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WPI EMS Response Vehicle Feasibility

An Interactive Qualifying Project Report

submitted to the Faculty

of the

WORCESTER POLYTECHNIC INSTITUTE

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Degree of Bachelor of Science

by



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Approved:

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## **Abstract**

Worcester Polytechnic Institute Emergency Medical Services is committed to providing EMS to the WPI community at the highest standard of care possible. This study seeks to determine whether the use of an emergency response vehicle will help WPI EMS continue to provide the highest standard of care and whether the purchase of a vehicle would be feasible for the organization.

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## Introduction

Over the past decade, Worcester Polytechnic Institute Emergency Medical Services (WPI EMS) has provided the WPI community with professional emergency medical first response service. From its humble beginnings in the early 1990's, WPI EMS has grown to an organization with over twenty highly trained members. These members have responded to an ever-growing need of the WPI community for emergency medical service. This growing need has been the result of many issues in the community, and WPI EMS is at a point where they must grow with the community in order to continue providing the same high standard of care that they have in the past.

One major issue of importance is the response time of its members to calls for aid. As the WPI community has grown, the response time of WPI EMS has increased, as has the over-all volume of calls to WPI EMS for help. Members have found themselves running to calls as a result of the lack of transportation, and have found they are ill equipped to handle the situations they are responding to. This is due to their inability to carry all the necessary equipment in their small backpack style first aid kits.

The answer to these problems is a vehicle that can provide the responders with adequate transportation to a call, and has the ability to contain all the necessary equipment the responders will need on the call. Such vehicles are already common assets of the EMS organizations in small towns and at many colleges and universities similar to WPI. Such organizations usually utilize

a Sport Utility Vehicle or large car equipped for emergency response and outfitted with all the necessary emergency equipment usually found on an ambulance with the exception of a cot to transport patients.

### **What is WPI EMS?**

WPI EMS is a student run organization which provides emergency medical care to the WPI community. Throughout the academic school year, WPI EMS provides 24-hour emergency medical coverage on WPI's Worcester campus. WPI EMS is comprised of approximately 25 highly dedicated student volunteers who respond to anywhere between 150 to 200 requests for aid each academic year. These students work as a student organization under the direction and funding of WPI Police, with the EMS chief reporting directly to WPI Police Chief John Hanlon, Director of Public Safety. Although not all requests for aid involve life threatening emergencies, WPI EMS aims to provide immediate life saving care to all those who need and request it. They have been fortunate in the fact that they have helped prolonged several lives and not lost one. WPI EMS strives to provide the highest levels of care with their ultimate goal to provide expert level aid in assisting a patient between the time of their call for help and their subsequent treatment.

## **History of WPI EMS**

In the spring of 1989, three WPI students, Kevin L'Heureux, Paul Sincaglia, and William Wong, realized the necessity for a student-run, EMT level first responder unit. The three students put together a proposal to perform a study on the feasibility of creating such an organization. Their plan evolved into an IQP. The goal of their IQP was to investigate the feasibility and practicality of creating a first responder unit. During their investigation, they projected many potential problems. To aid in the prevention of such problems the students considered all aspects of a successful system. They investigated where to obtain financing from, how to build a base of dedicated personnel staff, how to keep the organization servicing the campus 24 hours a day, liability issues the system would inevitably face, where it would receive its sponsorship and finally how the organization would generate support from the WPI community.

The group finished their project in the fall of 1989 with the successful formation of WPI EMS. Facing an increasing call volume and community need, it was decided in 1998 to hire an EMS Coordinator that would become a liaison between the campus police and EMS. The coordinator's functions were also to assist in training the members of WPI EMS and to oversee all emergency medical care.

## **WPI EMS: Community Need**

The WPI community is comparable to a small town, with a population of approximately 5000 people, including students, faculty and staff. This population is concentrated in an area of approximately 80 acres. These figures do not include the numerous tenants residing in the various WPI owned housing complexes on and adjacent to the campus, nor does it include the academic departments that are located just off campus in the surrounding community. The campus is situated in the center of Worcester, MA, the third largest city in New England, with a population of approximately 172,000 residing in an area of 38 sq. miles (U.S. Census Bureau).

Demographically WPI is very similar to both Brandeis University in Waltham, MA and Tufts University in Medford, MA. Both schools are similar in size, and exist in a similar community as WPI, and therefore their EMS programs have consistently served as a model for the projected growth of WPI EMS.

Although the city is serviced by three major hospitals, there are a limited number of ambulances that are available in the city at any given time to respond to emergencies. In addition, as the city budget is becoming more and more constricted, and the city's contracts for emergency medical services are nearing their expiration, the future of emergency medical services in the city is foggy. An uncertain future of emergency medical services in the City of Worcester highlights an even greater need for WPI EMS.



## **WPI EMS: Description of Service**

Although it does not participate in patient transport, WPI EMS does perform a necessary function. In the event of an emergency, timeliness is a critical component of patient care. Unfortunately, one cannot predict when an emergency will occur. Due to resources available in the city, an ambulance can take 15 minutes or more to arrive on the WPI campus after being summoned. The goal of WPI EMS is to provide a professional level of care to its patients from the time they arrive on scene to the arrival of an ambulance to transport the patient to a higher level of care.

Considered a Basic Life Support / Quick Response team, WPI EMS responds to emergencies to provide immediate, professional emergency care to the patient until the arrival of a transport unit. Currently WPI EMS responds to calls for care, either on foot, or by means of a WPI Police escort, after being dispatched by WPI Police through a two way radio emergency page tone. WPI EMS responds carrying most of the equipment they will need to handle an emergency call in small backpacks and shoulder bags.

While the primary function of WPI EMS is to provide immediate life saving care to those in need of it, the benefits of WPI EMS to both the WPI community and the Worcester area run far deeper. WPI EMS responders determine whether a transport unit is actually required. In many cases a patient does not need to be transported to the hospital by an emergency ambulance. WPI EMS alleviates the unnecessary response of an ambulance that may be needed for more important calls elsewhere in the city. Similarly, a patient's condition often

warrants the response of additional units to aid in treatment. If it were not for WPI EMS, these additional units would come from other city resources including other ambulances or the fire department. It is also possible for WPI EMS responders to assist the transport crew and to accompany that crew during transport allowing other units the ability to respond throughout the city. WPI EMS facilitates a smooth transition to higher levels of care while enhancing patient comfort by providing a familiar face to the patient. Often just knowing that the person coming to their aid is a fellow member of the WPI community calms much of the anxieties associated with a medical emergency.

Although WPI EMS has successfully provided life saving care required while waiting for a transport unit to arrive at the scene of an emergency, the response time of WPI EMS has been increasing dramatically as a result of an expanding community and growing call volume. Since the early ninety's, WPI EMS has seen a dramatic increase in call volume from approximately 30 calls in 1990 to over 150 calls in 2002, and has served a community that has grown to over 5000 people.

## **WPI EMS Organizational Structure**

The WPI EMS chief has five major responsibilities. The first is to work closely with the EMS Coordinator and elected leaders in the development and implementation of the program's standard operating procedures. Second, the chief functions as the liaison person to the WPI administration. Thirdly, the chief serves as the chairperson for all WPI EMS meetings and activities. The chief's fourth responsibility is to produce quarterly reports. The reports include one at the end of each academic term, as well as an annual report with a statistical summary of the EMS calls that were handled by the squad along with a narrative summary report of the squads accomplishments. Lastly the chief is required to perform any other duties he/she is directed to do by the EMS coordinator. Falling under the chief are three lieutenants: operations, service, and personnel.

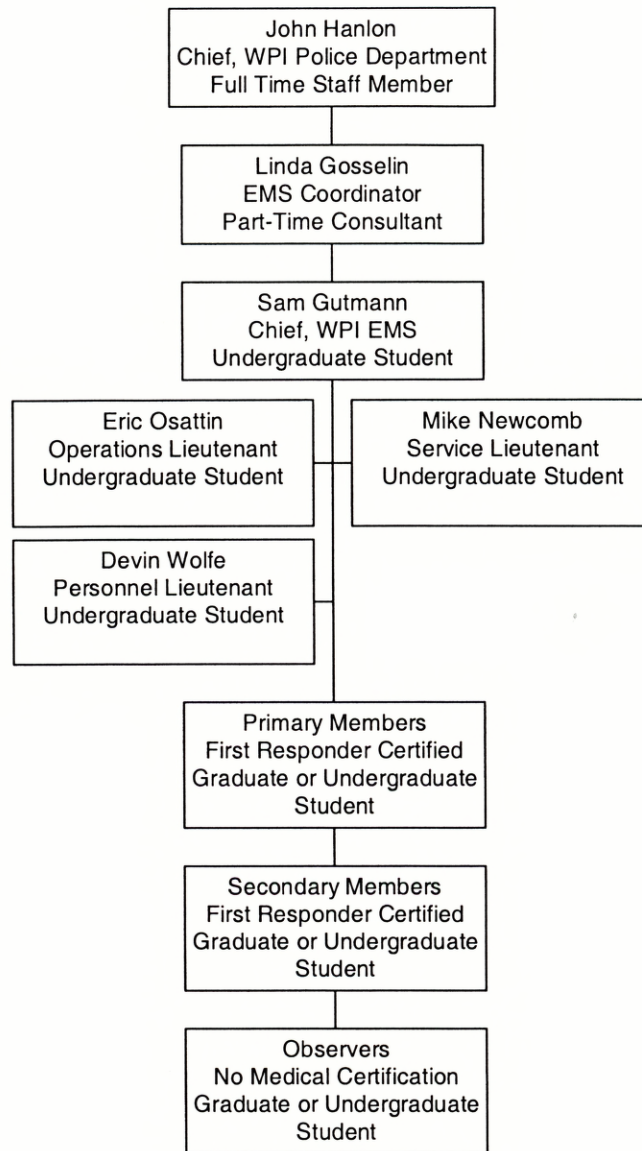
The roles of the Operations Lieutenant are to direct and supervise the squad's day-to-day operations. Also, he/she must ensure that all WPI EMS members are properly trained and certified. The Operations Lieutenant is also responsible for collecting and reviewing all run sheets (call reports), and compiling statistics for the Chief.

The Service Lieutenant's primary job is to maintain the squad's financial records. This person is responsible for maintaining the squad's inventory of supplies, performing maintenance on all equipment, and ensuring that all members receive proper uniforms. To do this, he/she must work closely with the Personnel Lieutenant who maintains records of all WPI EMS members.

As well as maintaining personnel records of all members, the Personnel Lieutenant is in charge of coordinating training for the squad and creating the shift schedule to ensure that WPI EMS is staffed 24-hours a day, 7 days a week during the academic school year. Finally, the Personnel Lieutenant is tasked with mediating any and all conflicts between members of WPI EMS.

The general membership is broken down into three levels according to members' skill levels and experience. Primary members are the principle responders and are in charge of the call when on shift unless an officer is present on scene. Primary members are the crew chiefs of the shifts and at least one must be on duty for every shift. Secondary members serve in the capacity of crewmember. They conduct their duties on scene as directed by the primary member. Typical duty crews consist of one primary and one secondary member.

Observer members are not authorized to perform any patient care. Observers respond to calls with the duty crew and simply watch what the crew does in an effort to gain experience and insight into how the squad operates and the actions carried out by the responding crew. Observers may be members who have yet to attain the necessary certifications or they may be people interested in applying for membership on the squad. On the authority of one of the officers, people unaffiliated with the squad may run as observers. This usually consists of counterparts from other public safety organizations or members of the media.



**Figure 1: WPI EMS Organizational Structure, 2001-2002**

## **Methodology**

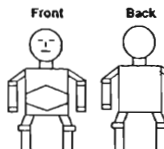
To assess and display the need of a response vehicle for WPI EMS, the project was broken down into three tasks. The three tasks were to analyze WPI EMS and its call statistics, show how the vehicle would benefit the community, and to assess the feasibility and costs associated with implementing the vehicle into WPI EMS.

Since WPI EMS first went into service, they have kept records of every emergency call they have responded to. These records are in the form of the formal reports taken by the responding members, and include all information pertinent to the emergency, including all necessary patient information, scene information, and response time information. Although the format of these reports has changed over time, the information they contain has remained consistent. Figure 2 shows examples of WPI EMS run reports. The first task of this project was to analyze these reports and to organize and extract the necessary information to summarize statistical data on response times and call volume. This data was necessary to show both the growth of the community and the organization's growth, as well as to document the steady increase in WPI EMS response times. Also analyzed was the growth of the WPI community, both in terms of area and population. The evaluation of this data showed a clear need for a vehicle.

# Central Massachusetts E.M.S. Run Report

Central Massachusetts  
Emergency Medical Systems  
Corporation

The information submitted on this form is reported by the provider when the direction of the form is printed and based on the best knowledge of the provider at the time of the patient's condition and is not intended to be used as a legal document. The information submitted on this form is not intended to be used as a legal document. The information submitted on this form is not intended to be used as a legal document.

472093		Control Number	Date	Dispatch Priority	Patient Name
Age:	Sex: <input type="checkbox"/> M <input type="checkbox"/> F	Patient's Physician:		Mechanism of Injury and Chief Complaint:	
Degree of Distress: Mild Moderate Severe		History of Present Illness:			
Past Medical History:					
Medications:					
Allergies: <input type="checkbox"/> NKDA					
Vital Signs: <input type="checkbox"/> Unable to obtain <input type="checkbox"/> Not attempted		Other Physical Findings:			
Time Taken:	Blood Pressure: (E)	Pulse:	Resps: (F)		
/	4 = >90 3 = 70-89		4 = 10-20 3 = >20		
/	2 = 50-75 1 = 1-49		2 = 8-9 1 = 1-5		
/	0 = no pulse		0 = none		
Skin: <input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Diaphoretic <input type="checkbox"/> Dry		<input type="checkbox"/> Regular <input type="checkbox"/> Irregular	<input type="checkbox"/> Normal <input type="checkbox"/> Obstructed		
Color: <input type="checkbox"/> Normal <input type="checkbox"/> Cyanotic <input type="checkbox"/> Flushed <input type="checkbox"/> Pale		<input type="checkbox"/> Normal <input type="checkbox"/> Shallow <input type="checkbox"/> Bounding <input type="checkbox"/> Labored <input type="checkbox"/> Weak <input type="checkbox"/> Absent			
Breath Sounds: Right <input type="checkbox"/> Clear <input type="checkbox"/> Decreased <input type="checkbox"/> Crackles <input type="checkbox"/> Wheezes <input type="checkbox"/>		Eye Opening: (A) ① Spontaneous ② To Pain ③ To Voice ④ None		Motor Response: (C) ⑥ Obeys ⑤ Localizes ④ Withdraws ③ Flexes ② Extends ① None <input type="checkbox"/> Unknown	
Pupils: Right <input type="checkbox"/> Reactive <input type="checkbox"/> Unreactive <input type="checkbox"/> Dilated <input type="checkbox"/> Mid-point <input type="checkbox"/> Constricted <input type="checkbox"/>		Verbal Response: (B) ⑤ Oriented ④ Confused ③ Inappropriate ② Incomprehensible ① None		Coma Scale (D) 13-15 = 4 4-5 = 1 9-12 = 3 0-3 = 0 6-8 = 2 (A+B+C-D)	
Emergency Care Administered: <input type="checkbox"/> Oxygen <input type="checkbox"/> LPM <input type="checkbox"/> Hemorrhage Control <input type="checkbox"/> Suction <input type="checkbox"/> Saline Irrigation <input type="checkbox"/> Ventilation <input type="checkbox"/> Ice Packs <input type="checkbox"/> Airway Insert <input type="checkbox"/> Burn Packs <input type="checkbox"/> Cardiac Compression <input type="checkbox"/> Obstet. Delivery <input type="checkbox"/> Spinal Immobilization <input type="checkbox"/> Psych. First Aid <input type="checkbox"/> Splinting <input type="checkbox"/> Extrication <input type="checkbox"/> Bandaging <input type="checkbox"/> Vomiting Induced		Mast Trousers <input type="checkbox"/> Applied <input type="checkbox"/> Inflated by: Time of Inflation:		Type of Injury: <input type="checkbox"/> None <input type="checkbox"/> Possible Internal [number suspected injury site] Front Back 	
Defibrillation Time (paced) _____ Joules (ma) _____ Performed by: _____		Blood Drawn: _____		Medication: _____ Dose: _____ Time: _____ Ad by: _____	
Service Name: _____		Vehicle Number: _____		Other Treatment: _____	
EMT Name & No.: _____		Time Received: _____		AID REFUSAL: I acknowledge that medical care is offered me by this ambulance service and I refuse care. Signature: _____ Witness: _____	
EMT Name & No.: _____		Dispatched: _____		Med. Ctl. Physician: _____	
EMT Name & No.: _____		Arrived Scene: _____		Med. Ctl. Hospital: _____	
Dispatch Location: _____		Departed scene: _____		Attendant's Signature: _____	
Pick-up Location: _____		Arrived Hosp.: _____			
Destination: _____		Back in Service: _____			
		Est. Incident time: _____			

WHITE COPY TO AMBULANCE

YELLOW COPY TO HOSPITAL

PINK COPY TO CMEMSC

Figure 2: Example of a WPI EMS Run Report

The second task was to display the response time data to show how WPI EMS, and thus the WPI community would benefit from the vehicle. This phase of the project was simply using the data acquired in the first part to show the community need. We compared current WPI EMS response time and call volume data to the data from a decade ago. We also compared WPI EMS response times to priority 1 WPI Police response times. Priority 1 calls for WPI police constitute all emergency calls, which would require the same type of immediate response as medical calls. This phase used knowledge gained from analyzing two other similar programs at local universities that use emergency response vehicles to show how the response vehicle enhanced those schools service to their communities.

The third task was to determine all the costs associated with acquiring and implementing an emergency response vehicle into the WPI EMS operations. The costs were broken down into two general categories. The first category was the actual costs of the vehicle itself. The research for this was done simply by “shopping around” at car dealers, specialty companies that specifically deal with emergency vehicles and companies that deal with outfitting and converting vehicles into response vehicles. This category showed the costs of the vehicle and its necessary components. The second category was to research the recurring costs of such items as insurance, registration, and maintenance. For this component the assistant treasurer of WPI, Daniel Cove, was consulted. Because she is responsible for the appropriation and administration of all WPI owned vehicles, and her department would handle these issues, Ms. Cove



presented all the necessary costs and the various options for funding them in a separate report to WPI EMS.

The result of these three tasks is a comprehensive display of the need and costs associated with implementing a response vehicle into the operations of WPI EMS. These results are shown in the following three chapters.

## **A First Response Vehicle Meets the WPI EMS Needs**

Because WPI EMS' primary function is to handle potentially life-threatening emergencies such as poisonings, major trauma and cardiac arrest, WPI EMS can have little margins for error, and response times are critical. Often times EMS personnel refer to the "Golden Hour," the name for the first hour following a life-threatening emergency. It is the golden hour that is the most crucial time period determining whether a patient lives or dies. The clock starts at the time the emergency occurs, and ends after the patient's full evaluation and initial hospital treatment, which includes emergency operation procedures. Due to the enormous amount of work that must be done after the arrival of a patient at the hospital, a fast response is one of the most crucial elements. In the world of pre-hospital care, members of the EMS team further break down the golden hour into the "Platinum Ten," referring to the ten critical minutes for EMS personnel to respond to and begin initial stabilization measures on a patient. The response time becomes even more critical in cases of cardiac arrest, or pulmonary distress where the effectiveness of initial emergency care drops considerably from 95% after just a few minutes. It is important to note that without emergency care, respiratory failure will lead to cardiac arrest, and CPR alone is usually not enough to save a life. Emergency defibrillation is necessary to restore a normal heartbeat, and the sooner it is done, the greater the chance of patient survival.

It is the goal of every EMS responder to operate within the platinum ten, and to further cut response times as much as possible. Due to the size of the

campus, and especially taking into account the recent expansion of the campus to peripheral properties, it is nearly impossible for anyone to respond to a call on foot in less than ten minutes unless they happen to be in the general vicinity of the emergency at the time, with the right equipment for the emergency.

Currently, WPI EMS can only carry what little equipment they can fit into their small backpack trauma kits. They have no way to carry the oxygen, or defibrillators, or other bulky heavy equipment they are trained to use, leaving them in many instances ill-equipped to handle the emergency, and relying on a police car to respond with the equipment they need.

Another problem is that many of the lifesaving measures taken by the responders require a great deal of physical exertion. If the responders must arrive as quickly as possible on foot, much of their energy is expended in the actual process of the response, leaving them tired and less effective EMS care providers.

With the expansion of the school off the main campus into surrounding properties, WPI EMS now has an even greater area of response, which includes some areas, which because of their remote locations, is impossible to respond to on foot in an adequate length of time. Figure 3 shows the WPI EMS area of response prior to the recent expansion of the school. Figure 4 shows a street map of the WPI area, including the areas of recent expansion, highlighting in blue the area WPI EMS was responsible for providing EMS coverage to, and

highlighting in yellow the area that WPI EMS is now responsible for providing coverage to.

The only way for WPI EMS to continue to be fully effective in the future is if they have some way to respond quickly and easily to an emergency, with all the equipment they will need to treat the emergency. A response vehicle that is capable of getting the responders to an emergency quickly, with all the equipment they will need is the only solution. The vehicle would have to be large enough to carry the responding crew and all their equipment in various weather conditions from snow and ice, to rain, and cold and heat. A large car or sport utility vehicle is the best answer, as it can be operated in harsh road conditions, can carry a full responding crew, and house all the necessary emergency equipment.



**Figure 3: WPI Campus Map**

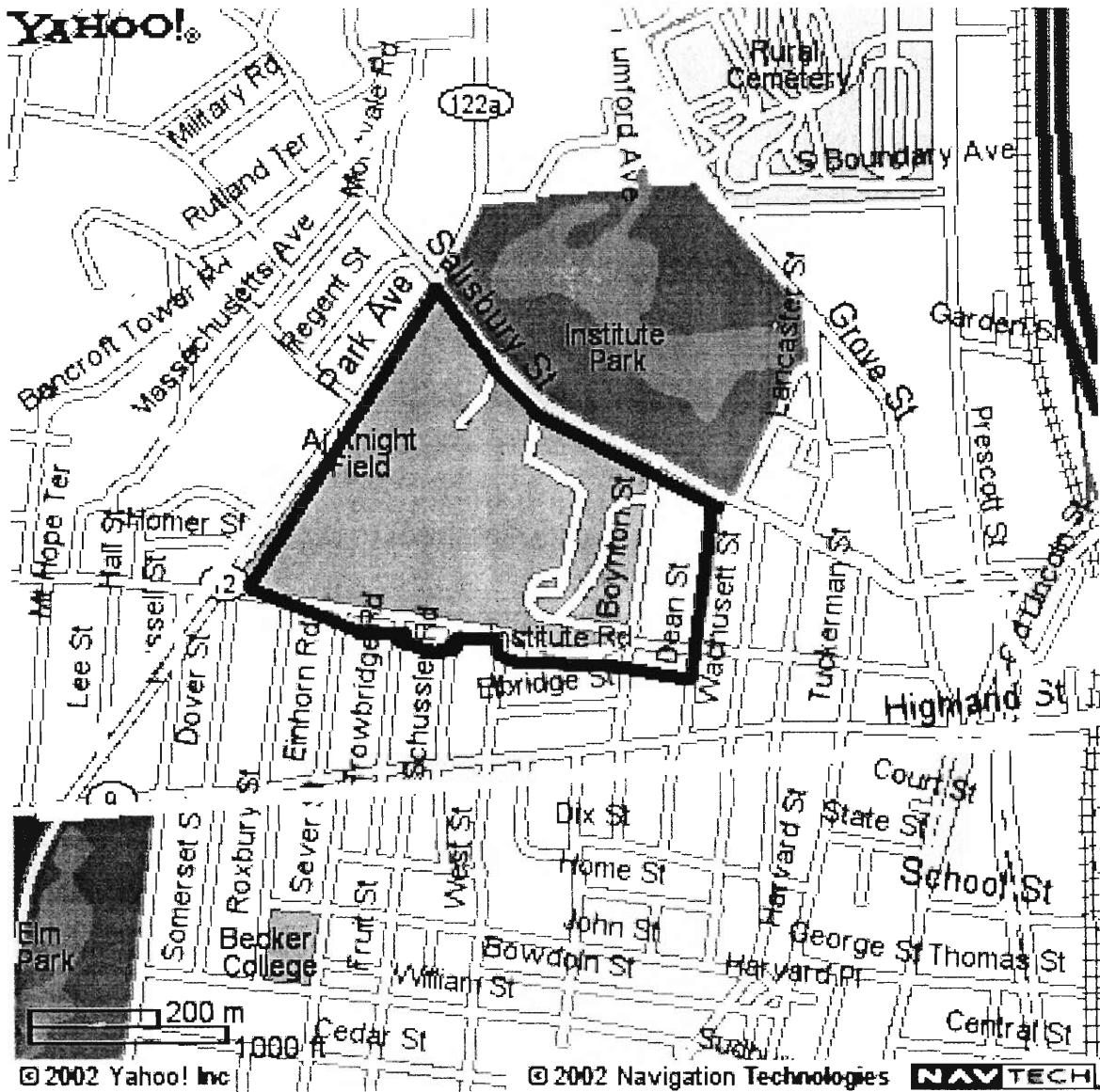


Figure 4: Area Street Map

## **Response Time Statistics**

Figure 5 shows a comparison of the current average response times for WPI EMS compared to the average response times of priority one WPI police calls. This comparison shows that WPI Police, which has the same area of response as WPI EMS, when responding to emergency calls of the same priority as EMS calls, has a far better response time. Due to the ability of WPI Police to respond with the aid of a vehicle, they are able to arrive on scene much faster compared to WPI EMS responders, who must either walk to a call, or wait for a police escort to come to their location then transport them to the call. If WPI EMS had a response vehicle, staffed by a responder who was always in or near the vehicle to quickly respond to a call, their response times would decrease significantly. Because the vehicle is a registered emergency vehicle, like any other emergency vehicle, it may legally park in any space or emergency artery. This is crucial to allowing the responding crew to remain close by the vehicle while giving them the freedom to go to classes and other obligations as necessary throughout their shift.

The four main streets that border the main campus are, Institute Road, Boynton Street, Salisbury Street, and Park Ave. These roads are the main arteries that are used by responders when traveling to a call. Figure six shows the time it takes to respond via these streets both on foot and in a vehicle. The difference between traveling these streets on foot and in a vehicle is several

minutes. This length of time could be the difference between life and death for a critically injured or ill patient.

	1 June 2000 to 31 May 2001	1 June 2001 to 31 May 2002
WPI EMS average response time	9.2 minutes	9.9 minutes
WPI Police priority 1 average response time	3.9 minutes	5.0 minutes

***Figure 5: Average Response Times***





	On Foot	In Vehicle
Boynton and Institute to Park and Institute	8 minutes, 6 seconds	55 seconds
to Park and Salisbury	6 minutes, 10 seconds	33 seconds
to Boynton and Salisbury	5 minutes, 0 seconds	27 seconds
to Boynton and Institute	3 minutes, 14 seconds	22 seconds

**Figure 6: Perimeter Travel Time**

## **Costs**

There are two costs issues associated with the vehicle. The first is the initial costs of purchasing the vehicle and outfitting it, and the second is the recurring costs such as registration, insurance, and maintenance. Depending on the vehicle and equipment purchased, and the installer of the equipment, the initial costs fluctuate greatly.

To get a general idea of the costs of a vehicle and its equipment, four sport utility vehicles were compared, the Chevrolet TrailBlazer, the Dodge Durango, the Ford Expedition, and the Ford Explorer. These vehicles were chosen for a few specific reasons. They all come standard with alternator and power systems to meet the service duty requirements of a response vehicle, they all have the cargo space required to neatly and efficiently organize the necessary EMS equipment, they are all four wheel drive vehicles, and most importantly, each of the vehicles has a proven performance record in EMS response service. The comparisons of the four vehicles are provided on the following pages.

## Vehicle Comparison



Make	Chevrolet	Dodge	Ford	Ford
Model	All New TrailBlazer	Durango	Expedition	Explorer 4-Door
Trim	LS 4WD	Sport 4X4	XLT 4x4 Value 4.6L - 200A	XLT 4X4

### Basics

Base Price	\$28,110	\$27,520	\$33,425	\$30,500
Dealer Invoice	\$25,440	\$25,208	\$29,381	\$27,715
Destination Charge	\$625	\$625	\$740	\$625
Standard Transmission	4 Speed Automatic	5 Speed Automatic	4 Speed Automatic	5 Speed Automatic
Standard Engine	4.2L I6	4.7L V8	4.6L V8	4.0L V6
Fuel Economy	15/21	13/17	14/18	15/20

### Engine

Type	4.2L I6	4.7L V8	4.6L V8	4.0L V6
Displacement (cc/ci)	4195/256	4701/287	4605/281	4015/245
Valves	24	16	16	12
Horsepower	270@6000	235@4800	232@4750	210@5250
Torque	275@3600	295@3200	291@3450	254@3750
Fuel System	SEFI	SEFI	SEFI	SEFI
Transmission	Auto OD	Auto OD	Auto OD	Auto OD
Fuel Economy (City/Hwy)	15/21	13/17	14/18	15/20
Performance Data	<a href="http://FromAutosite.com">From Autosite.com</a>	<a href="http://FromAutosite.com">From Autosite.com</a>	<a href="http://FromAutosite.com">From Autosite.com</a>	<a href="http://FromAutosite.com">From Autosite.com</a>

## Steering, Suspension, Brakes

<b>Steer Diameter (Curb)</b>	36.4/36.4	37.4/37.4	38.7/38.7	36.8/36.8
<b>Engine Locat./Drive</b>	FR/4WD-SEL	FR/4WD-PT	FR/4WD-FT	FR/4WD-FT
<b>Brakes (Fr/Rr)</b>	Disc/Disc	Disc/Drum	Disc/Disc	Disc/Disc
<b>Steering</b>	R&P	R&P	R&P	R&P
<b>Suspension (Fr/Rr)</b>	Ind/Live	Ind/Live	Ind/Ind	Ind/Ind
<b>Tires</b>	245/70R16	235/75R15	265/70R17	235/70R16

### Interior Dimensions

<b>Head Room (Fr/Rr)</b>	40.2/39.6	39.8/40.2	39.7/39.8	39.9/38.9
<b>Leg Room (Fr/Rr)</b>	44.6/37.1	41.9/37.3	41.2/38.7	42.4/37.2
<b>Shoulder Room (Fr/Rr)</b>	58.5/58.5	57.6/57.5	63.4/64.3	59.1/58.9
<b>Hip Room (Fr/Rr)</b>	55.5/58.1	56.9/56.0	63.0/62.4	55.0/54.3

### Exterior Dimensions & Weight

<b>Curb Weight</b>	NA/4495	NA/4629	NA/5564	NA/4378
<b>Wt. Dist. (Man/Auto)</b>	NA/NA-54/46	NA/NA-55/45	NA/NA-NL/NL	NA/NA-54/46
<b>Wheelbase (Fr/Rr)</b>	113	116.2	119	113.7
<b>Track</b>	63.1/62.1	61.6/61.9	67.0/67.3	60.9/61.2
<b>Length</b>	191.8	193.5	205.8	189.5
<b>Width</b>	74.6	71.3	78.7	72.1
<b>Height</b>	74.5	72	77.6	71.4

### Capacity & Volume

<b>Cargo Volume (EPA/Mfr)</b>	NA/41.0	NA/50.5	NL/20.2	NA/46.6
<b>Fuel Capacity</b>	18.7	25	28	22.5
<b>Tow Capacity (Std/Max)</b>	5200/6200	4400/5770	8900/8900	3500/7000
<b>Seating (Std.)</b>	5	5	9	5
<b>Seating (Opt.)</b>	NA	6	NA	7
<b>EPA Class</b>	SPURP4WD	SPURP4WD	SPURP4WD	SPURP4WD
<b>Pass. Vol. (EPA/Mfr)</b>	NA/83.3	NA/NL	NL/NL	NA/NL

## Warranty

<b>Basic (Months/Miles)</b>	36/36000	36/36000	36/36000	36/36000
<b>Powertrain (Months/Miles)</b>	36/36000	36/36000	36/36000	36/36000
<b>Rust (Months/Miles)</b>	72/100000	60/100000	60/Unlimited	60/Unlimited

## Equipment

<b>Air Conditioning</b>	Standard	Standard	Standard	Standard
<b>Driver Airbag</b>	Standard	Standard	Standard	Standard
<b>Passenger Airbag</b>	Standard	Standard	Standard	Standard
<b>Alloy Wheels</b>	Standard	Standard	N/A	Standard
<b>Anti-Lock Brakes</b>	Standard	Standard	Standard	Standard
<b>Anti-Theft Vehicle</b>	Standard	Optional	Standard	Standard
<b>Cruise Control</b>	Optional	Standard	Standard	Standard
<b>Rear Defogger</b>	Optional	Standard	Standard	Standard
<b>Keyless Entry/Unlock</b>	Optional	Standard	Standard	Standard
<b>Fog Lamps</b>	Optional	N/A	N/A	Standard
<b>Power Locks</b>	Standard	Standard	Standard	Standard
<b>Power Mirrors</b>	Optional	Standard	Standard	Standard
<b>Heated Side Mirrors</b>	Optional	Optional	Standard	N/A
<b>Power Steering</b>	Standard	Standard	Standard	Standard
<b>Power Windows</b>	Standard	Standard	Standard	Standard
<b>Traction Control</b>	N/A	N/A	N/A	N/A
<b>Automatic Transmission</b>	Standard	Standard	Standard	Standard

The other initial cost is outfitting the vehicle for EMS service. This includes the cost of all emergency response warning devices such as emergency warning lights and sirens. It also includes the cabinetry for organizing the EMS equipment in the cargo area of the vehicle. Although installation of the equipment is the most costly aspect, this can be avoided because the members of the squad are knowledgeable in this type of installation, thus could install the equipment themselves. This leaves just the cost of the retail purchase of the equipment. There are numerous companies that specialize in the sale of such equipment; however all offer the equipment at a similar cost. The prices listed for the equipment are approximate, and come from one such specialty retailer, Galls Incorporated. These costs are summed on the following pages.

## EQUIPMENT PRICE LIST

Item Description & No.	Qty	Galls' Price	Item Total
	FS005	1	
<u>Galls 3-in-1 Smart Flashers (Positive Standard Switched System/with DRL)</u>			
Item No: FS005			
(In Stock)		\$49.99	\$49.99
	GR007	3	
<u>Whelen® Heavy-Duty Remote Power Supply</u>			
Item No: GR007			
(In Stock)		\$169.99	\$509.97
	GR046 RED	2	
<u>Whelen® Compact Strobe Heads Fit Between the Grille</u>			
Item No: GR046 RED CLR			
First Color: RED			
Second Color: CLR			
(In Stock)		\$174.99	\$349.98
	GR061 CLR	3	
<u>Whelen® Hide-A-Way Strobes</u>			
Item No: GR061 CLR CLR			
First Color: CLR			
Second Color: CLR			
(In Stock)		\$74.99	\$224.97
	SK046	1	
<u>Compact SmartSiren® - Mount the Amplifier Anywhere and the Control Pad on Your Dash</u>			
Item No: SK046			
(In Stock)		\$869.99	\$869.99
	SK048	1	
<u>SmartSiren® Microphone</u>			
Item No: SK048			
(Backordered until 09/04/02)		\$49.99	\$49.99
	SK064 STD	1	
<u>Federal Signal® DYNAMAX™ 100 Watt Speaker</u>			
Item No: SK064 STD			
Vehicle Make: STD			
(In Stock)		\$179.99	\$179.99

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VE135	1
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Complete Galls Universal Console System

Item No: VE135

(In Stock)

\$269.99

\$269.99

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Subtotal: \$2,504.87  
(Taxes and shipping not included)

A description of these items can be found in appendix A.



## **Conclusions and Recommendations**

In order to continue to provide a high standard of care to the WPI community, and in keeping with the goals of the EMS system, it is necessary for WPI EMS to have a vehicle equipped for emergency medical response or service to the WPI community will greatly suffer. The current method of response is grossly inadequate given the recent growth of the WPI community, and the increase in call volume. Given the use of a first response vehicle, certain changes will be necessary to the standard operating procedures of WPI EMS. When these changes are implemented, WPI EMS will be able to continue the level of care it once provided.

After evaluating the EMS programs at Tufts University and Brandeis University, the two schools that most directly compare to WPI in terms of size, location, and demographics, where the implementation of a response vehicle has worked effectively, other possible changes to the WPI EMS response systems have also been made apparent as well.

Both Tufts and Brandeis have implemented policies that increase their scope of service they provide to the community. In most cities and towns, EMS responds to all fire alarms and hazardous materials situations, where there is an obvious increase in the possibility of their services being needed. Because colleges like WPI utilize their own resources, when there is a fire alarm on campus only the fire department responds. Tufts and Brandeis EMS policies require them to respond and remain on stand-by at or as close as safely possible

to the location of the fire alarm. Such a policy would become feasible at WPI with the implementation of a response vehicle.

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## **Appendix A**

### Galls Emergency Vehicle Product Descriptions

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## IQP/MQP SCANNING PROJECT



## **Appendix B**

Odyssey Automotive Literature  
(Including an alternative to a SUV response vehicle)

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IQP/MQP SCANNING PROJECT



## **Appendix C**

### **Brandeis Emergency Medical Corps Operating Rules**



# BRANDEIS EMERGENCY

## MEDICAL CORPS

### Operating Rules

1999

#### CONTENTS

- I. General Vehicle Use
- II. Radio Use
- III. Dispatch/Responding
- IV. On Scene
- V. Patient Transportation and Disposition
- VI. Duty
- VII. Active Members
- VIII. Observers
- IX. Command
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- XI. Emergency Standbys
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- XVII. Critical Incident Stress Debriefing
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#### Preface

Purpose: To establish the scope of the Operating Rules

A. The Operating Rules which follow were written to establish a general procedure for the operations of BEMCo. These rules were never intended to hinder or impede the provision of the best possible medical care to the Brandeis community. Therefore at no point should these rules be an obstacle to this care.

B. In the cases of urgent situations, these rules may be altered by the Operations Officer on a temporary basis to maintain the aforementioned level of care.

C. The E-Board will be notified of these changes as soon as possible.

D. These changes will stay in effect only until the E-Board can convene. At which time, the alterations will be reviewed and voted upon.

E. The decision of the E-Board will stand until a General Meeting can be held.

F. Violation of the Operating Rules by any member may result in disciplinary action.

## **I. GENERAL VEHICLE USE**

Purpose: To establish a policy for the general use of the BEMCo vehicle.

A. The driver of the BEMCo vehicle shall be directly responsible for its safe and prudent operation under all conditions.

B. The BEMCo vehicle shall be operated only by members who are authorized by the Operations Officer.

C. Anyone operating the vehicle must have a valid driver's license, have attended a Defensive Driving Course conducted by the Department of Public Safety, and preferably have passed an Emergency Vehicle Operations Course (EVOC).

D. Under normal conditions, the Primary will be the only operator of the vehicle.

E. All occupants are to wear safety belts whenever the vehicle is in motion.

F. There is to be no smoking in the BEMCo vehicle.

G. The BEMCo vehicle is to be operated in compliance with all Massachusetts Vehicle and Traffic Laws.

H. Rear audible warning signal shall be used whenever the vehicle is operated in reverse.

I. The BEMCo vehicle may park in any legal parking space on campus, including those designated reserved for emergency vehicles. The BEMCo vehicle may NOT park in any Handicap space, on the grass, or in any area which will impede the flow of traffic.

J. It shall be the responsibility of the driver of the BEMCo vehicle to ensure there is sufficient gasoline. The fuel tank is to be refilled at no less than 1/4 tank.

K. Only under extreme conditions is the vehicle to be operated in four wheel drive mode. At this time, it is to be operated by a driver trained for four wheel drive operation.

## **II. RADIO and PAGER USE**

Purpose: To establish a policy regarding the use of all communication equipment.

- A. Radio protocols as outlined in the call procedures guide should be followed at all times.
- B. The radio should be kept squelched at all times when not engaged on a call.
- C. All radio transmissions are to be kept as brief as possible.
- D. BEMCo radios are to be used only during activity for BEMCo.
- E. Patient names should not to be transmitted by radio.
- F. Emergency communication is to take place on the Brandeis Police frequency. For lengthy communications or in times of high amounts of traffic on this frequency, emergency use of the Brandeis Escort frequency may be made. Scene communication may also be made using the BEMCo PL channel (Channel 7)
- G. Digital numeric phone pagers will be provided by BEMCo for the Director, Operations Officer, Supervisors, and Training Officer. The pagers must be returned after the BEMCo member has finished his or her tenure at the appointed or elected position. In addition, BEMCo will provide, at cost, a pager to any interested Primary.

## **III. DISPATCH/RESPONDING**

Purpose: To establish a policy regarding the dispatching and the responding of the BEMCo crew.

- A. Brandeis Control is to dispatch the BEMCo duty crew in the following situations:
  - 1. Medical emergency
  - 2. Emergency standby

3. As directed by an authorized representative of BEMCo or the Department of Public Safety

B. A Supervisor is to be dispatched in the following situations

1. Simultaneous call
2. ALS Ambulance call. BLS Ambulance call at the discretion of the Primary.
3. Emergency standby
4. Need for additional manpower
5. Absence or injury of crew member
6. Loss or damage of equipment
7. Confrontation with other agencies
8. Crime scene
9. Fire, Hazmat, or Auto Accident
10. As directed by an authorized representative of BEMCo or the Department of Public Safety

C. Emergency use of the BEMCo vehicle:

1. All drivers shall exercise extreme caution.
2. All visible warning devices are to be used, unless specifically instructed not to do so by dispatch.
3. Audible warning devices are to be used when passing through the main gate or passing traffic. Audible devices should be kept to a minimum at the discretion of the vehicle operator.
4. Excessive or unnecessary use of the siren may result in disciplinary action.
5. The vehicle is not to cross railroad tracks against appropriate warning lights.
6. The vehicle is to be operated in compliance with all Massachusetts Vehicle and Traffic Laws including sections pertaining to Emergency Vehicles as applicable.
7. All visible warning devices are to remain activated for any outdoor scene.
8. The vehicle is not to proceed through upper K-lot behind Gerstenzang unless the call is in that area.
9. When parking the vehicle at a scene, the Primary should make every attempt possible not to impede the flow of traffic.

D. Emergency use of personal vehicles:

1. Personal vehicles may use a green courtesy light.
2. Personal vehicles are to adhere to all Massachusetts Vehicle and Traffic Laws and are not considered to be Emergency Vehicles.
3. Hazardous and unsafe driving while responding to a call may result in disciplinary action.
4. No personal vehicles are to proceed in the wrong direction on the Peripheral Road.
5. The operator of the vehicle is responsible for its safe and prudent operation.

6. Upon arrival at the scene, private vehicles are to be parked so as not to block any necessary arteries.

E. Responding BEMCo units may request transportation to the scene by the BEMCo vehicle so long as the vehicle does not deviate from the most direct route to the scene. Transportation may also be requested from the Campus Police.

F. In the event of simultaneous calls, the Supervisor is to respond with either the Secondary or the Tertiary from the duty crew as determined by the nature of the two calls.

G. A crew may not disregard a call once enroute. Exception may be warranted for simultaneous calls where an active member or police officer are at each emergency scene and the second call warrants priority. For this, the first patient must be stabilized and patient care must not be hindered.

H. If a crew member arrives at the scene area after the BEMCo vehicle, the crew member is to ascertain by radio if additional equipment is needed from the truck before entering the scene.

I. Any call dispatched for "BEMCo Only" will not have the Campus Police responding unless the scene is believed to be dangerous to the responding crew. This is a courtesy and is subject to the discretion of the Campus Police. The BEMCo crew can request police assistance at any time if they feel it is necessary (ex. combative patient).

J. A run sheet is to be filled for all responses including refusals, no patient found, and standbys.

K. If an emergency call is received on the office phone:

1. Ascertain the nature and location of the emergency.
2. Instruct the caller to hang up and dial x3333 so that BEMCo can be dispatched by Campus Police.
3. If the caller cannot or does not want to hang up and dial x3333, be sure to keep the patient calm and follow the below procedures 4-7.
4. Ascertain the following information:
  - a. the location of the patient, including quad, building, and room number
  - b. a call back number
  - c. the nature of the emergency
5. Advise the caller that they have reached the business phone on BEMCo and that we will advise the Police Dispatcher
6. Advise the caller that BEMCo will be there "as soon as possible"; do not give an estimated time of arrival
7. Call the Campus Police and report all necessary information

- L. Non-members are not permitted to respond with a crew member to any scene.
- M. If an off duty active member should on-site a medical emergency, the member is to initiate patient care and must stay with the patient until the duty crew arrives. With the arrival of the duty crew, the off duty member is to follow the instructions of the Primary.
- N. Off-duty active members are NOT to respond with on-duty members to a BEMCo call. However, if the member thinks that additional help may be needed (ex. for an auto accident or multiple patients), they may radio to the Primary or Supervisor and ask if they should respond.

#### **IV. ON SCENE**

Purpose: To establish a policy to be followed when on scene with a patient.

- A. Only on-duty personnel are to enter the scene. Off-duty members may volunteer assistance to the Primary, but should not otherwise interfere with the call in any way.
- B. Care should be taken to preserve any suspected crime scenes. Crime scenes should not be entered without the presence or authorization of a police officer. The Primary should ascertain if the scene is safe before any crew member enters.
- C. Universal precautions should be observed on all calls. At the minimum, gloves should be worn with any patient contact.
- D. Air exchange during resuscitation is to occur by pocket mask or ventilation bag, but not by mouth to mouth techniques.
- E. All patients will have their vital signs monitored, unless the patient signs a refusal stating that he/she does not want his or her vital signs monitored.
- F. Medical Control should be obtained preferentially by the attending physician at the receiving facility.
- G. The crew is not to enter any scene believed to be of danger in any way without the presence of a police officer.
- H. In the event that a crew member is exposed to a possibly infectious disease or disease carrier, an unprotected exposure report form is to be completed and appropriate medical attention is to be sought immediately. The Operations Officer should be notified immediately.

## V. PATIENT TRANSPORTATION AND DISPOSITION

Purpose: To establish a policy for the transportation and disposition of patients.

A. An active BEMCo crew member with equipment is to accompany any patient transported by Campus Police, as designated by the Primary.

B. An active BEMCo crew member may accompany a patient transported by ambulance at the discretion of the ambulance crew, and must accompany any cardiac arrest patient with the AED if the ambulance is not staffed by an EMT authorized to defibrillate or higher certified personnel.

C. Under normal conditions, the BEMCo vehicle will follow the transporting Campus Police vehicle.

D. When transporting a patient to the hospital in the BEMCo truck, the current, approved Transport Protocol (listed in the Call Procedures Handbook) will be followed.

E. Only one BEMCo crew member is to enter the hospital emergency room patient area.

F. Warning lights are to be turned off and sirens shall not be used while on hospital grounds.

G. If possible, prior to transport, the crew is to contact with the University Health Center or the hospital by telephone and advise them of the patient's condition.

H. All soiled laundry may be exchanged with the receiving medical facility when transporting the patient.

I. A refusal of medical assistance is to be signed by all patients who are not transported only after advising the patient that further medical attention should be sought. A refusal may only be signed by a mentally competent patient of 18 or more years of age, the patient's parent, or an appropriate guardian.

J. Under special circumstances when the patient is under 18 and does not want to be transported or receive further medical attention, the Primary may contact the UHC nurse or doctor and advise them of the patient's condition. The nurse or doctor may then allow BEMCo to obtain a signed refusal from the patient. The signature of the nurse or doctor must also be obtained following the call. In all cases, the decision to allow a signed refusal is up to the Primary or Supervisor, and he or she may require transport of any patient who does not fulfill requirements listed in (I).

K. A patient determined to be dead on arrival that meets all protocol for not initiating resuscitation is to be left in police custody, and the name and shield number of the police officer are to be documented.

L. Only the following are acceptable dispositions for a patient:

1. University Health Center
2. Hospital
3. Refused medical attention
4. Gone on arrival (no pt. found)
5. Unfounded
6. Canceled en route by police
7. Canceled on scene by police or Supervisor where no patient contact is made
8. Dead on arrival

M. Any patient who does not sign a refusal must be transferred to an equal or higher medical authority.

N. If University Health Center can not care for the patient, the patient is to be transported to the hospital. UHC will only treat Brandeis students and staff.

O. Run sheets are to be delivered as follows:

1. Canary copy: receiving agency
2. White copy: returned to BEMCo
3. Pink copy: forwarded to the Medical Director weekly for review

## **VI. DUTY**

Purpose: To establish a policy regarding the taking of duty by BEMCo members.

A. The on-duty crew shall consist of a Primary, a Secondary, and a Tertiary or Observer, and at no time shall consist of less than a Primary and a Secondary. Every attempt should be made to avoid a single sex crew.

B. In the event of a shortage of manpower, two experienced Secondaries may act in lieu of a Primary, as determined by the Director and Operations Officer.

C. A Supervisor will be available at all times and will remain within a reasonable distance from campus.

D. In the event of a shortage of manpower, an experienced Primary may act in lieu of a Supervisor, as determined by the Director and Operations Officer.



E. All duty shifts are 24 hours, with shift changes to take place at 17:00 hours in the BEMCo office.

F. A test of the pagers may occur daily between 17:00 and 19:00 hours.

G. All on-duty crew members are responsible for the completion of the following:

1. Sign in sheet with checklist:
  - a. Kit checklist for jumpkits completed daily
  - b. Truck Checklist for Primary completed weekly
2. Daily dispatch roster
3. Documenting all calls

H. All equipment is to be returned at the following shift change when the member is to sign out. Each member is responsible for all equipment signed out. This includes:

1. Kit
2. Radio/Pager
3. Keys
4. Parking pass
5. Green light
6. BEMCo jacket

I. Any missing or malfunctioning equipment is to be reported to the Operations Officer immediately.

J. If equipment left at UHC or the hospital is not yet available, missing equipment should be documented and the next crew notified at shift change. The primary on duty shall be responsible for equipment retrieval, and the Operations Officer should be notified if retrieval is unusual/impossible.

K. Battery Protocols as outlined in the call procedures guide should be followed.

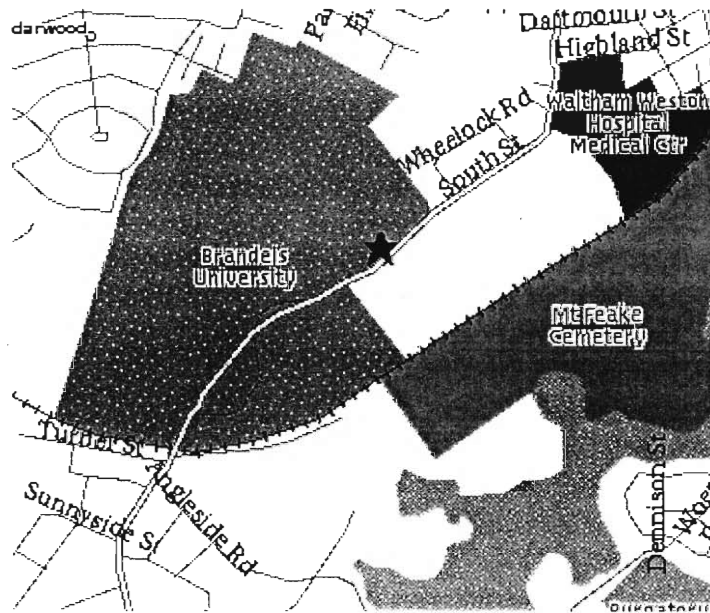
L. No member is to be on duty during an examination. Members should seek the approval and permission of teachers to be on call during a class.

M. Any changes in the duty schedule must be approved in advance by the Operations Officer or his/her representative. Swaps within a shift are strongly discouraged, and the Primary on duty is to be notified.

N. If a replacement for a shift of equal or higher level can not be found, the Operations Officer or his/her representative is to be notified 24 hours in advance of the shift.

O. Failure to attend duty or find a replacement may initiate disciplinary action.

P. The on-duty crew is to remain within the service area as defined by the map below. This applies to members who are travelling by vehicular means. Members on foot must remain on campus for their shift.



Q. Each on-duty crew members must carry a radio/pager at all times. The Secondary and Tertiary must carry aid kits at all times. The Primary is to park the vehicle within a reasonable distance for a prompt response.

R. The BEMCo parking pass entitles the crew member to park in any legal parking space or emergency vehicle space on campus. The crew member is responsible for any action taken resulting from occupying an illegal parking space. Crew members may not park in Handicap spaces, on the grass, or such as to impede the flow of traffic.

S. On-duty vehicles are not to park in Rosenthal circle, next to Sherman, or in I-lot unless the call is in that area. The automatic gate can be opened with the swipe card provided to each on duty member.

T. A crew member may not be allowed to take duty if he/she is not in a proper uniform at shift change. The uniform shall consist of the following:

1. A shirt, sweatshirt, or jacket identifying the crew member as a BEMCo member
2. Sneakers or closed shoes
3. Jeans or long pants in satisfactory condition

U. An incident report is to be filed for any of the following:

1. Injury of personnel
2. Equipment damaged or lost

3. Conflict with other responding personnel
4. Any other occurrence which needs to be documented

V. On duty crew members are to notify the duty crew by contacting campus police if approached to provide patient care.

W. No personnel shall respond to any call or take duty while under the influence of any type of intoxicating substance, severe mood altering, or legally controlled substance.

X. No alcoholic beverages or other controlled substances are permitted in the BEMCo office or any BEMCo vehicle.

Y. It is strongly recommended that all crews discuss their patient care at the conclusion of each call.

Z. No member shall take duty if suffering from illness or injury that would interfere with his/her ability to perform the required duties of a crew member. These duties include:

1. Ability to communicate over the radio
2. Ability to respond expeditiously to the scene
3. Ability to communicate with the patient and the crew
4. Ability to lift and carry the patient
5. Ability to treat the patient without exposing the patient to illness or any other harm

## **VII. ACTIVE MEMBERS**

Purpose: To establish a policy regarding the roles and responsibilities of BEMCo technicians.

A. All active members must hold a current and valid Massachusetts State Emergency Medical Technician certificate card, and a current and valid CPR card of either of the following: American Heart Association Healthcare Provider or BCLS Instructor, American Red Cross Professional Rescuer or BLS Instructor. In addition, a health care provider may be considered an active member with the approval of the Director of UHC and Operations Officer of BEMCo. All names, card certification numbers, and expirations dates shall be recorded. Members without cards on file or expired cards will not be allowed to take duty shifts.

B. All active members must be familiar with the names, locations, use and operation of all BEMCo equipment.

C. All technicians will operate within the Massachusetts protocols and BEMCo Operating Rules, as well as BEMCo Medical Protocols as determined by BEMCo and UHC.

D. The Primary shall be responsible for all care rendered to a patient until relieved by a Supervisor or until the patient is released to a higher medical authority.

E. No technician will render aid beyond their level of training.

F. No BEMCo member will dispense any information to unauthorized personnel. In addition, patient name and location of incident will not be discussed or given to unauthorized personnel.

G. Active members are insured by Brandeis University. This does not include personal liability.

H. Active members will not consume or purchase alcoholic beverages while wearing any article of the BEMCo uniform.

I. Active members must attend a minimum of 2 CE's per semester or else seek an excused absence from the Training Officer or Operations Officer.

J. Only active members will be permitted to take duty.

## **VIII. OBSERVERS**

Purpose: To establish a policy regarding Observers operating with BEMCo.

A. Only one Observer may take duty on a shift at any given time.

B. An Observer must hold a current and valid CPR card of either of the following: American Heart Association HCP or BCLS Instructor, American Heart Association PR or BLS Instructor.

C. The Observer may sign out the following equipment:

1. Radio/Pager
2. Keys
3. Parking pass

D. The Observer is not to be first on scene with a patient.

E. The Observer shall not wear any uniform identifying him/herself as an active member of BEMCo.

F. The Observer shall follow all instructions given by another crew member, and will not initiate patient care.

G. Observers will not participate in standbys.

H. The Observer will not dispense any information regarding a call to bystanders or family members. All inquiries during a call will be directed to the Primary.

## **IX. COMMAND**

Purpose: To establish a policy of chain of command while administering patient care.

A. The person with highest level of training shall be in charge of the treatment/stabilization, and transport of a patient, in the following order:

1. Medical doctor
2. Nurse
3. Paramedic
4. EMT
5. CPR trained
6. Bystander

B. In the event a physician is in attendance, the physician's signature should be obtained if he/she will be assuming medical control.

C. A non-member will be relieved of patient care responsibility provided that the BEMCo member is of equal or higher training.

D. The technician in charge shall assume responsibility for the call, including but not limited to radio communications, placement of the vehicle, and patient care. The technician in charge will be in the following order:

1. Supervisor
2. Primary
3. Secondary
4. Tertiary

## **X. MASS CASUALTY INCIDENT**

Purpose: To establish a guideline for BEMCo at a campus mass casualty incident.

A. All university or city disaster plans shall take precedence over this section.

B. A mass casualty incident (MCI) shall be declared when:

1. The number of patients and the nature of their injuries make the normal level of stabilization and care unachievable, and/or
2. The number of Brandeis and other EMS personnel that can be brought to the scene within 10-15 minutes is not enough to provide normal levels of care and transportation, and/or
3. The stabilization capabilities of Deaconess Waltham and Newton-Wellesley Hospitals are insufficient to handle all of the patients.

C. Upon identification of an MCI, Brandeis Control shall be called upon to notify the following:

1. Campus Police
2. AMR
3. BEMCo Supervisor
4. Waltham Police and Fire Departments
5. Deaconess Waltham and Newton-Wellesley Hospitals

D. Attempts should be made to summon all available active BEMCo members via the BEMCo roster.

E. The first EMT on scene should attempt to calm the injured and administer basic first aid. If there is imminent danger, he/she should rapidly move people out of the area, regardless of their injuries.

F. The BEMCo Supervisor should assume the role of Incident Commander and begin triage and MCI procedures. The Supervisor is to advise Brandeis Control of the estimated number of aided, direct the first ambulance to arrive, and advise arriving personnel of the situation.

G. Should there be no life-threatening injuries or illness (such as mass heat exhaustion), the BEMCo Supervisor is to be notified immediately. A decision should then be reached as to whether the situation will require local mutual aid, or if an MCI is in progress. A triage and a treatment area are to be established, and Brandeis Control is to be updated of the situation.

## **XI. EMERGENCY STANDBYS**

Purpose: To establish a policy regarding the use of BEMCo at emergency standbys.

A. BEMCo will be dispatched and the Supervisor notified in the following situations:

1. Active fire
2. Hazardous Materials Incident
3. Motor vehicle accident with injuries
4. Emergency scene with potential patients

B. The crew is to follow all orders of the Campus Police, city police, city fire department, or other responding agency.

C. The vehicle and crew are not to enter the emergency scene unless it is declared safe and directed to do so by an appropriate officer.

D. The incident commander is to be advised that BEMCo is on the scene, and an aid station is to be prepared.

E. An authorized driver of the vehicle is to remain with the vehicle at all times. The vehicle should neither block emergency vehicles or be blocked in by other vehicles.

F. A run sheet is to be filled out indicating whether any were aided at the scene.

G. In the event of a snow emergency, the duty crew may be changed in order to have crew members at opposite ends of campus, as per the Operations Officer.

## **XII. SCHEDULED STANDBYS**

Purpose: To establish a policy regarding scheduled standbys at campus events.

A. Non-emergency standbys shall be done by BEMCo under the following criteria:

1. By request of a university office or chartered club
2. At the discretion of the Director, Operations Officer, and the Director of Public Safety

B. The Operations Officer shall select a standby crew based on the estimated crowd size, and the nature of event. This will include the number of personnel, equipment to be used, uniform, and crew placement at the event.

C. Brandeis Control is to be notified of the standby crew, and advised once the standby crew is on location and available.

D. A run sheet is to be filled out indicating whether any were aided at the scene.

E. Only active EMTs may serve on a standby crew.

F. The highest ranking BEMCo member at the standby will be in charge of the crew at the scene.

G. Only those personnel authorized to standby at the event may identify themselves as the standby crew. Unauthorized access to an event by improper identification as a standby member may initiate disciplinary action.

H. The standby crew will have the duty crew paged to respond for any patients needing transport from the standby. The standby crew will transfer all patient care to the duty crew prior to patient transport.

I. The standby crew will remain available on the police frequency for the duration of the standby.

### **XIII. ORIENTATION**

Purpose: To establish a policy regarding the orientation of active members to BEMCo.

A. Any Massachusetts EMT who is new to BEMCo will be required to attend and successfully complete an orientation program. Every attempt will be made for the orientation to be a state-approved continuing education class (approx. 10 hours)

B. The orientation will include but is not limited to the following:



1. Equipment use and location
2. Radio protocol
3. Vital signs
4. Paperwork
5. Campus Locations (Map Test)

C. Any member, past or present, who has not taken a shift with BEMCo in over one semester may be required to attend a re-orientation at the discretion of the Operations Officer.

D. A new member cannot become an Active member until successful completion of Orientation, or equivalent at the discretion of the Operations Officer.

#### **XIV. PROMOTIONS (revised Fall 1999)**

Purpose: To establish a policy regarding promotions within BEMCo.

A. All Promotions will be reviewed and voted upon by the Promotions Committee.

1. The Committee shall consist of:
  - a. The Operations Officer
  - b. The two BEMCo Supervisors
  - c. Any full primary who expresses the desire to join the committee in writing.
  - d. A member voted upon by the membership as per the constitution.
2. The Committee shall meet once a month, and more often as needed.
3. The chair of the Committee shall be the Promotions Officer who will vote last.
4. A quorum shall consist of the Operations Officer, at least one supervisor, and two other Committee members.
5. In the event of a tie vote, the promotion of the member will be tabled for further evaluation until the next meeting.

B. A member who desires to be considered for a promotion must submit a request in writing to the Promotions Committee, no later than the date specified by the Promotions Officer.

C. The Promotions Committee will inform a member regarding any information necessary for a promotion that has not been submitted.

D. When all necessary information has been submitted, the Promotions committee will respond in writing within one week of a Promotions meeting.

E. All time lengths are based on weeks during which Brandeis University is in session.

F. All decisions made by the Promotions committee can be reviewed by the Director of Public Safety, as deemed necessary by the Operations Officer.

G. All minimum requirements are subject to the discretion of the Operations Officer. Minimum requirements for promotions are as follows:

1. To secondary:

- a. 5 BEMCo calls and 5 BEMCo shifts
- b. demonstration of competence and preparedness for calls

2. To primary:

- a. one semester as a secondary
- b. 10 BEMCo calls as a secondary
- c. 3 months with an off campus EMS
- d. letter of reference from a coworker or supervisor, to be submitted no later than the date specified by the Promotions Committee
- e. interview by the Promotions Committee
- f. successful completion of a Probational Primary period. During this time, a Supervisor or designated Primary will respond with the probational primary

to

all BEMCo calls. This period will last until the Promotions Committee feels the probational primary is ready to assume the responsibility of a primary.

Further,

a probational primary may be denied promotion to Primary at the discretion of the Promotions Committee.

- g. authorization to operate an AED in Region IV
- h. completion of a University sponsored defensive driving course.

3. To supervisor:

- a. one semester as a primary
- b. full spectrum of knowledge in cardiac arrests, multiple traumas, MVAs, MCIs, Incident command, HazMat, fire scenes, and extrication as they relate to the operations of BEMCo.

H. The appeal procedure for the decision shall be as follows:

- 1. The member may meet with the Director and Operations Officer
- 2. The member may have the promotion voted upon by the active members of the general membership after consultation with the Parliamentarian. A necessary quorum of the general membership shall be the same as that of a normal general meeting.

## **XV. MEDICAL AND MECHANICAL READINESS OF EQUIPMENT**

Purpose: To establish a policy regarding the condition of all equipment.

A. Any equipment found to be defective shall be placed out of service until repair. Upon being repaired the equipment shall be inspected prior to being returned to service.

B. The vehicle is to be inspected by the Operations Officer and a maintenance checklist is to be filled out on a weekly basis. Any deficiencies noted should be reported to the Operations Officer or Supervisor immediately. Inspection should include the following:

1. Tires
2. Brakes
3. Fluids
4. Mirrors
5. Visual and Audible warning devices
6. Headlights, brake lights, directionals, foul weather lights

C. The oxygen tank is to be replaced with a new tank when the pressure falls below 800 psi.

D. The BEMCo vehicle may be removed from service at the discretion of the Operations Officer. A university vehicle is to be used as a replacement. If a university vehicle is not available, a private vehicle may be used with fuel provided by BEMCo. At the minimum, the following equipment is to be relocated from the BEMCo vehicle, if out of service:

1. Clipboard
2. Primary kit
3. Oxygen duffel
4. Stair chair
5. Cardiac/trauma bag
6. Burn Kit
7. Peds kit
8. OB/GYN bag
9. Disposable splints
10. Any other equipment deemed necessary by the Primary

## **XVI. OUT OF SERVICE**

Purpose: To establish a policy for BEMCo to be out of service during the academic year.

A. BEMCo will be out of service under the following conditions:

1. Insufficient manpower available for a complete crew
2. At the discretion of the Operations Officer of BEMCo, or the Operations Officer and the Director of Public Safety. The decision of the Operations Officer will stand until the eboard can meet and vote upon that decision (this shall hold true only when the Operations Officer reaches that decision unilaterally).

B. The Director of Public Safety and the Health Center will be notified in writing before BEMCo goes out of service.

C. When BEMCo is out of service, major pieces of equipment are to be removed from the vehicle and stored in the office. When out of service for extended periods of time, all equipment is to be stored in the office.

## **XVII. CRITICAL INCIDENT STRESS DEBRIEFING**

Purpose: To establish a policy regarding the awareness and management of critical incident stress.

A. Critical incident stress debriefing may occur in the event of the following:

1. The serious injury of an emergency team member in the line of duty
2. Any case that is charged with profound emotions, such as particularly tragic circumstances
3. Any case that attracts unusual attention from the news media
4. Any failed rescue attempt requiring prolonged expenditure of physical and emotional energy
5. Any incident which can be considered a serious physical or psychological threat or a sudden loss to the rescuer
6. At the discretion of the Director or Operations Officer of BEMCo or the Director of UHC.

B. Debriefing shall be directed through the University Psychological Counseling Center.

C. Active members deemed to require debriefing will be considered out of service until deemed ready to return to active duty by the counseling center.

## **XVIII. PATIENT CONFIDENTIALITY**

Purpose: To establish a policy concerning the confidentiality of patient information.

A. Only the Director of BEMCo or his/her duly appointed representative will discuss matters of patient information, patient care, or any particular call with anybody outside of BEMCo.

B. All run sheets are to be viewed exclusively by the attending crew, the receiving medical facility, UHC, the transporting ambulance, the Operations Officer of BEMCo and his/her appointed representatives.

C. Every effort should be made by all members to respect the confidential nature of patient care. Failure to do so may result in disciplinary action.

## **Appendix D**

Massachusetts General Laws  
(pertaining to this study)

## **CHAPTER 89. LAW OF THE ROAD.**

### **Chapter 89: Section 7B. Operation of emergency vehicles.**

Section 7B. The driver of a vehicle of a fire, police or recognized protective department and the driver of an ambulance shall be subject to the provisions of any statute, rule, regulation, ordinance or by-law relating to the operation or parking of vehicles, except that a driver of fire apparatus while going to a fire or responding to an alarm, or the driver of a vehicle of a police or recognized protective department or the driver of an ambulance, in an emergency and while in performance of a public duty or while transporting a sick or injured person to a hospital or other destination where professional medical services are available, may drive such vehicle at a speed in excess of the applicable speed limit if he exercises caution and due regard under the circumstances for the safety of persons and property, and may drive such vehicle through an intersection of ways contrary to any traffic signs or signals regulating traffic at such intersection if he first brings such vehicle to a full stop and then proceeds with caution and due regard for the safety of persons and property, unless otherwise directed by a police officer regulating traffic at such intersection. The driver of any such approaching emergency vehicle shall comply with the provisions of section fourteen of chapter ninety when approaching a school bus which has stopped to allow passengers to alight or board from the same, and whose red lamps are flashing.

## **CHAPTER 90. MOTOR VEHICLES AND AIRCRAFT.**

### **Chapter 90: Section 7E. Display of red or blue lights on vehicles; permits; revocation; violations.**

Section 7E. No motor vehicle operated pursuant to section seven other than fire apparatus, ambulances, school buses, vehicles specified in section seven D used for transporting school children, and vehicles specified in section seven I shall mount or display a flashing, rotating or oscillating red light in any direction, except as herein provided; provided, however, that nothing in this section shall prohibit an official police vehicle from displaying a flashing, rotating or oscillating red light in the opposite direction in which the vehicle is proceeding or prohibit fire apparatus from displaying a flashing, rotating or oscillating blue light in the opposite direction in which the vehicle is proceeding.

A vehicle owned or operated by a forest warden, deputy forest warden, a chief or deputy chief of a municipal fire department, a chaplain of a municipal fire department, a member of a fire department of a town or a call member of a fire department or a member or a call member of an emergency medical service may have mounted thereon flashing, rotating or oscillating red lights. Such lights shall only be displayed when such owner or operator is proceeding to a fire or in response to an alarm and when the official duty of such owner or operator requires him to proceed to said fire or to respond to said alarm, and at no other time.

No such red light shall be mounted or displayed on such vehicle until proper application has been made to the registrar by the head of the fire department and a written permit has been issued and delivered to the owner and operator. In the event that the operator is not the registered owner of the vehicle, no permit shall be issued until said owner forwards to the registrar a written statement certifying that he has knowledge that such red light will be mounted and displayed on said vehicle.

Any person operating a vehicle upon which flashing, rotating or oscillating red lights herein authorized are mounted shall have the permit for said lights upon his person or in the vehicle in some easily accessible place. Upon termination of the duties which warranted the issuance of the permit, the head of the fire department shall immediately notify the registrar who shall forthwith revoke such red light permit. Upon the written request of the chief of police or chief of fire of the town in which such permitted vehicle is registered, the registrar may revoke such permit. The registrar shall revoke such permit for the unauthorized use of such red lights and the owner and operator shall be subject to a fine as hereinafter provided.

Upon revocation, the registrar of motor vehicles shall notify forthwith the owner and operator of the vehicle for which such permit was issued and the head of the police department and fire department of the town in which his original permit was issued.

No motor vehicle or trailer except (i) a vehicle used solely for official business by any police department of the commonwealth or its political subdivisions or by any railroad police department or college or university police department whose officers are appointed as special state police officers by the colonel of state police pursuant to section sixty-three of chapter twenty-two C and subject to such special rules and regulations applicable to such college or university police department as the registrar may prescribe, (ii) a vehicle owned and operated by a police officer of any town or any agency of the commonwealth while on official duty and when authorized by the officer's police chief or agency head and only by authority of a permit issued by the registrar, (iii) a vehicle operated by a duly appointed medical examiner or a physician or surgeon attached to a police department of any city or town only while on official duty and only by authority of a permit issued by the registrar, (iv) a vehicle operated by a police commissioner of a police department of any city only while on official duty and only by authority of a permit issued by the registrar, (v) a vehicle actually being used for the transportation of persons who are under arrest, or in lawful custody under authority of any court, or committed to penal or mental institutions, and only by authority of a permit issued by the



registrar, (vi) a vehicle operated by a chaplain of a municipal police department while on official duty and only by authority of a permit issued by the registrar shall mount or display a flashing, rotating or oscillating blue light in any direction. No motor vehicle, as hereinbefore provided, requiring a permit from the registrar, shall mount or display a blue light on such vehicle until proper application has been made to the registrar by the head of the police department and such written permit has been issued and delivered to the owner and operator. Such notice shall include the place of residence and address of the owner and operator of the vehicle for which such permit is issued and the name of the make, vehicle identification number and the registration number of the vehicle for which such permit authorizes the display of blue lights. Any person operating a vehicle upon which blue lights have been authorized to be mounted or displayed, by permit, shall carry such permit for said lights upon his person or in the vehicle in some easily accessible place. Upon termination of the duties of such person which warranted the issuance of the permit, the chief of police shall immediately notify the registrar, who shall forthwith revoke such blue light permit. Upon the written request of the chief of police of the town in which such permitted vehicle is registered the registrar may revoke such permit. The registrar shall revoke such permit for the unauthorized use of such blue lights and the owner and operator shall be subject to a fine as hereinafter provided. Upon revocation, the registrar of motor vehicles shall notify forthwith the owner and operator of the vehicle for which such permit was issued and the head of the police department of the city or town in which such permitted vehicle is registered. Upon receipt of his notice of revocation, such owner and operator shall forthwith deliver such blue light permit to the registrar and he shall not be eligible for reissuance of such permit without consent of the head of the police department of the town in which his original permit was issued. Nothing in this section shall authorize any owner or operator to disregard or violate any statute, ordinance, by-law, rule or regulation regarding motor vehicles or their use on ways of the commonwealth. The registrar may also make such rules and regulations governing or prohibiting the display of such other lights on motor vehicles as he may deem necessary for public safety.

Any person who violates any provision of this section for which a penalty is not otherwise provided shall be subject to a fine of not less than one hundred dollars, nor more than three hundred dollars.

#### **Chapter 90: Section 7I. Emergency disaster service vehicles of charitable corporations; identification and equipment.**

Section 7I. Special purpose motor vehicles and trailers, the property of and registered to charitable corporations, specifically assigned to the emergency disaster services of those organizations, and used for the benefit of firemen, policemen, civil defense workers and victims of fires and disasters, shall be furnished, without charge, by the registrar at his office, a number plate of the type and design furnished to ambulances, fire engines and fire apparatus. Such emergency disaster service vehicles may be equipped with sirens or other audible warning devices and with visible warning devices as provided in section

seven E. Such audible and visible warning devices may be used by the vehicle operator only when responding to an official alarm of fire or disaster and at no other time. Every such emergency disaster service motor vehicle shall be marked, on a part of the vehicle not readily removable, and in a conspicuous place, with the insignia of the corporation and with words identifying the vehicle as an emergency disaster service unit.

## **CHAPTER 111C. EMERGENCY MEDICAL SERVICES SYSTEM.**

### **Chapter 111C: Section 6. EMS first response service or ambulance service; application; license; renewal; provisional license**

Section 6. (a) Any person who proposes to establish or maintain an EMS first response service or an ambulance service shall file an application with the department, containing such information as the department may require, including, without limitation, the identity of the applicant, and any parent or affiliated entity, the level of service proposed and the number of emergency medical services vehicles for which application is made.

(b) Upon receipt and review of an application for a license, the department shall issue a license if it finds that the applicant is responsible and suitable to establish or maintain the proposed service and meets such requirements as the department may establish by regulation for a service license. Such requirements shall include, without limitation, the responsibility to dispatch EMS personnel and vehicles and transport patients to the appropriate hospital or other health care facility as necessary, and to participate in the local, regional and state EMS system. No original or renewal license shall be issued under this subsection, except in the case of a service owned or operated by an agency or political subdivision of the commonwealth, unless the applicant has received and there is in effect a contract of insurance conforming to the regulations promulgated by the department, subject to chapter 175.

(c) In the case of a renewal application, the department may, subject to such regulations as it may promulgate, issue a provisional license to an applicant that does not meet the requirements under this section; provided, however, that the applicant has demonstrated to the department's satisfaction a good faith intention to meet such requirements; and, provided further, that the department finds that the applicant provides adequate emergency medical care and evidences a potential for full licensure within a reasonable period, not to exceed six months. The department, however, shall in no case issue a person more than two consecutive provisional licenses for the same service.

(d) The department shall set forth in every license which it issues under this section the name and address of the person to whom such license is issued, the period for which such

license is issued, the classification or level of service, if any, for which such license is issued, the number and classification of EMS vehicles to be operated under the license, the conditions as to transfer and assignment prescribed by law, and such other terms of issuance as the department may, in the public interest, prescribe as necessary or appropriate. The department shall fix the period of a provisional license for no more than six months, and it shall fix the period of a full license for no more than 24 months.

(e) A complete renewal application properly filed with the department shall have the effect of a license, on all the same terms and conditions as the previously issued license, until the department acts on the application.

#### **Chapter 111C: Section 7. EMS vehicles; inspection; certificate.**

Section 7. Prior to issuing a license under section 6, the department may conduct an inspection of EMS vehicles to be listed in such license. Each person to whom a license is issued shall be entitled to a certificate of inspection for each such EMS vehicle upon proof that the EMS vehicle is in compliance with such requirements as the department may establish by regulation for a certificate of inspection. Each certificate shall be valid only for the vehicle for which it is issued and to the service for which it is issued, and shall not continue in force after the expiration or transfer of the license under which it is issued; provided, however, that if a complete renewal application is properly filed with the department, then each certificate issued in connection with the previously issued license shall continue in force until the department acts on the application. Each service issued a certificate of inspection shall cause such certificate to be displayed in such emergency medical services vehicle in such manner as the department may prescribe by regulation.

#### **Chapter 111C: Section 20. Remote communication; advice, consultation, or orders; limitation on liability of physicians, nurses, hospitals and EMS personnel.**

Section 20. No physician duly registered under section 2, 2A, or 9 of chapter 112, and no nurse duly registered under section 74 or section 76 of said chapter 112, and no hospital shall be liable in a suit for damages as a result of acts or omissions related to advice, consultation or orders given in good faith to emergency medical services personnel who are qualified under section 9 and are acting on behalf of a service duly licensed under section 6, by radio, telephone or other remote means of communication and prior to arrival of the patient at the hospital or other health care facility from which the emergency communication to the EMS personnel is made, nor shall any such EMS personnel be liable in a suit for damages as a result of their acts or omissions based upon such advice, consultation or orders by remote communication, if the such acts or omissions were made in good faith, nor shall any physician be liable in a suit for damages as a result of acts or omissions relating to the discharge of duties under this chapter,

including, without limitation, duties as a medical director at the state or regional level, if such acts or omissions were made in good faith.

**Chapter 111C: Section 21. EMS personnel; good faith performance of duties; limitation on personal liability.**

Section 21. No EMS personnel certified, accredited or otherwise approved under this chapter, and no additional personnel certified or authorized under section 9, who in the performance of their duties and in good faith render emergency first aid, cardiopulmonary resuscitation, transportation, or other EMS, to an injured person or to a person incapacitated by illness shall be personally liable as a result of rendering such aid or services or, in the case of an emergency medical technician or additional personnel, as a result of transporting such person to a hospital or other health care facility, nor shall they be liable to a hospital for its expenses if, under emergency conditions, they cause the admission of such person to said hospital.

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