communications, controllable from a field and/or central point, simultaneous to but not interfering with the routine dispatch systems.

Interagency coordination capabilities - Any incident involving more than one responder requires coordination. Coordination cannot occur without communications. This coordination requirement can often be complex and require significant flexibility in the communications system.

While these are the most critical requirements, there are a number of other requirements that must be considered in the evaluation of communications system alternatives. These include cost effectiveness, reliability, maintainability, and operability among others.

3.8 Communications Center Design

Because of the critical functions performed at public safety communications centers, considerable care is required in the location, design and construction of a center. A multitude of factors influence the selection of the most appropriate site for a new critical public safety facility such as a communications center. These factors must be understood at the outset so clear decisions can be made by the governing authorities and for the citizens that the center will serve. The factors generally fall into five major categories: Functional, Natural Conditions, Man-Made Threats, Cost Issues, and Technological.

Functional criteria include evaluation factors such as accessibility, convenience, multiple access points, site size, closeness to redundant facilities, and overall facility diversity/distribution. It is important in this criterion that the idealized site size be determined. This should include both the size of the facility and the site features such as parking, clearances and equipment. Depending on the facility overall size, this may include an early exploration of two-story vs. one story concepts. A site located on a primary road may be scored higher than one located on a secondary route, provided the primary road is easily accessible from a traffic perspective. Routes with frequent traffic jams are generally not desirable. Special events (such as major sporting events, which could prevent access to the site) should also be considered; even if they are not on the final criteria. The location should also be evaluated for the convenience to the employees in terms of commute distance. Locations on primary roads allow the possibility that employees may mass transit. The convenience of location next to population centers and businesses should be evaluated in relation to site visibility and security. Multiple access points are considered important so there can be a separation of public and private vehicular traffic as well as a secondary means to enter/exit the site in emergencies. Sufficient space is needed to provide for adequate set-back for security purposes. Where it is feasible, critical facilities should be set-back a minimum of twenty-five meters, (eighty-three feet) from public roadways. Zoning laws should be reviewed so any restrictions such as tower height and building size and type might be identified. This can be a major hurdle if not identified early in the process.

Natural conditions include all features which impact the site utilization and/or are risks to the continuous operation of a critical facility. Natural waterways particularly navigable waterways or shipping lanes pose risk as a result of the potential for accidental spills, or catastrophic fire or explosion. For these reasons a buffer zone is usually assigned to this feature with a ranking related to the relative distance from the buffer.

Most standards for PSAP's today include criteria intended to discourage locations within flood prone areas. The standard is based on the designated 500-year flood zone designation. In general, no critical facility should be located in this zone and similarly should not be located in basement locations which can be subject to localized flooding. Wetlands pose a similar threat and hazard, while impacting the environmental conditions in the area. This impact can be mitigated but will cause additional site development costs.

Localized drainage patterns are perhaps the most important feature to review in the site selection process. Sites that have poor drainage and or have major surface drainage features like ditches or natural swales would be considered less desirable than sites with high spots and naturally occurring drainage away from the major building location. Adjacent roadways should be lower than the proposed building location.

Wind hazards are hard to evaluate on a localized basis except in rare cases. Hurricanes and tornados effect whole regions and therefore should be identified for mitigation and protection rather than for individual site selection. For example, for facilities designed in Atlantic coastal regions, the maximum wind speed recorded is usually the design condition required for structural and component hardening.

Man-made threats are easily identified and usually impact the selection of sites the most in terms of overall risk. These factors include roadways (particularly interstate highways), freight rail lines, chemical plants (or other industrial manufacturing facilities which handle toxic or explosive products) and military installations. The relative risks and subsequent buffer areas for each of these factors are usually identified by the local emergency management agency.

Major highways and freight line railways pose similar hazards and thus are usually assigned similar buffer zones (usually one mile on either side). Evaluation criteria can be weighed on relative distance from the buffer zones to the proposed site. The recommended protective action zone for some chemicals can exceed ten miles. Sites near nuclear plants are ranked according to the location either inside or outside the evacuation zone. Likewise chemical or other industrial facilities should have a ranking relative to the assigned buffer zone.

The location of potentially hazardous utilities to the project site (such as high voltage electric transmission lines, cross country gas or oil transmission lines) would tend to lower the desirability of the proposed site for a PSAP.

One criterion which is related to an earlier discussion of convenience and accessibility is the fact that these facilities generally should not be highly visible. Due to the critical natural of the function, public access in not crucial and visibility may lead to potential targeting. Likewise, locations next to regular special events or public target buildings should be avoided.

Costs are always a factor when consider prospective sites. This ranges from the acquisition, utilities availability and extension requirements, overall site grading and physical development and offsite improvements including upgrades and provision of redundancies.

Sites that are already owned by the government are usually preferred and often the first evaluated. On the other end of the spectrum here is a site that requires all the acreage to be acquired through condemnation process, resulting in delays and additional service fees. Other options here include property that is donated but may include tax liabilities or restrictive covenants.

Higher ranking for economy is reserved for sites with all utilities including storm water, sanitary sewer, water, power, gas and data/telecommunications already located at or close by the project site. The availability of redundant utilities should also figure into the evaluation criteria. For example, it is desirable to have redundant feeds following diverse routes from the telephone company central office (CO) or from high speed fiber-optic lines provided either by the utility or the locality. Additionally, power availability from two different substations or two separate utilities is desirable. Utilities which must be extended to provide the required redundancy factors for the site are extremely costly and therefore are added to most cost factor evaluations.

Site development costs include overall grading, roads and parking areas. If there is a large amount of site clearing (tree removal) or leveling required to prepare the site for a building pad then costs can escalate. Generally, steep wooded sites fall into this higher cost category. Critical facilities can be constructed on these sites but costs are higher.

Sites for PSAPs should be evaluated on several technological factors. Diversity of power and data/telecommunications is required for all these sites. If this is not possible then other means must be devised to overcome the redundancy issues. This may include additional generators, or microwave communication links. On site utilities such as well water and septic fields may be provided for remote sites. Finally, the site should be evaluated for the line of sight to adjacent structures or natural features which may have microwave towers or transmission sites.

This review may require an option on the property, so that physical access to the site may be permitted. A complete analysis may also include soil test borings on the site to determine geologic and soil conditions on the site. For example, if the site has large rock outcroppings just below the surface, excavation costs will be higher to level the site for a building pad. Soil borings may also reveal conditions which may require supplemental foundations such as pilings or drilled piers. The process of selecting a site for a new communications center should be carefully considered. It is recommended that each criterion be weighted and ranked in a collaborative forum so that an objective scoring can be made for each potential site. This ranking can then be presented to the proper governmental authority knowing that all factors have been considered and the decision process can move forward.

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

- Avoid fixed objects (walls, furniture, etc.) when practical
- Select equipment and peripherals such as displays, keyboards, and computers that can change and move as much as possible
- The infrastructure (data and power cables, etc.) needs to be moveable and reconfigurable
- The space should be as open as possible, and raised flooring and high ceilings should be used
- Adequate equipment room space must be provided
- Extra attention must be focused on electrical grounding

There will need to be a functional back-up center for the primary center. That back-up center needs to be sufficiently geographically separated so that the same event is unlikely to impact both centers. There will also need to be a designated alternate. The Alternate center receives 9-1-1 calls in the event the primary center doesn't answer. Should the primary center become inoperable or need to be evacuated, the alternate center would take over while the back-up center was being active.

AECOM will use the requirements iterated in this section as we assess the current conditions and make our recommendations.

4 Problems and Concerns

The protection of life and property is a high priority for all levels of government in the United States. Based on the needs of their communities, each municipality has developed their own public safety system to meet their specific community needs. Each locality has been diligent in its efforts to provide service to their communities. The localities work collaboratively with each other and provide a high level of service to the communities they serve.

The systems, networks, and dispatch centers generally meet the routine day-to-day needs of the communities; however, there are some concerns about the lack of redundancy in some of the technologies. Public safety systems must function under all conditions. When unusual events occur, the issues and concerns highlighted in this section often significantly limit the ability of the agencies to effectively respond to incidents. The primary purpose of a public safety communications center is to get the correct assistance to the people who need it in the shortest amount of time.

Public safety communications centers generally provide four functions for the agencies and communities they serve:

- **Public Access**. The means and methods that the community uses to accesses the public safety agencies;
- **Command and Control Support**. An agency's capability to direct the actions of its personnel in support of operations;
- **Interagency Coordination**. An agency's ability to inter-operate with other agencies and/or departments through reliable communications;
- **Information Systems Access**. Authorized access to the various local, regional, state, and national information systems.

Each of the dispatch centers have operated as a self-sufficient entity for a long time. Because each locality functions independently, each center has followed a diverse path to meet the needs of their respective communities and its citizens. This diversity presents some challenges in consolidating services. This section will explore the major issues with the current situation and concerns we have identified in moving towards a Regional Emergency Communications Center (RECC). The identification of the issues is based on the interviews we conducted with various agency personnel and on our personal observations.

4.1 FCC UHF T-Band and Narrowband Mandates

As is discussed below the agencies participating in the study are operating on different frequencies with designated interoperational frequencies in place. While being researched in the survey process only one department described having coverage or capacity issues with their current two way radio environment. The sheer number of frequencies becomes an obstacle for consolidation, but the number of frequencies in use, are also accounted for in the staffing levels proposed later in the study.

4.1.1 UHF T-Band

While not an issue directly related to dispatch center consolidation, the Federal Communications Commission's mandates on the Ultra High Frequency (UHF) T-Band and for narrowband compliance will have a significant impact on each of the localities and the public safety agencies involved in this study. All of the agencies use radio channels in the frequency bands that are subject to the FCC narrowbanding order.

Congress has passed legislation to reallocate the 700 MHz D Block to public safety; however, in exchange the public safety users must vacate the T-Band. H.R. 3630 Bill, Middle Class Tax Relief and Job Creation Act of 2012, was signed into law on February 22, 2012. This reallocation of the public safety spectrum within the UHF T-Band (470 – 512 MHz) shall take place no later than nine years after it was signed into law. During this time, the FCC will be creating a system of competitive bidding to grant new initial licenses for the use of the T-Band. All auction proceeds from the competitive bidding system shall be available to make grants to cover relocation costs for the public safety agencies.

There are a total of eight agencies within this study that are currently operating in the T-Band. The agencies include: Bridgewater Police, Duxbury Police, East Bridgewater Fire, East Bridgewater Police, Halifax Police, Kingston Police, Whitman

Fire, and Whitman Police. In addition, Plymouth County Control (PCC) is currently using six mutual aid channels in the T-Band. All BAPERN channels are currently operating in the T-Band as well.

4.1.2 Narrowband Mandate

Narrowbanding is a proceeding to increase spectrum efficiency in the Private Land Mobile Radio (PLMR) bands below 512 MHz .The refarming proceeding, as it became known, introduced major changes in these bands. In the VHF high band, where existing 25-kHz (wideband) channels were spaced at 15 kHz, new narrowband channels were created 7.5 kHz from existing channels. The new channels may only be licensed for bandwidths of 12.5 kHz or less. The FCC also updated the rules to set a fixed deadline for all users to transition to 12.5 kHz operation. The deadline for conversion to 12.5 kHz efficiency is January 1, 2013 for all licensees.

After that date, all licensees in the bands 150-512 MHz must operate at a spectrum efficiency of one voice channel per 12.5 kHz of bandwidth. With its decision to set deadlines for the transition to 12.5 kHz operation, the FCC has provided much-needed clarity to the narrowbanding issue. Agencies may legally continue to operate its existing 25 kHz VHF and UHF systems until 2013, but will eventually face a reduction in bandwidth, which will result in a reduction in coverage. Base, mobile and portable radios capable of narrowband operation are readily available, but tone and voice pagers are not available on a widespread basis at this time. Those pagers capable of narrowband operation are significantly more expensive than the current models. In addition all of the Federal Communications Commission radio licenses must be modified.

This process could be a significant drain on both the scarce financial resources and staff time available over the remaining year. There are six agencies operating in the UHF band that will be affected by the deadline date of January 1, 2013, unless they apply and receive a waiver. Bridgewater Fire Department is in the process of becoming narrowband compliant and has been issued a narrowband emission designator. Halifax Fire Department is narrowband compliant and is licensed with a narrowband emission designator. Kingston Fire Department is narrowband complaint and both channels are licensed with narrowband emission designators. Plympton Fire and Police Departments are narrowband compliant and both channels are licensed with narrowband emission designators.

Interference problems may occur when wideband and narrowband devices are used to communicate on the same channel. When a radio transmits a message from a narrowband radio over a wideband channel, the received audio on the wideband receiver will be soft and low and the audio may not be captured by the wideband receiver. When a wideband radio transmits over a narrowband channel, the audio at the narrowband receiver will be loud and distorted and the audio may not be captured the receiver.

Table 4-1
Primary Frequencies Used

DEPARTMENT	VHF	UHF	UHF T
Bridgewater Fire			
Bridgewater Police			
Duxbury Fire			
Duxbury Police			
East Bridgewater Fire			
East Bridgewater Police			
Halifax Fire			
Halifax Police			
Kingston Fire			
Kingston Police			
Plympton Fire			
Plymouth Police			
Plymouth Fire			
Plympton Police			
Whitman Fire			
Whitman Police			
Plymouth County Control - Fire			
Plymouth County Control - EMS			
SEMLEC			
BAPERN			

FREQUENCY BAND USED

VHF
UHF
UHF - T

4.2 Budgetary Issues

Each of the localities involved in this study is facing unprecedented challenges and financial pressures as each strives to provide services to their community. The amount of funding received from the Commonwealth of Massachusetts has decreased, property values have declined, and the total number of home sales has dropped. Plymouth County did see a 4.7% population growth between years 2000 and 2010; however, the unemployment rate in the County is approximately 8.0%.

As a result of the increasing scarcity of financial resources, each of the dispatch centers has a more difficult time maintaining their existing staffs and keeping their systems functioning. Some of the agencies involved in this study either have never used or no longer use civilian staff for dispatch operations. It is difficult to justify expenditures as governing bodies must make hard choices. As the department's make changes in the services they are able to offer, the dispatch centers may be impacted.

Table 4-2
Current Civilian Personnel and On-Duty Staff

Dispatch Center	FT Authorized	FT Actual	PT Authorized	PT Actual	On Duty Days	On Duty Afternoon	On Duty Nights
Duxbury	5	5	6	6	1	2	1
Halifax	3	3	3	3	1	1	1
Kingston	6	6	0	0	1	1	1
Plympton (State Police)	0	0	0	0	1	1	1
Plymouth Police	9	9	0	0	2	3	1
Plymouth Fire	0	0	0	0	1	1	1
Bridgewater Police (Officer Staffed)	0	0	0	0	1	1	1
Bridgewater Fire (Firefighter Staffed)	0	0	0	0	1	1	1
East Bridgewater Police	3	3	0	0	1	1	1
East Bridgewater Fire (Firefighter Staffed)	0	0	0	0	1	1	1
Whitman Police (Officer Staffed)	0	0	0	0	1	1	1
Whitman Fire (Firefighter Staffed)	0	0	0	0	1	1	1
Total	**26**	**26**	**9**	**9**	**13**	**15**	**12**

Towns of Bridgewater, East Bridgewater, Plymouth Fire and Whitman utilize sworn Police and Fire personnel to perform the dispatch functions

4.3 Interagency Situational Awareness

The eleven dispatch centers have limited, or no ability to monitor the on-going activity at other dispatch centers. All of the agencies operate on their own channels. As a result, one agency is often unaware of events occurring with a neighboring agency / township.

4.3.1 Bridgewater Fire Department

Bridgewater Fire Department (BFD) is a secondary PSAP. All incoming calls are transferred to them by Bridgewater Police, Bridgewater State University Police Department, Massachusetts State Police (MSP), and/or other surrounding agencies. The fire department has the ability to hear all active incoming 9-1-1 calls at the primary PSAP located at the Bridgewater Police Department (BPD) in real time through the building public address (PA) system. BFD has the ability to silence the calls over the PA for HIPPA purposes when civilians are in the dispatch area. This real time audio connectivity into the BPD dispatch center gives BFD the opportunity to dispatch personnel before the call is actually transferred to them. BFD only dispatches fire and EMS calls.

4.3.2 Bridgewater Police Department

Bridgewater Police Department (BPD) is a primary PSAP. All incoming wireline emergency calls within the designated Emergency Service Zone (ESZ) are directly routed to the BPD. All wireless emergency calls are directly routed to the MSP dispatch center in Middleboro, MA and then transferred to either BPD or BFD depending on the nature of the call. BDP only dispatches law enforcement calls.

4.3.3 Duxbury Police Department

Duxbury Police Department (DPD) is a primary PSAP. All incoming wireline emergency calls within the designated ESZ are directly routed to the DPD. All wireless emergency calls are directly routed to the MSP dispatch center then transferred to DPD. DPD dispatches law enforcement, fire, and EMS calls.

4.3.4 East Bridgewater Fire Department

East Bridgewater Fire Department (EBFD) is a secondary PSAP. All incoming emergency calls are transferred to them from East Bridgewater Police Department (EBPD), MSP, and/or other surrounding agencies. EBFD dispatches all fire and EMS calls.

4.3.5 East Bridgewater Police Department

East Bridgewater Police Department (EBPD) is a primary PSAP. All incoming wireline emergency calls within the designated ESZ are directly routed to the EBPD. All wireless emergency calls are directly routed to the MSP dispatch center then transferred to EBPD. EBPD only dispatches law enforcement calls.

4.3.6 Halifax Police Department

Halifax Police Department (HPD) is a primary PSAP. All incoming wireline emergency calls within the designated ESZ are directly routed to the HPD. All wireless emergency calls are directly routed to the MSP dispatch center then transferred to HPD. HPD dispatches law enforcement, fire, and EMS calls.

4.3.7 Kingston Police Department

Kingston Police Department (KPD) is a primary PSAP. All incoming wireline emergency calls within the designated ESZ are directly routed to the KPD. All wireless emergency calls are directly routed to the MSP dispatch center then transferred to KPD. KPD dispatches law enforcement, fire, and EMS calls.

4.3.8 Plymouth Police Department

Plymouth Police Department (PPD) is a primary PSAP. All incoming wireline emergency calls within the designated ESZ are directly routed to PPD. All wireless emergency calls are directly routed to the MSP dispatch center then transferred to PPD. PPD dispatches law enforcement calls.

4.3.9 Plymouth Fire Department

Plymouth Fire Department (PFD) is a secondary PSAP. All incoming emergency calls are transferred to them from Plymouth Police Department (PPD), MSP, and/or other surrounding agencies. PFD dispatches all fire and EMS calls.

4.3.10 Whitman Fire Department

All law enforcement and motor vehicle related incidents are transferred to directly to WPD. If a motor vehicle incident is reported to involve injuries, Holbrook will alert WFD via the VOC to notify them.

4.3.11 Whitman Police Department

Whitman Police Department is a secondary PSAP. All wireline and wireless incoming emergency calls are transferred to them from the Holbrook Regional Communications Center. All fire and EMS related calls are transferred directly to WFD and the HRCC will notify WPD of the activity if warranted. All law enforcement and motor vehicle related incidents are transferred to directly to WPD and then HRCC will call WFD to notify them if warranted.

4.4 Separate Computer Systems

There are four different CAD vendor software's being used in eleven of the dispatch centers that were visited for this study. The predominant CAD software that is deployed throughout the centers is the TriTech IMC CAD software. The Duxbury Police Department is in the process of transitioning from their existing Pamet Systems, Inc. CADServer software to TriTech IMC CAD. The Kingston Police Department uses TriTech IMC CAD for all law enforcement incidents and RedAlert for all fire and EMS incidents. Plymouth Police use Pamet CAD and Plymouth Fire uses Alpine Software. None of the existing CAD systems are interfaced with each other and are not able to share data.

There are several RMS software packages that are being actively deployed throughout the 14 agencies in this study. The following RMS software is being utilized throughout the agencies: TriTech IMC Law, TriTech IMC Fire, Firehouse, FileMaker Pro, RedAlert, AmbuPro, and Pamet Systems, Inc. PoliceServer.

4.5 Use of Control Stations

The seven localities use repeaters and voter/comparators in order to cover their jurisdictions. Each of the repeaters is located at a site remote from the dispatch center. The majority of the centers use control stations to access the repeaters. While this solution does work, it is not the recommended approach in order to provide the reliability normally associated with public safety radio systems. Industry standard practices recommend that the dispatch center have both the ability to control the remote repeater and to preempt other units. Using a control station essentially makes the dispatch center another mobile unit without priority access. Fiber and/or microwave connectivity systems may provide a 99.999% reliability that is suggested for all public safety operations.

4.6 Dispatch Center Assessment

Each of the dispatch centers discussed in this report were visited and documented during the assessment period of this report. During our site visits, AECOM assessed and rated each center on twenty-one different attributes. The results are described below. As shown in Table 4-3, each of the centers has areas that need improvement.

Table 4-3
Dispatch Center Assessment

Dispatch Center	Dispatch Center Size	Dispatch Center Condition	Equipment Area Size	Equipment Room Condition	Expansion Capacity	Radio Console System	CAD System	CPE System	PBX/Admin Tlephones	Furniture	Lighting	HVAC	Reliability	Generator	UPS	Back-Up Provision	Maintainability	Parking	Internal Facilities	Security	Mapping
Bridgewater Fire	F	F	P	P	P	F	G	N	G	P	G	G	G	G	F	G	G	F	G	P	G
Bridgewater Police	G	G	F	F	G	F	G	G	G	F	G	G	F	G	G	G	G	F	G	G	G
Duxbury Police	G	G	P	P	P	F	G	G	G	P	G	G	G	G	G	G	G	F	F	F	G
East Bridgewater Fire	G	G	F	P	P	F	N	N	G	P	G	G	G	G	F	G	G	F	G	P	G
East Bridgewater Police	G	G	G	F	F	G	G	G	G	F	G	G	G	G	G	G	G	F	F	G	G
Halifax Police	G	G	F	P	F	F	G	G	G	F	G	G	G	G	F	G	G	F	F	F	G
Kingston Police	G	F	F	P	F	F	G	G	G	F	G	G	G	G	G	G	G	F	F	F	G
Plymouth Police	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G	F	G	G	G
Plymouth Fire	G	G	G	G	P	F	G	G	G	G	G	G	G	G	G	G	G	F	G	F	G
Whitman Fire	F	F	F	G	P	F	N	N	G	P	G	G	G	G	G	G	G	F	G	P	G
Whitman Police	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

P = Poor
F = Fair
G= Good
N= None

4.6.1 Dispatch Center Size

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

- **Bridgewater Fire Department – Fair:** the center has one call-taker/dispatch position and one position that are able to query reports. Space appears to be cramped, especially when additional personnel are in the dispatching area.
- **Bridgewater Police Department – Good:** the center has two call-taker/dispatch positions and one backup call-taker position. Room size is approximately 336 ft^2 and provides plenty of space for staff to move around. The building is planned to be renovated.
- **Duxbury Police Department – Good:** the center has two call-taker positions that share an located in the main dispatch area, and off into an open entry side room is another dispatch capable position that is staffed in case of a nuclear emergency.
- **East Bridgewater Fire Department – Good:** the center has two positions in a Motorola CommandPlus desktop radio console in between them. Room size is approximately 306 ft^2 and provides plenty of space.
- **East Bridgewater Police Department – Good:** The center has two call-taker/dispatch positions. Room size is approximately 216 ft^2 and provides plenty of room to move around.
- **Halifax Police Department – Good:** the center has two call-taker/dispatch positions. Room size is approximately 312 ft^2 and provides plenty of room to move around.
- **Kingston Police Department – Good:** the center has two call-taker/dispatch positions. Room size is approximately 280 ft^2 and provides adequate space for dispatchers to move around.
- **Plymouth Police Department– Good:** the center has four call-taker/dispatch positions. Room size is approximately 400 ft^2 raised flooring that provides adequate space for dispatchers to move around.
- **Plymouth Fire Department– Good:** the center has two call-taker/dispatch positions. Room size is approximately 180 ft^2 and provides adequate space for dispatchers.
- **Whitman Fire Department – Fair:** the center has one call-taker/dispatch position but has another position available to answer phones, dispatch, and or monitor incoming alarms. The room is narrow and does not provide much room for maneuvering around.
- **Whitman Police Department – Good:** the center has two call-taker/dispatch positions. Room size is approximately 513 ft^2 and provides ample room to move around. This room can be rearranged to accept additional call-taker/dispatch positions.

4.6.2 Dispatch Center Condition

The Dispatch Center is neat and clean. The area is organized and the positions are laid out in order to improve communications with each other, and to view security monitors and incoming foot traffic.

- **Bridgewater Fire Department – Fair:** the center is clean but is cluttered with equipment. The positions are able to communicate with each other and are able to see the garage area and incoming foot traffic.
- **Bridgewater Police Department – Good:** the center is neat, clean and organized. The positions are able to communicate with each other, view security monitors, and see incoming foot traffic.
- **Duxbury Police Department – Good:** the center is neat, clean and organized. The positions are able to communicate with each other, view security monitors, and see incoming foot traffic.
- **East Bridgewater Fire Department – Good:** the center is organized, neat and clean. The positions are not placed in the front of the building to see incoming foot traffic; however, it is placed in an area where it is able to look out into the garage at the fire apparatus. The positions are able to view the security monitors.
- **East Bridgewater Police Department – Good:** the center is organized, neat and clean. The two positions are able to interact with each other, view security monitors, and see incoming foot traffic.
- **Halifax Police Department – Good:** the center is clean and organized. The two positions are able to interact with each other, view security monitors, and see incoming foot traffic.
- **Kingston Police Department – Fair:** the center is neat and clean; however, each position is cluttered. The clutter is not the fault of the dispatchers but because of the type of furniture used. The two positions are able to interact with each other, view the security monitors, and see incoming foot traffic.
- **Plymouth Police Department– Good:** the center is organized, neat and clean. The positions are able to interact with each other, view security monitors, and see incoming foot traffic.

- **Plymouth Fire Department– Good:** the center is organized, neat and clean. The positions are able to interact with each other, view security monitors, and see incoming foot traffic.
- **Whitman Fire Department – Fair:** the center is organized. During our site visit the fire fighters were in the process of cleaning and removing the existing flooring because new flooring was scheduled to be installed during that week.
- **Whitman Police Department – Good:** the center is neat, clean and well organized. All call-taker/dispatch positions are optimally positioned to see all incoming foot traffic, view the security monitors, and to share information between the two positions.

4.6.3 Equipment Area Size

- **Bridgewater Fire Department – Poor:** the dispatch area is where all the equipment is housed. If additional equipment is added then space will not be sufficient to handle it. The building is not conducive to act as a modern dispatch and data center. The building was not originally designed and built with the needs of modern day dispatch operations.
- **Bridgewater Police Department – Fair:** the closet that houses the equipment racks for the CAD and towns servers provides adequate space. The rooms that house the CPE, radio, and security equipment is not adequate and the space is tight. No future growth in this area. The National Electrical Code (NEC) requires a minimum of three feet clearance in front of all electrical panels and there are some areas in the equipment room that may be less than this requirement.
- **Duxbury Police Department – Poor:** the CPE equipment is located downstairs in the workout area and is surrounded by exercise machines, benches, and weights. The CAD servers are located inside a closet. The building was not originally designed and built with the needs of modern day dispatch operations.
- **East Bridgewater Fire Department – Fair:** the dispatch area is where all the equipment is housed. The building would be able to handle future equipment space through proper renovations if used as a primary PSAP.
- **East Bridgewater Police Department – Good:** the equipment closet that the CPE equipment is located provides adequate space to house the CPE cabinet, UPS, phone demarc equipment, and by-pass switches. The area that houses the CAD server provides adequate space.
- **Halifax Police Department – Fair:** the sizes of the areas that house the CAD and radio equipment provides enough space to freely move around the equipment for servicing. The area housing the CPE equipment is appears cramped and may present difficulties during maintenance.
- **Kingston Police Department – Fair:** the size of the equipment area that houses the CAD and computer servers is adequate. The area that houses the CPE equipment is tight due to its location in the room.
- **Plymouth Police Department– Good:** the equipment is located in two locations downstairs. The building was designed and built to meet with the needs of modern day police and dispatch operations.
- **Plymouth Fire Department – Good:** the equipment is located downstairs. The building was designed and built for the needs of modern day fire and dispatch operations.
- **Whitman Fire Department – Fair:** the dispatch area is where the equipment is stored within the console furniture. The Emergency Operations Center (EOC) located up stairs has plenty of space around the equipment server cabinet and the closet that the control stations are stored in provides adequate space. Without building renovations, there is not an existing area that could handle the equipment needs of a primary PSAP.
- **Whitman Police Department – Good:** the size of Data/Alarm equipment room and the radio equipment room are adequate. Each equipment room can be used to house primary PSAP equipment.

4.6.4 Equipment Area Condition

The equipment area is neat and clean. The equipment is installed in an area that will protect personnel and data assets. The equipment area is designed to extend the longevity of equipment. The equipment room is locked and secured in order to prevent unauthorized access. Access to equipment enclosures is unobstructed. Equipment room provides minimum surge protection, fire protection, and equipment grounding.

- **Bridgewater Fire Department – Poor:** no dedicated equipment area for alarms, CAD, and radio consoles outside of the dispatch area.
- **Bridgewater Police Department – Fair:** equipment room areas are clean; however, there may be some NEC code violations with the amount of space free of obstacles in front of the electrical panels. The equipment area provides grounding and surge protection. No source of alarms or fire protection was observed during survey. Equipment areas were locked and secured.

- **Duxbury Police Department – Poor:** the CPE equipment is surrounded by workout equipment and it not physically protected from being damaged by the exercise equipment or employees. The CAD servers are in a location that prevents unauthorized access; however, the area does not provide adequate grounding and fire protection.
- **East Bridgewater Fire Department – Poor:** no dedicated equipment room area. The equipment that is housed in the dispatch area is neat and clean. Equipment is not properly grounded, area is not completely secure, and the equipment is not properly protected from physical damage.
- **East Bridgewater Police Department – Fair:** the equipment areas are neat, clean, and properly grounded. The CPE equipment room does not have a door that can be locked to prevent unauthorized access. Fire protection was not observed. Access to equipment enclosures is unobstructed.
- **Halifax Police Department – Poor:** the equipment areas are clean. The area is not properly protected from possible flooding and water leaks. Equipment room does not provide adequate fire protection and grounding. Radio and CAD equipment is unobstructed, but the CPE equipment has potential obstructions in the way that could make servicing equipment difficult.
- **Kingston Police Department – Poor:** the CAD servers are located in an office that was surveyed during office hours; therefore, it is difficult to determine if the room is secured and locked in the evenings. Proper fire protection and grounding was not observed in this area. There were no obstructions around the CAD servers. The CPE equipment was located down stairs through a locked door; however, the area has many obstructions and no fire protection.
- **Plymouth Police Department – Good:** the equipment room areas are locked and secured. Access to equipment enclosures is unobstructed. Equipment rooms do provide adequate surge protection and grounding.
- **Plymouth Fire Department – Good:** the equipment room areas are locked and secured. Access to equipment enclosures is unobstructed. Equipment rooms do provide adequate surge protection and grounding. Fire protection system is present.
- **Whitman Fire Department – Good:** the dispatch area has all radios in the room connected to the console.
- **Whitman Police Department – Good:** the equipment room areas are locked and secured. Access to equipment enclosures is unobstructed. Equipment rooms do provide adequate surge protection and grounding. No fire protection system was observed during the site visit.

4.6.5 Expansion Capability

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

- **Bridgewater Fire Department – Poor:** current space will not allow for the adequate expansion of operations to handle the personnel and equipment for a regional ECC.
- **Bridgewater Police Department – Good:** if the planned building renovations go through as discussed during or site visit, then there would be plenty of room to handle any additional personnel or equipment as required for a regional ECC.
- **Duxbury Police Department – Poor:** current space will not allow for the adequate expansion of operations to handle the personnel and equipment for a regional ECC. The existing Duxbury Fire Department would provide adequate space to handle a regional ECC if the upstairs area is renovated. The existing equipment room is properly designed to meet the requirements of a proper equipment room.
- **East Bridgewater Fire Department – Poor:** current space will not allow for the adequate expansion of operations to handle the personnel and equipment for a regional ECC.
- **East Bridgewater Police Department – Fair:** while the current equipment and dispatch center sizes are rated ‘Good’ and full-fill the current needs of EBPD, there is the possibility that the building would be able to handle a regional ECC through proper renovations and utilization of space.
- **Halifax Police Department – Fair:** the building has the possibility to handle expansion through proper renovations and utilization of space to become a regional ECC. The potential for expansion is based on physical characteristics of the building and not on any economical data.
- **Kingston Police Department – Fair:** the building has the possibility to handle expansion through proper renovations and utilization of space to become a regional ECC. The current dispatch area space has the possibility to be better utilized with proper furniture. The potential for expansion is based on physical characteristics of the building and not on any economical data.
- **Plymouth Police Department – Good:** the current facility would be able to handle a regional ECC with the least amount of worked required to facilitate such an expansion in two possible existing rooms.

- **Plymouth Fire Department– Poor:** current space will not allow for the adequate expansion of operations to handle the personnel and equipment for a regional ECC.
- **Whitman Fire Department – Poor:** current space will not allow for the adequate expansion of operations to handle the personnel and equipment for a regionalized ECC.
- **Whitman Police Department – Good:** the current facility would be able to handle a regional ECC with the least amount of worked required to facilitate such an expansion.

4.6.6 Radio Console System

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

- **Bridgewater Fire Department – Fair:** the Zetron Model 4010 desktop unit accommodates all the required channels needed and control types used by BFD. To date, this product has not reached its end-of-life.
- **Bridgewater Police Department – Good:** the Orbacom TDM-25 workstation provides an easy to use GUI interface for the dispatcher and accommodates the required channels used by BPD. To date, this product has not reached its end-of-life.
- **Duxbury Police Department – Fair:** the Zetron Model 4010R desktop unit accommodates all the required channels needed and control types used by DPD. To date, this product has not reached its end-of-life.
- **East Bridgewater Fire Department – Fair:** the Motorola CommandPlus desktop unit can only support 4, 8, or 12 channels. This product currently meets the needs of the EBFD. To date, this product is still being offered but through Gai-Tronics.
- **East Bridgewater Police Department – Good:** the Telex C-SOFT workstation is Internet Protocol (IP) capable. This radio console can use interfaces that allow it to handle PSTN/Phone and APCO P25 radio systems. To date, this product has not reached its end-of-life.
- **Halifax Police Department – Fair:** the Zetron Model 4010 desktop unit accommodates all the required channels needed and control types used by HPD. To date, this product has not reached its end-of-life.
- **Kingston Police Department – Fair:** the Zetron Model 4010R desktop unit accommodates all the required channels needed and control types used by KPD. To date, this product has not reached its end-of-life.
- **Plymouth Police Department – Fair:** the Zetron Model 4010R desktop unit accommodates all the required channels needed and control types used by KPD. To date, this product has not reached its end-of-life.
- **Plymouth Fire Department – Fair:** the Department uses ten year old Motorola MCC5500 consoles
- **Whitman Fire Department – Fair:** the Zetron Model 4010 desktop unit accommodates all the required channels needed and control types used by BFD. To date, this product has not reached its end-of-life.
- **Whitman Police Department – Good:** the Zetron Integrator RD workstation with Series 4020 TDM switched console switch accommodates the current needs of WPD. This console can support P25 Common Air Interface (CAI) standards if needed in the future. To date, this product has not reached its end-of-life.

4.6.7 Computer Aided Dispatch System

The CAD system adequately interfaces and supports the records management system. The dispatchers easily operate the system features. All controls and information readouts are clear and easily understood. The technology makes the dispatch and call taking easier and not more difficult. The system aids the dispatcher and call takers in incident management, time stamping, responding to emergency calls, offers automatic ANI/ALI interface to CPE equipment, event locations, unit selection, mapping, report generation, incident numbering, and other associative needs. Systems shall be designed for single entry and automation when possible to reduce work activities.

- **Bridgewater Fire Department – Good:** BFD uses both TriTech IMC CAD and TriTech IMC Mobile with Verizon Air Cards.
- **Bridgewater Police Department – Good:** BPD uses both TriTech IMC CAD and TriTech IMC Mobile with Verizon Air Cards.
- **Duxbury Police Department – Good:** DPD is currently in the process of transitioning from Pamet Systems, Inc. CADServer software to TriTech IMC CAD and TriTech IMC Mobile with Verizon Air Cards.

- **East Bridgewater Fire Department – None:** EBFD does not currently utilize any CAD software at either the PSAP or in vehicles. They do use RMS systems in its vehicles.
- **East Bridgewater Police Department – Good:** EBPD uses both TriTech IMC CAD and TriTech IMC Mobile with Verizon Air Cards.
- **Halifax Police Department – Good:** HPD uses both TriTech IMC CAD and TriTech IMC Mobile with Verizon Air Cards.
- **Kingston Police Department – Good:** KPD uses TriTech IMC CAD, TriTech IMC Mobile with Verizon Air Cards, and RedAlert CAD. The HADAX Electronics CPE to CAD translator is currently not operating and not allowing an automatic population of the ANI/ALI information into the CAD system.
- **Plymouth Police Department - Good:** PPD uses Pamet CAD and records with Airlink Air Cards.
- **Plymouth Fire Department - Good:** PFD uses Alpine Software CAD and records with Verizon Air Cards for 4 vehicles.
- **Whitman Fire Department – None:** WFD does not currently utilize any CAD software at either the PSAP or in vehicles.
- **Whitman Police Department – Good:** WPD uses both TriTech IMC CAD and TriTech IMC Mobile with Verizon Air Cards.

4.6.8 Customer Premise System

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

- **Bridgewater Fire Department – None:** Calls transferred to BFD come in over a handset and a printer prints the ANI/ALI information.
- **Bridgewater Police Department – Good:** BPD uses the commonwealths provided PLANT/CML VESTA PALLAS switch with Computer Telephony Integrated (CTI) workstations.
- **Duxbury Police Department – Good:** DPD uses the commonwealths provided PLANT/CML VESTA PALLAS switch with Computer Telephony Integrated (CTI) workstations.
- **East Bridgewater Fire Department – None:** Calls transferred to EBFD come in over a handset and a printer prints the ANI/ALI information.
- **East Bridgewater Police Department – Good:** EBPD uses the commonwealths provided PLANT/CML VESTA PALLAS switch with Computer Telephony Integrated (CTI) workstations.
- **Halifax Police Department – Good:** HPD uses the commonwealths provided PLANT/CML VESTA PALLAS switch with Computer Telephony Integrated (CTI) workstations.
- **Kingston Police Department – Good:** KPD uses the commonwealths provided PLANT/CML VESTA PALLAS switch with Computer Telephony Integrated (CTI) workstations.
- **Plymouth Police Department – Good:** PPD uses the commonwealths provided PLANT/CML VESTA PALLAS switch with Computer Telephony Integrated (CTI) workstations.
- **Plymouth Fire Department – Good:** PFD uses the commonwealths provided PLANT/CML VESTA PALLAS switch with Computer Telephony Integrated (CTI) workstations.
- **Whitman Fire Department – None:** Whitman Fire has no CPE equipment
- **Whitman Police Department – None:** Calls transferred to WFD come in over a handset and a printer prints the ANI/ALI information.

4.6.9 PBX/Administrative Telephone System

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

- **Bridgewater Fire Department – Good:** BFD uses a digital PBX with an automated attendant.
- **Bridgewater Police Department – Good:** the administrative telephone lines are integrated into the PLANT/CML VESTA PALLAS equipment cabinet through the Nortel Network BCM 400 call manager unit.
- **Duxbury Police Department – Good:** the administrative telephone lines are integrated into the PLANT/CML VESTA PALLAS equipment cabinet through the Nortel Network BCM 400 call manager unit.
- **East Bridgewater Fire Department – Good:** EBFD uses a digital PBX with an automated attendant.
- **East Bridgewater Police Department – Good:** the administrative telephone lines are integrated into the PLANT/CML VESTA PALLAS equipment cabinet through the Nortel Network BCM 400 call manager unit.

- **Halifax Police Department – Good:** the administrative telephone lines are integrated into the PLANT/CML VESTA PALLAS equipment cabinet through the Nortel Network BCM 400 call manager unit.
- **Kingston Police Department – Good:** the administrative telephone lines are integrated into the PLANT/CML VESTA PALLAS equipment cabinet through the Nortel Network BCM 400 call manager unit.
- **Plymouth Police Department – Good:** the PBX system is provide by the Town and allows intersystem switching and ease of call handling
- **Plymouth Fire Department– Good:** the PBX system is provide by the Town and allows intersystem switching and ease of call handling
- **Whitman Fire Department – Good:** WFD uses a digital PBX with an automated attendant.
- **Whitman Police Department – Good:** WPD uses a digital PBX with an automated attendant.

4.6.10 Dispatch Workstation Furniture

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

- **Bridgewater Fire Department – Poor:** the workstation furniture is not adjustable and space is limited. Equipment and cords are mounted inside and on the furniture.
- **Bridgewater Police Department – Fair:** the workstation furniture is not adjustable but there is space to put equipment and complete tasks.
- **Duxbury Police Department – Poor:** the workstation furniture is not adjustable and there is not much space to store keyboards and mice. Space is limited.
- **East Bridgewater Fire Department – Poor:** the workstation furniture is not adjustable and space limited. Equipment and cords are mounted inside and on the furniture.
- **East Bridgewater Police Department – Fair:** the workstation furniture is not adjustable but provides plenty of space to fit equipment and to complete tasks.
- **Halifax Police Department – Fair:** the workstation furniture is not adjustable, but there is plenty of space to fit equipment and to complete tasks.
- **Kingston Police Department – Fair:** the workstation furniture is not adjustable and space is cluttered, but the furniture allows for mounting radio consoles and cables.
- **Plymouth Police Department – Good:** the department use full featured, articulated Wrightline dispatch furniture
- **Plymouth Fire Department – Good:** the department use full featured, articulated Watson dispatch furniture
- **Whitman Fire Department – Poor:** the workstation furniture is not adjustable and space is limited. Equipment and cords are mounted inside and on the furniture.
- **Whitman Police Department – Good:** the workstation furniture is in good condition and is ergonomic. It is spaced to allow each user sufficient room to operate and complete tasks efficiently.

4.6.11 Lighting

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

- **Bridgewater Fire Department – Good:** the area is lit by overhead lights and natural lighting.
- **Bridgewater Police Department – Good:** the area is lit by overhead lights and natural lighting.
- **Duxbury Police Department – Good:** the area is lit by overhead lights and natural lighting.
- **East Bridgewater Fire Department – Good:** the area is lit by overhead lights and natural lighting.
- **East Bridgewater Police Department – Good:** the area is lit by overhead lights and natural lighting.
- **Halifax Police Department – Good:** the area is lit by overhead lights and natural lighting.
- **Kingston Police Department – Good:** the area is lit by overhead lights and natural lighting.
- **Plymouth Police Department – Good:** the area is lit by overhead lights and natural lighting.
- **Plymouth Fire Department – Good:** the area is lit by overhead lights and natural lighting.
- **Whitman Fire Department – Good:** the area is lit by overhead lights and natural lighting.
- **Whitman Police Department – Good:** the area is lit by overhead lights and natural lighting.

4.6.12 Heating, Ventilating, and Air Condition (HVAC)

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

- **Bridgewater Fire Department – Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient.
- **Bridgewater Police Department – Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient. Equipment areas were cooled.
- **Duxbury Police Department – Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient. Some concerns about the heat generated by the CAD servers and the insufficient air flow in the closet.
- **East Bridgewater Fire Department – Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient.
- **East Bridgewater Police Department – Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient. Equipment areas were cooled.
- **Halifax Police Department – Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient. Equipment areas were cooled.
- **Kingston Police Department – Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient. Equipment areas were cooled.
- **Plymouth Police Department– Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient. Equipment areas were cooled.
- **Plymouth Fire Department– Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient. Equipment areas were cooled.
- **Whitman Fire Department – Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient.
- **Whitman Police Department – Good:** no complaints were about the air temperature or circulation was mentioned. Humidity and temperature was sufficient. Equipment areas were cooled.

4.6.13 Reliability

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

- **Bridgewater Fire Department – Good:** the systems are generally reliable with seldom outages.
- **Bridgewater Police Department – Fair:** the systems are generally reliable with seldom outages. There are no backup provisions for CAD or the message switch.
- **Duxbury Police Department – Good:** the systems are generally reliable with seldom outages. Redundant CAD servers and message switches are deployed.
- **East Bridgewater Fire Department – Good:** the systems are generally reliable with seldom outages.
- **East Bridgewater Police Department – Good:** the systems are generally reliable with seldom outages. Redundant CAD servers and message switches are deployed.
- **Halifax Police Department – Good:** the systems are generally reliable with seldom outages. Redundant virtual CAD servers and message switches are deployed.
- **Kingston Police Department – Good:** the systems are generally reliable with seldom outages. Redundant CAD servers and message switches are deployed.
- **Plymouth Police Department – Good:** the systems are generally reliable with seldom outages. Redundant CAD servers and message switches are deployed.
- **Plymouth Fire Department – Good:** the systems are generally reliable with seldom outages. Redundant CAD servers and message switches are deployed.
- **Whitman Fire Department – Good:** the systems are generally reliable with seldom outages.
- **Whitman Police Department – Good:** the systems are generally reliable with seldom outages.

4.6.14 Generator

The emergency generator for the dispatch center provides adequate support for the operations including the HVAC system.

- **Bridgewater Fire Department – Good:** generator on premise.
- **Bridgewater Police Department – Good:** generator on premise
- **Duxbury Police Department – Good:** generator on premise
- **East Bridgewater Fire Department – Fair:** generator installed inside building and is in need for replacement.
- **East Bridgewater Police Department – Good:** generator on premise
- **Halifax Police Department – Good:** generator on premise.
- **Kingston Police Department – Good:** generator on premise.
- **Plymouth Police Department – Good:** generator on premise.
- **Plymouth Fire Department – Good:** generator on premise.
- **Whitman Fire Department – Good:** generator on premise.
- **Whitman Police Department – Good:** generator on premise.

4.6.15 Uninterruptable Power Supply (UPS)

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

- **Bridgewater Fire Department – Fair:** individual UPS units are used on individual equipment.
- **Bridgewater Police Department – Good:** PowerWare UPS system installed by commonwealth for all CPE related equipment. Individual UPS units installed for other systems.
- **Duxbury Police Department – Good:** PowerWare UPS system installed by commonwealth for all CPE related equipment. Individual UPS units installed for other systems.
- **East Bridgewater Fire Department – Fair:** individual UPS units are used on individual equipment.
- **East Bridgewater Police Department – Good:** PowerWare UPS system installed by commonwealth for all CPE related equipment. Individual UPS units installed for other systems.
- **Halifax Police Department – Good:** PowerWare UPS system installed by commonwealth for all CPE related equipment. Individual UPS units installed for other systems.
- **Kingston Police Department – Fair:** individual UPS units are used on individual equipment.
- **Plymouth Police Department – Good:** PowerWare UPS system installed by commonwealth for all CPE related equipment. Individual UPS units installed for other systems.
- **Plymouth Fire Department – Good:** PowerWare UPS system installed by commonwealth for all CPE related equipment. Individual UPS units installed for other systems.
- **Whitman Fire Department – Good:** PowerWare UPS system installed by commonwealth for all CPE related equipment. Individual UPS units installed for other systems.
- **Whitman Police Department – Good:** PowerWare UPS system installed by commonwealth for all CPE related equipment. Individual UPS units installed for other systems.

4.6.16 Back-Up Provisions

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

- **Bridgewater Fire Department –Good:** backed up by Bridgewater Police.
- **Bridgewater Police Department – Good:** backed up by East Bridgewater Police Department. Act as a backup to Raynham Police Department.
- **Duxbury Police Department – Good:** backed up by Kingston Police Department.
- **East Bridgewater Fire Department – Good:** backed up by East Bridgewater Police.
- **East Bridgewater Police Department –Good:** backed up by West Bridgewater.
- **Halifax Police Department – Good:** backed up by Bridgewater Police Department.
- **Kingston Police Department – Good:** backed up by Duxbury Police Department.

- **Plymouth Police Department – Good:** backed up by Middleboro State Police
- **Plymouth Fire Department – Good:** backed up by Plymouth Police
- **Whitman Fire Department – Good:** backed up by HRCC.
- **Whitman Police Department – Good:** backed up by HRCC.

4.6.17 Maintainability

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

- **Bridgewater Fire Department – Good:** all systems are still in business and parts are available by manufacturer.
- **Bridgewater Police Department – Good:** all systems are still in business and parts are readily available by each manufacturer. The CPE system is maintained by the commonwealth and the CAD system is maintained through a service agreement with TriTech IMC.
- **Duxbury Police Department – Good:** all systems are still in business and parts are readily available by each manufacturer. The CPE system is maintained by the commonwealth and the CAD system is maintained through a service agreement with TriTech IMC.
- **East Bridgewater Fire Department – Good:** all systems are still in business and parts are available by manufacturer.
- **East Bridgewater Police Department – Good:** all systems are still in business and parts are readily available by each manufacturer. The CPE system is maintained by the commonwealth and the CAD system is maintained through a service agreement with TriTech IMC.
- **Halifax Police Department – Good:** all systems are still in business and parts are readily available by each manufacturer. The CPE system is maintained by the commonwealth and the CAD system is maintained through a service agreement with TriTech IMC.
- **Kingston Police Department – Good:** all systems are still in business and parts are readily available by each manufacturer. The CPE system is maintained by the commonwealth and the CAD system is maintained through a service agreement with TriTech IMC.
- **Plymouth Police Department – Good:** all systems are still in business and parts are readily available by each manufacturer. The CPE system is maintained by the commonwealth and the CAD system is maintained through a service agreement.
- **Plymouth Fire Department – Good:** all systems are still in business and parts are readily available by each manufacturer. The CPE system is maintained by the commonwealth and the CAD system is maintained through a service agreement.
- **Whitman Fire Department – Good:** all systems are still in business and parts are available by manufacturer.
- **Whitman Police Department – Good:** all systems are still in business and parts are readily available by each manufacturer. The CPE system is maintained by the commonwealth and the CAD system is maintained through a service agreement with TriTech IMC.

4.6.18 Parking

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

- **Bridgewater Fire Department – Fair:** parking area is well lit but limited parking on the street.
- **Bridgewater Police Department – Fair:** parking area is well lit with ample parking. The parking lot is not secured or fenced off from the general public.
- **Duxbury Police Department – Fair:** parking area is well lit with ample parking. The parking lot is not secured or fenced off from the general public.
- **East Bridgewater Fire Department – Fair:** parking area is well lit with ample parking. The parking lot is not secured or fenced off from the general public.
- **East Bridgewater Police Department – Fair:** parking area is well lit with limited parking. The parking lot is open to all the buildings employees and the EBPD parking area is not secured and fenced off from the general public.
- **Halifax Police Department – Fair:** parking area is well lit with ample parking. The parking lot is not secured or fenced off from the general public.

- **Kingston Police Department – Fair:** parking area is well lit with ample parking. The parking lot is not secured or fenced off from the general public.
- **Plymouth Police Department – Fair:** parking area is well lit with ample parking. The parking lot is not secured or fenced off from the general public.
- **Plymouth Fire Department – Fair:** parking area is well lit with ample parking. The parking lot is not secured or fenced off from the general public.
- **Whitman Fire Department – Fair:** parking area is well lit with ample parking. The parking lot is not secured or fenced off from the general public.
- **Whitman Police Department – Good:** parking area is well lit with ample parking. The parking lot is secured and fenced off from the general public.

4.6.19 Internal Facilities

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

- **Bridgewater Fire Department – Good:** adequate break areas, restrooms, and quiet area for personnel on desk duty.
- **Bridgewater Police Department – Good:** adequate break areas and restrooms. No designated quiet room, but there are areas that officer on desk duty may go.
- **Duxbury Police Department – Fair:** did not observe a sufficient break area during site visit or quiet room. Rest area is conveniently located near the dispatch area.
- **East Bridgewater Fire Department – Good:** adequate break areas, restrooms, and quiet area for personnel on desk duty.
- **East Bridgewater Police Department – Fair:** did not observe a sufficient break area during site visit or quiet room. Rest area is conveniently located near the dispatch area.
- **Halifax Police Department – Fair:** did not observe a sufficient break area during site visit or quiet room. Rest area is conveniently located near the dispatch area.
- **Kingston Police Department – Fair:** Did not observe a sufficient break area during site visit or quiet room. Rest area is conveniently located near the dispatch area.
- **Plymouth Police Department – Good:** adequate break areas and restrooms. No designated quiet room, but there are adjacent office areas that dispatcher on desk duty may go.
- **Plymouth Fire Department – Good:** adequate break areas and restrooms. No designated quiet room, but there are areas that firefighter on desk duty may go.
- **Whitman Fire Department – Good:** adequate break areas, restrooms, and quiet area for personnel on desk duty.
- **Whitman Police Department – Good:** adequate break areas, restrooms, and quiet area for personnel on desk duty.

4.6.20 Security

The dispatch center is designed with controlled access to the Center using locked doors and closed circuit cameras for entrance controls. The exterior of the facility is well lighted and secure. Where a communications center has windows, the Windows shall be a minimum of 4 ft (1.2 m) above floor level and shall be bullet resistive if they are accessible to the general public. Windows that are required to be bullet resistant shall be configured so that they cannot be opened.

- **Bridgewater Fire Department – Poor:** electronic access control system and a surveillance camera system were not observed during the site visit. The Zetron Model 4010 desktop units auxiliary I/O is programmed to electronically control the sally port doors. There is a service window in the entry vestibule that separates the dispatcher from the general public.
- **Bridgewater Police Department – Good:** electronic access control system, surveillance camera system with a video management system, and bullet resistant Kevlar wall panels are installed. Sally ports are electronically controlled in the dispatch center. There is a bullet resistant service window in the entry vestibule that separates the dispatcher from the general public.
- **Duxbury Police Department – Fair:** did not observe an electronic access control system; however, the Zetron Model 4010R auxiliary I/O is programmed to electronically control the sally ports and doors. A surveillance camera system and video management system are installed in the dispatch area. There is a service window in the entry vestibule that separates the dispatcher from the general public.

- **East Bridgewater Fire Department – Poor:** an electronic access control system was not observed but a surveillance camera system and video management system are installed. The windows are not bullet resistant.
- **East Bridgewater Police Department – Good:** A surveillance camera system and video management system are installed. The radio consoles are able to electronically control the front and back door entrances. The window in the communications center is bullet resistant. There are two service windows installed in the vestibule area that separates the dispatcher from the general public.
- **Halifax Police Department – Fair:** an electronic access control system was not observed, but a surveillance camera system and video management system is installed. Windows do not appear to be bullet resistant. There is a service window installed in the vestibule area that separates the dispatcher from the general public. The Zetron Model 4010 desktop units auxiliary I/O is programmed to electronically control the sally ports and main doors.
- **Kingston Police Department – Fair:** an electronic access control system was not observed, but the Zetron Model 4010R desktop unit's auxiliary I/O is programmed to electronically control the main doors and sally ports. A surveillance camera system with video management system is installed. There is a service window installed in the vestibule area that separates the dispatcher from the general public.
- **Plymouth Police Department – Good:** electronic access control system, surveillance camera system, and bullet resistant glass panels are installed. There is a bullet resistant service window in the entry vestibule that separates the dispatcher from the general public. There are always station officer present.
- **Plymouth Fire Department – Fair:** electronic access control system, no surveillance camera system. The window in the dispatch area does not appear to be bullet resistant.
- **Whitman Fire Department – Good:** Station is locked down with an electronic access card system. The dispatcher has to press a button to unlock the door and allow access. The Zetron Model 4010 desktop units auxiliary I/O is not programmed to electronically control doors. The dispatcher is able to electronically control the garage doors via buttons installed on the wall in the dispatch area. The window in the dispatch area does not appear to be bullet resistant.
- **Whitman Police Department – Good:** an electronic access control system, a surveillance camera system and video management system are installed. There is service window installed in the vestibule area that separates the dispatcher from the general public. The Zetron IntegratorRD workstations auxiliary I/O is programmed to electronically control the sally ports and doors.

4.6.21 Mapping

Each call taking and dispatch position has ready access to an integrated computerized mapping system that manages, analyzes, and displays all forms of geographically referenced information or location information in a timely manner.

- **Bridgewater Fire Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **Bridgewater Police Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **Duxbury Police Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **East Bridgewater Fire Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **East Bridgewater Police Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **Halifax Police Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **Kingston Police Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **Plymouth Police Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **Plymouth Fire Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **Whitman Fire Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.
- **Whitman Police Department – Good:** using PLANT/CML Orion Mapstar version 5.2, build 026.

4.7 Interoperability

The public safety agencies involved in the study use radio channels within the UHF / UHF T bands, each agency has installed the radio channels of the other surrounding localities into control stations located at the dispatch center. This is what is commonly referred to as Level 4 Interoperability. This type of interoperability requires the intervention of the dispatcher to patch the systems together; however, there are limitations that may include: (1) limited coverage area, (2) audio transmission only, and/or (3) overloading the channel.

There are interoperability/mutual aid channels assigned in this area to help facilitate interoperability. The fire departments in this study all have access to Plymouth County Control (PCC) for fire incidents, especially incidents involving several other stations. The Boston Area Police Emergency Radio Network (BAPERN) system is currently in the process of being installed in the south east area and will cover Plymouth County. This will allow law enforcement to communicate with the surrounding agencies in their specific division and across the entire greater Boston area. In addition, agencies that are members of Southeast Massachusetts Law Enforcement Council (SEMLEC) communicate over dedicated SEMLEC channels.

4.8 CJIS/NCIC

Criminal justice computer databases permit authorized criminal justice agencies to check for warrants, stolen items, and articles. Integration with other databases also allows for verification of a driver's license status and vehicle registration information. In any consolidation environment, access to this information is critical in performing law enforcement operations.

4.8.1 Legal Responsibility

Information from these systems is used to detain and arrest wanted persons and/or persons in possession of stolen property. The agency that comes into contact with such a person and makes an arrest is depending on the originating agency to have provided accurate information. The liability for false arrest, or improper confiscation of items, rests solely with the agency inputting the data. This information must be accurate and completely up-to-date at all times. Failure to do so may result in an agency being denied access to the system.

4.8.2 Ten-Minute Responses

One of the checks and balances in the system that most directly affects a dispatch operation is the "10-minute response". This can best be described by an example: An officer in Florida stops a vehicle and enters the registration into the system. This particular vehicle has been put into the system as stolen by a member of the Monson Police Department. The computer system will immediately notify the officer in Florida that the vehicle has been reported as stolen by an out-of-state police department. The computer system also notifies the local department immediately that one of its vehicles is being detained in Florida. The local department has 10 minutes to confirm or disaffirm that the vehicle is, in fact, stolen.

This example requires constant attention to the CJIS/NCIC system and immediate access to accurate records. The gravity of this situation is evidenced by the fact that mistakes will cause innocent persons to be arrested. In a consolidated environment, if a dispatcher is unavailable to perform these tasks, then other personnel must be available to perform them. Wide area records computer systems might allow dispatchers to perform this service remotely, but the database information must be impeccably maintained.

4.8.3 Article Entry and Clearing

Items in the system must be entered in specific formats. This applies to persons, warrants, vehicles, guns, and articles. In each department there is a CJIS/NCIC operator that enters, clears, and modifies these items. Personnel who perform this function must be certified by the NCIC and the Commonwealth of Massachusetts. These entry functions should best be done on a 24-hour basis. To the extent that consolidation displaces dispatchers at each PSAP, other personnel must be assigned.

4.8.4 Non-Law Enforcement Agencies

There are provisions in the NCIC organization for non-law enforcement agencies to have access to the system. These agencies are normally non-enforcing criminal justice agencies (NCIC 'N' designator) and/or public safety dispatch agencies (NCIC 'P' designator). These agencies may make inquiries only and not entries or confirmations in the system. They also cannot obtain criminal history record information (CHRI). A consolidated dispatch center should gain access to the system as a public safety dispatch agency.

4.9 Warrants

Mandates by the Federal Bureau of Investigation (FBI), which operates the National Crime Information Center (NCIC), require that “an agency receiving a hit confirmation request should consult the original warrant and/or case file in order to provide the most accurate response.” Currently, each of the primary law enforcement agencies will keep the active warrants in a location that is easily accessible to the dispatch staff twenty-four hours a day. If a dispatch consolidation takes place, provisions will need to be made to assure that the NCIC mandates can be met without unduly creating an additional burden on the agencies or dispatch.

In addition, all entries must periodically be validated. Validation (vehicles, plates, fugitives, missing person entries) requires the entering agency to confirm the record is complete, accurate, and still outstanding or active. This too can be a time consuming process and provisions will need to be made to assure that the validation is accomplished in an acceptable manner.

4.10 Lock-Up Facilities

The Plymouth County Sheriff’s department does pick up detainees from the surrounding law enforcement agencies in this study or the agency will transport their detainee to the Plymouth County Correctional Facility.

Bridgewater Police Department has seven adult male cells, two adult female cells, two juvenile cells, and one processing holding cell. East Bridgewater Police Department has four adult cells and one juvenile cell. Whitman Police Department has six adult male cells, two adult female cells, and two juvenile cells. Kingston Police Department has holding cells for four adult males and two for females/juveniles. Duxbury Police Department has three adult male cells and two adult female cells. Plympton has a single cell. Halifax Police Department does not have holding cells. The detainee pick-ups by the County Sheriff’s Office should continue whether or not there is a consolidation; therefore lock-up provisions are not a major issue in this study.

4.11 Ancillary Duties

All of the agencies’ dispatchers perform a multitude of administrative tasks, and while consolidation will remove these non-9-1-1 functions from the dispatchers, the functions must be satisfied in some other fashion by the agency. The communities in the Old Colony project reflect the fact that dispatchers in the project Towns perform a myriad of duties. None are outside of the norm and are similar to the tasks performed across the nation. Some of these tasks are:

- Administrative telephone calls
- Emergency refuge
- Baby Safe Haven
- Domestic situation and drop off of children for court imposed custody
- Lock-up supervision
- 24/7 209A restraining order processing
- Section 12 processing
- Burning permits, issuance and reporting
- And Others

One of the unfortunate aspects of consolidation efforts is the determination as to who will handle these tasks. The most direct answer is to maintain a desk staff that handles these details and others for the various departments. In the OCPC region this would be performed by one person on each shift or five personnel. These positions could be filled by dispatchers who do not wish to make the transition to a consolidated center. Several of the Towns have voiced that they will maintain an officer on desk duties in any eventual situation. These officers could be tasked with the duties.

5 Analysis of Alternative Solutions

As part of this study, AECOM examined a number of possible alternative solutions to the issues and problems cited by the participants in this study. This section presents the three most logical alternatives. The alternatives included are:

No Consolidation – Maintain Existing Situation
Partial Consolidations
- #1 Duxbury, Halifax, Kingston, Plymouth and Plympton RECC
- #2 Bridgewater East Bridgewater, and Whitman RECC
- #3 Duxbury, Halifax, and Plympton RECC
- #4 Halifax and Plympton RECC
- #5 Duxbury and Plympton RECC
- #6 Halifax, Kingston, and Plympton RECC
- #7 Bridgewater, Halifax, and Plympton RECC
- #8 Duxbury, Kingston, Plymouth, and Plympton RECC

Full Regional Consolidated Communication Center

Each of the alternatives is discussed in terms of the organization, staffing, technology, facility size, and back-up issues. The study also identifies both the advantages and disadvantages of each alternative.

Previous sections of this report addressed the current situation, the requirements for a consolidated center, and the issues and problems currently encountered. The costs associated with each of the alternatives are outlined in Section 6. Section 7 includes AECOM's recommendations.

5.1 Technological Assumptions

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

5.1.1 Interoperability/Interagency Coordination

Each of the dispatch centers currently uses separate channels for law enforcement and fire communications. The agencies dispatched by the centers use radio channels in the VHF, UHF, and 800 MHz frequencies. The use of multiple frequency bands and multiple channels significantly limits interoperability between the agencies. As noted in Section 4, Federal Communications Commission requirements will necessitate a major upgrade to the current systems.

5.1.2 Computer-Aided Dispatch (CAD) System

Computer-Aided Dispatch (CAD) systems allow public safety operations and communications to be augmented, assisted or partially controlled by an automated system. It can include, among other capabilities, computer controlled emergency vehicle dispatching, vehicle status, incident reporting, and management information.

Most importantly, the CAD tracks the status of incidents and public safety units and recommends units to assign to the call. All aspects of a CAD system must be optimized for rapid response and system reliability. Since time is of the essence, the CAD system must accurately provide a data and time stamp for every activity. Properly designed and implemented CAD systems increase the accuracy and reliability of the public safety dispatch process. Call processing time is reduced. Case and assignment numbers are created and tracked automatically. CAD systems collect the initial information for an incident and then provide the information to one or more records management systems. The CAD system also supports other activities that assist in the effective use of public safety resources, including shift change roll call, "Be on the lookout" (BOLO) files, and the ability to schedule a call in the future. Currently, each dispatch center operates and maintains its own separate CAD system. The PSAPs use different software vendors and none of the systems are interfaced or interconnected so there is no sharing of data.

5.1.3 Records Management Systems (RMS)

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

Currently there are separate law enforcement RMS systems in use in the Old Colony region. A regional RMS, especially involving the law enforcement agencies, could provide further enhancements in the exchange of information by local law enforcement agencies.

The fire departments are required to participate in the Massachusetts Fire Incident Reporting System (MFIRS). MFIRS is the statewide system for tracking fire-related emergencies. Those fire departments that provide ambulance service must submit reports to the Office of Emergency Medical Services (OEMS). Each individual fire department and ambulance service maintains its own records. These systems are not interfaced with the CAD system.

5.1.4 9-1-1 System

Currently, the 9-1-1 system nationally is in a state of flux. Over the last decade, wireless 9-1-1 has become a reality. Internet telephony is growing. The 9-1-1 network is transitioning from a separate, dedicated, circuit-based infrastructure to one that is digital, using Internet Protocol. The current vision is that the system will migrate to a private Emergency Services Network (ESN). This will allow considerably more flexibility and capabilities than currently exist.

In 1990, the Massachusetts Legislature enacted legislation providing for Enhanced 9-1-1 on a statewide basis. This legislation established the Statewide Emergency Telecommunications Board (SETB) as the state agency responsible for coordinating and administering the implementation of Enhanced 9-1-1 and for promulgating standards to ensure a consistent statewide approach for Enhanced 9-1-1. In 2008, the SETB was changed to the State 9-1-1 Department. The Enhanced 9-1-1 program in Massachusetts is funded by a surcharge on all wire-line and wireless telephones. The State 9-1-1 Department provides funding for the 9-1-1 network as well as the Customer Premises Equipment (CPE). The State 9-1-1 Department also provides training grants. The 2008 legislation also provides for grants for allowable expenses related to enhanced 9-1-1 telecommunicator personnel costs, and the acquisition and maintenance of heat, ventilation and air-conditioning equipment and other environmental control equipment, CAD systems, console furniture, dispatcher chairs, radio consoles, and fire alarm receipt and alert equipment associated with providing enhanced 9-1-1 services. In addition, the grant provides reimbursement to Regional PSAPs and RECCs for allowable expenses related to the acquisition and maintenance of public safety radio systems.

5.1.5 Mapping/Geographic Information System (GIS)

GIS integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information or location information. GIS allows for the display of database information on a visual map. While the GIS does not contain any maps or graphics, it creates maps and graphics from the information contained in the databases.

It does this by displaying information in layers. Some of the layers commonly used in public safety communications centers include streets, pipelines, creeks, railroads, fire hydrants, cell tower locations, municipal boundaries, public safety response districts, and so forth. These layers can be turned on or off as needed.

Some form of computerized mapping became a de facto requirement for PSAPs with the deployment of wireless 9-1-1, since wireless caller location information is received in geographic coordinates (latitude and longitude) rather than specific addresses. As the 9-1-1 network migrates to the next generation, this will be even more critical. Each of the PSAPs has a mapping system installed as part of the 9-1-1 CPE provided by the State 9-1-1 Department. Updates to the maps are provided periodically by the State.

The municipalities in this study each maintain their own GIS system. Maintaining data integrity within each GIS and keeping the data synchronized with other, existing databases, such as the 9-1-1 Master Street Address Guide (MSAG), and the CAD geo-file requires high levels of coordination and is a challenge.

Integration of the GIS with the various other applications and systems is complex and challenging. Ideally, the 9-1-1 call location data, is seamlessly transferred from the 9-1-1 system to the mapping system and then to the CAD system so that the caller's location is displayed as a dispatchable address and entered correctly into CAD call for service form.

5.1.6 Emergency Medical Dispatch

The AECOM staffing recommendations are based on the implementation of an EMD program. EMD calls present challenges because the dispatcher must remain on the telephone with the complainant until responders arrive on the scene. An EMD call requires the full attention of the dispatcher, who cannot be asked to perform any other duties for the duration of the call.

5.1.7 Logging Recorder System

Industry standards require both the continuous recording of emergency telephone conversations and radio transmission for long- term retention, as well as the capability of immediate playback of both recorded telephone and radio traffic.

These recording systems are an indispensable source of information for criminal, fire/EMS, civil, and internal investigations. They enhance agency training and quality assurance programs. The ability to instantly replay a conversation while still recording other calls and radio transmissions can literally be the difference between life and death when a person requesting assistance is not able to repeat their request or the conversation is garbled, or spoken too quickly for easy understanding.

As 9-1-1, telephone, and radio systems become more complex, so do recording systems. In addition, some technologically complex systems may require dedicated recording systems.

Currently, the State 9-1-1 Department provides recorders as part of the 9-1-1 CPE equipment. It is assumed that they will continue to provide the recording systems.

5.2 Maintain Existing Situation – No Consolidation

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

5.2.1 Organization

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

5.2.2 Staffing

The staffing levels would continue as they currently exist. Table 5-1 displays the current authorized staffing levels.

5.2.3 Technology

Each of the dispatch centers will continue to bear the full responsibility for updating and replacing their 9-1-1 system, mapping, radio consoles, dispatch workstation furniture, CAD and RMS systems, and recording system. There will be limited benefits realized by not consolidating. Interchange of information will continue to be less efficient or effective than it could be.

5.2.4 Space

Each of the dispatch centers will continue to operate in their existing facilities. Several of the centers are limited in terms of space, especially in their communications and computer equipment rooms. In order to meet future needs, all nine communities will have to shoulder the cost of any expansion or renovation.

5.2.5 Back-Up

The dispatch centers will continue to have the same back-up provisions as outlined in their existing plans.

Table 5-1
Current CivilianStaffing

	Typical On Duty	Total Personnel
Duxbury	1	11 (6PT)
Halifax	1	3
Kingston	1	6
Plympton	0	0
Plymouth Police	2	9
Plymouth Fire	1	Sworn
Bridgewater PD	1	Sworn
Bridgewater Fire	1	Sworn
East Bridgewater PD	1	3 + Sworn
East Bridgewater Fire	1	Sworn
Whitman PD	1	Sworn
Whitman Fire	1	Sworn

5.3 Partial Consolidations

This option weighs eight different scenarios of partial consolidation between various combinations of communities.

5.3.1 Organization

Within each of the scenarios the combined center would stand alone. The remaining communities not included within the scenario being considered would continue to operate independently, no organizational changes would occur outside of the particular scenario participants. There would need to be a Joint Powers Agreement or Memorandum of Understanding (MOU) between the participating entities covering the details of the operation of the consolidated center.

5.3.2 Staffing

Within the communities not participating, the dispatch staffing levels would continue as they currently exist. For the different scenarios there will be differing levels of staff required. Here also the displays covers both an ‘Independent” organization – where the RECC is free a freestanding governmental agency; and “Hosted” where the RECC is organized and managed by a hosting department. Table 5-2 Independent and Table 5-2 Hosted display the required staffing levels for each of the eight scenarios.

Table 5-2 Independent
Partial Consolidations

Partial Consolidation Centers/PSAP					
Partial Consolidations	**On Duty**	**Dispatchers**	**Supervisors**	**Manager**	**Admin**
Duxbury, Halifax, Kingston, Plymouth and Plympton RECC	6	20	4	1	1
Bridgewater East Bridgewater, and Whitman RECC	3	8	4	1	0
Duxbury, Halifax, and Plympton RECC	4	12	4	1	0
Halifax and Plympton RECC	2	8	1	0	0
Duxbury and Plympton RECC	3	8	4	1	0
Halifax, Kingston, and Plympton RECC	4	12	4	1	0
Bridgewater, Halifax, and Plympton RECC	3	8	4	1	0
Duxbury, Kingston, Plymouth, and Plympton RECC	6	20	4	1	1

Table 5-2 Hosted
Partial Consolidations

Partial Consolidation Centers/PSAP					
Partial Consolidations	**On Duty**	**Dispatchers**	**Supervisors**	**Manager**	**Admin**
Duxbury, Halifax, Kingston, Plymouth and Plympton RECC	6	20	2	0	0
Bridgewater East Bridgewater, and Whitman RECC	3	8	2	0	0
Duxbury, Halifax, and Plympton RECC	4	12	2	0	0
Halifax and Plympton RECC	2	6	0	0	0
Duxbury and Plympton RECC	3	8	2	0	0
Halifax, Kingston, and Plympton RECC	4	12	2	0	0
Bridgewater, Halifax, and Plympton RECC	3	8	2	0	0
Duxbury, Kingston, Plymouth, and Plympton RECC	6	20	4	0	0

5.3.3 Technology

For each of the scenarios, a new set of the major systems (9-1-1 CPE, mapping, CAD, RMS, dispatch consoles, logging recorders, and dispatch workstation furniture) would be required. Some of the options would require a technological and operational change to address the alarm receipt process. Radio systems for each of the scenarios would remain as they are until a more thorough radio study can be done. Anticipated radio sites and channels can only be determined after the coverage area is defined and an FCC agreement has been approved.

5.3.4 Space

Each of the scenarios will require differing amounts of space with adequate, properly air-conditioned space for the shared technology. For planning purposes, the communities should plan on the following space availability for the consolidated center under each option:

#1 Duxbury, Halifax, Kingston, Plymouth and Plympton RECC – 2,600 sq ft
#2 Bridgewater East Bridgewater and Whitman RECC – 1,550 sq ft
#3 Duxbury, Halifax, and Plympton RECC – 1,900 sq ft
#4 Halifax and Plympton RECC – 1,200 sq ft
#5 Duxbury and Plympton RECC – 1,550 sq ft
#6 Halifax, Kingston, and Plympton RECC – 1,900 sq ft
#7 Bridgewater, Halifax, and Plympton RECC – 1,550 sq ft
#8 Duxbury, Kingston, Plymouth, and Plympton RECC – 2,600

5.3.5 Back-Up

Depending on which of the various options are selected, it will be possible to create satisfactory back up arrangements within the Old Colony area. The various partial consolidated RECC's could offer back-up services to each other. The exceptions will be the Duxbury, Kingston, Plymouth, and Plympton scenario which will be too large for a local back arrangement.

5.4 Establish One Full Regional RECC

This option would consolidate the dispatch operations of up to nine communities into a single Regional Emergency Communications Center (RECC).

5.4.1 Organization

A governance structure would need to be determined for the RECC. The governance alternatives are more fully discussed in Section 5.6.

5.4.2 Staffing

The estimated staffing is shown in Table 5-3. The center would require two administrative or management positions, including the RECC manager/9-1-1 coordinator, an operations/training manager, a full-time technical support coordinator and an Administrative Assistant. How do the roles of the RECC manager and the operations/training manager differ? The operations/training manager would be responsible for the day-to-day operation of the center, including staffing, training, and quality assurance, while the technical support coordinator would be responsible for keeping the system and equipment in the dispatch center up to date and functioning properly, as well as maintaining the various data bases used by that center. An Administrative Assistant would also be needed for the center. The center would have a lead dispatcher and eight telecommunicators on duty. If this option were chosen, more detailed staffing analysis would be required to determine the exact number of staff required.

5.4.3 Technology

A new set each of the major systems (9-1-1 CPE, mapping, CAD, RMS, dispatch consoles, logging recorders, and dispatch workstation furniture) would be required. This option would require a technological and operational change to the alarm receipt process. Two operations utilize municipally-owned cable fire and burglar alarm systems and four use either leased lines or wireless alarm systems. These systems are not compatible and the receipt function would need to be relocated to the new center. Radio systems would remain as they are until a more thorough radio study can be done. Anticipated radio sites and channels can only be determined after a coverage area is defined and an FCC agreement has been approved.

5.4.4 Space

In order to accommodate peak workloads and future growth, the center would need to be of sufficient size for thirteen dispatch workstations. While not all of the positions would be required initially, they would be required by the end of the project. Additional space to house the technology, office for supervisory personnel, training space, and auxiliary space such as break rooms, lockers, etc., will be required.

A thirteen position center would require approximately 11,400 square feet of dedicated space along with raised flooring, redundant routing for 9-1-1 and emergency telephone circuits, back-up power supplies, and HVAC systems. Before any facility would be identified or constructed, programming will be required to determine the exact space requirements. There will be space identified for Administration/Support including space for staff support (break rooms, lockers, etc.), building services, as well as offices for administrative personnel. The requirements may be reduced if the dispatch center were located in an existing building where this space could be shared with other building tenants.

5.4.5 Back-Up

In this scenario, the RECC would need to have a back-up facility either outside of the region or utilize an assigned available back-up facility within the region. The NMCOG RECC could also seek back-up from another RECC. The facility should be designed with the capacity to back-up the primary PSAP.

Table 5-3
Full Consolidation

Consolidated Center		
	On Duty	Total
Manager/9-1-1 Coordinator	1	1
Administrative Assistant	1	1
Lead Dispatcher/Shift Supervisor	1	4
Communications Officers	8	32
Total	11	38

5.5 Strengths and Weaknesses of Alternatives

AECOM has investigated a number of alternatives to improve the provision of public safety communications services and public safety services in the Old Colony region. This section briefly discusses the ability of each alternative to meet the needs and requirements of the participating agencies and to address the issues and problems cited.

No Consolidation – Maintain Existing Situation
This alternative has traditionally been the selected option for many communities. Each agency has operated independently and the system has evolved to meet the changing needs. Communities with scarce financial resources do not wish to make significant financial errors. In addition the cost of change can be significant.

Strengths: Retain maximum agency control since each agency is in charge of its own dispatch. Least disruption to current operations and allows most focus on individual communities. Provisions for other dispatch duties would be unchanged. Back-up provisions remain stable.

Weaknesses: The alternative provides no improvement to the current situation. There is significant duplication of equipment since each agency must purchase and maintain its own systems and equipment. There would be no improvement in interagency situational awareness or in interagency communications (interoperability). Also in this scenario the various centers would continue to have difficulty handling large increases in call volume due to a major incident or disaster operation.

Partial Consolidations
This alternative consolidates the technical dispatch systems of particular communities in various combinations; the communities not included in each partial consolidation will remain as is.

Strengths: The public safety agencies of the individual towns involved in the partial consolidation would enhance their interagency and interoperability knowledge within the dispatch center. Future purchases would be simplified and cost savings would be realized in the central processor and software areas. Back-up provisions could be developed in a stable environment.

Weaknesses: For the agencies involved, there will be personnel dislocations and possible reassignments. Provisions to cover the non-dispatch duties now performed by the center's dispatcher would be required. No benefits would be realized for the communities not involved.

Establish One Regional RECC
Here the dispatch operations are combined into a single Regional Emergency Communications Center.

Strengths: This alternative provides the greatest improvement in situational awareness and in interagency communications and coordination. Since the systems would be shared, significant improvements could be realized in the exchange of information between agencies. This alternative provides for the elimination of duplication of personnel, equipment and systems. Training and retention could be improved as well.

Weaknesses: There could be the perception of the loss of agency control in that general policies and procedures would be developed to meet the needs of every community rather than an individual community as now exists. A new facility and new systems and equipment would be required. The location could be inconvenient for some communities. This option will require

a new alarm receipt system. Other non-dispatch duties currently being performed by the dispatchers will be disrupted in the existing centers, possibly requiring additional personnel. Back –up provisions become very difficult, requiring either a dedicated back-up facility or back-up facility outside of the region.

5.6 Governance Alternatives

In addition to determining which alternative will be implemented, the organizational structure and governance of the shared system must be decided, unless the communities choose to maintain the current system. Several different methods of governing a shared emergency communications center and communications system have been used in different localities throughout the Commonwealth of Massachusetts and the nation, with varying degrees of success. These may be categorized into three broad alternatives:

- One existing agency expands its services to include the other agencies' dispatch services (Hosted)
- Co-location of dispatch centers or
- Consolidation into a separate, independent agency (Independent)

Following is a brief discussion of each of the alternatives, including the comparative advantages and disadvantages of each.

5.6.1 Use Existing PSAP (Hosted)

Under this alternative, one of the seven communities that currently provide dispatch services would expand and assume responsibility for providing dispatch services for the other communities. That community would be responsible for the hiring of personnel, establishing policies and procedures, and providing and operating the various systems used by the dispatch center. In some cases where this method is used, the services are included without any charge to the other communities; while in other cases, communities pay a fee to the host community.

5.6.2 Co-location

With a co-location of dispatch services, each of the participating communities would move their dispatchers into a shared location, but would retain full control of their personnel. The facilities and some systems would be shared, but operations and personnel would remain separate. Cost-sharing agreements with each of the participating communities would be required to cover the costs of the facility and the systems, but all operational costs would be paid through each community's budget.

5.6.3 Separate Organization (Independent)

An independent authority focused on the provision of public safety communications would be created through a Joint Powers Agreement (JPA) or Memorandum of Understanding (MOU) under this approach.

Representatives of each participating community would serve on the authority's governing body. The personnel providing dispatch services would be employees of the authority, not employees of the individual communities. This model has been used successfully in a number of consolidations.

5.6.4 Discussion of Governance Alternatives

No two public safety agencies are identical. This is true with the eight towns participating in this study as well as across the Commonwealth, nationally, and worldwide. Among the communities participating in this study, there is a great deal of commonality in how the public safety dispatch services are provided.

While there is some variation between the agencies, there is sufficient commonality so that a shared communications center is feasible. Each of the alternatives identified above would provide improved situational awareness of what each public safety agency was doing, as well as improving interagency communications through the location of dispatch personnel at the same facility.

While the model of consolidating dispatch services under one of the existing agencies would be the simplest to implement, concerns over the ability of the other agencies to influence policies and procedures generally limit the desirability of this

organizational alternative. An unintended consequence with this model is an increase in interagency and intercommunity friction. Personnel from other communities often feel that they come second to personnel from the host community. Another disadvantage is that the public could lose a significant amount of direct contact with the other communities except for the host community. Dispatch employees of the other communities would either transfer to the host community or to other positions in their current community. This could result in significant employee disruption in terms of pay and benefits. Employee seniority could be significantly changed as well.

The second organizational alternative involves each of the existing dispatch operations being relocated into a new, shared facility. Each organization would retain responsibility and control of its own dispatch operations. Common facilities, such as break rooms, lockers, and other facilities would be shared. It could be feasible to share systems as well. Since each of the employees assigned to the dispatch center would remain an employee of their community, there would be no disruption of employee pay and benefits. There could be significant competition between communities for employees, especially given the differences in pay and benefits among the communities. There would be limited opportunity for more effective use of staff resources since each dispatch operation would be independently staffed.

The most common model for a shared communications center is the independent agency model. Under this model, a single agency provides the dispatch services for all the participating communities. An advantage of working within a separate organization is that the perception of bias is minimized. The emergency communications function may become more visible and have increased access within local government. A disadvantage of working within a separate organization is that the emergency communications staff must work to build and maintain rapport with officials from many departments and agencies and avoid becoming isolated. Establishing strong networks is critical in this situation. Another significant disadvantage of the shared center is the perception that each agency would lose a degree of control over its dispatch operations.

Dispatch employees then become employees of the independent agency. This would cause significant disruption to the employees of the existing dispatch centers. Typically, when consolidation occurs, the adopted pay and benefits are at least equal to the highest being paid by the participating communities. Two different approaches are taken to employee seniority. One is that the employees bring their seniority with them; the other is that every employee starts without any seniority. This alternative allows the most flexibility in the use of personnel, requires the fewest number of personnel assigned to dispatch.

With proper training, policies, and procedures, the negative effects of this model can be minimized. Table 5-4 displays these characteristics in graphic form.

Table 5-4
Governance Comparison

Hosted Agency Agencies Contract with Existing Agency		Independent Agency Separate Dispatch Agency Created	
Advantage	**Disadvantage**	**Advantage**	**Disadvantage**
Single Agency Responsibility	Loss of Agency Identity	Single Agency	Major Organizational Restructuring
Minimal Restructuring	Loss of Agency Control	Reduced Management Costs	Loss of Agency Identify
Reduced Management Costs	Limited Operational Input By Other Agencies	More Flexible Use of Staff	Loss of Agency Control
Reduced Employee Competition	Employee Disruption	More Efficient Use of Technology	Multi-Agency Management
Some Service Delivery Improvement		Most Service Delivery Improvement	Most Employee Disruption

Cost information is provided in Section 6 and AECOM recommendations are stated in Section 7.

6 Opinion of Probable Costs

Cost projections were developed for the nine consolidation scenarios addressed in this study. Each projection uses the expected dispatch load of the consolidated center, based on information provided by the participants, to determine the equipment and staffing requirements that are necessary to adequately handle the expected workload. Projected costs for each scenario were developed using the same procedures and inputs, and are presented in the same manner, to allow for easy comparison of each scenario.

The cost information used in these projections has been developed by AECOM from our historical data and vendor pricing on comparable projects, by weight and comparing costs for same or comparable items in our data to derive average costs from competitive bidding. These prices are recommended for planning and budgetary purposes only.

6.1 Cost Elements

6.1.1 Initial Equipment Purchase

The probable costs include equipment necessary for a RECC. Each scenario estimate contains the following equipment items:

- Telephone Equipment (CPE):
  - The equipment necessary to interface with the Enhanced 9-1-1 system is provided by the Commonwealth, and is therefore not included in the cost estimate.
  - Operator position equipment is provided by the Commonwealth, and is therefore not included in the cost estimate.
- Computer Assisted Dispatch (CAD):
  - Hardware and software upgrade for CAD server.
  - New operator equipment and software for each position.
- Radio Console System:
  - New operator equipment and software for each position.
  - Backup control stations for every position.
- Dispatch Console Furniture, including heavy-duty dispatcher chairs.
- Voice Logging Recorder is provided by the Commonwealth.
- Automatic Vehicle Location (AVL):
  - Hardware upgrade/
  - MDT upgrade for radio system users/
  - Software licenses/
- Contingency fund of 10% of the equipment cost.
- Spares.

In each scenario, the type of equipment estimated is the same, but the amount of equipment is tailored to the load and number of dispatch positions projected. Each scenario includes:

- Dispatch positions equal to the number of dispatchers required per shift.
- One fully-featured supervisor’s position.
- One limited-functionality training position.

The estimates assume the equipment will be purchased with a 10-year loan at an interest rate of 1.5%. Repayment of this loan is included in the annual assessment to each agency.

6.1.2 Equipment Replacement

The communities should plan ahead for the eventual replacement of the equipment in the RECC. For planning purposes, this is expressed as a 10-year timeframe. The costs for replacement include an annual inflation of 1.75% in equipment costs. We have accounted for the replacement of systems at the following frequencies:

- PCs & Laptops – 3 year cycle
- Servers & Routers – 5 year cycle
- Software Upgrades – 7 year cycle
- Radio console – 7 year cycle
- Dispatch furniture – 10 year cycle

We recommend that a fund be established for future equipment replacement. We have assumed that it will be an interest bearing account with a 1.50% yield, and that the interest will be used as part of the equipment replacement fund.

The annual cost of this fund is not included in the total annual projected cost for each participant.

6.1.3 Personnel

AECOM analyzed the personnel costs of the existing centers. We used the following methods to determine costs in our estimate:

- Dispatchers - a wage was derived by averaging the wages currently paid by each of the study participants.
- Supervisors - the dispatcher wage was increased by 25%.
- 9-1-1 Director –the supervisor wage was increased by 25%.
- Technician – same rate as supervisor.
- Administrative assistant – the dispatched wage was decreased by 10%.

All employees are assumed to be full-time. To account for fringe benefits and other expenses, actual fringes being paid by the communities was averaged and added to each salary computation.

Two options are presented for each costing analysis; “Independent” and “Hosted”. The Independent option assumes the RECC would be a standalone agency requiring a complete administrative and supervisory staff. The Hosted option assumes that the RECC would be part of one of the existing agencies and much of the supervisory and administrative functions would be performed by the agency.

Every scenario has four equally staffed dispatch shifts. Each shift is composed of the number of dispatchers required by the projected load. Each Independent scenario has a Director, four supervisors, and an administrative assistant. Hosted scenarios generally have two supervisors for the operation.

6.1.4 Operations and Maintenance

These costs address maintenance of the equipment in the dispatch center, and the cost to operate the center.

For maintenance cost projections, we concentrated on the equipment category. For the equipment in the centers we have looked at the predicted capital costs and used a percentage based on experience of 2.5% of the costs per year for maintenance.

Operations costs differ widely from community to community. This difference is partly due to how communities list line items and account to budget the costs associated with providing E9-1-1 services. Additionally, Center Director’s manage and create budgets based upon the size, individual needs, and operational differences across jurisdictions. The existing facilities are in differing conditions, causing operations costs to vary based partially on the age of the center. In these scenarios we are attempting to apply a factor to new facilities with no prior experience in the center. Based on nationwide data for similar facilities, it is AECOM’s opinion that operations costs will be $4.00 per square foot for the facility. We applied this to the differing sizes of the facilities in each of the options, with facility size based upon the number of personnel expected to address the projected load.

6.1.5 Facility

The cost of obtaining and preparing space for the RECC, aside from the installation of the equipment discussed in this study, is not included in any of the calculations.

6.2 Participation Ratio

AECOM has worked with the study participants to develop a model for fairly assessing the costs of the RECC to each participant. This model will provide a starting point for the RECC, and can be updated or replaced as real time operational data of the RECC is obtained.

The projected size, equipment, and staffing requirements of the RECC are driven by call volume data provided by each of the participants. The participation ratio is an attempt to divide the costs between the participants based on how much they contribute to the load on the RECC. This is calculated from two factors, each weighted equally:

- Call volume is a combination of 9-1-1 and radio calls reported by a participant, compared to the sum of the 9-1-1 and radio calls reported by all of the participants in that scenario.
- Population is the population of a participant compared to the sum of populations of all participants in that scenario.

The resultant ratio is expressed as a percentage, and rounded to the nearest percent. The participation ratio is calculated separately for each scenario.

6.3 Grant Funding

To encourage consolidation, the Commonwealth has provided grant funding for each scenario. The grant funding is divided up amongst the participants based on their participation ratios, and subtracted from their annual assessment.

6.4 No Consolidation – Maintain Existing Situation

6.4.1 Staffing

The staffing costs will remain the same as the 2011 Fiscal Year at $1,599,300. This information is a total derived from data provided by all potential participating agencies associated with this needs assessment. Note that Plympton, Bridgewater, East Bridgewater, and Whitman utilize unformed officers as dispatch and their costs did not contribute to this sum.

6.4.2 Maintenance and Operations

This expenditure category includes such expenditure categories as equipment repair and maintenance, office supplies, training and travel, telephone, and similar non-capital expenditures. We have used the same figure as currently budgeted $74,959. Each agency currently uses its own equipment. This would continue as is with all future upgrade and replacement costs borne by each agency individually. Maintenance and Operations budgets were only provided by Halifax and Kingston.

6.4.3 Capital Outlay

No information on capital outlay budgets of the study participants was provided.

6.5 Consolidation Scenarios

Section 6.5 provides the opinion of cost for each scenario, including the probable annual cost to each participant. These values are shown in a series of tables for each scenario:

#.	Participation Ratio for that scenario
#.1	Capital Equipment Costs and the annual payment for a loan to purchase this equipment at 1.5% for ten years
#.2	Annual expected Operations and Maintenance costs
#.3	Annual expected salaries for the Independent and Hosted options
#.4	Annual RECC expected costs with the State Grant applied
#.5Independent	Each participant's total annual expenses for the scenario
#.5Hosted	Each participant's total annual expenses for the scenario

The Communities of Kingston, Whitman, Halifax, and East Bridgewater expect to maintain staff at the Police and/or Fire Headquarters in the event that the RECC was not located in their station. The intent is to staff the station with a records clerk or equivalent position so that the station is not what is known as a "dark station". The estimates for this service are salaries only. The Commonwealth has proposed to provide grants for any equipment needed in this situation. Each community can expect the annual salaries to be $224,700.

In all of these tables, the cost projections and the participation ratios have been rounded to the values shown.

6.5.1 Scenario 1: Duxbury, Halifax, Kingston, Plymouth and Plympton RECC

In this scenario, the communities of Duxbury, Halifax, Kingston, Plymouth and Plympton form a RECC. This scenario in the Independent option includes 20 dispatchers, 4 supervisors, a director, and an administrative assistant. In the Hosted Option there are 20 dispatchers and 2 supervisors. The Commonwealth has offered to provide $496,702 in RECC grants and Support funding if this scenario is realized. The tables below show the projected costs of this center.

Table 6-1

Opinion of Probable Cost

Participation Ratio

Duxbury, Halifax, Kingston, Plymouth and Plympton RECC

Scenario 1

User Agency	Call Volume	Population	Participation Ratio
Duxbury	28,180	15,059	19.5%
Halifax	11,767	7,518	8.8%
Kingston	30,320	12,629	19.1%
Plympton	3,186	2,820	2.8%
Plymouth	48,670	56,468	49.8%
TOTAL	**122,123**	**94,494**	**100%**

Table 6-1-1

Opinion of Probable Cost

Duxbury, Halifax, Kingston, Plymouth and Plympton RECC

Capital Equipment Expenses

Scenario 1

Equipment Cost Elements	Cost Opinion
CAD Systems	$ 753,600
Radio Console	$ 265,500
Dispatch Console Furniture	$ 70,000
Vendor Services	$ 272,300
Spares	$ 21,800
Contingency	$ 108,900
TOTAL	**$ 1,492,100**
Annual Loan Assessment	**$ 79,500**

Table 6-1-2

Opinion of Probable Cost

Duxbury, Halifax, Kingston, Plymouth and Plympton RECC

Annual Operations & Maintenance Expenses

Scenario 1

Cost Element	Cost Opinion
Facility Operations	$ 10,200
Equipment Maintenance	$ 27,200
TOTAL	**$ 37,400**

Table 6-1-3

Opinion of Probable Cost

Duxbury, Halifax, Kingston, Plymouth and Plympton RECC

Annual Salary Expenses

Scenario 1

Staffing Cost Element	Independent	Hosted
Dispatch Staff	$ 998,500	$ 998,508
Supervision	$ 249,600	$ 124,814
Administration	$ 122,900	$ -
Technical	$ 62,400	$ -
TOTAL	**$ 1,433,400**	**$ 1,123,322**

Table 6-1-4

Opinion of Probable Cost

Duxbury, Halifax, Kingston, Plymouth and Plympton RECC

Annual Expenses Participation

Scenario 1

User Agency	Total Annual Assessment Independent	Total Annual Assessment Hosted
Capital Loan Expenses	$ 79,500	$ 79,500
Operating Expenses	$ 37,400	$ 37,400
Annual Salary Expenses	$ 1,433,400	$ 1,123,322
Pre Grant-Total	**$ 1,550,300**	**$ 1,240,222**
State Grant	$ 496,702	$ 496,702
New Annual RECC Budget	**$ 1,053,598**	**$ 743,520**

Table 6-1-5 Independent

Opinion of Probable Cost

Duxbury, Halifax, Kingston, Plymouth and Plympton RECC

Annual Change

Scenario 1

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Duxbury	19.5%	$ 289,190	$ 205,513	$ (83,677)
Halifax	8.8%	$ 324,569	$ 92,670	$ (231,899)
Kingston	19.1%	$ 344,490	$ 201,197	$ (143,293)
Plympton	2.8%	$ -	$ 29,465	$ 29,465
Plymouth	49.8%	$ 546,686	$ 524,753	$ (21,933)
TOTAL	**100%**	**$ 1,504,935**	**$ 1,053,598**	**$ (451,337)**

Table 6-1-5 Hosted

Opinion of Probable Cost

Duxbury, Halifax, Kingston, Plymouth and Plympton RECC

Annual Change

Scenario 1

User Agency	Partiicipation Ratio	2011 Budget	New Allotment	Annual Change
Duxbury	19.5%	$ 289,190	$ 145,030	$ (144,160)
Halifax	8.8%	$ 324,569	$ 65,397	$ (259,172)
Kingston	19.1%	$ 344,490	$ 141,984	$ (202,506)
Plympton	2.8%	$ -	$ 20,793	$ 20,793
Plymouth	49.8%	$ 546,686	$ 370,316	$ (176,370)
TOTAL	**100%**	**$ 1,504,935**	**$ 743,520**	**$ (761,415)**

6.5.2 Scenario 2: Bridgewater, East Bridgewater, and Whitman RECC

In this scenario, the communities of Bridgewater, East Bridgewater, and Whitman form a RECC. This scenario in the Independent option includes 8 dispatchers, 4 supervisors, and a director. In the Hosted Option there are 8 dispatchers and 2 supervisors. The Commonwealth has offered to provide $341,743 annually in grant funding if this scenario is realized. The tables below show the projected costs of this center.

Table 6-2
Opinion of Probable Cost
Participation Ratio
Bridgewater, East Bridgewater and Whitman RECC
Scenario 2

User Agency	Call Volume	Population	Participation Ratio
Bridgewater	21,124	26,563	42%
East Bridgewater	21,403	13,794	31%
Whitman	16,985	14,489	27%
TOTAL	**59,512**	**54,846**	**100%**

Table 6-2-1
Opinion of Probable Cost
Bridgewater, East Bridgewater and Whitman RECC
Capital Equipment Expenses
Scenario 2

Equipment Cost Element	Cost Opinion
CAD Systems	$ 614,300
Radio Console	$ 172,100
Dispatch Console Furniture	$ 46,900
Vendor Services	$ 208,300
Spares	$ 16,700
Contingency	$ 83,300
TOTAL	**$ 1,141,600**
Annual Loan Assessment	**$ 87,900**

Table 6-2-2
Opinion of Probable Cost
Bridgewater, East Bridgewater and Whitman RECC
Annual Operations & Maintenance Expenses
Scenario 2

Cost Element	Cost Opinion
Facility Operations	$ 6,200
Equipment Maintenance	$ 20,800
TOTAL	**$ 27,000**

Table 6-2-3

Opinion of Probable Cost

Bridgewater, East Bridgewater and Whitman RECC

Annual Salary Expenses

Scenario 2

Staffing Cost Element	Independent	Hosted
Dispatch Staff	$ 399,400	$ 399,400
Supervision	$ 249,600	$ 124,800
Administration	$ 78,000	$ -
Technical	$ -	$ -
TOTAL	**$ 727,000**	**$ 524,200**

Table 6-2-4

Opinion of Probable Cost

Bridgewater, East Bridgewater and Whitman RECC

Annual Expenses Participation

Scenario 2

User Agency	Total Annual Assessment Independent	Total Annual Assessment Hosted
Capital Loan Expenses	$ 87,900	$ 87,900
Operating Expenses	$ 27,000	$ 27,000
Annual Salary Expenses	$ 727,000	$ 524,200
Pre Grant-Total	**$ 841,900**	**$ 639,100**
State Grant	$ 341,743	$ 341,743
New Annual RECC Budget	**$ 500,157**	**$ 297,357**

Table 6-2-5 Independent

Opinion of Probable Cost

Bridgewater, East Bridgewater and Whitman RECC

Annual Change

Scenario 2

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Bridgewater	42%	$ -	$ 209,884	$ 209,884
East Bridgewater	31%	$ 116,698.00	$ 152,834	$ 36,136
Whitman	27%	$ -	$ 137,438	$ 137,438
TOTAL	**100%**	**$ 116,698.00**	**$ 500,156**	**$ 383,458**

Bridgewater and Whitman use sworn officers for all dispatching; East Bridgewater uses sworn officers for Fire dispatching. Although savings in salaries are not shown, an RECC would return approximately ten police officers and twelve firefighters to field service.

Table 6-2-5 Hosted

Opinion of Probable Cost

Bridgewater, East Bridgewater and Whitman RECC

Annual Change

Scenario 2

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Bridgewater	42%	$ -	$ 124,782	$ 124,782
East Bridgewater	31%	$ 116,698.00	$ 90,864	$ (25,834)
Whitman	27%	$ -	$ 81,711	$ 81,711
TOTAL	**100%**	**$ 116,698.00**	**$ 297,357**	**$ 180,659**

Bridgewater and Whitman use sworn officers for all dispatching; East Bridgewater uses sworn officers for Fire dispatching. Although savings in salaries are not shown, an RECC would return approximately ten police officers and twelve firefighters to field service.

6.5.3 Scenario 3: Duxbury, Halifax, and Plympton RECC

In this scenario, the communities of Duxbury, Halifax, and Plympton form a RECC. This scenario in the Independent option includes 12 dispatchers, 4 supervisors, and a director. In the Hosted Option there are 12 dispatchers and 2 supervisors. The Commonwealth has offered to provide $140,585 in RECC grants and Support funding if this scenario is realized. The tables below show the projected costs of this center.

Table 6-3

Opinion of Probable Cost

Participation Ratio

Duxbury, Halifax, and Plympton RECC

Scenario 3

User Agency	Call Volume	Population	Participation Ratio
Duxbury	28,180	15,059	62.31%
Halifax	11,767	7,518	28.44%
Plympton	3,186	2,820	9.25%
TOTAL	**43,133**	**25,397**	**99%**

Table 6-3-1
Opinion of Probable Cost
Duxbury, Halifax, and Plympton RECC
Capital Equipment Expenses
Scenario 3

Equipment Cost Elements	Cost Opinion
CAD Systems	$ 683,900
Radio Console	$ 218,800
Dispatch Console Furniture	$ 58,500
Vendor Services	$ 240,300
Spares	$ 19,200
Contingency	$ 96,100
TOTAL	**$ 1,316,800**
Annual Loan Assessment	**$ 139,800**

Table 6-3-2
Opinion of Probable Cost
Duxbury, Halifax, and Plympton RECC
Annual Operations & Maintenance Expenses
Scenario 3

Cost Element	Cost Opinion
Facility Operations	$ 7,600
Equipment Maintenance	$ 24,000
TOTAL	**$ 31,600**

Table 6-3-3
Opinion of Probable Cost
Duxbury, Halifax, and Plympton RECC
Annual Salary Expenses
Scenario 3

Staffing Cost Element	Independent	Hosted
Dispatch Staff	$ 599,100	$ 599,100
Supervision	$ 249,600	$ 124,800
Administration	$ 78,000	$ -
Technical	$ -	$ -
TOTAL	**$ 926,700**	**$ 723,900**

Table 6-3-4
Opinion of Probable Cost
Duxbury, Halifax, and Plympton RECC
Annual Expenses Participation
Scenario 3

Item	Total Annual Assessment Independent	Total Annual Assessment Hosted
Capital Loan Expenses	$ 139,800	$ 139,800
Operating Expenses	$ 31,600	$ 31,600
Annual Salary Expenses	$ 926,700	$ 723,900
Pre Grant-Total	**$ 1,098,100**	**$ 895,300**
State Grant	$ 140,585	$ 140,585
New Annual RECC Budget	**$ 957,515**	**$ 754,715**

Table 6-3-5 Independent
Opinion of Probable Cost
Duxbury, Halifax, and Plympton RECC
Annual Change
Scenario 3

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Duxbury	62.31%	$ 289,190	$ 596,665	$ 307,475
Halifax	28.44%	$ 324,569	$ 272,327	$ (52,242)
Plympton	9.25%	$ -	$ 88,523	$ 88,523
TOTAL	**99%**	**$ 613,759**	**$ 957,515**	**$ 343,756**

Table 6-3-5 Hosted
Opinion of Probable Cost
Duxbury, Halifax, and Plympton RECC
Annual Change
Scenario 3

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Duxbury	62%	$ 289,190	$ 470,292	$ 181,102
Halifax	28%	$ 324,569	$ 214,648	$ (109,921)
Plympton	9%	$ -	$ 69,774	$ 69,774
TOTAL	**100%**	**$ 613,759**	**$ 754,715**	**$ 140,956**

6.5.4 Scenario 4: Halifax and Plympton RECC

In this scenario, the communities of Halifax and Plympton form a RECC. This scenario in the Independent option includes 4 dispatchers, 4 supervisors, and a Committee. In the Hosted Option there are 4 dispatchers and 2 supervisors. The Commonwealth has offered to provide $61,565 in RECC grants and Support funding if this scenario is realized. The tables below show the projected costs of this center.

Table 6-4
Opinion of Probable Cost
Participation Ratio
Halifax and Plympton RECC
Scenario 4

User Agency	Call Volume	Population	Participation Ratio
Halifax	11,767	7,518	61%
Plympton	12,500	2,820	39%
TOTAL	**24,267**	**10,338**	**100%**

Table 6-4-1
Opinion of Probable Cost
Halifax and Plympton RECC
Capital Equipment Expenses
Scenario 4

Equipment Cost Elements	Cost Opinion
CAD Systems	$ 544,600
Radio Console	$ 125,400
Dispatch Console Furniture	$ 35,400
Vendor Services	$ 176,300
Spares	$ 14,100
Contingency	$ 70,500
TOTAL	**$ 966,300**
Annual Loan Assessment	**$ 102,600**

Table 6-4-2
Opinion of Probable Cost
Halifax and Plympton RECC
Annual Operations & Maintenance Expenses
Scenario 4

Cost Element	Cost Opinion
Facility Operations	$ 4,700
Equipment Maintenance	$ 17,600
TOTAL	**$ 22,300**

Table 6-4-3
Opinion of Probable Cost
Halifax and Plympton RECC
Annual Salary Expenses
Scenario 4

Staffing Cost Element	Independent	Hosted
Dispatch Staff	$ 199,700	$ 199,700
Supervision	$ 249,600	$ 124,800
Administration	$ 78,000	$ -
Technical	$ -	$ -
TOTAL	**$ 527,300**	**$ 324,500**

Table 6-4-4
Opinion of Probable Cost
Halifax and Plympton RECC
Annual Expenses Participation
Scenario 4

User Agency	Total Annual Assessment Independent	Total Annual Assessment Hosted
Capital Loan Expenses	$ 102,600	$ 102,600
Operating Expenses	$ 22,300	$ 22,300
Annual Salary Expenses	$ 527,300	$ 324,500
Pre Grant-Total	**$ 652,200**	**$ 449,400**
State Grant	$ 61,565	$ 61,565
New Annual RECC Budget	**$ 590,635**	**$ 387,835**

Table 6-4-5 Independent
Opinion of Probable Cost
Halifax and Plympton RECC
Annual Change
Scenario 4

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Halifax	61%	$ 324,569	$ 357,957	$ 33,388
Plympton	39%	$ -	$ 232,678	$ 232,678
TOTAL	**100%**	**$ 324,569**	**$ 590,635**	**$ 266,066**

Table 6-4-5 Hosted
Opinion of Probable Cost
Halifax and Plympton RECC
Annual Change
Scenario 4

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Halifax	61%	$ 324,569	$ 235,049	$ (89,520)
Plympton	39%	$ -	$ 152,786	$ 152,786
TOTAL	**100%**	**$ 324,569**	**$ 387,835**	**$ 63,266**

6.5.5 Scenario 5: Duxbury and Plympton RECC

In this scenario, the communities of Duxbury and Plympton form a RECC. This scenario in the Independent option includes 8 dispatchers, 4 supervisors, and a director. In the Hosted Option there are 8 dispatchers and 2 supervisors. The Commonwealth has offered to provide $90,590 in RECC grants and Support funding if this scenario is realized. The tables below show the projected costs of this center.

Table 6-5
Opinion of Probable Cost
Participation Ratio
Duxbury and Plympton RECC
Scenario 5

User Agency	Call Volume	Population	Participation Ratio
Duxbury	28,180	15,059	87%
Plympton	3,186	2,820	13%
TOTAL	**31,366**	**17,879**	**100%**

Table 6-5-1
Opinion of Probable Cost
Duxbury and Plympton RECC
Capital Equipment Expenses
Scenario 5

Equipment Cost Elements	Cost Opinion
CAD Systems	$ 614,300
Radio Console	$ 172,100
Dispatch Console Furniture	$ 46,900
Vendor Services	$ 208,300
Spares	$ 16,700
Contingency	$ 83,300
TOTAL	**$ 1,141,600**
Annual Loan Assessment	**$ 121,200**

Table 6-5-2
Opinion of Probable Cost
Duxbury and Plympton RECC
Annual Operations & Maintenance Expenses
Scenario 5

Cost Element	Cost Opinion
Facility Operations	$ 6,200
Equipment Maintenance	$ 20,800
TOTAL	**$ 27,000**

Table 6-5-3
Opinion of Probable Cost
Duxbury and Plympton RECC
Annual Salary Expenses
Scenario 5

Staffing Cost Element	Independent	Hosted
Dispatch Staff	$ 399,400.00	$ 399,400
Supervision	$ 249,600.00	$ 124,800
Administration	$ 78,000.00	$ -
Technical	$ -	$ -
TOTAL	**$ 727,000**	**$ 524,200**

Table 6-5-4
Opinion of Probable Cost
Duxbury and Plympton RECC
Annual Expenses Participation
Scenario 5

User Agency	Total Annual Assessment Independent	Total Annual Assessment Hosted
Capital Loan Expenses	$ 121,200	$ 121,200
Operating Expenses	$ 27,000	$ 27,000
Annual Salary Expenses	$ 727,000	$ 524,200
Pre Grant-Total	**$ 875,200**	**$ 672,400**
State Grant	$ 90,590	$ 90,590
New Annual RECC Budget	**$ 784,610**	**$ 581,810**

Table 6-5-5 Independent
Opinion of Probable Cost
Duxbury and Plympton RECC
Annual Change
Scenario 5

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Duxbury	87%	$ 289,190	$ 682,885	$ 393,695
Plympton	13%	$ -	$ 101,725	$ 101,725
TOTAL	**100%**	**$ 289,190**	**$ 784,610**	**$ 495,420**

Table 6-5-5 Hosted
Opinion of Probable Cost
Duxbury and Plympton RECC
Annual Change
Scenario 5

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Duxbury	87%	$ 289,190	$ 506,378	$ 217,188
Plympton	13%	$ -	$ 75,432	$ 75,432
TOTAL	**100%**	**$ 289,190**	**$ 581,810**	**$ 292,620**

6.5.6 Scenario 6: Halifax, Kingston, and Plympton RECC

In this scenario, the communities of Halifax, Kingston, and Plympton form a RECC. This scenario in the Independent option includes 12 dispatchers, 4 supervisors, and a director. In the Hosted Option there are 12 dispatchers and 2 supervisors. The Commonwealth has offered to provide $136,725 in RECC grants and Support funding if this scenario is realized. The tables below show the projected costs of this center.

Table 6-6
Opinion of Probable Cost
Participation Ratio
Halifax, Kingston, and Plympton RECC
Scenario 6

User Agency	Call Volume	Population	Participation Ratio
Halifax	11,767	7,518	29%
Kingston	30,320	12,629	61%
Plympton	3,186	2,820	10%
TOTAL	**45,273**	**22,967**	**100%**

Table 6-6-1

Opinion of Probable Cost

Halifax, Kingston, and Plympton RECC

Capital Equipment Expenses

Scenario 6

Equipment Cost Elements	Cost Opinion
CAD Systems	$ 683,900
Radio Console	$ 218,800
Dispatch Console Furniture	$ 58,500
Vendor Services	$ 240,300
Spares	$ 19,200
Contingency	$ 96,100
TOTAL	**$ 1,316,800**
Annual Loan Assessment	**$ 139,900**

Table 6-6-2

Opinion of Probable Cost

Halifax, Kingston, and Plympton RECC

Annual Operations & Maintenance Expenses

Scenario 6

Cost Element	Cost Opinion
Facility Operations	$ 7,600
Equipment Maintenance	$ 24,000
TOTAL	**$ 31,600**

Table 6-6-3

Opinion of Probable Cost

Halifax, Kingston, and Plympton RECC

Annual Salary Expenses

Scenario 6

Staffing Cost Element	Independent	Hosted
Dispatch Staff	$ 599,100	$ 599,100
Supervision	$ 249,600	$ 124,800
Administration	$ 78,000	$ -
Technical	$ -	$ -
TOTAL	**$ 926,700**	**$ 723,900**

Table 6-6-4
Opinion of Probable Cost
Halifax, Kingston, and Plympton RECC
Annual Expenses Participation
Scenario 6

User Agency	Total Annual Assessment Independent	Total Annual Assessment Hosted
Capital Loan Expenses	$ 139,900	$ 139,900
Operating Expenses	$ 31,600	$ 31,600
Annual Salary Expenses	$ 926,700	$ 723,900
Pre Grant-Total	**$ 1,098,200**	**$ 895,400**
State Grant	$ 136,725	$ 136,725
New Annual RECC Budget	**$ 961,475**	**$ 758,675**

Table 6-6-5 Independent
Opinion of Probable Cost
Halifax, Kingston, and Plympton RECC
Annual Change
Scenario 6

User Agency	Participation Ratio	2011 Budget	Annual Assessment	Annual Change
Halifax	29%	$ 324,569	$ 282,312	$ (42,257)
Kingston	61%	$ 344,490	$ 586,306	$ 241,816
Plympton	10%	$ -	$ 92,859	$ 92,859
TOTAL	**100%**	**$ 669,059**	**$ 961,476**	**$ 292,417**

Table 6-6-5 Hosted
Opinion of Probable Cost
Halifax, Kingston, and Plympton RECC
Annual Change
Scenario 6

User Agency	Participation Ratio	2011 Budget	Annual Assessment	Annual Change
Halifax	29%	$ 324,569	$ 222,764	$ (101,805)
Kingston	61%	$ 344,490	$ 462,639	$ 118,149
Plympton	10%	$ -	$ 73,272	$ 73,272
TOTAL	**100%**	**$ 669,059**	**$ 758,675**	**$ 89,616**

6.5.7 Scenario 7: Bridgewater, Halifax, and Plympton RECC

In this scenario, the communities of Bridgewater, Halifax, and Plympton form a RECC. This scenario in the Independent option includes 8 dispatchers, 4 supervisors, and a director. In the Hosted Option there are 8 dispatchers and 4 supervisors. The Commonwealth has offered to provide $196,759 in RECC grants and Support funding if this scenario is realized. The tables below show the projected costs of this center.

Table 6-7
Opinion of Probable Cost
Participation Ratio
Bridgewater, Halifax, and Plympton RECC
Scenario 7

User Agency	Call Volume	Population	Participation Ratio
Halifax	11,767	7,518	26.5%
Plympton	3,186	2,820	8.2%
Bridgewater	21,124	26,563	65.3%
TOTAL	**36,077**	**36,901**	**99%**

Table 6-7-1
Opinion of Probable Cost
Bridgewater, Halifax, and Plympton RECC
Capital Equipment Expenses
Scenario 7

Equipment Cost Elements	Cost Opinion	
CAD Systems	$	614,300
Radio Console	$	172,100
Dispatch Console Furniture	$	46,900
Vendor Services	$	208,300
Spares	$	16,700
Contingency	$	83,300
TOTAL	**$**	**1,141,600**
Annual Loan Assessment	**$**	**121,200**

Table 6-7-2
Opinion of Probable Cost
Bridgewater, Halifax, and Plympton RECC
Annual Operations & Maintenance Expenses
Scenario 7

Cost Element	Cost Opinion	
Facility Operations	$	6,200
Equipment Maintenance	$	20,800
TOTAL	**$**	**27,000**

Table 6-7-3
Opinion of Probable Cost
Bridgewater, Halifax, and Plympton RECC
Annual Salary Expenses
Scenario 7

Staffing Cost Element	Independent	Hosted
Dispatch Staff	$ 399,400	$ 399,400
Supervision	$ 249,600	$ 249,600
Administration	$ 78,000	$ -
Technical	$ -	$ -
TOTAL	**$ 727,000**	**$ 649,000**

Table 6-7-4
Opinion of Probable Cost
Bridgewater, Halifax, and Plympton RECC
Annual Expenses Participation
Scenario 7

User Agency	Total Annual Assessment Independent	Total Annual Assessment Hosted
Capital Loan Expenses	$ 121,200	$ 121,200
Operating Expenses	$ 27,000	$ 27,000
Annual Salary Expenses	$ 727,000	$ 649,000
Pre Grant-Total	**$ 875,200**	**$ 797,200**
State Grant	$ 196,759	$ 196,759
New Annual RECC Budget	**$ 678,441**	**$ 600,441**

Table 6-7-5 Independent
Opinion of Probable Cost
Bridgewater, Halifax, and Plympton RECC
Annual Change
Scenario 7

User Agency	Participation Ratio	2011 Budget	Annual Assessment	Annual Change
Halifax	26.5%	$ 324,569	$ 179,750	$ (144,819)
Plympton	8.2%	$ -	$ 55,881	$ 55,881
Bridgewater	65.3%	$ -	$ 442,811	$ 442,811
TOTAL	**99%**	**$ 324,569**	**$ 678,441**	**$ 353,872**

Bridgewater uses sworn officers for all dispatching. Although savings in salaries are not shown, an RECC would return approximately five police officers and four firefighters to field service.

Table 6-7-5 Hosted

Opinion of Probable Cost

Bridgewater, Halifax, and Plympton RECC

Annual Change

Scenario 7

User Agency	Participation Ratio	2011 Budget	Annual Assessment	Annual Change
Halifax	26.5%	$ 324,569	$ 159,084	$ (165,485)
Plympton	8.2%	$ -	$ 49,456	$ 49,456
Bridgewater	65.3%	$ -	$ 391,901	$ 391,901
TOTAL	**99%**	**$ 324,569**	**$ 600,441**	**$ 275,872**

Bridgewater uses sworn officers for all dispatching. Although savings in salaries are not shown, an RECC would return approximately five police officers and four firefighters to field service.

6.5.8 Scenario 8: Duxbury, Kingston, Plymouth, and Plympton RECC

In this scenario, the communities of Duxbury, Kingston, Plymouth, and Plympton form a RECC. This scenario in the Independent option includes 20 dispatchers, 4 supervisors, a director, and an administrative assistant. In the Hosted Option there are 20 dispatchers and 4 supervisors. The Commonwealth has offered to provide $459,790 in RECC grants and Support funding if this scenario is realized. The tables below show the projected costs of this center.

Table 6-8

Opinion of Probable Cost

Participation Ratio

Duxbury, Kingston, Plymouth, and Plympton RECC

Scenario 8

User Agency	Call Volume	Population	Participation Ratio
Duxbury	28,180	15,059	19%
Kingston	30,320	12,629	19%
Plymouth	69,844	56,468	59%
Plympton	3,186	2,820	3%
TOTAL	**131,530**	**86,976**	**100%**

Table 6-8-1

Opinion of Probable Cost

Duxbury, Kingston, Plymouth, and Plympton RECC

Capital Equipment Expenses

Scenario 8

Equipment Cost Elements	Cost Opinion
CAD Systems	$ 823,300
Radio Console	$ 312,200
Dispatch Console Furniture	$ 81,500
Vendor Services	$ 304,200
Spares	$ 24,300
Contingency	$ 121,700
TOTAL	**$ 1,667,200**
Annual Loan Assessment	**$ 177,100**

Table 6-8-2

Opinion of Probable Cost

Duxbury, Kingston, Plymouth, and Plympton RECC

Annual Operations & Maintenance Expenses

Scenario 8

Cost Element	Cost Opinion
Facility Operations	$ 10,600
Equipment Maintenance	$ 30,400
TOTAL	**$ 41,000**

Table 6-8-3

Opinion of Probable Cost

Duxbury, Kingston, Plymouth, and Plympton RECC

Annual Salary Expenses

Scenario 8

Staffing Cost Element	Independent	Hosted
Dispatch Staff	$ 998,500	$ 998,500
Supervision	$ 249,600	$ 249,600
Administration	$ 122,900	$ -
Technical	$ 62,400	$ -
TOTAL	**$ 1,433,400**	**$ 1,248,100**

Table 6-8-4

Opinion of Probable Cost

Duxbury, Kingston, Plymouth, and Plympton RECC

Annual Expenses Participation

Scenario 8

User Agency	Total Annual Assessment Independent	Total Annual Assessment Hosted
Capital Loan Expenses	$ 177,100	$ 177,100
Operating Expenses	$ 41,000	$ 41,000
Annual Salary Expenses	$ 1,433,400	$ 1,248,100
Pre Grant-Total	**$ 1,651,500**	**$ 1,466,200**
State Grant	$ 459,790	$ 459,790
New Annual RECC Budget	**$ 1,191,710**	**$ 1,006,410**

Table 6-8-5 Independent

Opinion of Probable Cost

Duxbury, Kingston, Plymouth, and Plympton RECC

Annual Change

Scenario 8

User Agency	Participation Ratio	2011 Budget	Annual Assessment	Annual Change
Duxbury	19%	$ 289,190	$ 230,827	$ (58,363)
Kingston	19%	$ 344,490	$ 223,874	$ (120,616)
Plymouth	59%	$ 546,686	$ 703,257	$ 156,571
Plympton	3%	$ -	$ 33,752	$ 33,752
TOTAL	**100%**	**$ 1,180,366**	**$ 1,191,710**	**$ 11,344**

Table 6-8-5 Hosted

Opinion of Probable Cost

Duxbury, Kingston, Plymouth, and Plympton RECC

Annual Change

Scenario 8

User Agency	Participation Ratio	2011 Budget	Annual Assessment	Annual Change
Duxbury	19%	$ 289,190	$ 194,935	$ (94,255)
Kingston	19%	$ 344,490	$ 189,064	$ (155,426)
Plymouth	59%	$ 546,686	$ 593,907	$ 47,221
Plympton	3%	$ -	$ 28,504	$ 28,504
TOTAL	**100%**	**$ 1,180,366**	**$ 1,006,410**	**$ (173,956)**

6.5.9 Scenario 9: Full Consolidation RECC

In this scenario, all of the study participants – Duxbury, Halifax, Kingston, Plymouth, Plympton, Bridgewater, East Bridgewater, and Whitman - forms a single RECC. This scenario includes 32 dispatchers, 4 supervisors, a director, an administrative assistant, and a technician. AECOM believes this organization is too large to be a “Hosted” agency and has listed this RECC as an ”Independent” organization. The Commonwealth has offered to provide $734,539 annually in grant funding if this scenario is realized. The tables below show the projected costs of this center.

Table 6-9

Opinion of Probable Cost

Participation Ratio

Full Regional Consolidated Communication Center

Scenario 9

User Agency	Call Volume	Population	Participation Ratio
Duxbury	28,180	15,059	12%
Halifax	11,767	7,518	5%
Kingston	30,320	12,629	12%
Plymouth	69,844	56,468	36%
Plympton	3,186	2,820	2%
Bridgewater	21,124	26,563	14%
East Bridgewater	21,403	13,794	10%
Whitman	16,985	14,489	9%
TOTAL	**202,809**	**149,340**	**100%**

Table 6-9-1

Opinion of Probable Cost

Full Regional Consolidated Communication Center

Capital Equipment Expenses

Scenario 9

Equipment Cost Elements	Cost Opinion	
CAD Systems	$	1,032,300
Radio Console	$	452,300
Dispatch Console Furniture	$	126,700
Vendor Services	$	402,800
Spares	$	32,200
Contingency	$	161,100
TOTAL	**$**	**2,207,400**
Annual Loan Assessment	**$**	**211,600**

Table 6-9-2

Opinion of Probable Cost

Full Regional Consolidated Communication Center

Annual Operations & Maintenance Expenses

Scenario 9

Cost Element	Cost Opinion
Facility Operations	$ 14,900
Equipment Maintenance	$ 40,300
TOTAL	**$ 55,200**

Table 6-9-3

Opinion of Probable Cost

Full Regional Consolidated Communication Center

Annual Salary Expenses

Scenario 9

Staffing Cost Element	Independent
Dispatch Staff	$ 1,597,600
Supervision	$ 249,600
Administration	$ 122,900
Technical	$ 62,400
TOTAL	**$ 2,032,500**

Table 6-9-4

Opinion of Probable Cost

Full Regional Consolidated Communication Center

Annual Expenses Participation

Scenario 9

Item	Total Annual Assessment Independent
Capital Loan Expenses	$ 211,600
Operating Expenses	$ 55,200
Annual Salary Expenses	$ 2,032,500
Pre Grant-Total	**$ 2,299,300**
State Grant	$ 734,539
New Annual RECC Budget	**$ 1,564,761**

Table 6-9-5

Opinion of Probable Cost

Full Regional Consolidated Communication Center

Annual Change

Scenario 9

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Duxbury	12%	$ 289,190	$ 187,605	$ (101,585)
Halifax	5%	$ 324,569	$ 84,779	$ (239,790)
Kingston	12%	$ 344,490	$ 183,129	$ (161,361)
Plymouth	36%	$ 546,686	$ 565,272	$ 18,586
Plympton	2%	$ -	$ 27,064	$ 27,064
Bridgewater	14%	$ -	$ 220,652	$ 220,652
East Bridgewater	10%	$ 116,698	$ 154,833	$ 38,135
Whitman	9%	$ -	$ 141,430	$ 141,430
TOTAL	**100%**	**$ 1,621,633**	**$ 1,564,762**	**$ (56,871)**

Bridgewater and Whitman use sworn officers for all dispatching; East Bridgewater uses sworn officers for Fire dispatching. Although savings in salaries are not shown, an RECC would return approximately ten police officers and twelve firefighters to field service.

7 Conclusions and Recommendations

The participants in this study are facing complex decisions concerning how to proceed with their public safety dispatching operations. During the course of this study, we examined several different alternatives. The advantages and disadvantages of each alternative were identified in Section 5. This section of the report is designed to present AECOM's recommendations and to answer the specific questions the study participants asked in the Request for Proposals.

We provide our recommendations in answering the following subsections:

- Should a consolidation take place?
- Who should participate in a consolidation?
- How should it be organized, governed, and staffed?
- How should policies be made and changed?
- What services should it perform?
- What equipment, systems, software and hardware are needed to in the combined center?
- Where should a consolidated center be located?
- How should the shared center be funded?
- What is the timetable for the consolidation to occur?
- What is the cost of a shared center?

Specific questions are addressed in the appropriate subsection.

7.1 Should a Consolidation Take Place?

A public safety Emergency Communications Center (RECC) functions as both the interface between the public and the public safety agencies of the community, and provides coordination and support to those public safety agencies. Co-ordination is required for every situation with more than one public safety responder, regardless of whether or not the responders are all from the same agency. More responders require more coordination, which cannot occur without communications. A number of the participants in this study indicated the lack of overall situational awareness of events occurring in neighboring jurisdictions and the lack of readily available interoperability between agencies is a significant problem in the region. Bringing the existing dispatch centers into the same room will result in significant enhancements to the interagency coordination that is required when more than one agency is responding to an emergency.

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

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

- **AECOM recommends that two shared regional emergency communications centers be created.**

7.2 Who Should Participate in the Regional Emergency Communications Centers?

AECOM has two recommendations to make. This reflects the original scope of work to explore three RECC combinations. After researching over nine different scenarios, we make the following recommendations:

Duxbury, Halifax, Kingston, Plymouth, and Plympton are in close geographic proximity and interact frequently. These five entities make a logical core of a five town Regional Emergency Communications Center (RECC).

Bridgewater, East Bridgewater, and Whitman are also in close geographic proximity and interact frequently. These three entities also make a logical core of a three town Regional Emergency Communications Center (RECC).

Also it is expected that other Towns may later wish to join the RECC and in fact individual participants may wish to leave the organization. The governing body of the RECCs should include formulas for funding requirements should other wish to join later or one of the founding Towns wishes to withdraw. The RECCs will be sized to accommodate known staffing and workloads; any entity wishing to leave or join must recognize the financial impact on the existing members.

- **AECOM recommends that the Towns of Duxbury, Halifax, Kingston, Plymouth, and Plympton form a Regional Emergency Communications Center; and the Towns of Bridgewater, East Bridgewater, and Whitman also form a separate Regional Emergency Communications Center.**

7.3 How Should It Be Organized, Governed, and Staffed?

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

One of the first issues that must be resolved is the governance structure of the shared center. There are a number of models for the governance of a consolidated center. One possibility is for one of the existing agencies to absorb the dispatch operations of the other participants. Another model would be for one agency to run a center, with the other agencies contracting with it for services. The third involves co-location of dispatch centers. Each co-located center operates independently of the other co-located centers. Facilities are shared, but operations are separate. The fourth alternative is an independent center, where a single department or agency provides the dispatch services for all of the participating agencies. These organizational alternatives were discussed in Section 5.

- **Due to the size and complexity of both recommended RECC's, the model that would best serve all of the towns is to create a single independent agency focused on the provision of public safety communications services for the participants for both of the RECCs. A separate entity has been the model of choice in most successful consolidations that we have studied. We envision that the Regional Emergency Communications Centers would be separate governmental authorities. We recommend that a two-tiered governance structure be established to provide oversight of each of the two agencies. This structure would be a Board of Directors and a User Advisory Committee.**

7.3.1 Regional Emergency Communications Center Board of Directors

The Board of Directors for each of the dispatch authorities should be comprised of members from the participating Towns. One member would be appointed by each governmental entity as members of the Board. It is recommended the appointments be made from senior elected or appointed officials, such as the Town Manager. The selection, however, shall be the individual decision of each participating town. This board should be the general policy making authority for the dispatch operations. Its functions should include:

- Entering into contracts
- Acquiring, holding, or disposing of property
- Approval of authority's annual budget and expenditures
- Hiring, employing and terminating dispatch management staff
- Adopting and revising bylaws for its operations as well as the operations of the user advisory committee

7.3.2 User Advisory Committee

The second part of the governance structure is the User Advisory Committee. The User Advisory Committee should consist of senior representatives of the agencies served by each of the RECCs.

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

7.3.3 Emergency Communications Center Director

The Regional Emergency Communications Center Director should be appointed by the Boards of Directors, subject to the advice and consent of the User Advisory Committees. For purposes of efficiency and consistency in management, many of the duties which are outlined to the Board should be delegated to the Director. However, the Board should reserve the right of review and oversight.

The Director should be subject to the following standards:

- The Director should be responsible for managing the day-to-day operations of the center. The bylaws written by the Board should outline the powers bestowed upon the Director.
- Those powers should include, but not be limited to, the rights to hire, terminate, discipline, and manage personnel. However, the Board should reserve the right of review and to overrule a decision by the Director for serious personnel actions.
- The bylaws should specify when the Director may be involuntarily dismissed.

7.3.4 Administrative Staff

The RECC Director should have administrative staff to help manage the centers. The administrative staff should consist of full-time administrative assistants.

7.3.5 Operations Staff

As discussed in Section 5 of this report, AECOM recommends that there be a Shift Supervisor on duty in each RECC twenty-four hours a day. The shift supervisors should be experienced staff members who would be available to provide assistance and support to the staff in the event of questions, as well as ensure smooth running of the RECCs on an around-the clock basis. Staffing in these estimates includes factors such as large volume events (disasters, etc) and normal and planned events. Summer peaks as well as expected growth are also accounted for in the staffing models and recommendations.

The Director should develop standard operating procedures that ensure sufficient answering of incoming emergency calls. Even during peak periods of the day, staff at the communication centers should strive to answer at least 90% of incoming emergency calls within two rings (ten seconds) and complete 95% of emergency dispatching within sixty seconds.

Adequate staffing, as determined by the boards and directors, should be provided to ensure that those calls are answered in a timely fashion. We recommend staffing total as shown in Table 7-1 below.

Table 7-1
Recommended Consolidations

Partial Consolidation Centers/PSAP					
Partial Consolidations	**On Duty**	**Dispatchers**	**Supervisors**	**Manager**	**Admin**
Duxbury, Halifax, Kingston, Plymouth and Plympton RECC	6	20	4	1	1
Bridgewater East Bridgewater, and Whitman RECC	3	8	4	1	1

7.3.6 Dispatch Staff

As noted elsewhere, fewer people will need to be assigned to dispatch duties than are currently. The existing dispatch personnel have significant additional, non-dispatch duties. Each town will need to decide how they are going to handle these collateral duties when the RECC becomes operational.

As part of the policy and procedure development discussed below, employment standards and procedures will need to be established. Once that process is complete, recruitment and selection of the RECC's dispatch staffs can begin. Existing dispatch employees of the participating agencies should be encouraged to apply. Some may choose to remain with their existing agency. Others may choose to retire or seek other employment.

If a sufficient number of existing dispatch employees apply, then the selection process can begin. We suggest that open applications only be sought if sufficient qualified people cannot be found in the pool of current employees.

The selection process should be completed no later than the end of the first quarter of 2015 so the employees can begin training. In addition to being trained on the new policies and procedures, the employees will need to become familiar with the operation of each of the participating agencies as well as the geography served by the RECC.

7.3.7 Staff Training

The staff assigned in the new RECCs will require additional training above what they already possess. There are several sources: The National Association of Public Safety Communication Officers (APCO); and the National Emergency Number Association (NENA) offer basic and advanced training courses that cover many areas of subject matter. These courses are offered periodically and are either on-site or at convention sites. For Emergency Medical Dispatching there are 3 commercial sources; Medical Priority, Powerphone, and DOT. These protocols are essentially the same, however as this is an expected function of the system one should be selected and all dispatchers trained in the process. Periodically there is also training available from the Commonwealth and they will provide training stipends for dispatchers. Lastly the embedded vendors will provide training on their products, normally for a fee.

Much of the procedures and other dispatch protocols will however be specific to each RECC. This causes a great deal of the required training to be created and performed in-house and will be one of the most important responsibilities for the supervisors and managers.

We do not recommend the RECCs pursue a detailed effort in language training for dispatchers. It will be more cost effective to use such commercial solutions as the AT&T Language Line and others. Of course added language expertise is always valuable and should be encouraged in employees if not mandated.

7.3.8 Personnel Issues

Displacement Concerns:
In response to concerns expressed by current dispatchers about their future employment, it can be presumed that many will have the opportunity to transfer to the new organization. In addition, there will be a need for some positions to be retained at the employees' current departments for the collateral duties now currently being handled by the dispatch staff.

Rehiring & Seniority:
The ECC Directors should be responsible for hiring the staff. The Directors should give preference to dispatchers currently working in the participating entities. The standards for hiring new personnel should be set out in the directives that govern the communication centers. The boards should decide compensation for the staff.

Tenure and seniority for dispatchers who have been displaced by the reorganization of a central communications center should remain (e.g., a dispatcher with 10 years of service at a particular department, should maintain his or her 10 years of service at a new center).

Existing dispatch employees of the involved agencies at the time of consolidation should also have the opportunity to apply for a position within their existing entity depending on their qualifications. The salary and benefits should be determined by the position for which the individual applies.

Compensation & Benefits:
There should be one compensation and benefits package equal to that of the highest paid dispatcher within the current grouping (e.g., if one entity offers the best compensation package to its dispatchers, then the board should offer a comparable package to all of its dispatch staff). The compensation package should include health and retirement benefits.

AECOM recommends that:

- **Regional Emergency Communications Centers Authorities be established as one independent governmental agency overseeing both RECCs.**
- **The RECCs should be governed by a single Board of Director consisting of representatives of the participating towns.**
- **There should be two User Advisory Committees consisting of senior representatives of the participating agencies for each of the RECC operations.**
- **The Regional Emergency Communications Center Director should be hired by the Board of Directors.**
- **We recommend that the compensation packages for the two RECCs be similar so as to not create competition between the two centers.**

7.4 How Should Policies Be Made and Changed?

The rules governing each of the RECCs should be laid out in sets of Standard Operating Procedures (SOP). The RECC Director and the User Advisory Committees should develop the SOPs jointly for each center. It would be advisable that, as much as possible, the SOPs for the two RECCs reflect the same provisions and operational standards. The SOPs would be subordinate to any contradictory local ordinance, Massachusetts Statutes, the Board by laws or any current labor agreement or one subsequently adopted.

The Commission on Accreditation of Law Enforcement Agencies (CALEA) in conjunction with the Association of Public Safety Communications Officials (APCO) has developed an accreditation program for communications centers. Two hundred eighteen standards have been developed as a part of the program. These standards are organized into six topic areas:

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

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

- **AECOM recommends the RECC Director and the User Advisory Committee of each RECC should jointly develop a Standard Operating Procedure Manual for that center modeled on the CALEA Communications Center Accreditation Standards.**

7.5 What Services Should It Perform?

The Regional Emergency Communications Centers should function as the primary Public Safety Answering Points (PSAP) for all of the participating towns, dispatch and coordinate resources for the agencies now being dispatched by the existing dispatch centers, coordinate with other public safety services, and maintain appropriate records of their operations. Reverse 9-1-1 operations would be expanded to each separate operation if utilized. All existing public safety tasks are accounted for including external duties such as the Harbormaster and Coast Guard where required. We have planned the staffing to include receiving transferred wireless 9-1-1 calls as well.

All dispatch personnel should be fully trained and capable of performing all of these functions. Once the center becomes operational, all dispatch personnel should be trained in Emergency Medical Dispatch (EMD). Once that is accomplished, an Emergency Medical Dispatch program should be implemented within each RECC.

Duties currently performed by the Plymouth County Sheriff's Office such as fire control will remain with the Sheriff's Office and are not accounted for in these models.

Each of the existing dispatch centers currently answer telephone calls received on non-emergency or administrative telephone lines after normal business hours, and provide after-hours answering for other departments and agencies in their respective jurisdictions. Some of the centers answer these lines all of the time. We recommend each department be responsible for answering these lines during normal business hours and the shared communications center be given the responsibility for answering the lines at other times.

We suggest each department not staff the front desk or reception position outside of normal business hours. A direct telephone line to the dispatch center should be installed by the main entrance to each department. This will allow anyone who comes to the department to call for assistance.

Departmental personnel currently come to the dispatch center to have dispatch personnel initiate an inquiry into one of the various state and national computerized information systems. With the proposed relocation of the dispatch function, we recommend that terminals and printers, connected to the CAD and RMS systems be installed in each department. This will allow authorized personnel to receive information as required.

7.6 What Equipment, Systems, Software and Hardware are Needed in the Combined Centers?

The five major equipment systems in a modern emergency communications center are the 9-1-1 system, the Computer Aided Dispatch (CAD)/Records Management System (RMS), the radio consoles, the logging recorder, and the workstation furniture. The public safety radio system is an essential element that extends beyond the RECC.

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

Each of the PSAPs has installed a PlantCML VESTA Pallas 9-1-1 system provided by the state 9-1-1 department. While the systems are relatively new and employ current technology, new 9-1-1 CPE should be installed in the RECC. By the time each RECC becomes operational, the existing equipment will be nearing its recommended replacement date. A new system will also ease cutover. In addition, the VESTA Pallas system is sized to handle smaller PSAPs, and the proposed RECC will be close to the CPE system's capacity.

- **AECOM recommends that new 9-1-1 CPEs be provided for the RECCs.**

7.6.2 Computer Aided Dispatch/Records Management

There are differing CAD and records systems at use in the current operations. We recommend the two RECCs combine to purchase and install a new CAD and RMS system which will operate both RECCs. We also recommend that the two subsystems be connected in such a way as to allow timely updates between the servers and that the two servers can act as

each other's back-up. The CAD system should support mobile data applications and automatic vehicle location system currently in use. This recommendation is accounted for in the various estimates presented.

- **AECOM recommends a single CAD/RMS platform be obtained that will support both RECCs.**

7.6.3 Radio Consoles

The radio console serves as the interface between the telecommunicator or dispatcher and the radio system. As with the other systems in the ECC, radio consoles are increasingly computer-based. Console systems are not yet standards based; as a result, consoles from one vendor may not work with another vendor's radio system infrastructure. We recommend that the two RECCs join together to obtain a new radio console system that serves both RECCs. This should cover all of the features currently existing such as paging and others. We suggest that all of the frequencies in use by the participants be available in both RECCs. This will provide back-up ability.

- **AECOM recommends that a new radio console system be obtained that will support both RECC's.**

7.6.4 Logging Recorder

In recent years the technology used in recording the telephone and radio traffic in dispatch centers has also changed significantly. Digital Voice Recorders, using computer based systems, are the standard in the industry. A new digital voice recording system with sufficient capacity to record and store the appropriate radio and telephone messages will be needed. The State 9-1-1 Department will provide the logging recorder as part of the 9-1-1 CPE package.

- **AECOM recommends that new digital voice recording systems with sufficient capacity to record and store the appropriate radio and telephone messages be installed in the RECCs.**

7.6.5 Dispatch Workstation Furniture

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

- **AECOM recommends that new workstation furniture be procured for each of the RECCs.**

7.6.6 Back-Up Equipment

It is anticipated the two RECCs could provide back-up for each other. Training equipment has been estimated for each RECC in the costs estimates. The two RECCs should coordinate this equipment so that training equipment can serve as extra positions in disaster scenarios.

7.7 Where Should a Consolidated Center Be Located?

A multitude of factors influence the selection of the most appropriate site for a new PSAP. These factors must be understood at the outset so clear decisions can be made by the governing authorities and for the citizens that the center will serve. The factors generally fall into five major categories: functional, natural conditions, man-made threats, cost issues, and technological.

The process for selection is obviously one which is based on rational criteria, but may be influenced by political processes. Recognizing this, the relative risks and strengths of each site may be evaluated and adapted to the final site and building design. For example, a piece of property may be owned by a jurisdiction and therefore attractive from a cost perspective but may have inherent risks nearby such as a heavily traveled freight train route. Additional measures which might be required to protect the facility for this increased threat may offset the cost savings for the free site. For this reason, it is recommended an evaluation matrix be developed and include weighted criteria for all factors, including cost and availability.

7.7.1 Functional

Functional criteria may include evaluation factors such as accessibility, convenience, availability of multiple access points, site size, closeness to redundant facilities, and overall facility diversity/distribution. The ideal site size should be determined prior to evaluating sites. This should include both the size of the facility and the site features such as parking, clearances and equipment. Depending on the facility overall size, this may include an early exploration of two-story vs. one-story concepts. A site located on a primary road may be scored higher than one located on a secondary route, provided the primary road is not prone to traffic jams. Special events (such as major sporting events, which do not allow access to the site) should also be considered, even if they are not on the final criteria. The location should also be evaluated for the convenience to the employees. Locations on primary roads have increased potential for employees to use mass transit. The convenience of location next to population centers and businesses should be evaluated in relation to site visibility and security. Multiple access points allow a separation of public and private vehicular traffic as well as a secondary means to enter/exit the site in emergencies. Sufficient space is needed to provide for adequate set-back for security purposes. Where feasible, critical facilities should be set-back a minimum of twenty-five meters, (eighty-three feet) from public roadways. Zoning laws should be reviewed so that any restrictions such as tower height and building size and type might be identified. This can be a major hurdle if not identified early in the process.

7.7.2 Natural Conditions

Natural conditions include all natural features which impact the site utilization and/or are risks to the continuous operation of a critical facility. Natural waterways and tidal zones, particularly navigable waterways or shipping lanes, pose risk as a result of the potential for accidental spills, or catastrophic fire or explosion. For these reasons a buffer zone is usually assigned to this feature with a ranking related to the relative distance from the buffer.

Most standards for PSAP's today include criteria intended to discourage locations within flood prone areas. The standard is based on the United States Geological Services (USGS) designated 100-year flood zone designation. In general, no critical facility should be located in this zone and similarly should not be located in a below grade room, which can be subject to localized flooding. Wetlands pose a similar hazard, and mitigating the environmental impacts of building in wetlands causes additional site development costs.

Localized drainage patterns are another important feature to review in the site selection process. Sites that have poor drainage or major surface drainage features like ditches or natural swales are less desirable than sites with high spots and naturally occurring drainage away from the major building location. Adjacent roadways should be lower than the proposed building location.

Wind hazards are hard to evaluate on a localized basis, except in rare cases. Hurricanes and tornados effect whole regions and therefore should be identified for mitigation and protection rather than for individual site selection. For example, for facilities designed in Atlantic coastal regions, the maximum wind speed recorded is usually the design condition required for structural and component hardening.

7.7.3 Man-Made Threats

Man-made threats are easily identified and usually impact the selection of sites the most in terms of overall risk. These factors include roadways (particularly interstate highways), freight rail lines, chemical plants (or other industrial manufacturing facilities which handle toxic or explosive products) and military installations. The relative risks and subsequent buffer areas for each of these factors are usually identified by the local emergency management agency.

Interstate highways and freight line railways pose similar hazards and thus are usually assigned similar buffer zones. These buffer zones are typically one mile on either side, however, the recommended protective action zone for some chemicals can

exceed ten miles. Evaluation criteria should therefore be weighed on relative distance from the buffer zones to the proposed site, instead of a simple check to determine whether a site is inside a buffer zone. Likewise, chemical or other industrial facilities should have a ranking relative to the assigned buffer zone. Sites near nuclear plants are ranked according to whether the location is inside the evacuation zone.

The location of potentially hazardous utilities to the project site (such as high voltage electric transmission lines, cross country gas or oil transmission lines) would lower the desirability of the proposed site for a PSAP.

One issue that cannot be avoided is the Emergency Planning Zone for the Plymouth Nuclear Power Station. Several portions of the area and towns near the coast are located inside the10 mile radius of the plant. This must be considered in the planning.

One criterion which is related to an earlier discussion of convenience and accessibility is the fact these facilities generally should not be highly visible. Public access to the facility is not crucial, and due to the critical natural of the RECC, visibility may lead to targeting. Likewise, locations next to regular special events or public target buildings should be avoided.

7.7.4 Cost Issues

The costs of each site include acquisition, utilities availability and extension requirements, overall site grading and physical development and offsite improvements, including upgrades and provision of redundancies.

Sites that are already owned are usually preferred and often the first evaluated. On the other end of the spectrum is a site that requires all the land to be acquired through condemnation, which may result in delays and additional service fees. Property that is donated should be evaluated carefully to determine if it includes tax liabilities or restrictive covenants.

A higher economic ranking is reserved for sites with all utilities (such as storm water, sanitary sewer, water, power, gas and data/telecommunications) located at or close by the project site. The availability of redundant utilities should also figure into the evaluation criteria. For example, it is desirable to have redundant feeds following diverse routes from the telephone company central office (CO) or from high speed fiber-optic lines provided either by the utility or the locality. Additionally, power availability from two different substations or two separate utilities is desirable. Utilities which must be extended to provide the required redundancy factors for the site are extremely costly and therefore are added to most cost factor evaluations.

Site development costs include grading and the paving of roads and parking areas. Large amounts of site clearing (tree removal) or leveling required to prepare the site for a building pad are usually cost-prohibitive, and often rules out steep, wooded sites.

7.7.5 Technology

Sites for PSAPs should be evaluated on several technological factors. As mentioned earlier in the cost section, diversity of power and data/telecommunications is required for all these sites. If this is not possible then other means must be devised to overcome the redundancy issues. This may include additional generators or microwave communication links. On site utilities such as well water and septic fields may be provided for remote sites. Finally, the site should be evaluated for the line of sight to nearby structures or natural features which may have microwave towers or transmission sites.

7.7.6 Other Location Analysis and Considerations

The final analysis (due diligence) for completing the site selection for a PSAP may include a Phase One Environmental Site Assessment. This includes a data search for any jurisdictional wetlands and site specific archeological or historical significance. This review may require an option on the property, so that physical access to the site may be permitted. A complete analysis may also include soil test borings on the site to determine geologic and soil conditions. For example, if the site has large rock outcroppings just below the surface, excavation costs will be higher to level the site for a building pad. Soil borings may also reveal conditions that require supplemental foundations such as pilings or drilled piers.

It is clear the process of selecting a site for a new PSAP should be carefully considered. It is recommended that each criterion be weighted and ranked in a collaborative forum so that an objective scoring can be made for each potential site. This ranking

can then be presented to the local governing authority knowing all factors have been considered and the decision process can move forward.

In addition to determining the location of the RECC, there are several other steps that will need to be taken before construction can begin. First is the Pre-Design Phase, which involves the development of the building program (space planning and functionality requirements), and the conceptual design. The Design Phase follows, including Schematic Design, Design Development, and the creation of construction documents. .

In addition to the primary PSAP, there should be a fully functional back-up center, capable of taking over operations in the event the primary PSAP is rendered inoperable or uninhabitable. If the recommendations of this report are followed, the two RECCs will act as each other's backups. The back-up center needs to be sufficiently distant so that an event is unlikely to impact both centers. In addition to a backup, there will need to be a designated alternate. The Alternate PSAP receives 9-1-1 calls in the event the primary PSAP doesn't answer.

The design of Emergency Communications Centers and Emergency Operating Centers is a specialized field. Most architectural and engineering firms are not familiar with the unique requirements for a fully functioning ECC. AECOM is well experienced in ECC/EOC design, and can provide additional guidance and support.

7.7.7 Existing Facilities

Another possibility is to remodel an existing facility to include the RECC. An in depth study of each of the facilities currently in use by the participants of this study was not performed, however, some have potential:

- With proper remodeling, the Five Town RECC could be housed in the Plymouth Police Training Room or Public Meeting Room. Other possibilities for housing the RECC include the Halifax Police building current area if expanded, or the second floor of the Duxbury Fire Headquarters.

- With either proper remodeling the Bridgewater Police Headquarters and East Bridgewater Police Headquarters, or use the Whitman Police Headquarters building could handle the Three Town RECC.

- **AECOM recommends that each RECC begin the design of a new facility as quickly as feasible.**

7.8 How Should The Shared Center Be Funded?

The recommended creation of two RECCs will include significant capital expenditures as part of the start-up of operations. While the amount required is significant, and the first year of operation will require the expenditure of more funds than the combined cost of operating the existing dispatch centers independently, the consolidation will result in long-term cost savings for each of the jurisdictions. Not only will the personnel and operating costs be reduced, by combining the dispatch centers, the jurisdictions will not need to each purchase the items of capital equipment.

Table 7-2 - Total Budget Impact for RECC – Five Towns
Table 7-3 - Total Budget Impact for RECC – Three Towns

These tables summarize all of the financial categories shown individually in Section 6.

Table 7-2
Opinion of Probable Cost
Duxbury, Halifax, Kingston, Plymouth and Plympton RECC
Annual Change

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Duxbury	20%	$ 289,190	$ 205,513	$ (83,677)
Halifax	9%	$ 324,569	$ 92,670	$ (231,899)
Kingston	19%	$ 344,490	$ 201,197	$ (143,293)
Plympton	3%	$ -	$ 29,465	$ 29,465
Plymouth	50%	$ 546,686	$ 524,753	$ (21,933)
TOTAL	**50%**	**$ 1,504,935**	**$ 1,053,598**	**$ (451,337)**

Table 7- 3
Opinion of Probable Cost
Bridgewater, East Bridgewater and Whitman RECC
Annual Change

User Agency	Participation Ratio	2011 Budget	New Assessment	Annual Change
Bridgewater	42%	$ -	$ 209,833	$ 209,833
East Bridgewater	31%	$ 116,698.00	$ 152,834	$ 36,136
Whitman	27%	$ -	$ 137,438	$ 137,438
TOTAL	**100%**	**$ 116,698.00**	**$ 500,105**	**$ 383,407**

Bridgewater and Whitman use sworn officers for all dispatching; East Bridgewater uses sworn officers for Fire dispatching. Although savings in salaries are not shown, an RECC would return approximately ten police officers and twelve firefighters to field service.

The State 9-1-1 Department has two grant programs that provide significant inducements to join a Regional Emergency Communications Center. The first of these is the Regional and Regional Secondary PSAP and Regional Emergency Communication Center Development Grant program, which supports the development and startup of regional and regional secondary PSAPs and regional emergency communication centers including facility construction and the necessary equipment. The second grant program is the PSAP and Regional Emergency Communication Center Support and Incentive Grants which assists PSAPs and regional emergency centers in providing enhanced 9-1-1 service and to encourage the development of regional PSAPs, regional secondary PSAPs and regional emergency communication centers. Each PSAP currently receives some funding through this program. The amount of funding for a RECC is significantly higher. The following items are eligible for reimbursement under this program:

- 9-1-1 Telecommunicator Personnel Costs
- HVAC Equipment
- Computer Aided Dispatch systems
- Radio Consoles
- Console Furniture
- Fire Alarm Receiving and Alerting Equipment
- Public Safety Radio Systems
- Other Equipment and Related Maintenance

There are also twenty-six (26) federal grant-making agencies and over 900 separate federal grants-in-aid programs. There are fifteen (15) different types of federal assistance. These include seven (7) financial types of assistance and eight (8) non-financial types of assistance. Here we focus on two of the seven types of financial assistance: Formula Grants and Project Grants. Formula grants allocate funds to states or local governments according to a distribution formula prescribed by federal law. The State Homeland Security Grant Program and the Law Enforcement Prevention of Terrorism grant program are two examples of formula grants. The amount appropriated by Congress is distributed to the states on the basis of population. Other formula grant programs use more complex formulas to distribute the grants. Block grants, a subcategory of formula grants often have a wide range of eligible activities typically covering a general problem area. Two examples of block grants are the Community Development Block Grant and the Byrne Memorial Justice Assistance Program. Project grants are also referred to as discretionary grants. Funding is provided for specific projects for a fixed period of time. Often there is a

competitive process among the grant applicants. The COPS Interoperable Communications grant program is an example of a project grant program

There is a good possibility grants will cover most of the cost of the equipment needed to initiate the consolidated operation. With some exceptions, grants generally will not cover the cost of the facility.

While grant funding will be a significant source of revenue for the Regional Emergency Communications Centers, the participating towns will have to provide funding as well. A formula will need to be devised to allocate the funding requirements among participating entities. There are numerous examples of funding formulas available. Some use only one metric, such as 9-1-1 calls, radio transmissions, and so forth. The cost estimates in Section 6 are based on the number of 9-1-1 calls, as an example. Others use multiple factors. Central Operations for Police Services in Muskegon County, Michigan uses a formula that includes population, equalized property values, and system usage. The Charlottesville, Albemarle County, University of Virginia Joint Dispatch Center uses a formula including population, index crime, and calls for service. These are just two of many examples. Here are some other examples:

Orange County, FL
Orange County primarily utilized impact fees to fund their radio system. They attached a $500 radio assessment fee to each single-family residential building permit in the County under the justification that it was the growth in the County that was causing the degradation of the system coverage and the need for an expanded radio system. The assessments are proportionally higher for larger commercial permits.

Cobb County, GA
Cobb County sold County owned property to finance the radio system upgrades. This property primarily came from the deaths of residents, as well as asset forfeitures under the RICO Act (where people convicted of certain acts forfeit all ill-gotten gains, including interest in any business gained through a pattern of "racketeering activity").

Muskegon, MI
Muskegon charged local jurisdictions a monthly user fee based on a formula containing the jurisdiction population, the tax base, the number of calls for service, and the number of CJIS checks requested of the 9-1-1 center (for law enforcement agencies). They also utilized funds from the 9-1-1 surcharges. The initial financing for construction of the system was obtained through a lease/purchase program managed by a local bank. Tax-exempt financing was provided at 70% of the prime rate. A dedicated millage was subsequently enacted to provide for continuing technological updates.

Pima County, AZ
Pima County is constructing a wide-area, Project 25 (P25) trunked, simulcast 700/800 MHz two-way radio communications system covering over 10,000 square miles and designed to serve twenty fire departments and districts, eleven law enforcement agencies, and the Pima County Office of Emergency Management and Homeland Security. The County is utilizing a bond issued for the purpose, and already approved by the citizens through a special ballot. The County, in partnership with the City of Tucson, is also seeking supplemental funding through public grant programs from the U.S. Department of Homeland Security. The grant monies will be used to offset some of the acquisition costs, especially as they relate to specific equipment classifications covered by the federal grant.

- **AECOM recommends that the RECC organization develop a funding method and associated formulae to cover those costs not funded by other means.**

7.9 Cost Comparison

The costs for a new RECC must be viewed in comparison with continuing to operate in the existing models. For the 2011 Fiscal Year, the eleven entities have a combined budget total of $1,599,267 for the provision of dispatch services. This does not include any salary costs for police officers or firefighters assign to dispatch duties. If the communities do not participate in a consolidation effort there will be multiple forecastable expenses. There is no true standing still in this arena. The current salaries will continue with inflation, calculated at 2.5% increase per annum. The projected future expenditures of salaries and maintenance for the next five and ten years are displayed below in Table 7- 4; the estimates in this table reflect only the current staffing and maintenance, not any expansion:

Table 7-4
Projected Future Expenditures
Salary and O&M

AGENCY	2013	2014	2015	2016	2017	5 Year Totals	2023	10 Year Total
Bridgewater	$ -	$ -	$ -	$ -	$ -	**$ -**	$ -	**$ -**
East Bridgewater	$ 120,198	$ 123,804	$ 127,518	$ 131,344	$ 135,284	**$ 638,148**	$ 161,536	**$ 1,539,470**
Whitman	$ -	$ -	$ -	$ -	$ -	**$ -**	$ -	**$ -**
AGENCY	**2013**	**2014**	**2015**	**2016**	**2017**	**5 Year Totals**	**2023**	**10 Year Total**
Duxbury	$ 334,306	$ 344,335	$ 354,665	$ 365,305	$ 376,264	**$ 1,774,877**	$ 449,279	**$ 4,281,724**
Halifax	$ 334,306	$ 344,335	$ 354,665	$ 365,305	$ 376,264	**$ 1,774,875**	$ 449,279	**$ 4,281,724**
Kingston	$ 305,880	$ 315,057	$ 324,508	$ 334,243	$ 344,271	**$ 1,623,959**	$ 411,077	**$ 3,917,650**
Plymouth	$ 563,087	$ 579,979	$ 597,379	$ 615,300	$ 633,759	**$ 2,989,504**	$ 756,741	**$ 7,211,898**
Plympton	$ -	$ -	$ -	$ -	$ -	**$ -**	$ -	**$ -**

Additionally, the current equipment will need to be replaced. Due to the differences in equipment, we have accounted for the replacement of the following systems and frequency:

- PCs & Laptops – 3 year cycle
- Servers & Routers – 5 year cycle
- Software Upgrades – 7 year cycle
- Radio console – 7 year cycle
- Dispatch furniture – 10 year cycle

The capital replacement costs for the next five and ten years are displayed below in Table 7-5:

Table 7-5
Projected Future Expenditures
Capital Replacement

AGENCY	2013	2014	2015	2016	2017	5 Year Total	2023	10 Year Total
Bridgewater	$ -	$ 32,000	$ -	$ 200,000	$ 201,000	**$ 433,000**	$ 201,000	**$ 889,000**
East Bridgewater	$ -	$ 25,600	$ -	$ 160,000	$ 178,800	**$ 364,400**	$ 178,800	**$ 758,200**
Whitman	$ -	$ 32,000	$ -	$ 200,000	$ 201,000	**$ 433,000**	$ 201,000	**$ 889,000**
AGENCY	**2013**	**2014**	**2015**	**2016**	**2017**	**5 Year Total**	**2023**	**10 Year Total**
Duxbury	$ 120,000	$ 156,600	$ -	$ -	$ 175,000	**$ 451,600**	$ -	**$ -**
Halifax	$ -	$ 19,200	$ -	$ 120,000	$ 156,600	**$ 295,800**	$ 156,600	**$ 627,400**
Kingston	$ -	$ 19,200	$ -	$ 120,000	$ 156,600	**$ 295,800**	$ 156,600	**$ 627,400**
Plymouth	$ -	$ 38,400	$ -	$ 240,000	$ 223,200	**$ 501,600**	$ 223,200	**$ 1,019,800**
Plympton	$ -	$ -	$ -	$ -	$ -	**$ -**	$ -	**$ -**

The total costs for salaries and Operation and Maintenance, and equipment purchases are outlined in Table 7-6 and represent the total possible exposure for each community by maintaining the status quo.

Table 7-6
Total Projected Future Expenditures
Capital and Salaries

AGENCY	2013	2014	2015	2016	2017	5 Year Totals	2023	10 Year Total
Bridgewater	$ -	$ 32,000	$ -	$ 200,000	$ 201,000	**$ 433,000**	$ 201,000	**$ 889,000**
East Bridgewater	$ 120,198	$ 149,404	$ 127,518	$ 291,344	$ 314,084	**$ 1,002,547**	$ 340,336	**$ 2,297,670**
Whitman	$ -	$ 32,000	$ -	$ 200,000	$ 201,000	**$ 433,000**	$ 201,000	**$ 889,000**
AGENCY	**2013**	**2014**	**2015**	**2016**	**2017**	**5 Year Totals**	**2023**	**10 Year Total**
Duxbury	$ 305,880	$ 334,257	$ 324,508	$ 454,243	$ 500,871	**$ 2,226,476**	$ 567,677	**$ 4,545,050**
Halifax	$ 334,306	$ 363,535	$ 354,665	$ 485,305	$ 532,864	**$ 2,070,676**	$ 605,879	**$ 4,909,124**
Kingston	$ 305,880	$ 334,257	$ 324,508	$ 454,243	$ 500,871	**$ 1,919,759**	$ 567,677	**$ 4,545,050**
Plymouth	$ 563,087	$ 618,379	$ 597,379	$ 855,300	$ 856,959	**$ 3,491,103**	$ 979,941	**$ 8,231,698**
Plympton	$ -	$ -	$ -	$ -	$ -	**$ -**	$ -	**$ -**

As a comparison to these numbers the costs as expressed in the two RECC budget are also extended for 10 years with inflation.

Table 7-7
Total Projected Future Expenditures
RECC Expenditures (Rounded)

AGENCY	2013	2014	2015	2016	2017	5 Year Totals	2023	10 Year Total
Bridgewater	$ 124,780	$ 127,280	$ 129,830	$ 132,430	$ 135,080	**$ 649,400**	$ 152,200	**$ 1,518,900**
East Bridgewater	$ 90,860	$ 92,680	$ 94,530	$ 96,420	$ 98,350	**$ 472,840**	$ 110,700	**$ 1,105,340**
Whitman	$ 81,710	$ 83,340	$ 85,010	$ 86,710	$ 88,440	**$ 425,210**	$ 99,600	**$ 994,110**
AGENCY	**2013**	**2014**	**2015**	**2016**	**2017**	**5 Year Totals**	**2023**	**10 Year Total**
Duxbury	$ 145,030	$ 145,030	$ 145,030	$ 145,030	$ 145,030	**$ 725,150**	$ 163,300	**$ 1,658,250**
Halifax	$ 65,400	$ 65,400	$ 65,400	$ 65,400	$ 65,400	**$ 327,000**	$ 73,600	**$ 747,700**
Kingston	$ 141,980	$ 141,980	$ 141,980	$ 141,980	$ 141,980	**$ 709,900**	$ 159,900	**$ 1,623,500**
Plymouth	$ 20,790	$ 20,790	$ 20,790	$ 20,790	$ 20,790	**$ 103,950**	$ 23,300	**$ 237,250**
Plympton	$ 370,320	$ 370,320	$ 370,320	$ 370,320	$ 370,320	**$ 1,851,600**	$ 417,100	**$ 4,234,500**

7.10 Implementation Plan

The implementation of a Regional Emergency Communications Center is a significant, multi-faceted project. There will need to be close coordination between all of the activities in order to make certain that all of the activities occur in a timely manner. We suggest thinking of the projects as four elements that must come together: the governance structure; dispatch facility and equipment (including radio system); personnel selection and training; and policy and procedure development.

7.10.1 Governance Structure

- **Commitment to Participate:** Before any other activities occur, and as expeditiously as possible, each of the towns should formally commit to participate in the RECCs. We suggest this be accomplished by July, 2013.

- **Draft Intergovernmental Agreement:** As soon as the involved entities have committed to the consolidation projects, legal counsel for the entities should prepare the intergovernmental agreement and present it for adoption. All involved entities should adopt the agreement no later than October, 2013.

- **Recruit, select, and hire the Emergency Communications Center Directors.**

The creation of a RECC is a challenging undertaking; finding the right person to lead that consolidation is a critical early step in the consolidation process. Efforts should begin to recruit, select and hire the directors. It is important that the directors be brought on board as early in the process as feasible. The additional dispatch administrative positions recommended should be phased in over the next twelve months.

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

7.10.2 Facility Development

Typically, the construction of a new public safety communications center takes a minimum of eighteen months from the start of the design phase until the completion of construction. Installation and burn-in of the new equipment requires another forty-five to sixty days after the substantial completion of construction. The actual design of the facility should begin as soon as the commitment to participate is received from the entities involved. It should begin no later than August, 2013. The design of public safety communications centers and emergency operations centers is a specialized field. It is important to the success of the project that a firm with the appropriate experience be selected.

The following tasks are part of the development of the new facility:

- Subproject start — August, 2013
- Complete Space Planning for RECC — December, 2013
- Complete Dispatch Center Design — March, 2014
- Begin Dispatch Center Construction — June, 2014
- Dispatch Center Substantial Completion — March, 2015
- Cutover to Consolidated Center — May, 2015

- **AECOM recommends that the RECCs begin the design and development of the new facilities no later than August, 2013 and begin the procurement process for new 9-1-1 CPE, a new CAD system, radio consoles, and specialty furniture in a timely manner to allow the installation as soon as the new dispatch facilities are substantially completed.**

Detailed functional specifications, based on the specific needs of the user agencies, will need to be developed, requests for proposals issued, proposals received and reviewed, negotiations conducted with the successful respondents, and the systems implemented, all in close coordination with the building schedule. In order to achieve this coordination, the procurement process for this specialized equipment should begin shortly after the building contractor is selected. This process should begin about the time the facility construction starts.

7.10.3 Policy and Procedures Development

A comprehensive, well thought out uniform set of written directives, including standard operating procedures and policies, will be a critical part of the operation of the shared communications centers. Work to develop these directives should begin immediately after the directors are brought on board, with the goal of having them completed well before cutover.

- **AECOM recommends the RECC Director be selected and hired no later than November, 2013.**

- **AECOM recommends the development of the comprehensive policy and procedure manuals be completed no later than March, 2015.**

- **AECOM recommends the RECC dispatch staff be selected and begin training on the policies and procedures no later than March, 2015.**

The entities participating in this study face significant challenges as each seeks to provide high quality services to its citizens and visitors. The implementation of a Regional Emergency Communications Center is an opportunity to provide improved services while reducing the long-term costs to each participating community. This is made even more advantageous by the

grant programs of the State 9-1-1 Department. The implementation of both of the recommended RECCs is not only feasible, it is strongly recommended.

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