Plan for Concord Twp Fire Dept. To Implement Mobile Data Computers

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CERTIFICATION STATEMENT

I hereby certify that the following statements are true:

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ABSTRACT

The primary focus of the research paper is to help the Concord Fire Department develop a plan to implement mobile data computers (MDC) into their vehicles. Using information gathered through journals, periodicals, reports, related websites, surveys and interviews this paper will be an evaluate how this could be accomplished.

Evaluative research will was conducted to answer three questions:

1. How can the Concord Township Fire Department cover the initial expense for the required equipment?
2. Can the new hardware run the required software needed, such as mapping, preplans and fire reporting?
3. Which device(s) would be best suited for the Concord Township Fire Department?

Procedures involved searching for information that related to mobile data computers, their costs, their abilities to operate other software programs, and which units operate most effectively in the public safety field.

Results show that there is a larger selection that could be utilized for public safety. With the technology available today, there is very little that can be accomplished with mobile computers in the field. Wireless communication has had unparalleled improvement over the past decade.

A survey was sent out to gather relevant information on mobile data computers from other departments that were about the same size as Concord Twp Fire Department. This included their population and call volume. The questionnaire was comprised of 18 questions that provided

information on costs, hardware, software, applications and overall operation of the mobile computers.

An interview was completed with a local fire department that uses MDC's and is also dispatched through the same center as Concord Twp Fire. The questionnaire from the survey was used in the interview.

A discussion of the data received was completed and included data from the survey, interview and literature obtained. Recommendations were made to help Concord Twp Fire implement mobile data computers into their vehicles, with recommendations on cost savings, applications available for use with the mobile devices and which devices would be best suited for Concord.

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INTRODUCTION

Statement of the Problem

Over the past two decades, Concord Township has grown considerably. Not in area, but in population. Concord Twp covers an area of approximately 23 square miles and is covered by two fire stations. The growth in population has strained the township in several areas. To accommodate this growth, the amount of roads and homes has increased significantly. This increase has also been felt by the fire department in call volume.

The population as recorded in1990 by the US Census Bureau put Concord Twp at 12,432 people. In 2000 the population grew to 15,282 (Bureau, 2000). The population as of 2010 has grown to 18,201 (Concord Twp, 2008). This is a total increase of 46% from 1990. The growth in housing has been even larger. Total housing units in 1990 were 4,444 (Comprehensive Plan Committee, 2004). In 2000 total housing was up to 5,911 (Comprehensive Plan Committee, 2004) and at the end of 2010 it was up to 7,472 (Concord Twp Zoning Board, 2010). This is an increase of 68% from 1990.

The growth of the Fire Department has been even greater than that of the Township population with regards to call volume. The difference in call volume between 1990 (754) and 2010 (1851) translate to a 145% increase. The area of most growth in the call volume has been that of EMS and Assist calls. They have grown by 57% and 31% respectfully. Concord Twp Fire Department has taken steps to keep up with the growing community, such as the increase in staffing. In 1990 the Department staffed the community with four personnel, two at each of the two stations. Today we are staffed with nine persons, with five at the main station and four at the satellite station.

With the growth of the community at the level it is, it is becoming more difficult to maintain our prompt responses to our customers. We are finding it more time consuming to locate the addresses that we are being dispatched to. Our current dispatch center does utilize CAD. However, they have not been forthcoming with the mobile units for the local fire departments. Currently, only one fire department utilizes MDC's. They have the capability to send all the dispatch information directly to mobile units, which would include the location and type of incident. This would not take the place of the initial radio dispatch but would work in conjunction with it. As it stands currently, we are still using the same book method that was in place years ago. With the addition of streets and homes, the books have tripled in size. To respond to an incident, the crew must first check the map book. This is to identify which station is to respond and to locate the exact location. After that is determined the proper gear is donned and the vehicle(s) begin their response. This alone can take anywhere from two to three minutes depending on time of day. In addition to our own community, Concord Fire has automatic aid agreements with several surrounding communities. To locate the address of the incident in our neighboring communities extends this time even further. Our goal is to begin the response in one minute or less.

At the current time Concord Twp Fire has eleven vehicles that would require MDC/MDT's. The Department already utilizes three Panasonic CF-19 Ruggedized notebooks for EMS purposes in the squads. These would remain in place for EMS. The average cost of the CF-19 is $2,200 - $4000. This brings the cost for all vehicles to $24,200 - $44,000. This does not include the cost for mounting and antennas and related software for mapping.

Another aspect of the growth is the demographics of those moving into the Township. A large portion of the individuals moving to Concord Twp are people from the surrounding cities.

They are not a familiar with the country living life style. They expect the same comforts as they had in the city. When they call for the fire department, they believe that we are right around the corner, unaware that it may take up to ten minutes for a unit to arrive from the other side of the Township. The response time could be reduced if there was no need to look in a book to locate the residence.

Information needed to mitigate the increasing amount of incidents is also a factor to consider. Once we arrive there is more information needed to handle the incident which again must be looked up in books. Books take up space in the rigs and command cars. This space seems to be shrinking as the vehicles continue to get smaller. Cab space in a fire truck is at a premium, with all the new fangled equipment we have to carry. With MDC's, a large portion if not all the information could be stored in the device and be at the ready for the incident commander. He/she could also have the ability to use the internet for information, send and receive emails while on scene that may be of great value at certain types of incidents, such as hazardous material incidents.

Purpose of the Study

The purpose of this study is to develop a plan to implement mobile data computers into the Concord Township Fire Department. There are numerous questions that need to be answered in order for the Fire Department to proceed with this endeavor. The primary questions to be answered are listed below.

Research Questions

The following questions will be answered by this evaluation research:

1. How can the Concord Township Fire Department cover the initial expense for the required equipment?
2. Can the new hardware run the required software needed, such as mapping, preplans and fire reporting?
3. Which device(s) would be best suited for the Concord Township Fire Department?

BACKGROUND AND SIGNIFICANCE

Currently the Concord Twp Fire Department is dispatched via radio only as noted earlier. If the call requires automatic aid either received or given, then the officers receive a page with the address and type of call. The current standard for when the Fire Department receives a call and the exact location is not known, is that the crew has to first go to a large map book to see where the call is. If the location is on a common street that the fire department responds to frequently then the appropriate station can acknowledge the alarm and look up the exact location while enroute. If the street is not common or a newer street, then both stations have to look up the street and address to identify which station is to respond. This takes up time that could be used getting gear on and beginning the response. Our goal set forth by the Chief is to begin our response in less than 1 minute from the time the call is received. This coincides with NFPA 1710 which allows for 60 seconds for turnout. NFPA 1710-Response Times, list two times after the turnout time. 4 minutes for the first piece of apparatus to arrive and/or 8 minutes for the first full-alarm assignment, 90% of the time. (Elliott, 2001) Table I show the percentages that the

department has met the first time. Records for the second time, 8 minutes for full alarm arrival, where unavailable or where not kept. Even with the increase in staffing, the times have not improved. This is generally because we still have to go to the book to locate the incident prior to going to the units. Concord covers 23 square miles and has two stations. Both stations have to check the map book to see which station is to respond if the location is not a well known location or business. On several occasions the units have attempted to look up the address after beginning the response only to find they have turned the wrong way out of the station. This of course adds to the response time. There are no records that indicate how often this occurs over the course of a year, however it does occur and most likely accounts for a percentage of the longer response times as indicated in Table I.

Table I

Percentage of calls vs. how long in minutes till the first unit arrived

	2000-2008		2009	
	Time	%	Time	%
Time of Call to Unit(s) on Scene	4	18.3	4	18.3
	5	17.9	5	21.1
	6	14.3	6	15.9
	7	9.9	7	10.2
	8	6.0	8	5.3
	9	3.8	9	3.5
	10+	5.5	10+	5.1

Note. Staffing increased from 5 on duty in 2000 to 9 on duty in 2009

As the incident unfolds the OIC spends much of the time searching through binders to find the appropriate paper work for the incident. The OIC may also have several binders open for preplans and any forms needed. This all takes up space in the unit which is already cramped to begin with. Several pieces of equipment formally carried in the command car have been removed due to limited space and the need for more and larger binders as Concord Twp grows.

The dispatch center for Concord Twp is located in Kirtland and is staffed by the Lake County Sheriffs Dept Communications Officers. They are responsible for receiving 9-1-1 calls and then dispatching the proper department(s). They also record all emergency traffic and related times and information needed to complete our fire and EMS reports. Along with these tasks they make contact to utility companies and other organizations for the local fire departments when there is a need for them at an incident. They utilize CAD and have the capability to transmit data to mobile computers. This already occurs for all the Police departments and two of the fire departments they dispatch for. Since they are staffed by the Sheriff's they are also the act as the liaison between the fire departments and the Sheriffs Deputies. In large scale incidents or incidents that require the use of the internet or other on-line programs that may be useful, Concord has to wait for the County Command Vehicle to arrive. This vehicle is stored at the dispatch center and is not regularly manned. There are incidents that may not require the command unit its-self, but the availability of the computers could be used. Currently only the squads have any type of computer, but they are set up strictly for EMS. Information such as incident times that may be required on scene has to be retrieved from dispatch via phone or radio.

Another situation that frequently arises is the possibility of receiving a call while the units are out on the road. When this occurs the units must either pull over to check the map book or if

there is a second person in the vehicle, he/she must jumbles through the map book to locate the incident.

As for the ability of the Fire Prevention Division to obtain information from inspections and then pass that information to the response crews, that can take several days and up to weeks. Any information they do receive currently, must be passed to the crews via email, memos or verbally to the shift commanders.

The expectation of this research paper is to help Concord Twp Fire Department develop a plan to implement mobile data computers into the department at a reasonable cost. To identify the needed equipment, hardware, software, and service and maintenance agreements that would best suit the needs of the department. With the implementation of the MDC's we hope to improve response times, and enhance the abilities of the on-scene commanders to mitigate the incident more efficiently, safely and prudently with readily available information. To increase the ability of the Fire Prevention Division to obtain and pass along information more readily to the officers and response crews.

LITERATURE REVIEW

Gary (2000) discusses how they researched the implementation of mobile services for the Livermore-Pleasanton Fire Department. What issues they explored, what categories of vendors they would need to research, and the goals they wanted to achieve. The article also covers the systems and hardware that they finalized and how it has been working for them.

Public Safety IT (2010 Vol. 5 – No. 2) shows the costs benefit realized by utilizing refurbished equipment, and how well the manufacture works with their clients to provide the

services they require. It also has a listing of all the manufactures involved in mobile data services. This includes hardware, software and system management.

Mobile Data for Public Safety (2010) an article from Dispatch Magazine On-Line reviews the growth of mobile data services since the 1980's, and reviews the differences between types of mobile data services and basic questions to be considered when considering mobile data services and equipment.

Elliot (2001) reviews the committee meeting on the issue of NFPA 1710 and provides an overview of the response guidelines as stated in NFPA 1710.

Green (2008) is an article from Law and Order magazine that discusses mobile data network coverage and integrating multiple software programs.

Thorp and Wood (2010) is an article from Public Safety IT discussing mobile records management systems that are compatible with CAD.

Public Safety IT (2011 Vol. 6 – No. 1) discusses the introductions of 4G LTE and WiMAX into public safety communications.

The Beginning of the Future (2010) is an article from Motorola White Papers discussing the future of 4G in the public safety service. This article covers many topics including the abilities of 4G, the cost effectiveness of 4G, and the future growth of 4G.

Prepare for the Mobile Broadband Evolution (2010) is a Motorola eZine Insights article that covers the 4G transformation into the public safety sector and discusses how to choose devices and level of service. It discusses how the new 4G will interact with current applications and services.

Low Cost Computers Come at a Price (2007) is a report from Motorola that discuss the advantages of ruggedized hardware over consumer hardware. Using several studies, it shows the

TCO comparisons for both types of hardware over a 5 year period. The report also make note of the construction differences and standard feature differences between consumer and ruggedized hardware.

What Does it Mean to be Ruggedized (2007) is a report from Motorola that describes the testing standards used for ruggedized hardware. It lists the most commonly accepted standards and also covers the testing methods utilized by the testing organizations.

PROCEDURES

The initial research for this OFE ARP began by looking into articles in journals, reports, periodicals, and related websites to learn more about the costs of MDC's, how they are fitting into the fire service and any other related information that may help with the research questions.

A survey was sent out to 11 fire departments of similar size and call volume as Concord Twp Fire department. The questionnaire was used to find out if those departments have MDC/MDT's. How did they cover the cost of the hardware, what type of hardware are they using, how they are using the hardware, and how well the hardware is functioning for them. Information on training and other cost associated with the system was also gathered from the questionnaire. Other costs include maintenance of the system and components. The survey also gathered information about programs used in conjunction with the MDC such as mapping, preplan and inspections programs. The surveys were sent out with self addressed and stamped envelopes for easy return.

An interview using the same questions as the survey questionnaire was conducted with a local fire department that uses MDC's and is dispatched through the same center as Concord Township. This will keep the information gathered through both collection types the same.

With the data collected, the information was compiled and a statistical analysis completed to determine several items and provide the needed information to assist the Concord Twp Fire Department in answering the research questions. How can the Concord Twp Fire Department cover the initial expense for the required equipment, software, updates and maintenance? How can the MDC device meet the requirements needed such as mapping, preplans, fire reporting, and inspections? Which device(s) would be best suited for Concord Twp Fire?

The information gathered in this research is not expected to answer every question that the fire department may have, but should provide the fire department with the necessary information to begin the process of implementing MDC's into the vehicles of Concord Township Fire Department.

Definition of Terms

OFE - Ohio Fire Executive

ARP – Applied Research Project

MDC. - Mobile data computer

Preplan. - Information gathered pre-incident to identify hazards or other key elements that may be used to mitigate the incident.

NFPA 1710. - The Standard for the Organization and Deployment of Fire Suppression Operations, Emergency medical Operations, and Special Operations to the Public by Career Fire Departments.

Limitations of the Study

As the current market fluctuates, the actual prices may not be the same as listed in the paper as when Concord Township begins to implement the mobile data computers into the vehicles.

Network systems are growing rapidly and newer system may have more options by the time the MDC's are implemented into the vehicles.

RESULTS

The results of the research project came from the evaluation and examination of the data collected from the journals, periodicals, reports, related websites, an interview, and the survey.

Question One

How can the Concord Twp Fire Department cover the initial expense for the required equipment?

> Public Safety IT (2010 Vol. 5 - No. 2)
>
> Toughbook Depot offers a unique array of new and refurbished Toughbook® products, vehicles mounting solutions and hard-to-find parts and accessories for today's demanding public safety applications… …with savings of 75 percent compared to purchasing new items, and combined with a standard one year warranty.

The Beginning of the Future (2010)

A study by VDC Research Group examined the costs of buying ruggedized public safety equipment over a five-year timeframe. VDC found that buying ruggedized devices delivers a savings of about $2,000 per year per device thanks to reduced equipment failure and downtime – even though it might initially require a larger upfront investment

Lost Cost Computer Come at a Price (2007)

A 2007 VDC Research Group study quantified the total cost of owning and supporting a mobile computing device for five years. In government applications, the cost differences were stark: a fully ruggedized notebook computer cost $15,700 to purchase, support, and operate – while a "low-cost" consumer laptop costs over $27,100 over the same timeframe.

Question 2 of the survey asked the departments how many vehicles in their fleet utilize MDC/MDT's. Of the 8 departments that utilize MDC's, they ranged from 3 – 14 vehicles. Table II shows how many departments vs. how many vehicles.

Table II

Vehicles	Departments
3 Vehicles	1
5 Vehicles	2
6 Vehicles	2

7 Vehicles	1
11 Vehicles	1
14 Vehicles	1

Question 5 of the survey asked the departments how much they paid for the components. Of the 8 that replied only 5 where able to provide the costs per device. They ranged from $1800 for semi-rugged to $6500 for full rugged. The remaining 3 departments did not know the cost of their components. Table III shows the cost per unit, how many vehicles and the total cost.

Table III

Cost per unit:	Number of Vehicles:	Total Cost:
6,500	6	39,000
4,000	5	20,000
2,400	5	12,000
2,200	14	30,800
1,800-2,200	11	19,800-24,200

Question 4 of the survey asked how the units were purchased, by county, department or combination. Of the 7 that have MDC's, 2 were by county, 3 by department, and 2 by combination. See table IV.

Table IV

No. Dept's:	No. Units:	Purchaser:
2	10	County
4	35	Department
2	12	Combination

Question 6 of the survey asks if any of the Departments received any Grant money to offset the costs of the hardware. Three departments received grants. Two where grants at the County level and they could not provide the amount of the grants. One of the grants was from UASI. The third department received a grant from FEMA (AFG) to purchase all their devices.

Question Two

Can the new hardware run the required software needed, such as mapping, preplans, and fire reporting?

> Prepare for the Mobile Broadband Evolution (2010)
>
> LTE networks can overlay and interoperate with narrowband data networks and other wireless broadband networks such as WLAN to balance coverage and capacity requirements throughout the desired service area.
>
> Existing networks will be maintained to support existing mission-critical voice, while the new broadband networks can be deployed to support the new mobile services.

Mobile Data for Public Safety (2010)

Now, in the 21st century, mobile data is common among ordinary consumers and every size of American business. There are dozens of PDA's, cellular phones and laptops that can transmit data wirelessly from anywhere.

Cellular telephone carriers also offer a mobile data solution over the data networks that mirror their voice network coverage. The current cellular network eliminates the design, construction and maintenance of a private network, and in most regions provides improved and more reliable coverage.

Today's third generation (3G) technologies are operated separately from the cellular voice network, and have increased speed as well.

As large and medium sized agencies have successfully implemented mobile data over the past five years, public safety officials recognized the advantages of having access to data in the field. This, in turn, as generated interest in so-called broadband applications for mobile data, including video, photos, in-field reporting, and sophisticated ad hoc networking and messaging at critical incident scenes.

Question 15 of the survey asked what functions do they utilize with their devices, choices of mapping, preplans, inspections, and reporting where listed. Table V shows how many departments utilize which software program.

Table V

Mapping	Preplans	Inspections	Reports

7	**6**	**2**	**4**

Question 16 of the survey referred directly to mapping software and inquired as to the improvement of responses times and the reduction of responding to the wrong location. Five of the respondents were able to answer this question. Response time improvement was a yes for 2 and a no for 3. Reductions in wrong location responses were 4 for yes and 1 for no. Table VI reflects this data.

Table VI

	Response Times	Wrong Locations
YES	2	4
NO	3	1

Question 3

Which device(s) would be best suited for the Concord Township Fire Department?

Gary (2000)

These first IPAQs have exceeded our expectations and draw considerable attention from Palm, handheld and laptop users. They are easy to set up without computer staff help and they sync right up to all out Microsoft applications.

Public Safety IT (2010 Vol. 5 - No. 2)

…Rugged Notebooks have been a leader in providing ruggedized laptops, tablet computers and PDAs to the military and public safety agencies.

Currently, El Campo PD has 15 mobile data computers in service, and half of those are the Panasonic Toughbook. Chief Marek said they are intending to replace the other models with Panasonic's.

The Beginning if the Future (2010)

Public safety officials will choose from a portfolio of tiered devices offering the necessary ruggedness and ergonomics for public safety environments. These devices will also support various modes of operation from 3G to 4G and private to public for the most flexible operating models.

What Does it Mean to be Rugged? (2007)

Where is ruggedized wireless technology most commonly needed? Typically, it is the optimal technology for mission-critical applications of police, fire departments and EMTs providing care in the field.

Question 12 of the survey asked what model of MDC or console do you use in your vehicles. Panasonic's Toughbook® line of mobile devices was used by 7 departments and Durabook mobile consoles by 1 department. See Table VII

Table VII

	Toughbook	Durabook
Departments	7	1

DISCUSSION

After reviewing all the data collected, there is a wide range of options for the Concord Twp Fire Department with respect to implementing mobile computers into their vehicles. The data shows that with today's technology you can develop a mobile computer system that does just about anything you wish it to do. The key factor becomes cost, how much do you want to spend and complex of a system do you need?

Research question 1 asked, how can the Concord Twp Fire cover the initial expense for the required equipment? To better answer that question we need to estimate what that amount might be. Survey question 5 seeks to find out how much other departments paid for their devices. The range was between $1,800 and $6,500 per device. This range in prices covers semi-rugged and fully ruggedized, however it does not specify if the devices were all new or if any were refurbished. Concord Fire has 11 vehicles that could be outfitted with MDC's. This would put the estimated cost to outfit all the vehicles at $19,800 to $71,500. This figure only covers the initial cost of the devices and does not include any additional software or air-cards that may be required.

Research question 4 inquired as to who purchased the devices for each of the departments. The research showed that the majority of the departments where responsible for the costs of the devices, with only a 2 departments not having to cover any of the initial cost for their MDC's. Of the remaining, 4 departments covered the initial cost completely and 2 where required to split the cost with another agency. Upon the completion of the interview with Perry Fire District, who currently operate MDC's, and are dispatched through the same center as Concord, there is an option to rent the devices from Lake County Emergency Operations Center. Lake County E.O.C. is the dispatch center for all fire departments in eastern Lake County. It is

operated by the Lake County Sheriff's Department. At the time of this paper the cost was $1,000 per month per device. This option would also limit you to a few models to select from.

Research question 6 asked the departments about receiving grant money to offset the costs. Only 3 departments received money from grants. Of the 3 departments, 1 department was unable to provide the information on the grant received, and 1 department provide information that the grant they received from UASI went directly to the County to cover the cost of the devices. The remaining department was able to received grant money through the FEMA (AFG) grants to cover the costs of all the devices and required equipment to put them in use. This included but is not limited to the software, air-cards and mounting equipment. They did not have the exact amount of the grant at the time of the interview.

Other research shows that certain devices can be obtained from venders at reduced prices and the some models can be refurbished and sold at lower costs. Public Safety IT (2010 Vol.5 – No. 2) relates to refurbished equipment sold at well under half price. The devices are from the Toughbook line of computers offered by Panasonic. The company that refurbishes them and offers them at as much as a 75 percent savings is Toughbook Depot. All the devices come with a 1 year warranty and extended warranties can be purchased out to 3 years.

In order to best answer research question 1, research questions 3 should be determined. Research question 3 asks which device(s) would be best suited for Concord Twp Fire Department. The research shows that the best suited devices for the fire industry application would be those that are ruggedized and have the ability to stand up to the environment that they could be subjected to. What Does it Mean to be Rugged (2007) brings to note this fact. The article state "typically, it is the optimal technology for mission-critical applications of police, fire departments and EMT's providing care in the field."

Gary (2000) talks about the Compaq IPAQ series of mobile data computers. The department that looked into these computers was very pleased with the performance that they received from the computers. This department utilized more than the laptop portion of the system and also included hand held devices for their inspector. They devices where able to sync to one another and to other Microsoft applications to kept all the devices updated with inspection information. They were exceptionally please with the ease of setup that the IPAQ's offered. This article did not mention if the devices where ruggedized or not and did not express what the cost of all the devices where.

Low Cost Computers Come at a Price (2007)

> A 2007 VDC Research Group study quantified the total cost of owning and supporting a mobile computer device for five years. In government applications, the cost differences were stark: a fully rugged notebook computer costs $15,700 to purchase, support, and operate, while a "low-cost" consumer laptop costs over $27,100 over the same time frame. Similarly, a "low-cost" consumer handheld PDA cost nearly $25,300 over five years, over $10,000 more than a fully rugged PDA.

This research clearly shows that the best suited equipment for the fire service is the fully rugged equipment. The article What Does it Mean to be Rugged (2007) reiterates this data. The cost benefits of purchasing less costly devices that are not fully rugged may save funds initially, but will cost more in the long run with repairs, maintenance and lost usage.

The survey data show that the majority of departments use fully rugged devices. Question 12 of the survey asked which model computer or console do the departments use in their vehicles. Of the 7 departments that responded to the survey and the 1 interview, all but one of the departments utilize fully rugged devices. The other department does utilize semi-rugged

computers. All of the departments using rugged computers have chosen the Toughbook line from Panasonic. The Durabook line of computers was used by the department that went with semi-rugged.

With the cost of the devices, and which devices maybe the best for Concord analyzed, the final research question can be reviewed. Research question 2 inquires to the ability of the device(s) to run the required software such as mapping, preplans and on-scene fire reporting. The research data obtained from all the sources utilized clearly show that all are available currently and that as technology improves, many more application will become available in just a few years.

Current technology is using 3G (third generation) to send and receive data. 3G broadband is separate from voice communication and they can be run simultaneously. 4G is now available in some areas and has greater speed and the ability to move greater quantities in data.

Prepare for the Mobile Broadband Evolution (2010)

> LTE networks can overlay and interoperate with narrowband data networks and other wireless broadband networks such as WLAN to balance coverage and capacity requirements throughout the desired service area.
>
> Existing networks will be maintained to support existing mission-critical voice, while the new broadband networks can be deployed to support the new mobile services.

As noted by this article, the new 4G LTE can work in conjunction with other wireless broadband networks. This data is also referred to in several other articles such as Mobile Data for Public Safety (2010) and Public Safety IT (2011 Vol. 6 – No. 1) both of which list the ability of 4G overlay and interoperate with narrowband data networks and other wireless broadband

networks. Public Safety IT (2011 Vol. 6 – No. 1) also discusses WiMax (Worldwide Interoperability for Microwave Access) as a telecommunication protocol that provides fixed and mobile internet access. Both 4G LTE and WiMax operate the same leaving the decision as to which one to use to be whom you want as your carrier. 4G LTE is offered by Verizon and AT&T and WiMax by Sprint.

Question 15 of the survey asks what functions the departments utilize with their MDC's. Choices of mapping, preplans, inspections and reports were offered for them to mark. Mapping is utilized by all but one of the departments. Preplans are utilized by 6 of the departments and on-scene reports by 4. Only 2 departments incorporate inspections into their MDC's.

As noted by the research, the current mobile data computers available can run almost any application and interoperate with most other networks.

RECOMMENDATIONS

With the analysis of the data from the literature review, the survey and the interview compiled, recommendations for the research questions can now be made.

Question #1

How can the Concord Township Fire Department cover the initial expense for the required equipment?

The research show there are several ways Concord Twp Fire could save, reduce or share the costs of MDC's.

To save and reduce the costs;

1. Concord should prioritize the fleet of vehicles and spread the purchase over time.

2. Purchase refurbished devices at a reduced cost.

To share the costs;

1. Apply for FEMA grant funds.
2. Multi-agency purchases.

Question #2

Can the new hardware run the required software needed, such as mapping, preplans and fire reporting?

With the available technology today there is very little that can be accomplished electronically. With the increase in availability of 4G and associated applications, there is almost no program or software that cannot be adapted or used in conjunction with any other program. Concord Fire will need to evaluate the multitude of mapping programs available and chose the best fit for Concord. Preplans can be loaded directly onto the new devices. As for fire reporting, mobile Firehouse may need to be purchased. This however, may already be in the works with the local departments looking to move Firehouse to the dispatch center for records storage.

Question #3

Which device(s) would be best suited for Concord Twp Fire Department?

Ruggedized equipment offers the best over-all life expectancy. They have show to have the best total cost of ownership (TCO) over a five year period as compared to non-ruggedized equipment.

Concord already uses several Panasonic Toughbooks for EMS purposes, and therefore should stay with this brand. The members of Concord Fire are already familiar with the operations of the Toughbooks. A neighboring department also uses the same Toughbook as Concord, and has shown that the software Concord is looking to employ with these devices is available.

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APPENDIX 1 – SURVEY

1. Does your department currently use Mobile Data Terminals (MDT/MDC)?

   Yes No

2. How many vehicles in your fleet have MDT/MDC's?
3. Is your MDT/MDC system, county based or department based?

   County Department Other

4. How was the system and the terminals purchased?

   County Department Combination Other

5. How much did the system and components cost?

   Cost =

6. Did you receive any grant money to offset the cost of the system or the components?

   Yes No

   If yes, which grants?

7. What is the associated maintenance cost to your department for the system and/or the components?

   Cost =

8. Who provides the maintenance for the system?
9. Was the department involved in any of the planning for the new system or the components?

   Yes No

10. What type of system do you operate with? Ex – Radio/4G/3G/Air-card etc…

11. What CAD (computer assisted dispatch) system addresses or transmits to the MDT/MDC system?
12. What model MDT/MDC or console do you use in your vehicles?
13. Who provided the training for your employees?
14. How long did the training take?
15. What functions do you utilize with the MDT/MDC'c?
    a. Mapping
    b. Preplans
    c. Inspections
    d. Reporting
    e. Other
16. If mapping is used, has it improved your response times and cut down responding to wrong locations?
    a. Response time improved Yes No
    b. Wrong location Yes No
17. How would you rate the overall performance of your system?
18. What changes would you make now that it is use?