

When Minutes Count

Michigan Tech Emergency Medical Services



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Abstract

The Michigan Technological University (Michigan Tech) campus community receives emergency medical attention from an all-volunteer, non-profit, emergency medical services organization. This organization voluntarily provides response to any 9-1-1

medical service call on the Michigan Tech campus and auxiliary properties with an average response time of four minutes.² The provided services benefit thousands of students, faculty, staff and campus visitors annually. As a non-profit, all-volunteer organization, MTEMS challenged with funding needs to purchase supplies, including new equipment that would aid in their ability to provide greater service to the campus community and a better partnership with Mercy Ambulance Services. An example of service enhancing equipment is a portable cot (stretcher) that would be used to expedite victim mobilization to an on-campus location, where the ambulance crew can quickly retrieve the injured, in order to transport to an area hospital. This white paper describes their need and how a cot would benefit the people they

*On February 22, 2012, Michigan Technological University's Emergency Medical Services (MTEMS) unit was dispatched by the regional 9-1-1 Station to an on-campus automobile accident where the victim was experiencing head and neck pain. The all-volunteer MTEMS extricated and immobilized the victim, provided medical services and prepared the victim to be transported by Mercy Ambulance Service, who arrived on scene **43 minutes after** MTEMS.*

*On April 13, 2012, MTEMS responded to a dispatch at McArdle Theatre, located on Michigan Tech's campus, where the victim had fallen from the bleachers at an evening performance and suffered a broken leg and pelvis. MTEMS was on scene one minute after the call, while Mercy Ambulance arrived **17 additional minutes.***

*On January 23, 2013, MTEMS unit was dispatched, along with Mercy Ambulance Services to a report of Hypothermia on Michigan Tech's campus. MTEMS arrived within three minutes provided necessary medical services and prepared the victim for transport to an area hospital. Mercy Ambulance Services arrived 20 minutes after the time of dispatch, and **17 minutes after** MTEMS.¹*



¹ Transcribed from call response data maintained by Michigan Technological University-Department of Public Safety, provided by Brian Cadwell, Houghton, Mi, October 17, 2013

² Brian Cadwell, interview by C.Maxson, Houghton, Mi, October 16, 2013

Client Background

Michigan Technological University (Michigan Tech) is a public university located in Houghton, near the northernmost point of Michigan's Upper Peninsula. Michigan Tech's campus is nestled in the center of Houghton, along the Portage Canal and across the canal from the city of Hancock. Houghton and Hancock are joined by a four lane lift bridge that provides the only vehicular crossing into the Keweenaw Peninsula where both regional hospitals are located. Mercy Ambulance Service is the only medical transportation operation in the area and it is also located on the north side of the canal.



View from the north side of the Portage canal looking south towards Michigan Tech's campus. The Portage lift bridge provides the only access from Houghton to the two area hospitals and Mercy Ambulance Service.

Michigan Tech's student population includes 6,976 students and 1,535 faculty and staff.³ During the school year, Michigan Tech's on-campus population doubles the population of Houghton. Through programming and facilities, the University is an important partner in regional tourism and provides cultural, education and sporting opportunities for people living in the region.

The University's facilities support a number of campus and community events. Facilities like the Student Development Complex and John MacInnes Student Ice Arena, with a maximum capacity of 4,128,⁴ provide public sports and recreation venues. The Rozsa Center for performing arts boasts an 1101⁵ seat capacity for hosting regional arts performances. The Memorial Union Building and Wadsworth Hall Dining Facility are frequently booked for weddings, anniversaries and other group functions. During the summer months, the campus is used for pre-college education and sporting camps. Year round, the University hosts a considerable number of meetings and conferences.



Michigan Tech's ski system hosts a variety of events, from local youth ski lessons to National competitions.

Michigan Tech also operates its own system of Nordic ski trails, a downhill ski facility (Mount Ripley) located on the north side of the canal and an eighteen-hole golf course south of Michigan Tech's main campus.

³ Michigan Technological University Marketing and Communication website. Last retrieved on 10/19/2013

⁴ <http://www.stadiumjourney.com/stadiums/john-j.-macinnes-student-ice-arena-s1371/>. Last retrieved on 10/14/2013

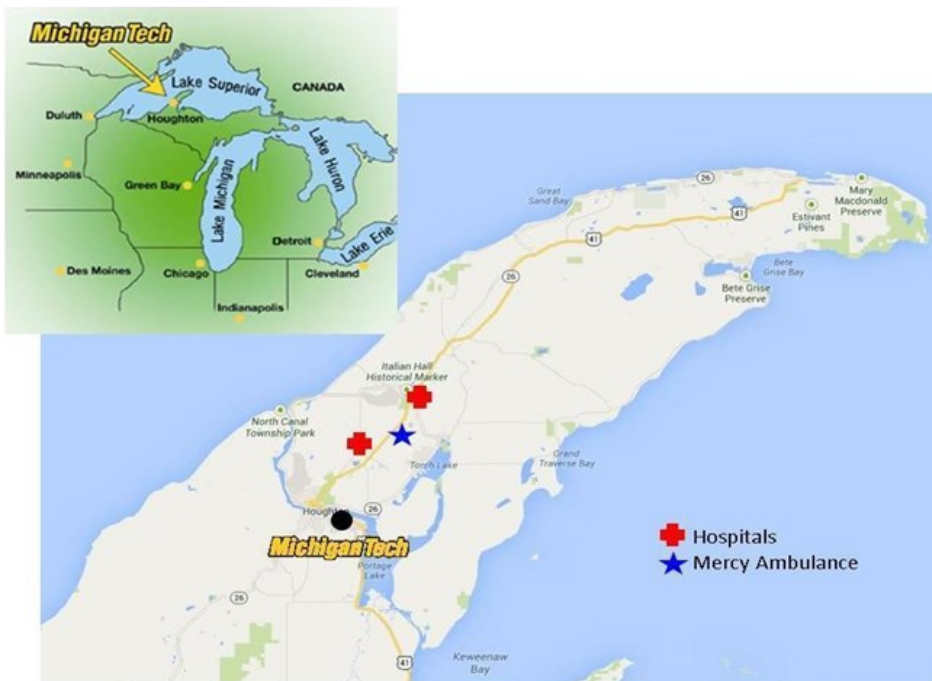
⁵ Rozsa Center for Performing Arts website. Last retrieved 10/19/2013



Michigan Tech’s Daniel Heights Residential Council that represents the residential needs of on campus families and tenants.

Michigan Tech is the largest housing provider in the area, operating three dormitories and two apartment complexes. Many residents of on-campus housing are from other countries and do not possess valid driver’s licenses or own personal transportation. This creates a community within a community where basic services, like emergency medical services, are a critical service need to an isolated population.

In the Keweenaw area, ambulance service is provided by Mercy Ambulance, which operates from Calumet, Michigan, approximately 10 miles north of Houghton. There are two local hospitals, Portage and Aspirus, both located north of the bridge.



Michigan Tech is located 5 miles from Portage Hospital, 10 miles from Mercy Ambulance and 15 miles from Aspirus Hospital. All three locations rely on bridge service at a single point across the Portage Canal.^{6,7}

In collaboration with the public safety department, the local police, and Mercy Ambulance, a group of volunteers created an emergency medical services program on Michigan Tech’s campus. MTEMS is the State of Michigan’s first and only all-volunteer university emergency medical services unit. The mission, as established by MTEMS, is *“to provide rapid, quality medical care to patients in and around the Michigan Tech campus”*.⁸ Students, staff and faculty are all enrolled as volunteers, and all members within this organization have access to training sessions for medical certifications ranging from C-CERT to medical first response. New member are always welcome and no prior experience is needed.

⁶ [Map inset] Michigan Technological University, University Marketing and Communications division. Last retrieved on 10/11/2013

⁷ [Large map] www.googlemaps.com, modified and last retrieved on 10/11/2013

MTEMS received its first call in October of 2011 and by the end of its first year 52 emergency calls were received. The following year, through September of 2013, 61 emergency calls had been responded to. MTEMS provides a 24/7 service and, in average, nine volunteers are always ready to respond to an emergency. This helps to provide an emergency response time of less than 5 minutes on average; while the response time of the ambulance service averages 18-19 minutes.⁸



Michigan Tech's Emergency Medical Services volunteers, the mobile first aid station, and the Department of Public Safety staff.

Challenges

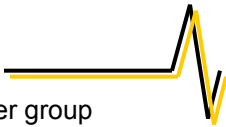
As a non-profit, volunteer organization, MTEMS faces challenges in meeting their mission of providing rapid emergency services. These include basic funding, operating in adverse weather conditions, and navigating Michigan Tech's campus infrastructure.

Funding Challenges As a fully volunteer organization, MTEMS operational costs are directly related to the services they provide to the university community and campus visitors, which are free of charge. With an annual operating budget of \$7,500, MTEMS continues operating on donations and gifts. These gifts and donations come from Alumni, local civic groups, Michigan Tech employee contributions and other Michigan Tech departments. For the purposes of receiving financial gifts, donations, and grants, Michigan Tech operates a 501(c)(3) organization called the Michigan Tech Fund, which serves as the fiscal agency for the University and MTEMS in grant/gift applications. Annual licensure is paid as a line item in the Department of Public Safety's annual budget with funds provided by the University.

⁸ Presentation by Daniel Bennett, on September 17th, 2013

MTEMS facts

- all volunteer group
- not-for-profit
- 24/7 emergency services
- open to students, faculty and staff
- first and only campus based first responder group in Michigan
- impressive four minute average response time



Climate Challenges The weather in the Keweenaw is characterized for having a short and warm summer, often followed by a long, cold and snowy winter, which makes vehicular access and travel difficult. As an example of the harsh winters, during the spring semester of 2013, the temperatures reached -20°F, which feels like -40°F with the wind-chill, and more than 20 ft. of snow fall on record.⁹ These conditions make it difficult for vehicles and people to traverse to the scenes of emergencies. Additionally, it can be challenging to protect a victim from adverse weather conditions that may complicate injuries or create new health risk. Stabilizing and moving a victim to a protected location is critical in reducing stress induced by the environment.

Infrastructure Challenges MTEMS faces two distinct infrastructure challenges in carrying out its mission. First is the limited crossing between Houghton and the upper Keweenaw Peninsula. This single bridge crossing is a known barrier for immediate assistance from the ambulance service and hospitals located on the other side of the bridge. In the fall of 2009, the bridge got stuck in a raised position and crossing was suspended for a period of two hours, impeding the ambulance from retrieving a victim and providing transport to the closest hospital. In this case the patient remained indoors and the situation was controlled by MTEMS, but this could happen again and in different conditions which could be catastrophic, if an emergency that requires immediate transportation takes place. With a cot/stretchers MTEMS could be authorized to provide medical transport to another facility located south of Houghton.

The second infrastructure challenge is Michigan Tech's campus which can be a maze to unfamiliar ambulance personnel. Examples include buildings located on the hillside where the campus main entrance accesses the sixth floor but the lower campus road accesses the first floor. This causes difficulties for Mercy Ambulance to navigate and retrieve victims needing transport.

Need

If you parked the MTEMS mobile response unit next to another basic life support ambulance and opened the back doors, the only difference you would find is that one is lacking a portable cot. With MTEMS being a non-transport emergency response provider, the portable cot/stretchers was not required and at the time of acquisition, an unthought-of necessity and a cost savings for basic operations. After two years of on-call activity, a portable cot would be a benefit to providing better victim care. A portable cot would improve MTEMS's ability to navigate the unique infrastructure and environmental challenges they face while providing critical medical response services, which can dramatically decrease the time that it takes to get a patient to higher level medical care. Another benefit to adding a cot to the MTEMS emergency response vehicle is that in an event where Mercy was unable to respond, as was the case in the Fall of 2009, the Mobile Aid Station could be pressed into action as an additional transporting ambulance for the surrounding community.

⁹ JohnDee website. Last retrieved on 10/19/2013



MX-Pro R3 Cot manufactured by Stryker Medical Company



Power-Pro XT Stretcher manufactured by Stryker Medical Company

Research identified two possible cots that would meet the needs of MTEMS. Both cots are manufactured by Stryker Medical Company.

The MX-Pro R3 Cot can support up to 700 pounds and at the same time is lightweight (less than 85 pounds) for easy handling. The oversized wheels can roll on different terrains and lock to prevent roll away. This durable cot is a good fit for all the environmental conditions that MTEMS might face. The retail cost of the MX-Pro R3 is \$5,315.¹⁰

The Power-Pro XT Stretcher is strong, resistant, and impermeable with a battery-powered hydraulic system that allows raising or lowering the stretcher with greater ease. This system is more than just convenient; given that nationally 47% of EMS providers have suffered a back injury while performing EMS duties, it would provide a safer experience for the patient as well as the emergency responder.¹¹ The retail cost of the Power-Pro XT is \$14,620.¹²

In summary, the challenges facing MTEMS and the need for a portable cot include:

- As a volunteer organization, funding for equipment is a challenge
- Weather in the area impacts their ability to provide comfort and reduce the risk of additional adverse environmental effects to those waiting medical transport
- Faster relocation of victims waiting for medical transport to a location that Mercy Ambulance can easily access on Michigan Tech's campus
- Improved process for providing quality emergency medical services to the Michigan Tech community and campus visitors.

Cot Funding Solution

Funding sources for such a project would include a direct request to a corporation and/or a grant application made to a charitable organization. Strategically, MTEMS could secure a matching offer from a cot manufacturer that would strengthen a charitable grant application. Michigan Tech has an existing relationship with Stryker Medical Company.

Farmers Insurance Group was identified as a charitable agency that supports communities where they have agency presence. Houghton has a Farmers Insurance agent. The Farmers Insurance corporate giving program provides grants to 501(c)(3) non-profit organizations in the areas of education, safety and civic participation. The MTEMS group can demonstrate a strong case in both the safety and civic participation categories for application of funds. Local agent Phil Kolehmainen may be able to provide insight regarding other local successful grant applications and additional insight on funding levels and types of projects funded Nationally. The Farmers Insurance Group submission and review process is on-going through an electronic application process. The website indicates that there is a six week turnaround on application outcome.

¹⁰ <https://www.mooremedical.com/index.cfm?/MX-PRO-R3-Cot/&PG=CTL&CS=HOM&FN=ProductDetail&PID=6704&spx=1> Last retrieved on 10/21/2013

¹¹ National Association of Emergency Medical Technicians, 2005

¹² <https://www.mooremedical.com/index.cfm?/Power-PRO%E2%84%A2-XT-Stretcher/&PG=CTL&CS=HOM&FN=ProductDetail&PID=24711&spx=1>. Last retrieved on 10/21/2013