EMS for a growing community-
Service Delivery alternatives for the City of Delaware, Ohio

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ABSTRACT

The situation that prompted this paper was the steady increase in Emergency Medical responses by the Delaware City Fire Department in the last 5 years. This has become a drain on staffing resources and equipment, as well as leaves run areas unprotected for fire protection while handling an EMS run.

The purpose of this project was to determine if alternative methods of response were feasible to address the problems of getting units back into service in less time and utilize limited personnel to make the best use of a multi-station environment.

The survey method of research was employed to investigate how other fire departments provided Emergency Medical Services in a multi station environment. This survey was conducted with Ohio fire departments randomly chosen from each county in the state.

Two research questions were posed as a basis for this project:

1. How can alternative methods of EMS delivery improve utilization of limited personnel for EMS in the Delaware City Fire Department?
2. How do similar departments provide Fire/EMS services in a multi-station environment with limited personnel?

The procedures consisted of a literature review and an external survey conducted of Ohio fire departments to determine how EMS was provided. The results of the survey contradicted the literature search as to trends of how EMS is being provided in the State of Ohio.

Recommendations include conducting further research into the reallocations of resources and personnel to better serve the public as well as conducting the survey with respondent tracking modifications to provide a method for respondent follow-up. This will provide more accurate data for an informed decision.

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INTRODUCTION

In the City of Delaware EMS responses outnumber fire responses by a wide margin, nearly 3:1. This project will explore service delivery alternatives in order to provide methods to utilize the limited personnel available on a daily basis due to a steady increase of EMS responses over the last 5 years. A report will be generated that will provide alternatives to traditional methods of delivering EMS.

Research Questions:

1. Can alternative methods of EMS delivery improve utilization of limited personnel for EMS in the Delaware City Fire Department?
2. How do similar departments provide Fire/EMS services in a multi-station environment with limited personnel?

Research Method:

These questions will be explored by researching other service providers similar in size and scope to our own department. This will be accomplished by the survey method of research. A search of equipment manufacturers may indicate what has been manufactured for these non-traditional uses. This will provide a background of information to better understand these concepts. The final project will contain a list of like departments, run volume, how they provide emergency services and at what level this service is provided. The project should contain both pros and cons to allow the reader to form their own opinion based on the information provided. The project will also provide a recommendation for the department as a basis for consideration when planning future stations and staffing.

BACKGROUND AND SIGNIFCANCE

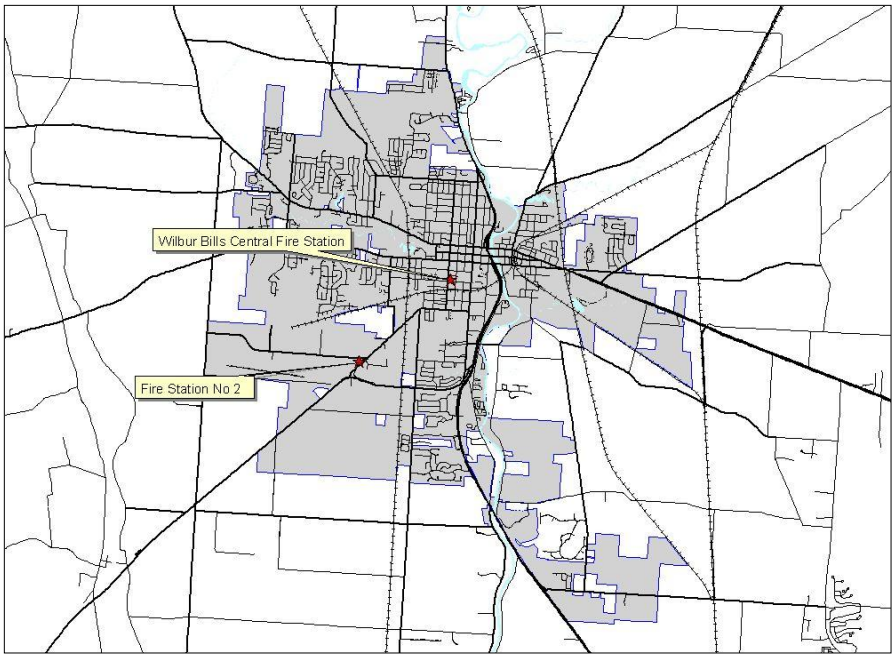
Delaware is the largest city in Delaware County. This city is experiencing tremendous growth and the demand for city services are growing as well. The Delaware Fire Department is laying out plans for expansion and is questioning the best and most efficient means to provide services to the population that they serve.

The city of Delaware is located approximately 20 miles north of Columbus, Ohio. The city covers about 16.9 square miles and is home to 28,500 people. (See Figure 1)

Figure 1

The Delaware City Fire Department has two stations, designated station 300 and station 302. (See Figure 2) Station 300 (Wilbur Bills Central Fire Station) is located roughly in the center of the city, and houses the administration offices, fire, and EMS equipment. Station 302(Fire Station No. 2) is located on the west side of Delaware, adjacent to the city's industrial park. This station houses both EMS and fire equipment.

Figure 2



Delaware provides fire and rescue services, is a member of a countywide HazMat team and

provides emergency medical care to its citizens. The department staff is 40 uniformed personnel and 1 civilian secretary. Of these, 14 are trained to EMT Basic level and 26 are trained to EMT Paramedic level. Table 1 below shows the types and numbers of equipment that are housed in each station.

Table 1

Equipment in the Delaware Fire Dept		
Equipment	Station 300	Station 302
Engines	1 front line 1 backup	1 front line 1 backup
Ladders	1	0
ALS Ambulance	1	1
BLS Ambulance	1	0
Rescue	1	0
Grass Unit	1	0
Water Rescue Boat	1	0
HazMat Trailer	1	0
Trench Rescue	0	1

According to the most recent department annual report (2001), the Delaware Fire Department had 2,626 requests for emergency medical services. This includes both ALS and BLS runs. ALS (Advanced Life Support) runs are defined in the department as any request for service requiring defibrillation, invasive procedures, or the administration of protocol regulated medications. BLS (Basic Life Support) is defined in the department as basic lifesaving procedures that focus on a patient's airway, breathing, and circulation. In contrast, the department had 944 requests for fire/rescue services. These include all fires, rescues, hazmat, and service runs. This represents a 2.8:1 ratio of EMS to fire responses. Tables 2 and 3 show the

number of EMS requests by month the year 2001. These are separated by station to illustrate how the runs were split between stations.

Table 2

Station 300 EMS Run Statistics By Month			
Month	ALS Runs	BLS Runs	Total Runs
January	108	58	166
February	108	33	141
March	133	39	172
April	83	76	159
May	83	76	159
June	85	79	164
July	88	72	160
August	101	62	163
September	85	79	164
October	100	85	185
November	53	59	112
December	69	73	142
Totals	1096	791	1887

Table 3

Station 302 EMS Run Statistics By Month			
Month	ALS Runs	BLS Runs	Total Runs
January	34	4	38
February	35	7	42
March	50	0	50
April	23	48	71
May	30	34	64
June	32	34	66
July	27	43	70
August	36	53	89
September	31	49	80
October	22	42	64
November	30	28	58
December	22	25	47
Totals	372	367	739

Delaware has historically provided BLS and ALS response out of a single station (Station 300). The approved staffing level for this station was eleven personnel. Due to the city's rapid growth, a second station was opened in April of 1998. This station (Station 302) provides ALS and fire response. The staffing levels were changed for Station 300 from eleven to eight personnel and the remaining three were transferred to Station 302. An additional person per crew was added to supplement Station 302 personnel but due to certain provisions regarding time off and minimum staffing in the existing labor contract, the present staffing levels of Station 302 is three to four personnel with three being the norm. This is to keep Station 300 staffed to at least minimum manning. It is anticipated that discussion regarding staffing levels in a multi-station environment will be undertaken in the next labor negotiations.

Typically, when answering a response, Station 300 will respond with three on an ALS unit or two on a BLS unit. The present department guidelines in place require at least two paramedics be on an ALS unit in order for it to respond. The remaining spot on the unit is filled with at least an EMT-Basic. The BLS unit is staffed with any available combination of paramedics and or EMT-Basics for a total of two personnel on a BLS response. This leaves the remaining personnel to respond with fire apparatus (four on an apparatus, or five if a BLS unit is out.). This problem becomes compounded if more than one apparatus needs to respond to an incident or personnel are off due to vacation or sick leave. All calls, whether Fire or EMS are handled on a "first in, first out" basis. This can leave some equipment understaffed or unmanned.

This procedure is further complicated by the occurrence of "back to back" or simultaneous runs. Table four illustrates these figures by showing the number of times the department had two runs at the same time as well as three or more runs simultaneously. The number of runs transferred to an outside mutual aid department is also shown. This occurs when EMS or fire responses leave the department unable to respond to a call.

Table 4

2001 Back to Back EMS Runs			
Month	2 Runs	3+ Runs	Transfers
January	43	0	2
February	38	0	3
March	47	8	1
April	62	5	7
May	53	10	4
June	57	4	5
July	66	3	4
August	63	1	3
September	79	1	1
October	55	7	5
November	36	3	2
December	36	5	6
Totals	635	47	43

Station 302 responds with three personnel on the medic unit for EMS or three personnel on an engine company for a fire response. The exception to this is when manpower levels allow and four personnel are assigned to this station, four personnel are assigned to the engine or three are assigned to the medic for EMS. This arrangement leaves one firefighter at Station 302 during an EMS response. With typical staffing, when on an EMS run, this station is unmanned or with just one person and fire equipment sits idle for the time the ALS unit is out of station. The same situation applies when the station has a fire run, the EMS unit sits idle and the station is unmanned. This arrangement doesn't utilize all the personnel when staffing levels are at four and when staff levels are at three, it leaves the station with a three-person engine company.

LITERATURE REVIEW

The literature review was performed primarily to determine the number of departments using the EMS delivery method being referenced in the research questions, as well as how these services are utilizing this method. This section discusses:

1. Service Delivery Methods
2. Departments that utilize alternative EMS delivery methods.

Service Delivery Methods:

Sachs (July, 1998) wrote that before the 1960's the victim in a medical emergency did not receive much more medical assistance besides being transported to the hospital. Since ambulances were often staffed only by a driver, ambulance services until that time offered little in the way of lifesaving care. (Page 1) Sachs (July 1998) also writes that as EMS in the fire

service has grown, EMS vehicles have become dual-role, much like the emergency personnel who staff them. (Page1).

EMS Engines-

Sachs (July, 1998) wrote that one option for delivering ALS first response is to place paramedics aboard engine companies, increasingly referred to as "front-loaded ALS," and requires cross-trained personnel. This delivery mechanism allows ALS initiation prior to the ambulance's arrival and increases efficiency because personnel fill multiple roles. (Page 2). Sachs (July, 1998) continues to explain that one disadvantage of paramedic engine companies is that sometimes an engine company is put out of service when a paramedic must accompany a patient to the hospital. In services in which this happens regularly, as in those using BLS ambulances to respond with paramedic engine companies, fire departments often assign two paramedics to an engine so that the company does not need to go out of service. (Page 2)

Ambulances –

Ambulances are units that are considered "task specific" units. They come in three general styles or configurations. Type I is a pickup truck chassis with a modular patient compartment attached. Type II ambulances is a van chassis with a raised roof. These units allow for access from the passenger compartment to the patient area without leaving the vehicle. Type III ambulances are van chassis with modular patient compartment. This configuration allows for the benefits of walk through access and modular construction. These units typically carry two to four personnel to respond to EMS emergencies.

Multiple Role Ambulance-

Sachs (July, 1998) wrote that today it is not uncommon to have an ambulance with a PTO pump and water tank large enough to supply a 1-¾" attack line or two. This type of unit may be called a transport-capable fire/rescue unit or a suppression ambulance. (Page 3).

Sachs (July, 1998) concludes that all fire departments should have a very good understanding of their EMS demands, including the unique challenges of their terrain and levels/types of services that will be provided… (Page 3) the type and design of EMS vehicles must be based on the needs of the community and how EMS and other services should be provided by the fire department (Page 3).

Cavette, (1998, April) stated a new trend in the 1990s was taking shape in the form of "three-function vehicles that combined the patient transport capability of an ambulance, the equipment storage space of a light rescue and the fire suppression ability of an initial attack pumper." The theory behind the concept was that the majority of a fire department's calls were for EMS, which usually called for an ambulance or light rescue rather than a pumper. (Page 1)

Cavette (1998, April) also wrote that since its introduction, the combination vehicle has grown and evolved. Some departments liked the concept and made it work; some didn't. In talking with departments that are currently running combination vehicles, it became apparent that the type of operation is as important as the vehicle specification in making this concept a success. (Page 1)

EMS Delivery Profiles-

Page, (1988) wrote about six basic profiles exist for the implementation of EMS delivery services in this country. These were illustrated by portraying in six different hypothetical fire departments

Profile A, An ALS equipped engine or truck responds to the scene, begins triage, determines which level of care is needed, begins treatment and a private ambulance service does the transportation. At least two personnel in this profile are trained to paramedic level and the remaining members are trained to EMT-Basic level.

Profile B includes many of the same aspects as profile A, except that the transporting ambulances are provided by the fire department. Even though many of the same services are the same as in profile A, out of service times tend to be longer because the department is providing the transport vehicle.

Profile C provides for only BLS and no department supplied transport vehicles. Transportation is provided by a separate, community ambulance service provided by tax resources. This arrangement provides for first responder and BLS support from the fire department, emergency ALS transport and care from the community ambulance service, and non-emergency transport from a private ambulance service.

In profile D, the fire department has created an EMS in the fire department that is separate from the department and utilizes civilian personnel in a single role capacity. This profile raises some operational difficulties due to the separation of the two services and the fact that fire department personnel are only trained as first-aiders. This profile also does provide very little opportunities for advancement and a high probability for employee turnover and burnout.

Profile E utilizes combines both fire protection and emergency medical services in combined resources of personnel and vehicles. The department designates a certain number of fire stations as *medic companies*. Each such station is equipped with a four person crew. These four consist of an assigned driver or engineer, company officer and at least two personnel trained as paramedics. Each station is equipped with a standard fire pumper and a fully equipped

paramedic unit. All requests are handled in a “first in, first out” basis, that is, if a fire run comes in first, the crew responds with an engine, leaving the paramedic unit unstaffed. The same is true when an EMS response comes in. all four respond on the paramedic unit, leaving the engine in the station and unstaffed. This procedure allows for implementation of paramedic service without hiring more staff. It also allows for a full four persons on an EMS response and a fully staffed engine company. This profile depends on the availability of first due engine companies covering medic company’s response district while they are out of service. This profile seems to be better suited to locales that have dense populations and have compact boundaries.

Profile F incorporates the use of volunteers in both the fire department and the emergency medical services. It assumes pre-existing entities for both services and that no cooperation existed before the application of this profile. The volunteer ambulance service is well trained, but due to response from a single station response times have become unacceptably high. A proposal was made to the volunteer fire department to become trained to an EMT-Basic level and provide service as first responders.

Page, (1988) further goes on to explain that readers of the above profiles will recognize that no single set of features is appropriate for every agency. Community desires, tradition and history affect the design of an EMS delivery system. Budgetary, political and availability of supplemental funding are also factors in how a delivery system is structured.

Page, (2002) in the third edition of *Managing Fire and Rescue Services*, discusses how the fire department is the ideal medium for delivery of rapid emergency medical services due to the high state of readiness, knowledge of their districts, and quick response. It is these factors as well as others that have made first responders and paramedic fire companies so successful. This evolution of paramedic fire companies has proved beneficial due to fire station placement that is

ideal for providing quick response by ALS equipped pumpers or ladders. These companies can usually provide more rapid response, initiate ALS care and "stop the clock" for ambulances responding from more distant locations.

Departments that use ALS Transport Engines:

A search of the Internet has produced only a limited number of responses. Most information has been references to departments from discussion forums. Departments that have been contacted and located that use this delivery system are the following:

1. Sycamore Township Fire Department
   8540 Kenwood Rd.
   Sycamore Township, OH 45236-2010

2. Sandy City Fire Department
   9010 South 150 E.
   Sandy, UT 84070

3. City of Kent Fire Department
   24611 116th Ave. SE
   Kent, WA 98031

These three departments have all used transport engines to some degree with varying success. Sycamore Township has two of these units that are used as backups to their regular transport units. They are not used exclusively as primary service providers. Sycamore has approximately 24,000 residents and covers approximately 8 square miles. The township has 96 career employees and 2 stations. While the township is similar in population to Delaware, the area covered is not as large and they have a higher fire run volume than Delaware.

The city of Kent, Washington experimented with this service delivery alternative method in an entirely different manner. They equipped several engines for patient transport capability strictly as an alternative for BLS transport if all of the ALS ambulances are tied up with other

calls. Several years later, they abandoned the idea and retrofitted the engines to fire fighting duties only. Kent is approximately the same size as Delaware, but because they no longer use this method of service delivery, further figures were not gathered. The city of Kent did however; provide some insight into why they discontinued this method of service.

They stated that concerns with public safety in engine response to EMS runs rather than an ambulance was a factor as well as patient comfort and decreased life of fire vehicles made this service delivery alternative unfeasible for this city.

Delia (June, 1998) wrote that the city of Sandy, UT faced the challenge of providing quality firefighting and paramedic care with limited staffing and equipment (Page 70) The city has about 97,000 residents and also services approximately 15,000 resident in an unincorporated area. The fire department has 60 full time and 15 to 20 volunteer firefighters. In 1990, EMS calls were 2,700 per year and by 1998 had increased to 4,800 per year. The city determined through discussing their needs with apparatus manufacturers that the ALS transport engine would be their best option. This approach has worked so well for this department that as of this year (2003), they will no longer use any ambulances or single task EMS units in any of their 5 stations. All of their patient transport units are ALS transport engines.

Discussion Forums-

One of the more interesting avenues of the literature search was posting a question at www.firehouse.com in their forum section to get a general opinion of people from different parts of the country on the subject of ALS Engines as a transport alternative. This was by no means a scientific study or survey, but an interesting trend did show up in the people who responded.

As a general rule, respondents from the east coast and areas east of the Mississippi river did not like the idea of a transport engine. On the other hand, the people that responded from west of the Mississippi seemed to agree that the idea had merit. This seemed to support the articles and other research done.

Further research was done by contacting various equipment manufacturers and requesting specifications and a customer list of fire departments that have requested a multi-purpose vehicle, specifically ones that have the capability of patient transport within a crew area. The response was varied, from "we used to do that but didn't sell enough" to references to the Federal specification for a star of life ambulance. (KKK-A-1822E) Not all manufacturers responded and a follow-up letter was sent in hopes of getting another response.

All manufacturers that responded stated that they could, and have placed EMS compartments on all kinds of vehicles, specifically pumpers and ladders for carrying EMS equipment either as a first response vehicle or as a primary response vehicle. Both of these require an EMS transport vehicle to be dispatched with them in order to move the patient to the hospital. However, the true ALS transport engine seems to be rare. One manufacturer, American LaFrance referred to their crashworthiness tests and the fact their units have not been tested to include a patient. Several manufacturers referred to the possibility that these units would have issues with the federal specifications for Star-of-Life Ambulances. Specifically, the floor height for a pumper would be too high to comply with the specifications. This problem was solved for Sandy, Utah by creating a hydraulic lift to raise the wheels of the cot to the height of the apparatus' floor. The problem was also solved for Sycamore Township by incorporating a ramp in the cab to facilitate loading of the cot. The literature search was beneficial in this research because it showed how truly varied the fire service is and how it has adapted to local conditions.

PROCEDURES

A survey form (Appendix A) was designed to gather information from the entire state of Ohio. The survey method of research was chosen in an effort to obtain the most varied cross-section of fire departments in the shortest amount of time. This covered a range of fire-based EMS providers, from large cities to small volunteer departments. These departments were chosen at random so as not to show any preference to size, type, or department affiliation. This survey was mailed to the departments with a cover letter explaining the purpose for the survey. This survey requested information concerning population served department EMS demographics and how it provides EMS services to its community.

The departments were chosen by first requesting a listing of all fire departments in Ohio from the State Fire Marshal. This list was a basic mailing list and contained name, address chief's name and phone numbers as well as number of firefighters, both paid and volunteer. This list did not contain any demographic information as to population served or department size. These names were categorized by county and Fire Department Identification number. (FDID) It was found that there are 1222 fire departments in the state. Initially, the plan was to use the first four FDID numbers from each county to provide a cross-section of departments from the entire state. This netted 352 fire departments in which to send surveys. Due to budget constraints, only 200 surveys could be sent along with a return envelope. These were chosen at random from the previous number of departments. The survey questions, in the format as sent to each department can be found in appendix A in this document. The surveys were sent to the departments on January 15, 2003 and the return date was listed as March 15, 2003. Out of the 200 surveys that were mailed, 141 were returned, for a 70.5% return rate.

RESULTS

Once the surveys were returned, the information was placed into a spreadsheet and coded to allow it to be analyzed. The coding system can be found in appendix B. One error was noticed in that prior to mailing each individual letter was not assigned a unique ID number as to the department to which it was sent. This made it extremely difficult to follow up with specific departments that fit the same demographics of the Delaware City Fire Department but made it a truly random survey. The information was then examined to determine if any department in the state that corresponded to the Delaware Fire Department in size, and population served. Six departments were found to have the same population range as Delaware. These demographics are shown in table 5. Of those, four had more than one station, five were career departments, none were volunteer, and one was a combination department. As the table shows, one of the departments doesn't provide EMS within their service structure, and the rest of the departments all provide ALS service with one of those providing BLS as well. The final column in this table shows whether or not the department is using an alternative service delivery method, in this case, ALS engines or ladder companies. Of the six departments, two are using this alternative service delivery method. Neither of the respondents provided a name or address so a follow-up interview was not possible due to the error in coding as mentioned earlier in this section.

Table 5

Surveyed Departments with populations of 20001- 30000								
Survey ID No.	1st Resp	BLS	ALS	Volunteer	Combination	Career	Number stations	ALS Engines
00046			X		X		1	N
00048						X	2	N
00057			X			X	2	Y
00080			X			X	2	Y
00085			X			X	3	N
00086		X	X			X	1	N

The overall results of survey received were placed in a pie chart to compare the cross section of the departments that responded with the over all statewide cross section. (Figures 3 and 4) It was noted that over 61% of the respondents were volunteer departments. (Figure 3) The survey results correspond closely with the pattern of fire departments types statewide. (Figure 4)

Figure 3

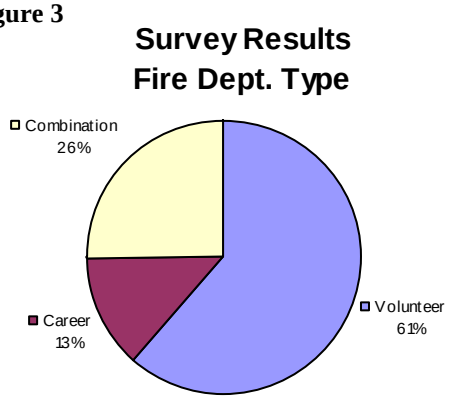
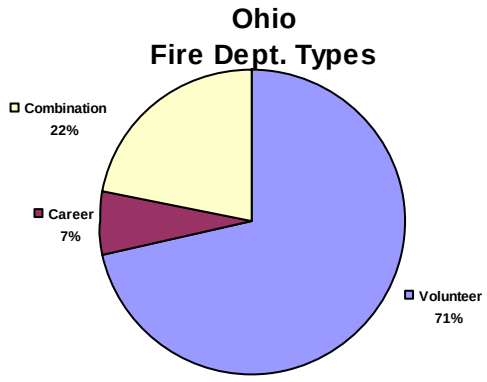


Figure 4



The survey also showed that 103 (73%) departments run out of one station. It also showed that 95 (67.3%)of the responding departments provided some sort of emergency medical services, whether it was first responder, Basic Life Support (BLS), or Advanced Life Support (ALS). Some departments provide all of the services while some just provide one or two. (Table 6)

Table 6

Emergency Medical Services Provided by Survey Departments

Service Type	Number	Percent
First Responder Only	10	7%
First Responder/BLS	5	3.5%
BLS Only	7	5%
ALS Only	49	34.7%
ALS/BLS	18	12.8%
First Responder, BLS, ALS	10	7%

All of the departments surveyed provided EMS in what would be considered a traditional method, i.e. a dedicated unit designed for EMS only. These units vary in the number of paramedics on board, but the survey showed that 31% of the departments that provide ALS have a minimum of one paramedic on the ALS unit and fill in with EMT-Intermediates or EMT-Basics. Of the departments who responded, 14.8 % indicated they used ALS Engines or Ladders in their service delivery plans. This indicates a shift toward this alternative method of service delivery, but all departments that have ALS engines of ladders still utilizes a traditional method as well as this alternative method of service delivery.

DISCUSSION

The survey that was done for this project provided interesting information for this project, but not enough to make many clear cut recommendations. The survey did however, point toward the indication that the fire departments in Ohio still provide EMS in a "Traditional" way that is, single role units manned with crossed trained firefighters. Alternative methods of service delivery are in Ohio's fire service, but not as prevalent as was first imagined. As mentioned in the literature review, discussion forums provide an interesting insight to how the fire service views itself. These forums are by no means scientific, but provided a thumbnail sketch of fire departments across the country. The forums provided a view that was decidedly traditional, with a few departments willing to try different approaches in an attempt to solve a local problem.

After reviewing the responses from the forums and the data received from the survey, this researcher has to wonder if the Delaware City Fire Department actually has a problem or is it just a perceived problem. As explained earlier, Delaware's current staffing policy for ALS units is a minimum of two paramedics per unit and fill in personnel for a total of three on an ALS unit is presently at or above the departments surveyed. This indicates that consideration was given to providing maximum service to the customer when the service delivery plan was put into use. The original plan though, did not take into account service delivery in a multi-station environment. The survey also showed the need to investigate more targeted questions on staffing to identify alternatives in this area as well. This will help clarify a direction for creating a structured plan for the department.

RECOMMENDATIONS

The next step in this project is more research. If the department is to consider alternative methods of EMS delivery, more in depth research is needed. This will help to assist in answering the research questions.

Question one: Can alternative methods of EMS delivery improve utilization of limited personnel for EMS in the Delaware City Fire Department? This question can be answered by further research of methods in current fire service management books. Several methods were noted as being very viable options for our department. All would need to be modified somewhat if we chose not to modify our operating procedures. If we chose to alter both operating procedures and resource allocation these methods could work quite well with the present or a small increase in personnel. Before undertaking this challenge however, care must be taken to ensure the customers the department serves will accept the change, as well as city government and the inherent political ramifications. A cost analysis of the alternatives is necessary as well as how it affects staffing and overtime costs. An agreement should be investigated with other EMS providers to supply coverage in outlying areas if it is chosen not to place an EMS vehicle in each station. Careful planning is necessary and a test period must be implemented if a radically different approach is decided. (i.e. ALS engines, ALS transport engines). This will be necessary to be able to provide City Council with accurate findings of how well the new procedures and equipment is working.

Question number two: How do similar departments provide Fire/EMS services in a multi-station environment with limited personnel? This question was more difficult to answer due to how the survey was administered. Errors in the survey failed to provide the necessary data to fully answer this question. The recommendation in response to this would be to more

thoroughly conduct the survey again with identifying codes to mark prospective departments for a follow-up, in-depth interview. This would allow more detailed questions to be asked and able to provide clarification for the respondents. One must bear in mind that while every department is different, there are many things that remain the same. These similarities could provide valuable additional information that could then be used as a basis for decisions on station staffing, and whether reallocation of resources and personnel could be undertaken. We, as a department may find that by tweaking the personnel we have may yield better service to our customers. By utilizing these recommendations, the groundwork could be laid to provide the Delaware City Fire Department with accurate information to make an informed decision.

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APPENDIX A

Survey for Ohio Fire Executive Research Project
December 2002

Thank you for taking time to complete this survey. Please return it before March 15, 2003. When you are finished with the survey, a self-addressed, stamped envelope is provided for you to return it.

1. Does your department provide EMS service?

   ❒ Yes
   ❒ No

2. If you answered "No" to question 1, who provides your EMS service?

   ❒ Private Service
   ❒ Other Government agency
   ❒ Other (Please list) _____

3. If you answered, "Yes" to question 1, what level of service do you provide? (Please check all that apply.)

   ❒ First Responder
   ❒ BLS (Basic Life Support)
   ❒ ALS (Advanced Life Support)

4. What is the size of the population that your department serves?

   ❒ 0-1000
   ❒ 1001-5000
   ❒ 5001-10000
   ❒ 10001-20000
   ❒ 20001-30000
   ❒ 30001-40000
   ❒ 40001-50000
   ❒ Above 50000

5. What type is your fire department?

   ❒ Volunteer
   ❒ Career
   ❒ Combination department

6. What is the number of personnel in your department?
   _____ Career
   _____ Volunteer or Part-time

7. How many stations does your department operate?
   _____

8. What is your department's daily crew strength?
   _____ Career
   _____ Volunteer or Part-time

9. Are your personnel cross-trained to perform both fire and EMS duties?
   ❒ Yes
   ❒ No

10. What was your fire run volume for the year 2001?
    _____

11. What was your EMS run volume for the year 2001?
    _____

12. How many of each type of EMS unit does your department operate?

    ALS _____
    BLS _____

13. How many personnel respond on each type of vehicle?

    ALS Paramedics _____ EMT-Basic _____
    BLS Paramedics _____ EMT-Basic _____

14. Does your department use ALS engines or ladder companies?
    ❒ Yes
    ❒ No

15. If you answered, "Yes" to question 14, how many paramedics respond on the apparatus?
    _____

16. If your department uses ALS engines or ladders, where does the transport vehicle originate?

    ❒ Department supplied
    ❒ Outside or private service

17. If your department supplies the EMS transport vehicle, do you have one in every station?

❒ Yes
❒ No

18. If you answered "No" to question 17, how are your EMS vehicles allocated?

❒ Run Area
❒ Other (Please explain) _____

Thank you for your time in completing this survey. If you have any question about or would like A copy of the results, please contact me at 740-369-4418 or you may E-mail me at wanderson@delawareohio.net

APPENDIX B

SURVEY CODING SHEET

1. Variable Name: **EMS_1?**
    a. Value
        i. 1=yes
        ii. 2=no

2. Variable Name: **Provide EMS?**
    a. Value
        i. 1=Private Service
        ii. 2=Other Government Agency
        iii. 3=Other
        iv. 4=N/A

3. Variable Name: **First Responder?**
    a. Value
        i. 1=yes
        ii. 2=no

4. Variable Name: **BLS (Basic Life Support)**
    a. Value
        i. 1=yes
        ii. 2=no

5. Variable Name: **ALS (Advanced Life Support)**
    a. Value
        i. 1=yes
        ii. 2=no

6. Variable Name: **Popserved**
    a. Value
        i. 1= 0-1000
        ii. 2= 1001-5000
        iii. 3= 5001-10000
        iv. 4= 10001-20000
        v. 5= 20001-30000
        vi. 6= 30001-40000
        vii. 7= 40001-50000
        viii. 8= Above 50000
7. Variable Name: **FDType**
    a. Value
        i. 1= Volunteer
        ii. 2= Career
        iii. 3=Combination
8. Variable Name: # **Career**
    a. Value
        i. Enter actual number
9. Variable Name: # **Vol or P/T**
    a. Value
        i. Enter actual number
10. Variable Name: # **Stations**
    a. Value
        i. Enter actual number
11. Variable Name: **Crew Strength Career**
    a. Value
        i. Enter Actual Number
12. Variable Name: **Crew Strength Volunteer, P/T**
    a. Value
        i. Enter Actual Number

13. Variable Name: **Cross Train?**
    a. Value
        i. 1=yes
        ii. 2=no
14. Variable Name: **Fire Runs ‘01**
    a. Value
        i. Enter Actual Number
15. Variable Name: **EMS Runs ‘01**
    a. Value
        i. Enter Actual Number
16. Variable Name: **# ALS Units**
    a. Value
        i. Enter Actual Number
17. Variable Name: **# BLS Units**
    a. Value
        i. Enter Actual Number
18. Variable Name: **ALS Units # Medics**
    a. Value
        i. Enter Actual Number
19. Variable Name: **ALS Units # EMT-B**
    a. Value
        i. Enter Actual Number
20. Variable Name: **BLS Units # Medics**
    a. Value
        i. Enter Actual Number
21. Variable Name: **BLS Units # EMT-B**
    a. Value
        i. Enter Actual Number

22. Variable Name: **ALS Ladder/Engine?**
    a. Value
        i. 1=yes
        ii. 2=no
23. Variable Name: **#Medics on ALS Co**
    a. Value
        i. Enter Actual Number
24. Variable Name: **ALS Co. Transport**
    a. Value
        i. 1= Department Supplied
        ii. 2= Outside or Private Service
        iii. 3= N/A
25. Variable Name: **EMS vehicle each Sta?**
    a. Value
        i. 1=yes
        ii. 2=no
26. Variable Name: **EMS Allocation**
    a. Value
        i. 1= Run Area
        ii. 2= Other
        iii. 3= N/A