

ABSTRACT

A Theoretical First Response Model Proposal with a Historic Look at Baylor EMS and a Literary Review of First Response Programs

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Time can be of the utmost importance when a medical emergency occurs. First response programs are designed to have highly trained first responders arriving before an ambulance to the scene of the emergency within a matter of minutes. A historic look at Baylor EMS was performed to better understand the history of first responding on Baylor University's campus and to analyze where the program went wrong and what caused its disbandment. A literary review of current city based first response programs and other collegiate EMS programs were also looked into as well to reveal the necessity and benefits of such programs as well as to display the versatility of available programs. Finally a theoretical model for the implementation of a collegiate first response program was detailed and proposed, specifically for use on Baylor University's campus however the model could also apply to any other college or university looking to start their own program.

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A THEORETICAL FIRST RESPONSE MODEL PROPOSAL WITH A HISTORIC
LOOK AT BAYLOR EMS AND A LITERARY REVIEW OF FIRST RESPONSE
PROGRAMS

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CHAPTER ONE

A Historical Look at Baylor EMS

Baylor Emergency Medical Services, or Baylor EMS, was founded as a student organization in March of 1982 by four students who shared the same idea of providing first response emergency care to fellow Baylor Students in a timely and efficient manner. The necessity of the rise of Baylor EMS derived from the true need to reduce the time it took for a sick or injured person to receive emergency medical care on Baylor's Campus. A 1986 article published in the Baylor Lariat, the university's newspaper, states that just prior to Baylor EMS "a student suffered a serious back injury and the ambulance did not arrive for 45 minutes" (Baylor Lariat, 9-16-1986). A separate Lariat article states that the average response time for Baylor EMS to reach the patient was under 3 minutes whereas an ambulance took an average of 15 minutes to arrive (Baylor Lariat, 9-10-1982). In 1985 Brad Allen, then President of Baylor EMS, wrote an article for the Baylor Lariat in which he said "[Baylor] EMS was formed in 1982, as a response to the growing need on campus for mobile emergency aid. Doctors and nurses at the Health Center, fully occupied with patients at the Health Center, were unable to adequately respond to campus calls requiring on-site medical aid. Enter Baylor EMS to fill the need" (Baylor Lariat, 11-5-1985).

It should be noted that there is almost no written record of Baylor EMS outside of the Baylor Lariat Articles in which the original papers were scanned, recorded, archived, and made available online. The only other source of information that can be obtained regarding Baylor EMS is through personal interviews.

Those original four students who started Baylor EMS soon grew to eight members within the first semester of its creation. Furthermore, at least two of them were “on-call” 24 hours a day, 7 days a week while Baylor was in session during the Fall and Spring semesters. In addition to having people on-call 24 hours a day, Baylor EMS also staffed people to provide first aid at Baylor Events such as Diadeloso, intramurals, the annual homecoming parade and bonfire, campus concerts, as well as sporting events such as football and basketball games to name a few (Baylor Lariat, 11-14-1990). These student volunteers were all either emergency medical technicians (EMTs), or emergency care attendants (ECAs), and some even worked part time with local emergency medical services (EMS) agencies in Waco while still attending Baylor full-time. Baylor EMS worked in conjunction with the Student Health Center. Despite having no budget allotted to them from Baylor University, they still initially managed to acquire supplies through the Health Center and most of the volunteers paid for their own medical equipment and gas with each member spending roughly between 200 and 300 dollars individually each year to cover those expenses (Baylor Lariat, 3-30-1988). “In the Fall of 1982 Baylor EMS had nine EMT’s responding to calls and their services were available for all students, faculty, staff, employees and guests while they are on campus” (Baylor Lariat, 12-1-1982). The volunteers responded to these calls in their own personal vehicles without the use of lights and sirens. Special parking stickers were given to the volunteers to allow them to park as close to the calls as possible (Baylor Lariat, 9-10-1982). In an article published in April of 1982, John Hallford, one of the original founders of Baylor EMS said “the Baylor program is modeled after an expanded EMS service at Kent State University” (Baylor Lariat, 4-27-1982). This means that Baylor EMS did not

spontaneously come into existence; there was obviously extensive research that was involved prior to its creation and inception. This is confirmed by a statement made in one article that says that “Baylor spent a year studying programs at other schools before granting the charter” (Baylor Lariat, 3-30-1994).

The initial system created by Baylor EMS had the volunteers’ on-call being paged by the Health Center through the use of ‘beepers’ to respond to calls. They would respond in their personal vehicles or by running across campus on foot carrying their tackle box full of first aid equipment, and should an ambulance be needed they would call for one (Baylor Lariat, 4-27-1982). However for the non-life-threatening calls that required transport to the Health Center, a Baylor police officer would be called to the scene in order to transport the patient in their squad car to the Health Center (Baylor Lariat, 4-27-1982). This in and of itself created problems; the police department had to take an active duty patrol car and officer out of service in order to transport a sick or injured student to the Health Center from somewhere on campus. That was not a favorable solution or ideal situation for the officer to be placed in, due to the already limited resources of the police department. Thus this was one factor that ultimately led to the purchase of a Baylor EMS transport vehicle, otherwise known as an ambulance.

Baylor EMS volunteers could be identified by their specialized T-shirts, nametags, and specially made EMS Identification cards (Baylor Lariat, 9-10-1982). However, no record exists of what those initial t-shirts and EMS ID cards looked like prior to Baylor EMS getting uniforms. Paramedics were identified via their white uniform and Texas Paramedic patch and EMT’s and dispatchers wore white uniform shirts with their associated patches as well; all members had to purchase their own

uniforms (Townsend, Rosemary, 2011). To request EMS, one simply had to call the Health Center, which was open 24 hours a day at that point in time. A nurse would gather as much information as possible and as needed, and then proceed to dispatch the ‘on-call’ volunteers through their beepers, which were required to be worn at all times while on-call, to the location of the patient or accident (Baylor Lariat, 9-16-1986). Later, after the purchase of some communication equipment such as radios and scanners, a student volunteer would listen to the scanner and would dispatch Baylor EMS when an ambulance was sent to campus as well as when they received a phone call for their services through the Health Center. Students initially responded to these calls with fishing tackle boxes stocked with minimal wound care supplies and were often referred to as “The Band-Aid Kids” since their kits contained such items as bandages, a stethoscope, and sterile water for irrigation (Baylor Lariat, 11-6-1992). The Health Center would not send Baylor EMS to apartments, regardless of their proximity to campus, because “while responding to such a call, the team could miss a need on campus” (Baylor Lariat, 9-16-1986). Later this evolved to the point that when the first two people on-duty received a call, a second set of two were notified and placed on standby to cover the campus should a second need arise while the first two were taking care of the initial call (Baylor Lariat, 11-18-1992).

A significant turn of events in the history of Baylor EMS occurred in the fall semester of 1990. In the fall semester of 1990, Baylor EMS was given a grant from the Cooper Foundation (located in Waco, Texas) for \$71,188 dollars. This money was given to Baylor EMS for the sole purpose of acquiring and equipping an ambulance for their use. This is a true turning point for Baylor EMS and will be discussed in depth later.

Baylor EMS purchased their ambulance from the City of Austin in the middle of October and began training the drivers over the next three months on how to operate and respond with the ambulance (Baylor Lariat, 10-10-1990). The ambulance was approved and certified as a Basic Life Support Service ambulance, or BLS ambulance, on January 8th 1991 and soon afterwards began responding to every call on campus (Baylor Lariat, 2-20-1991). The reasoning behind the ambulance for Baylor EMS is sound for the time period and for its original intents; however, it is with the acquisition of this ambulance that Baylor EMS left the path of being solely a first responder system and began an attempted transition to something more.

Interestingly, Baylor EMS actually played a small part in helping assist with the April 19, 1993, siege attack on the Branch Davidian Complex at Mount Carmel. According to an April 22, 1993, Lariat Article, Baylor EMS actually responded to 911 calls in the local Waco area because all of the other ambulances were dealing with the victims from Mount Carmel. In total, they responded to four 911 calls in the area, and those calls “ranged from motor vehicle accidents to strokes” and surprisingly they also transported patients “from the Hillcrest emergency room to local medical facilities to make space for possible injured coming in from the compound” (Baylor Lariat, 4-22-1993).

The transportation of patients from one hospital to another medical facility is known as "transferring patients" and typically the patients are already in a stable condition to allow for transferring to other medical facilities. However, without knowing much more about the individual 911 calls, or about the transfer patients, it is difficult to extrapolate any further information regarding their severity without more specific details.

It can be said, however, that stroke patients by the very nature of the problem that they are suffering from, require advance life support (ALS) treatment and that involves IVs and certain medications. Trauma patients involved in those motor vehicle incidents, (MVI) easily could have needed Paramedic level training and ALS treatment as well. The patients that Baylor EMS responded to may not have necessarily needed it at the time, but what if they had needed it? Baylor EMS's ambulance was a certified basic life support (BLS) ambulance through the Texas Department of State Health Services (Baylor Lariat, 2-20-1991), but BLS ambulances are not allowed to provide ALS care nor are they allowed to carry the medications that ALS trucks are required to. One could argue that desperate times call for desperate measures, and with such a huge need for ambulances at the compound tragedy, that could fit a description of being desperate. However, what Baylor EMS did that day is exactly what they wanted to continue doing. It is the type of service that the members wanted to continue doing, the type of service that they did in their part-time jobs or that they volunteered to do. It is, however, not the type of service that Baylor University needed.

Some of the other calls that Baylor EMS is known to have responded to, since they were publicized in the Baylor Lariat, include such events as major motor vehicle incidents, motor vehicle versus pedestrians and bicyclists (Baylor Lariat, 10-2-1990), numerous sick person calls, employees injured from a fall (Baylor Lariat, 2-9-1984) and related traumas such as sports related injuries, and even a massive event such as the "carbon monoxide poisoning incident" (Baylor Lariat, 1-24-1992). The "carbon monoxide poisoning incident" should be expanded upon especially since it offers itself to be a prime proponent for the necessity of an EMS system. Thankfully, no one was killed

when the Ferrell Center had a carbon monoxide leak in January of 1992. In total, 17 people were taken to local hospitals because of it. Within two minutes of the report of a gas leak, a Baylor EMS first responder was already on scene, the first of many EMS to arrive (Baylor Lariat, 1-24-1992). Within ten minutes of the initial report, 22 out of the 28 EMT's serving on Baylor EMS were on scene, in uniform with their equipment, and were treating patients and in fact one Baylor EMS responder was on the ambulance with every single patient that went to a hospital that night (Baylor Lariat, 1-24-1992). This story is absolutely incredible because it illustrates beautifully the essential necessity for a first response system to be in place and at the same time it demonstrates how beneficial such a system can be. Without this system in place, victims would have likely gone ten minutes or more before receiving care from an ambulance after the initial call was placed. With Baylor EMS in place, trained professionals arrived within 2 minutes to have people on scene dealing with the situation and within 10 minutes, approximately 80% of the entire Baylor EMS volunteer force was present, in uniform and with their equipment, helping to provide care to this massive incident. Ten minutes is the typical amount of time one can expect to lapse while waiting for an ambulance to arrive. Yet within that same time frame, 80% of the first responders that Baylor EMS had were already providing care. One can only assume that they were triaging, as this would be in line with their training, so the most critical patients received the necessary treatment much more rapidly than if the first response system not have been in place and they had to wait for the first of the ambulances to arrive. One can only speculate on how things could have potentially turned out had Baylor EMS not been in place and had the dedicated volunteers not been able to help out their fellow students. However, there is a strong possibility that

it would not have ended as positively as it did without the help and resources of Baylor EMS. This is especially true when one begins to think about the large number of students that are present on Baylor's campus and how quickly a comparably minor incident could turn into a major one with the involvement of a large number of students and faculty members.

Although the true number of calls that Baylor EMS responded to may never be fully determined, what is currently known is what is officially on record from the Student Health Center, whose call records go back as far as September of 1987 and extend to 1991, with only one month, January 1991, absent from this record (Townsend, Rosemary, 2011). A graph of the known calls logs vs. what month and year that they occurred in and an associated linear trend line can be found in the attached Appendix. After reviewing the files at the Student Health Center, it is believed that during 44 months of existing records, Baylor EMS ran 864 calls. That averaged out to approximately 19.6 calls per month (Townsend, Rosemary, 2011). The range of the number of calls was 66 during its peak month and 5 for its lowest month, with peak months typically being associated with intramurals and other sporting events. One month, June of 1989, was shown as having 27 calls and a noted 42 patients in total (Townsend, Rosemary, 2011). There is an obvious pattern present in the data, displayed by the linear trend line, showing that the number of calls received by Baylor EMS each month slowly but surely increased over the years.

Even though the health center has official records on file, a few discrepancies have been found with what the health center has record of and in what the Baylor Lariat have reported. One article says that "From Aug. 11 through Oct. 1 [1990], EMS received 51 calls, 15 of which required ambulance service" (Baylor Lariat, 10-10-1990) however

the records on file with the Health Center show that August and September alone for that year had 74 calls recorded (Townsend, Rosemary, 2011) . That's a 20 call difference and could potentially be caused by inaccurate information given to the Lariat reporter or because a report may not have filed. We see another disparity in a 1988 article where one EMS member is quoted as saying "This year, just for the month of September, the service received over 50 calls" (Baylor Lariat, 10-11-1988). However records from the Health Center for that month only record 23 calls (Townsend, Rosemary, 2011). That discrepancy could actually come from the way in which the Health Center recorded calls. It is unclear as to what exactly is factored into the number of calls that is recorded, since it could be the number of calls that resulted in patients being brought to the Health Center or it could be in-fact the number of times Baylor EMS was dispatched. However, if that was the case then the number recorded by the Health Center should be higher than expected due to the likelihood and probability of Baylor EMS being disregarded multiple times in a given month while responding to a call.

Under the presumption that the total number of calls will not truly be one hundred percent accurate, we can better use the records provided by the Lariat to give some sense of clarity to the years not found within the Health Center records. The last month on record from the Health Center was May of 1991. That leaves approximately 3 years of data unaccounted for during a period that was well known to be the busiest time Baylor EMS had ever experienced. A 1994 Baylor Lariat article stated that: "In 1992-1993, the Baylor Emergency Medical Service responded to 437 calls, an increase of 54 percent from the previous year." (Baylor Lariat, 1-19-1994) That can thus be extrapolated to mean that in the year of 1991-1992 Baylor EMS responded to approximately 284 calls.

Again, some discrepancy can be found among the different articles, even those posted within two months of each other. A March article printed in 1994 states that “In 1993, the organization responded to 477 calls plus 103 special-events calls” (Baylor Lariat, 3-30-1994) which conflicts with the data presented in the previous article. Nonetheless the consistency of being over 400 calls in one year pays tribute to the fact that Baylor EMS was indeed receiving at least one call per day for its services. That average of one call a day increases more so towards two or three calls a day when you factor in the summer and winter breaks into that time frame since there is a lack of students on campus and thus less calls are likely to take place during those time periods. It is reasonable to conclude from that data is that there was truly a need for their services and their steady increase in call volume, regardless of the individual calls significance, is proof of that.

According to Rosemary Townsend, who used to be the Health Center Administrative Coordinator and was heavily involved with Baylor EMS and the students involved, Baylor EMS never once had a single claim filed against them and the geographical confines of their call area was specifically the entire campus. The Health Center was previously located in the building that is now currently housing the ROTC. It is here that Baylor EMS was stationed and it is here where they not only did their own dispatching but where they received their supplies from as well (Townsend, Rosemary, 2011). The Health Center use to be a 24 hour service and also use to have in-patient beds for overnight stays and monitoring, and according to Townsend, the Health Center also paid the bill for not only the Ambulance Insurance but the Liability insurance for the volunteers as well. The Health Center unfortunately started cutting back its hours of operations in 1993, which presented a problem for Baylor EMS and their dispatchers

since they no longer had 24 hour access to a building (Townsend, Rosemary, 2011). Baylor EMS had two rooms allotted to them in the Old Health Center, one was a dispatch and call taking station and the other was a bedroom with a restroom and shower in between the two rooms (Townsend, Rosemary, 2011). Essentially they had everything that they needed to run their operations. The Medical Director of the Health Center also was the Medical Director over Baylor EMS's standing protocols and would be on-call with their own alpha numeric pager as well. Later, near the end of Baylor EMS's time, there was a Paramedic on duty at all times in addition to a dispatcher and two EMT's (Townsend, Rosemary, 2011). On average, Townsend said that there would be 3-4 calls per night during intramurals and 1-2 calls during the day. Baylor EMS also staffed additional people at on-campus events, providing first aid and care at a tent or table, as a preventative and even as a proactive measure. Throughout the years Baylor EMS also hosted numerous 'mock' events on campus to educate students on different types of dangers and to demonstrate their own skills, while taking the opportunity to work in conjunction with the various ambulance services over the years and with the Waco Fire department (Baylor Lariat, 9-28-1990).

Sometime between the spring and fall semester of 1994, Baylor administrators and the legal department of Baylor University no longer felt comfortable with the services being provided by Baylor EMS. "Baylor administrators said they felt that providing services for anyone besides students and faculty members created too much of a liability for the university" and they even "tried to get a waiver from the Texas Health Department stating Baylor EMS volunteers did not have an obligation to give their service to any visitors." However that waiver was never approved, and "the problem of

liability still existed” (Baylor Lariat, 10-13-1994). “[Baylor] EMS members said they felt they had a moral obligation to help anyone [on-campus] and did not agree with the administration's way of thinking,” and it was this disagreement that ultimately led to the voluntary disbandment of Baylor EMS on August 12, 1994, after more than a decade of dedicated service (Baylor Lariat, 9-8-1994). A few articles state that one of the primary reasons for discontinuing service was the students had issues with ‘time constraints’. However this is unlikely considering it had never been a problem mentioned or brought up before this disbanding. It is even harder to believe when one considers that Baylor EMS started out with only 4 students and still managed to provide adequate coverage for the campus. When Baylor EMS disbanded it had over 100 actively participating members (Baylor Lariat, 9-8-1994). So just like that and within a blink of an eye, Baylor EMS existed no longer, primarily because Baylor University was concerned over the potential liability of their services.

The idea that Baylor University took steps to attempt to make Baylor EMS only treat students is an unsettling notion. When people call 911, they are not asked if they are a student or not, so the whole idea of having Baylor EMS solely treat students is one that voids the principle of the formation of the first response system in the first place. They are there to provide emergency care to people on campus. Not just to students, but people in general, whoever that may be. The President of Baylor University at the time of the disbandment, Herbert H. Reynolds, said, “We are not talking about the liability that stems from helping our own students and faculty....If you are licensed to make a full response, then you must treat the people in the whole geographic area, and we would have to respond if there was an accident down on LaSalle, or if someone has a problem in their

home," he said. Reynolds said the university becomes liable for anything that might occur in terms of malpractice. He said the board of regents and the administration are concerned about this (Baylor Lariat, 10-26-1994). This in fact is not entirely true. Yes, there is liability for malpractice, but that is what insurance is for, and furthermore Baylor EMS did have liability insurance coverage that was paid for by the student health center (Townsend, Rosemary, 2011). Where President Reynolds was not entirely correct, with all due respect, is that the geographic area for response is defined by the responding system. If Baylor EMS chooses for their sole response area to be the direct confines of Baylor University, then they would only respond to those calls. Thus if the response area is specifically marked and known by the dispatching agency then the first responders would only be dispatched to calls within that area and they would not be dispatched to calls outside of that response area. They explicitly said previously that they would not respond to houses or apartments near campus, because "while responding to such a call, the team could miss a need on campus" (Baylor Lariat, 9-16-1986). One cannot control who is present on the confines and property of Baylor University either, especially when it is open for prospective students and their family as well as the families of faculty and current students. A former Baylor EMS member illustrates this through a fictional scenario, where "If your dad happened to have a heart attack, [all Baylor EMS can say and do is] 'I'm sorry I can't help, but let me call the [local ambulance service]. It will only take 10 minutes — try not to die'" (Baylor Lariat, 10-13-1994). The idea is completely ridiculous and one that never would have worked, even if Baylor had received approval from the state.

What President Reynolds, and the board of regents as well as the administrators, were probably most concerned about was Baylor EMS evolving into a fully capable advance life support ambulance service that responded outside of Baylor's campus and that truly would be something of concern. If left unchecked, it is highly probable that the evolution into an ALS ambulance service may have occurred given enough time. Baylor EMS evolved way past their original intentions with the acquisition of the ambulance and the subsequent transportations. The true test and proof that this is correct is found only when one theorizes about what would have happened if Baylor EMS has acquired an SUV or other vehicle as opposed to an ambulance. If you eliminate the ambulance from the equation, and replace it with an SUV or truck, you thus remove Baylor EMS from being able to transport patients directly to the hospital emergency room and you eliminate the misconception of them wanting to be an ambulance service and responding to 911 calls throughout the city of Waco. What you are then left with is a team of highly trained volunteers, with a first response vehicle, first responding to calls and injuries that occur on campus who could take sick students to the Health Center and nowhere else (without explicit approval from the medical directors) while still remaining on campus. When you factor that out, and remove the ambulance, you have a team that in all likelihood would still be around today. They might be bigger in the number of members and could possibly have more than one vehicle in their inventory, but they would still be most probably still be around and would have over thirty years of experience today. But unfortunately, as it stands, they didn't acquire an SUV or truck, but instead acquired a \$70,000 ambulance in 1990 (Baylor Lariat, 10-10-1990) which makes that year the critical and pivotal point in Baylor EMS's history.

As stated previously, Baylor EMS's acquisition of the ambulance is in fact a major turning point in their history, and ultimately, this action led to their demise and disbandment. However, it is not *per se* the actual ambulance that led to this downfall but the semesters leading up to it and the ideas that flourished in those semesters. The actual ambulance itself is merely a physical representation of the true cause of Baylor EMS's termination. The semesters where the Baylor EMS members were seeking a grant for an ambulance, where they were writing that grant, and thus the semester that they received approval for the grant are what truly solidified the cause for their demise. It's not the ambulance that led Baylor EMS astray, but what the ambulance stands for and what it represents. An ambulance, which is something that many of the volunteers had worked in previously, is iconic for responding to 911 calls all over town. Its basic principle is to provide the best and most advanced pre-hospital care available when transporting and providing first-aid to its patients. All ambulances, by sheer appearance alone, are thought to be Mobile Intensive Care Units, or MICU's, and are thought to provide ALS services. What truly led to the downfall of Baylor EMS was the idea that they needed an ambulance to respond to the on-campus calls because it is this idea that led them to want to be more than what they were originally founded and created for. In short, they were created to be a First Response Program and not an ALS emergency transportation program. Ultimately, Baylor University did not need an in-house ambulance program. What Baylor needed at that time was what it already had, a first response team that provided essential emergency medical care prior to, and while waiting for, an ambulance to arrive. In the fall of 1982, after Baylor EMS had been in service for one semester, Keith M. Hankins, the then administrative director of Baylor Health and Counseling

Center and the Baylor E.M.S. coordinator was quoted as saying "The philosophy is the same.... We will keep it a first-responder unit on campus without an ambulance which we do not need" (Baylor Lariat, 9-10-1982). This goes back to the principle that the original design and intent for Baylor EMS was not to replace the ambulance service in Waco or to act in the manner of an ALS service, but rather to solely be a First-Responder unit that remains on campus and does not use nor have a need for an ambulance. So with the acquisition of their ambulance, Baylor EMS's fate was sealed and the events that occurred post acquisition are what ultimately led to their demise.

One could also theorize that Baylor EMS possibly wanted to expand and compete with the rival EMS program at Texas A&M, simply known as Texas A&M EMS. At the time Baylor EMS and A&M EMS were the only two collegiate EMS systems in the State of Texas (Baylor Lariat, 10-11-1988), and as the previously referenced article shows, Baylor EMS compared themselves to that EMS system. The key differences between Baylor and A&M is that A&M is a complete 911 ambulance service and, even back during the 80's and early 90's, A&M was responding to 911 calls off campus and had 3 ALS ambulances as opposed to Baylor EMS who at that time did not have an ambulance. So, in theory, there could be a sense of rivalry between the two EMS's and that rivalry could have played a part in some of the members feelings and desires to push for an ambulance and thus to push for being more than a first response system. However, it is more likely that this was not a primary cause but a secondary concern that led Baylor EMS to desire to be more than what they currently were.

So it is likely this desire of wanting to deviate from this mission of being first responders that is truly what inevitably caused Baylor EMS to disband. Is the desire to be

more and to do more for your fellow students a bad thing? No, not at all, and in fact, wanting to help your fellow students is a premise for Baylor EMS's original existence. It is, however, a significant liability that Baylor University was clearly not comfortable with at that time. It was not having the ambulance that drove Baylor EMS to disband but rather it was the lawyers and the legalities that rang the final toll on their services.

In a November 1992 article of the Baylor Lariat, we see what appears to be the start of an additional problem that Baylor EMS faced. That problem was the communication between their group and the Baylor administrators, or in some cases, the lack thereof. The primary purpose of the article was to state that Baylor EMS was awaiting approval to be able to directly transport injured students from a campus accident or scene, outside of the Health Center, straight to a Hospital emergency room (Baylor Lariat, 11-18-1992). At the time, they were only allowed to transfer patients from the Health Center to the Hospital. This undoubtedly arose from responding to sports related injuries, or other various types of injuries, requiring x-rays or further medical treatment that was not offered at the Health Center at that time. These patients who needed transportation to the emergency room and were left with only two options outside of Baylor EMS transporting them; they could either have a 911 ambulance summoned to transport them or they would have to have a friend drive them in their personal vehicle. These two options present problems and challenges that had to be faced. Calling for an ambulance meant taking a 911 ambulance out of service for a non-emergent transportation and that the students would be billed for the ride to the hospital. This thus ultimately meant that the ambulance would not be available for any possible emergencies that might arise as well elsewhere. On the other hand, having someone else drive the

injured patient meant that the patient was no longer with medically trained personnel and it is possible that a car might not be readily available to them to use. Being a licensed basic life support ambulance, Baylor EMS could by law transport and transfer BLS patients to hospitals, but during this time period they were only allowed to transfer patients (from the Health Center to a Hospital) whereas transporting means to take them straight to a hospital from the scene where the emergency occurred (Baylor Lariat, 11-18-1992).

The decision on Baylor EMS being able to transport was a university decision and was left up to the University Health Committee who supposedly gave a partial approval on 10-29-1992. However, they did not grant a full approval due to lack of liability insurance (Baylor Lariat, 11-18-1992). The article goes on to show the difference between what the university wanted and what the members of Baylor EMS actually desired. We see in this article how the Baylor administrators solely wanted Baylor EMS to remain a first response system. When you start transporting patients straight from the scene of the emergency you are no longer acting in a first responder way. By transporting patients, they would be simply responding to emergencies as an independent ambulance service because there would be no point in sending two ambulances (one from Baylor EMS and the other from the local ambulance service). Additionally, a few of the administrators were not comfortable in the steps they were taking to basically becoming a fully-fledged ambulance service. We even see a lack of communication between the administration and Baylor EMS members when one member is quoted as saying he submitted a proposal for a radio antenna to an administrator and that same administrator is quoted as saying that he doesn't know who he "submitted a proposal to, but he hasn't

submitted it to me, or it hasn't been forwarded to me. I don't know anything about the proposal of an antenna" (Baylor Lariat, 11-18-1992). This lack of communication and cooperation between Baylor EMS and the administrators of Baylor University did not bode well for the fate of Baylor EMS. Eventually it was this confusion and disagreement on the programs direction that inescapably led to Baylor not being comfortable with Baylor EMS's service at all.

The disbanding of Baylor EMS came rather rapidly. In retrospect, it became very apparent, retrospectively of course, that early in 1994, Baylor University itself was no longer comfortable with the direction that Baylor EMS was headed in. Baylor EMS wanted the ability to transport patients from the scene or location of the call directly to the Hospital emergency room; whether that was emergency traffic (with Lights and Sirens on, a clear sign of an urgent patient) or non-emergency traffic, the members of Baylor EMS wanted the freedom and the option to basically become an ambulance service independent of the ambulance company that was currently serving Waco. It is understandable as to why they wanted to be independent of the Waco service, but as the years progressed it became clear that it was not needed or necessary. During the 12 years of Baylor EMS, they saw Waco change their EMS service providers at least 3 times from Daniel EMS to West EMS to the American Medical Transport (AMT) which was active at the time that they disbanded. Currently East Texas Medical Center, or ETMC, provides 911 ambulance services to the Waco area. There was an underlying instability of the region back during the 80's, especially since Waco was much smaller during this time frame as well, and this instability is evident in the shear fact that within ten years, the EMS provider in Waco changed three times. It is this same instability that played a part

in the formation of Baylor EMS to begin with. The plain and simple fact that one never knew how long it would take for an ambulance to arrive is a scary thought and one that requires corrective action to fix.

Baylor EMS was at one point quoted at having accumulated well over 36,700 service hours in the course of the previous year prior to its breaking up, and that number does not even include the myriad of other special events that Baylor EMS would staff such as Diadeloso and Homecoming (9-8-1994). They were also quoted in 1988 as providing at least \$156,300 dollars' worth of free emergency health care to Baylor University, and that was determined to be the amount it would cost if Baylor EMS was a paid EMS service and charged for their services (Baylor Lariat, 10-11-1988). One could only imagine how much that would cost today. That kind of dedicated service provided to Baylor free of charge is something well worth the cost of any liability that may have been even associated with providing responsible care to the people on their campus and its worth even more when one reconsiders the fact that in their 12 years of service, and having dealt with thousands of patients, they never had one single claim filed against them.

CHAPTER TWO

Literature Review for First Responder and EMS Literature

There are very limited research data related to collegiate EMS systems as well as to first response systems (FRS) in general. Most of the research pertaining to EMS systems is in regard to out of hospital cardiac arrests, such as the article entitled “Dual dispatch early defibrillation in out-of-hospital cardiac arrest: the SALSA pilot” (Hollenberg, 2009), and to early defibrillation often associated with such out of hospital cardiac arrests. Of the research currently available, very little has been written about or researched regarding collegiate based EMS systems. That being said, what little information can be found only highlights the benefits and necessities of such established systems and even calls for the creation of more institutions of the same nature (Fisher, 2006). The articles that were located for discussion were found using the search engine Pub Med (www.pubmed.gov) using such key terms in the search engine as “EMS First Responder” and “EMS First Response, College”.

There is a very valid reason as to why the limited amount of research available for first response systems is primarily directed at cardiac arrests and various associated treatments. Cardiac arrest is the epitome of a medical emergency where time is of the utmost importance. Brain cell death can start to occur after four minutes from the cessation of blood flow and irreversible damage can occur after seven minutes (Cardiopulmonary resuscitation, 2011). A first response system, however, is not solely in place for response to cardiac arrests. However, that is one of the most crucial calls that they respond to. First response systems are in place to respond rapidly to any medical

emergency within the designated response area. The benefits of a first response system are seen more evidently in such an event where time is the critical element and a cardiac arrest is an example of that type of event.

In the article, *Collegiate-Based Emergency Medical Services (EMS): A Survey of EMS Systems on College Campuses*, Fisher defines collegiate based emergency medical services as “emergency medical services in a university or college campus setting” and describes them as a “unique model for the delivery of pre-hospital care” (Fisher, 2006). Although his article is survey based, it details a nationwide examination using a large sample size of 145 collegiate systems. This allows for a much clearer idea of exactly what other campuses are doing based on their individual needs. This ends up showing that there truly is no ‘one size fits all’ model for collegiate EMS systems. Each campus establishes a first response system based off of its individual needs and capabilities. Due to the study being conducted relatively recently, and how diverse the information contained within it is, it is very insightful to review this particular article in depth since it reveals a wide range of information over a large number of different collegiate EMS systems.

Fisher breaks down the national study into different categories. Additionally, in those categories he breaks them down even further into sub categories for more specific evaluation. The main categories include demographics, population served, staffing, the type of response, the budget and funding, medical direction and organizational direction. In the category of demographics it is divided into subcategories such as geographic region, type of college (public or private), location, and student body size (Fisher, 2006). The findings were that 60% of the schools with EMS systems were in the Northeastern

United States and that 53% of the total EMS systems were at private schools (Fisher, 2006). The data also showed that 49% of the systems served between 1,000 and 9,999 students and 48% served more than 10,000 students on their campus (Fisher, 2006).

The study investigators also report the response capacities which include the level of care at which the EMS systems are staffed at, the response level, if they have vehicles, if they possess automated external defibrillators (AED's), and if they perform early defibrillation. (Fisher, 2006) The survey showed that 66% of the systems provided basic life support as the minimum staffing level. It also showed that 38% percent of the services used a quick response vehicle, 12% of responses were non-emergency, and 32% used an ambulance (Fisher, 2006). The study is rather unclear as to what exactly responding with a quick response vehicle means. Does it mean it's a vehicle that uses lights and sirens in its response or does it mean it does not? It is feasible that someone could respond in a 'quick response vehicle' without lights and sirens but would still be traveling urgently. It is most probable that the phrasing 'quick response vehicle' is meant for a vehicle other than an ambulance that responds with lights and sirens to the scene of a call. However, it is unclear if the lights and sirens part are actually utilized.

Sixty-eight percent of the collegiate EMS systems have some form of response vehicle and 70% of them have AED's in their arsenal of available equipment (Fisher, 2006). The coverage of the collegiate based EMS systems was further broken down into three categories: coverage area, population served, and the coverage hours. Out of the 145 nationwide services, 113 of them, or 78%, provided service solely within the confines of the campus and 18% provided service not only on campus but off campus as well (Fisher, 2006). 48% of the collegiate EMS systems provided emergency services

and coverage 24 hours a day, 7 days a week, all year round and 15% provided the same 24 hours a day service, 7 days a week, only during the school year (Fisher, 2006).

35% of the campuses systems were governed by the campus's public safety department, 29% by the student health center, and 14% were directed and run by the student body government of the campus, with an additional 12% found to be listed under the category of "other" (Fisher, 2006). This leaves room to speculate that the "other" systems may be self-governing since that was not a direct option or choice.

Funding for the systems was looked at next and unfortunately, in this survey, 50% of the systems funding was unknown. However, 40% of the remaining systems were found to be directly funded through the University or through money allocated by the student government. Seventy-three percent of the collegiate EMS systems were found to be staffed entirely by volunteers, 17% were found to be fully paid, and 9% were a mixture of paid and volunteer staffing (Fisher, 2006). Logistically, 60% of the systems were dispatched to calls via the campus security / public safety department, 12% were dispatched by the municipal 911 system, and 1% was dispatched by both (Fisher, 2006). As to the average response times for these collegiate EMS systems, 48% were found to have an average of less than 2 minutes, and 43% had an average between 3 and 4 minutes. This equates to a total of 91% of the EMS systems responding in less than 5 minutes. Ultimately, this is a very critical time frame for responders to arrive in because as Hoyer (Hoyer, 2009) describes in his article, five minutes is the key time frame for early defibrillation.

Fisher's study (Fisher, 2006) illustrates that although numerous collegiate EMS systems are similar, there is flexibility not only in their establishment, but also in how

they operate, and to what level they operate. In short, there is no-one-size-fits-all model for collegiate EMS systems, and that is what makes them so very unique and so highly versatile and adaptable. Collegiate campuses have the ability to make a program and to shape it to specifically meet their individual demands, needs, and wants. Collegiate EMS systems are also unique in the fact that those which are responding in the limited area that is confined to the campus (or in some cases the area directly off of campus) are intimately knowledgeable in that area and know the best, safest, and quickest ways to respond. Those responding are already in a position to respond quickly and efficiently to whatever medical emergency may occur.

Another earlier article that is commonly referenced was written by King and is titled “A Survey of Emergency Medical Services Systems on College and University Campuses” (King, 1996). It too sought to analyze collegiate based EMS systems throughout the United States and Canada. The investigators sent questionnaires to all 1503 four-year colleges and universities throughout the US and Canada. They had approximately 919 schools that replied for a 61% response rate. Out of those responses, 234 had an EMS system in place. Eighty-three percent of those systems solely responded to calls on campus (King, 1996). The survey goes into more detailed statistics pertaining to the different systems. However, due to the date and time frame of the article itself, the question of how reliable such information truly is in today’s day and age can be asked. This information is also limited in its application especially since the purpose of King’s study was not to determine the purpose of those EMS systems but to determine the extent of collegiate EMS systems found within the United States and Canada. A discrepancy that is also noted by Fisher (Fisher, 2006), is that King found more than 230 EMS

systems within the US and Canada, however Fisher only found 145. Both articles determined that the number of systems show a positive trend and were on the rise, and new systems were being formed or created each year. There is no known reason for this discrepancy at this time, because it is extremely unlikely that over one hundred collegiate EMS systems were shut down or became in-active within ten years without more being formed in their place in other schools or campuses.

As mentioned earlier, there are various articles in which first responding EMS systems are looked at from the stand point of the treatment of out of hospital cardiac arrest. An article written by Hollenberg (Hollenberg, 2009), explored the effects of a dual dispatch system in which the fire department, equipped with AED's, was dispatched simultaneously with the responding EMS providers. The findings for this study revealed that the addition of the fire department as a first responder decreased the time it took for someone to arrive on scene and it also decreased the time from when 911 was called to when the first defibrillation of the patient occurred (Hollenberg, 2009). Hollenberg also found that survival rates increased, albeit only a few percent in some cases whereas other situations found survivability increased to nearly 25% with the addition of the dual response program (Hollenberg, 2009). The interesting thing is that Hollenberg (Hollenberg, 2009) identifies that there was often a delay of 2 minutes between the time EMS was dispatched to the time the fire department was dispatched to the cardiac arrest, and yet the first responder times from the fire department were still an improvement on the EMS arrival times (Hollenberg, 2009). This illustrates how effective first responders can be in arriving to a medical emergency since despite having a delay in dispatch time, the first responders still remained effective in their response to such emergencies.

One associated article, although not directly examining collegiate EMS, is related to emergency planning in the school environment. The article is entitled “Response to Cardiac Arrest and Selected Life-Threatening Medical Emergencies: The Medical Emergency Response Plan for Schools” by Hazinski (Hazinski, 2004). This study details and shows the need for an emergency action plan to be in place at schools where first responders in the school would respond to medical emergencies that take place on the campus. It describes how in addition to the nurse and possibly athletic trainers, other teachers or coaches should be trained in first aid/CPR and should have a way of being notified when an emergency occurs on campus so that they too can actively respond and assist as needed (Hazinski, 2004). Hazinski claims that at any given moment, up to 20% of the combined adult and student population of a community can be found in schools, and that although life-threatening emergencies are uncommon, when they do occur, they require a planned and efficient response to provide first aid and CPR as needed. The biggest obstacle for the schools would be the communication aspect of notifying those first responders. However, the article offered the ideas of cell phones, a public announcement system, and radios as possible solutions to this obstacle (Hazinski, 2004). The study also reported on the issues of cost for such a program and found that the largest potential expenditure would be solved simply because the first responders already receive a salary for working at the school and the additional responsibilities could be written into the job description itself. Hazinski (Hazinski, 2004) estimated that it would cost approximately \$3,000 per year per school in order to pay for continued training, equipment, and other associated costs in order to establish a first responder system in those schools, with the initial startup cost at approximately \$8,000 dollars (Hazinski,

2004). This article was approved and endorsed by numerous organizations such as the American Heart Association, National Association of Emergency Medical Technicians, National Association of EMS Physicians, and numerous others (Hazinski, 2004). This begs the question: if those well respected organizations endorse such an idea as to have a basic medical first response system within a high school setting, why shouldn't a college have one? A college or university has far more students contained within its campus, and even faces the challenges of a larger number of staff and of daily visitors. So the question really isn't why a college should have one, but rather it is a question of why doesn't every college already have one? If high schools see a need for a basic first response system, then it could be strongly argued that colleges should most assuredly have a need for one as well.

In another article, Firefighters as basic life support responders: A study of successful implementation, Hoyer studied the effects of basic life support responders (BLS) "in the treatment of OHCA [Out of Hospital Cardiac Arrest] by using existing resources" in an area with approximately 80,000 people. The BLS responders were found to arrive before the EMS ambulance in three out of four times (Hoyer, 2009). Eight patients were defibrillated and seven survived to hospital discharge during the study period of 28 months" (Hoyer, 2009). The purpose of the study was to implement a first response system, where responders were equipped with automated external defibrillators (AEDs) in an area that already had short emergency medical response times in the hopes of improving those times. The goal was also to have shock delivery within 5 minutes of the EMS call being placed for cardiac arrests. This time frame meets the definition of early defibrillation. The results of the study found that in 1037 cases, the average

response time was 3.5 minutes for the first responders, with a 25th and 75th percentile of that range being 2.8 and 4.3 minutes respectively which is well under their goal of a shock delivery time of five minutes (Hoyer, 2009).

Out of those 1037 cases responded to by the BLS first responders, who were trained fire fighters that responded in a separate response vehicle, they arrived on scene before EMS 73.3% of the time. Cardiac Arrest occurred in 53 cases and an AED was attached by the first responders for 29 of those cases. Unfortunately only 9 shockable rhythms were detected out of those 29 cases and eight of them were defibrillated using the First Responder's AED (Hoyer, 2009). Seven of those had restoration of spontaneous circulation on scene, with the eighth regaining circulation at the hospital (Hoyer, 2009). Restoration of spontaneous circulation is the medical terminology used when a person who had previous been in cardiac arrest, with either a lack of a regular pulse or a completely absent pulse, regains a pulse through either spontaneous means or through medication and defibrillation. Six out of the 7 who had restoration of spontaneous circulation on scene survived for more than 30 days. The reason for only a 55% attachment rate of the first responder AED was discussed by Hoyer as being due to the ambulance arriving very shortly after the first responders did and before they had a chance to apply their electrode pads (Hoyer, 2009). One can only speculate that for the cases where the ambulance arrived very shortly after the first responders, and the first responders did not have time to attach their own AED, the first responders assumed a primarily supportive role. A primarily supportive role would potentially include such things as providing basic life support through manual CPR while the ambulance crew started on more advanced life support techniques such as through the use of medications

and manual defibrillation. Such secondary purpose of providing support to the ambulance crew is just as valuable to the care of the patient as quick response time. This is especially true in cardiac arrest situations where the more able bodies that are present who are trained in CPR, the better the likelihood of a good outcome is for those patients.

This study showed that it is possible to successfully implement a basic life support first response system within an urban area that results in the first responders arriving before the ambulance on average 3 times out of every 4 (Hoyer, 2009). The area of coverage was everything within a 3 kilometer radius of the fire station at which the first responders were stationed (Hoyer, 2009). The 3 kilometer radius was used to keep the area small so as to better maintain faster response times (Hoyer, 2009). Overall this study is very beneficial to the implementation of first responders within an urban setting because, not only does it show that it is extremely possible to do so, it also shows that there is a definitive improvement in response time which can equate to improved patient care under the right circumstances. Although the number of cardiac arrests in this study was on the low end for their purposes, and the fact that six of the seven regained spontaneous circulation on scene and survived for more than 30 days does illustrate its benefits (Hoyer, 2009). That being said, cardiac arrests are not the only medical emergencies that first responders respond to, and within the twenty-eight month time period of the study, those first responders' responded to over one thousand emergency calls which makes them an invaluable asset in any setting.

In conclusion, there is limited peer-reviewed research available pertaining directly to collegiate EMS systems and to first response systems. That being said, what is available highlights the benefits of such systems and the resulting improved patient care

in cardiac arrests as well as improved response times for medical emergencies in general. Such systems are valuable assets to have in place for medical emergencies of all kinds, but most importantly for cardiac arrests where time is of the most critical factor.

CHAPTER THREE

Collegiate EMS Systems in Texas

There are currently only two fully established collegiate based EMS systems operating within the state of Texas. Those two systems are located at Rice University and Texas A&M University. Although each model is different from the other, they share certain aspects. These two collegiate EMS systems show how the needs and demands of a university dictates how the program operates. It should be noted that despite numerous attempts to contact the aforementioned fully established EMS systems in Texas, via email and phone calls place to their administrators, neither one responded back. All information contained within this chapter regarding the two systems is what was publicly available through their websites.

Texas A&M University

Texas A&M University is located in College Station, Texas and currently has three different organizations that provide emergency medical services on campus. The three different organizations are Texas A&M EMS, Texas A&M University Emergency Care Team, and the Rec Sports Medics. All three work closely together ("A&M public resources," 2011). Texas A&M Emergency Care Team, often referred to as TAMECT, was established in 1976 as a student run organization and provides first aid "at most major University events including football games, various athletic events, corps FTXs, March to the Brazos, Greek events, and many others" ("History of tamect," 2011). They also provide a large number of training opportunities for their members which includes

training for First Aid, CPR, Mass Casualty management, and EMT classes ("History of tamect," 2011). In 1980, TAMECT purchased its first ambulance and shortly thereafter split into two separate and distinct organizations so that TAMECT could keep its student organization status ("History of tamect," 2011). It was then that Texas A&M University EMS was created, or TAMU EMS for short. Both organizations operate out of the campus health center; however TAMU EMS is run by the Student Health Services while TAMECT is run by the students because it is a student organization ("History of tamect," 2011). Currently TAMECT does not own any response vehicles; however, the vehicles they use at events are John Deere Gator's which are equipped to handle patients on backboards, and are loaned to the organization by the Student Health Services and/or the Athletic Department ("Tamect equipment," 2011). TAMECT has an organizational structure that is very similar to most student organizations, with the typical president and vice president positions, secretaries, treasurer, and then various other coordinators that are held responsible for various aspects of the organizational structure ("Tamect operations," 2011).

TAMU EMS, as previously stated, has been in operation since 1980 and is currently staffed by students. TAMU EMS "is a campus-based emergency medical service agency that responds to medical and traumatic emergencies on the Texas A&M campus. [Texas A&M] University EMS offers its services to all students, faculty, and patrons on the Texas A&M campus" ("Texas a&m ems," 2011). TAMU EMS "operates 24 hours a day continuously throughout the year" and is "staffed at the mobile intensive care unit (MICU) level" which means that there is at least one paramedic on each ambulance in operation ("Texas a&m ems," 2011). TAMU EMS also provides its own

dispatching for its EMS service ("Texas a&m ems," 2011). Texas A&M University EMS "answers 900-1000 calls for emergency assistance each year with service continually growing with the university" ("Texas a&m ems," 2011). According to the National Collegiate Emergency Medical Services Foundation, TAMU EMS has 3 ambulances, receives approximately six hundred thousand dollars (\$600,000) in an annual budget, and has an average response time of 3 minutes ("Ncemsf tamu ems," 2011). TAMU EMS provides their services to over 5,500 acres of campus (where one fifth of the student population lives) or approximately eleven thousand students ("Ncemsf tamu ems," 2011). The Command structure for the TAMU EMS system has one student acting as the EMS Chief, which would be the highest position in the system, and then there is an assistant chief working under them, who then has numerous other positions assigned under them that are guarded with the responsibilities of the organization ("Tamu ems command," 2011).

According to Texas A&M official reports, the university currently has a little less than 50,000 students with approximately 2,000 faculty members ("Student enrollment summary," 2012). The Campus' 5,500 acres is approximately 8.6 square miles; dividing the number of students and faculty by the number of square miles equates to a Texas A&M population density of approximately 6,000 per square mile. That figure is about half of the population density of Baylor University, which is approximately 11,741 and this will be further elaborated on in the next chapter. Using the average of 1000 EMS calls per year as stated previously, Texas A&M EMS would thus respond to approximately 116 calls per square mile of campus. If this were to be extrapolated as potentially equivalent for the number that could be expect on a campus such as Baylor's,

it would equate to approximately 350 EMS calls per year to occur on campus when the difference in population density is factored in as well.

The third and final division of EMS care at Texas A&M is the Rec Sport Medics. The Rec Sports Medics, as their name implies, are responsible for providing first aid primarily for "the Student Rec Center, Penberthy Intramural Fields, Reed Arena, Read Building, Intermural Tennis Courts, and the University Polo Fields" ("A&m public resources," 2011). The Rec Sports Medics do not normally operate 24 hours a day continuously but instead operate from 5:45 a.m. until midnight daily and will only operate 24 hours continuously for special events ("Ncemsf rec medics," 2011). The Rec Sports Medics primary mode of transportation is, once again, John Deer Gators that have been specially equipped to handle patients on backboards, and they receive roughly eighty thousand dollars (\$80,000) annually in funding from the Department of Recreational Sports ("Ncemsf rec medics," 2011).

Rice University

The other established First Response EMS system in the State of Texas can be found in operation at Rice University in Houston, Texas. Rice EMS was founded in 1995 and began emergency response operations in the fall of 1996 ("Rice ems history," 2011). The first response program was initially "a difficult concept to sell to the University, which lies across the street from the largest medical center in the world. However after the university examined the average response times of the municipal EMS service, which was around 9-10 minutes, the University was convinced that in a serious emergency this delay could be life threatening. REMS, in addition to its daily responses, participates in

many university special events which includes varsity athletic events such as football and basketball, as well as intramural events such as rugby, and university special events such as matriculation, commencement, and the annual Beer Bike event ("Rice ems history," 2011). REMS also works in conjunction with the Rice Police Department, the Houston Police Department, the FBI, the US Secret Service, and the US Department of State to provide medical operations support for visiting dignitaries ("Rice ems history," 2011). Annually the Rice EMS program is allocated one hundred thousand dollars (\$100,000) in funding to pay for the full time EMS Director, stipends for student supervisors, and for training programs that receive college credit within the university ("Rice ems history," 2011). Recently an additional \$85,000 dollars was allocated for the purchase of what they refer to as an in-charge truck, a heart monitor, and a new golf cart for on duty crews to use ("Rice ems history," 2011).

Rice EMS is "certified as an Advanced Life Support (ALS) service" which means that they "are authorized to provide a wide spectrum of emergency care, including non-invasive procedures (such as oxygen therapy, bleeding control, automated defibrillation, and assistance with basic medications) to advanced procedures (such as advanced airway management, IV therapy, IO therapy, and advanced medication administration)" ("Rems our services," 2011). All of these procedures are governed by a set of protocols and standing orders approved by their medical director ("Rems our services," 2011).

However, despite being considered an ALS service, REMS does not transport patients; they are simply a first responder based program. Rice EMS is also a part of the Rice University Police Department which means that the full-time EMS Director position responds directly to the Chief of Police ("Rems our services," 2011). The command

structure for Rice EMS is such that there is the full-time EMS director who oversees the entire program; then there are students who act as a captain, which is the highest ranking student officer; there are multiple lieutenants that work under the captain to handle various aspects of running the organization, followed by 'in-charges', which are basically students that are at least EMT-Intermediates, who respond to every call in the marked Rice EMS SUV and can administer medications that regular EMT-B's cannot ("Rems command structure," 2011). REMS ran approximately 500 EMS calls in 2005 and the call volumes steadily rose each successive year until most recently they reached 800 EMS calls in 2010 ("Rice ems history," 2011).

Southern Methodist University EMS

Although it was stated earlier that there are only two fully established collegiate based EMS systems in the state of Texas, there is actually a third EMS system which is newly forming and thus shouldn't quite be considered fully established. Southern Methodist University in Dallas, Texas, recently created their own first response program SMU EMS, or Mustang EMS, which responds to medical emergencies that occur on its own campus. They have "over 100 general members who are full time undergraduates and graduate students," and their members "range from the causal, non-medical trained observers to the highly trained and specialized EMT-Paramedics" (Friske, 2012). Mustang EMS operates in cooperation with the local fire department and the local area ambulances to provide their medical care and works with in conjunction with Risk Management and the University Police Department (Friske, 2012). Currently the office of risk management is overseeing the student run organization, and the university police department even has its own "Medical Response Team of Police Officers [who are]

crossed trained as ECA's who provide invaluable medical aid and scene security for emergencies on campus" ("Frequently asked questions," 2012). Mustang EMS serves only in the first responder sense, in which they do not transport patients and are responding solely to provide emergency medical care faster to the patients than an ambulance alone ("Frequently asked questions," 2012). The Mustang EMS first responders are dispatched not only by the responding ambulance service's dispatchers, but by the university police department dispatchers as well ("Frequently asked questions," 2012). Currently Mustang EMS receives its funding through the University and from federal grants, and it is in the works to receive its own agency budget from the university ("Frequently asked questions," 2012).

All things considered, the Southern Methodist University EMS program is very similar to the proposed theoretical model that is presented in the next chapter of this thesis for Baylor University, and it clearly demonstrates that other universities are starting to see the true value in having such systems in place on their campus. The similarities also show that those theories and ideas presented in the theoretical model may be ideal since a comparable private institution is using a strikingly similar structured model for their own system. The driving force behind the creation of Mustang EMS was the realization that an average ambulance time of 9-10 minutes was unacceptable and could endanger the lives of the students and faculty members should a medical emergency arise on campus.

Baylor University

Currently there is only a first-aid providing program that is on Baylor University's campus, and it is far from being considered an EMS first responder based program. This program, which is known as the Baylor Medical Service Organization's Response Team, or the Response Team for short, is an event-only program that is limited in what type of care they are allowed to provide. The response team primarily works at university sponsored events; however they are also present by request at various other events such as those hosted by Greek organizations or from community based organizations. The response team is composed largely of first-aid and CPR certified members, however they do also have numerous EMT's that actively volunteer with the response team at the various events. The response team does, however, require that at least one EMT is present at every event in which they are present for. The organization also has two AED's in its inventory in addition to numerous first aid kits stocked with as many supplies as they are allowed to use. However, the response team does not have any form of transportation at its disposal.

CHAPTER FOUR

Theoretical Model Proposal

Should Baylor University, or any collegiate institution for that matter, choose to create such an invaluable program as that of an emergency first response team, they should first consider the concepts and ideas presented within this chapter. The concepts and ideas presented are theoretically the best case options designed specifically for Baylor University based on its own situation and campus needs. Conversely, other options are discussed as well. The options presented within this chapter can be applicable to different universities. However, the individual institutions may need to slightly refine and/or modify the suggestions presented here based on their own needs and circumstances.

The best way to outline the proposed theoretical first response program would be to start with an overview of what the program would specifically encompass. The proposed program would be designed in accordance with a standard first responder model, where trained first response personnel would respond to 911 calls placed within the vicinity and geographic confines of the campus. Since the geographic confines can ambiguously be defined as 'the campus', a map of the campus with an outline as to what the response area could be is attached in the appendix section. What can be seen is an outline of Baylor University's campus including the athletic riverfront complex such as the Ferrell center and baseball fields, Robinson Tower, the Law School, the maintenance facility, as well as the Presidents house, on-campus living apartment complexes such as

the Arbors apartments, and the recently purchased University Parks apartments which will be considered on-campus living. The Baylor Plaza apartment complexes, which are owned by Baylor University and managed by the Brothers Management Company, were excluded from the proposed response area. Although there are many Baylor students that live in those apartment complexes, they are not solely leased to Baylor students which means almost anyone can rent an apartment there. There is a safety issue that is brought up when one considers sending volunteer student first responders to an apartment complex that houses people other than students and is not even considered to be on campus. One cannot guarantee that the volunteers would be responding to a safe situation since it is technically off campus living. Besides that fact, one of the main points of the program is to provide first response to areas that are deemed part of Baylor University's campus, not just to the general area. Apartments such as University Parks, which is on the other side of La Salle from the main campus, will still be housing only students in an on-campus living and learning type of situation.

An apartment that is considered "on-campus living and learning" should basically be considered as a dormitory. Since dormitories are primarily locations where only students, and some faculty members, live on campus, these on-campus living apartments should be extended first response coverage as well even if they are away from the main campus. There is less inherent liability when responding to an on-campus apartment than there would be to responding to an off-campus apartment that potentially houses non-students. Responses to such off-campus locations would also make first responders unavailable to respond to any situations that may occur on campus while responding to off-campus locations.

In our model, the first response personnel would be responding to the 911 call in conjunction with a third party 911 ambulance service. The role and purpose of the first responders would be to provide critical medical care and attention while simultaneously reducing the amount of time it takes for that patient to receive emergency care prior to an ambulance arriving. This role does **not** include the transportation of the patient. The purpose is to get emergency medical care to people in need of that care faster than with a call to an ambulance alone. Once the ambulance arrives, the first responders would then assume a supportive role to the ambulance crew in the care of that patient. This is not only beneficial to patient care, but it can also help to reduce the amount of time an ambulance spends on location prior to transporting the patient to the hospital. Once the ambulance begins transporting the patient to the hospital the first responders would in essence be finished with that patient and that call. Subsequently, the first responder would then be placed back in service and would be available to respond to the next 911 call.

It can be argued that this proposed model has a limited amount of "negatives" or risks associated with its implementation. Perhaps the largest barrier to the implementation of such a program is the concern that such a program would be an inherent liability risk, and that should an institution create such a program, they themselves would be liable, as well. Due to the litigious nature of the society we live in, that concern does have merit and should be considered. However, if interpreted correctly, it appears that the current legislation regarding first responders and programs actually provides immunity from such liability. The Texas Civil Practice Code Ann. Section §74.151 specifically provides immunity from liability for a person who in good faith administers emergency care for an

act performed during the emergency unless the act is willfully or wantonly negligent. This includes emergency care as a volunteer who is a first responder as the term is defined under Section §421.095 of the Texas Government Code (*Texas civil practice, 2007*). Under section §421.095, a "first responder" means a public safety employee or volunteer whose duties include responding rapidly to an emergency. This includes a volunteer firefighter who is certified or a member of an organized volunteer fire-fighting unit as described in Section §615.003 as well as an individual certified as an emergency medical services personnel by the Texas Department of State Health Services (*Texas government code, 2007*). To put all of that into simpler terms, as long as a first response program is certified by the Texas Department of State Health Services and all of its responders are certified by the same department, that program and its first responders will be immune from any and all liability as long as no negligent acts are willfully or wantonly performed. In addition, since the organization is statutorily immune from any liability, this would also extend to include the university hosting the organization.

Texas Civil Practice Code Ann. Section §74.151 and Section §421.095 of the Texas Government Code were designed to help foster the growth of first response systems in the state of Texas, which is primarily a rural state and those vast and expansive rural areas often depend on first responders when the nearest ambulance could be many miles away. Now although it is specifically stated that "immunity from liability" is provided under this section of law, it should be noted that in the very litigious world that we live in today that anyone could potentially sue over anything. This immunity theoretically mitigates potential lawsuits from occurring. However, a lawsuit is still possible to occur even if the outcome is eventually found to be that the university and

first response program are not liable. In cases where the organization is found to be liable is where the additional liability insurance would come into play and would cover costs associated with the liability incident. Such incidents, as defined by the law, would be incidents where an act that is willfully or wantonly negligent is performed and would thus have caused additional harm or suffering. The best way to protect the university from this liability is continuous training to maintain the skills and protocol knowledge of all first responders under various training circumstances.

Immunity from further liability would be also be observed by the fact that this first response program would be required to follow the medical direction and protocols of the current 911 ambulance service. For Baylor University that ambulance service is East Texas Medical Center, subsequently referred to as ETMC. Thus, Baylor University would neither be responsible nor liable for the protocols that the emergency first response program would follow. This is due to the fact that the City of Waco is currently under contract with ETMC as the sole providers of 911 emergency care. In order to "first respond" within the city of Waco, which is where Baylor is located, a first response program must follow the protocols and medical direction that has been established by ETMC. This is typically the case for any first response program working in conjunction with a 911 ambulance service; the first responders follow the protocols and medical direction of the responding 911 ambulance which in turn creates uniformity in patient care and less confusion between possibly conflicting medical direction. Thus, with the first response program under the medical direction of ETMC, Baylor University would theoretically not be held liable for the protocols that the program would follow. On the other hand, it may be prudent to have Baylor University separately approve the protocols

that the program would be following. However it may not be legally necessary to extend any sort of approval which could in-turn create potentially shared liability. That being said, the protocols that the first response program would be following would be extremely basic in nature, and therefore would not truly be much that would warrant further scrutiny and approval.

A program of this magnitude, however physically small it may be in comparison to city based systems, has numerous areas of operations that need to be addressed and discussed. Such areas include organizational structure, communication and dispatch, response to emergency calls, and training. Without these various aspects of the program, it simply would not be able to meet its expectations. A first response program and model needs to have an extremely structured organization system as well as a need for reliable communication and continuing education for its members in order to function and to survive as a first response program.

Organizational Structure

The structure of this theoretical organization would rely heavily on student volunteers with only one position needing to be a salary based position. This salary based position could be viewed as a combination of multiple professional positions that in larger organizations would be held by numerous people. This position would encompass such duties and responsibilities as found in the Director of Operations, Field Supervisor, Clinical Manager, Supply Coordinator, and Public Relations Coordinator. In a larger system, each of those positions would be held by different people responsible for their designated areas. However, taking into consideration the relatively small size of the proposed campus emergency first response system, it is theoretically possible for one person to manage all aspects of such a program. That being said, it is still significant amount of responsibility for one person, which is why one must strongly consider it being a paid salary position. Leaving all of that organizational responsibility to volunteer students can lead to many things potentially being overlooked and over the years can lead to an instability within the program itself. One of the major pitfalls for Baylor EMS in the past, as shown and accounted for in Chapter One, was that the organization was led solely by student volunteers, and that over the course of the program it evolved from a solely first responder type of organization to an attempt at becoming a fully-fledged advanced life support ambulance service. It is this type of change in direction over the years, combined with the change of leadership as students graduated and left Baylor, which can cause the inevitable downfall of a perfectly well intended program. If a college or university choose to invest in such a potentially beneficial program, it would behoove

such an institution to insure that the direction of the program remain constant and in-line with the university's intentions and goals for that program.

As discussed above, in order for the proposed program to be successful, a full time salaried position is needed. In order to justify the need for such a position, one must first break down the total responsibilities that this position would entail and the salary range needed to secure a qualified candidate. This position would encompass the duties and responsibilities of multiple positions such as the director of operations, field supervisor, clinical manager, supply coordinator, and public relations coordinator. The duties and responsibilities of the various positions can be generalized and expanded upon to better understand the total responsibility and duties of the paid salary position. The director of operations is in-charge of complete and total oversight within the organization. This position would insure the organizational oversight and would ensure that the program's day-to-day needs and obligations were being met and running effectively. Furthermore, they would be responsible for insuring that long-term goals were maintained and that the overall direction of the program remained unchanged or would only change appropriately in accordance to the wants and needs of the university. The responsibilities of the field supervisor position would include responding to some of the 911 calls in addition to the volunteer first responders, insuring that protocols and medical direction were well known and followed by said first responders. They are required to respond to all cardiac arrests that occur on campus, regardless of the time of day, and would be required to deal with issues that volunteer students should not be made aware of such as dealings with fellow students who are civilly arrested. The supervisor would also review and sign off on every patient care report after they were submitted for

review, and would also be responsible for any other duties that may occur while in the field of operations. Such duties could potentially involve dealing with staffing issues, supply issues, as well as any other types of issues that supervisors would generally need to handle.

A clinical manager's typical responsibilities include offering and providing continuing education and up-to-date training for the members and volunteers to keep them prepared for any type of situation they may be called to and for their skills to be finely tuned. The clinical manager would also be responsible for insuring that the certifications of all active members and volunteers are current and valid. This position would typically be responsible for conducting regular meetings in which various training concepts would be re-taught and specific in-field occurrences could be addressed as well. They would also coordinate to have occasional speakers present relevant presentations regarding educational information that may be of interest to the members as well as any outside persons who would wish to attend such a seminar. A supply coordinator, as the name implies, is directly in-charge of the coordination of supplies and logistics for the organization. The supply coordinator is responsible for ordering any new supplies and maintaining a well-stocked storage area from which supplies could be exchanged or replaced as needed. The public relations coordinator position is responsible for dealing with the public and all of the normal responsibilities that are inherent and included with such a position. This would include, but would not be limited to, dealing with the press, the student body at large, as well as shaping and developing a positive image for the organization as a whole.

This is an extensive (but not all encompassing) list of responsibilities and duties, and the single paid position within the program would be an extremely important and invaluable position. It is difficult to determine a salary amount that would be justifiable yet still practical for such a position with as much responsibilities and duties as this one would entail. An equivalent director of operations position, as well as a full-time field supervisor position, could both easily be paid anywhere between \$60,000 and \$80,000 a year individually, not to mention factoring three additional yet separate positions in as well. Further, such a position would be on-call 24-hours a day in order to respond to the most important of calls and would not be limited to only when classes were in session. Although the list of responsibilities that this individual position would have is extremely extensive, it is possible for a single person to manage all of it. This is because the organization would be relatively small enough in size during its developmental stages that one person should be able to micromanage all aspects of the program. Should the program ever expand in the future, or the need become apparent, then multiple paid positions may be necessary. Various aspects of the salaried position's responsibilities could also be assigned or tasked to student volunteers seeking further leadership opportunities within the organization, which in turn could create a hierarchical structure similar to what is found in other student organizations.

As discussed just previously the salaried position would have the responsibility of multiple positions that are paid \$60,000 to \$80,000 a year. Although it will ultimately be up to the university to decide the salary, it is the suggestion of this thesis that the salaried position for the theoretical model should be paid approximately \$80,000 to \$100,000 per year since they would be on-call and available not only during the daytime, but during the

night as well should they be needed, thus making them available and ready to respond 24 hours a day, seven days a week, all year round. In addition to being available to respond to calls 24 hours a day, the position also entails a large number of responsibilities, as previously discussed, that in larger organizations are handled by multiple people. Thus it only seems logical that a position with such responsibility, and with so many vary aspects to handle, will need to be paid on the higher end of the salary scale.

Although it may be advantageous to have this entire program be a stand-alone entity with no direct oversight other than the university itself, it is most likely and probable that the Office of Risk Management would be the office to which the salary position, as well as the first response program, would report to. Even though it theoretically makes sense to have it as a part of either the student health center or with the campus department of public safety, it is most in-line with the idea and concepts found within the Office of Risk Management. Baylor University's health center is a primary care ambulatory health clinic and having an organization contained within that clinic that responds to emergencies on campus could potentially affect its accreditation from the Accreditation Association for Ambulatory Health Care (“Baylor University health”). It is also unfeasible that the Baylor Police Department would allow student volunteer's access to their offices on campus, much less 24 hour access and that will be discussed later on in this chapter. Thus, one of the most logical choices, after eliminating the Baylor Health Center and the Baylor Police Department, would be that of the Office of Risk Management. Part of Risk Management's duties include general safety and emergency planning and preparedness. Even though in-progress emergencies are reported to Baylor Police Department, Risk Management is the logical choice for the paid salary position to

report to directly. The campus first response program would not only be increasing the safety of students on campus but would also be an invaluable tool in the handling of large-scale disasters on campus. Risk Management's own mission statement states that:

The mission of the Baylor University Department of Risk Management is to provide, in concert with the University's Vision 2012, a comprehensive risk management program that... contributes to the health, safety and protection of employees, students and visitors... ("Risk management mission")

By design, the emergency first response program helps to protect and maintain the health and safety of the employees, students, and all visitors to the campus of Baylor University. Taking this into consideration, such a program, as proposed in this paper, appears to be justified. As discussed earlier, there appears to be limited liability as a result of providing emergency first response care on campus. Secondly, the primary costs associated with the program are the costs of a single salary position and a few minor upkeep expenses such as continued training and supplies. Thus, taking this information into account, it poses the question as to why a university would not take full advantage of such an invaluable and beneficial program.

In order for the theoretical first response program to function optimally, it will not only need an office for the paid salary position, but it will also need an EMS type room for the on-duty volunteers. These two rooms could essentially be one dual function room. It is necessary for the first responders to have 24 hour access to an EMS type room because they will need to be able to resupply their emergency response kits if needed and will also need a place where they can type up and submit their reports to the supervisor for review. After much consideration, and after factoring in numerous items, a potentially ideal location for this room and office could be in the Baylor Science Building. Although

it is not located in the heart of campus, it is one of the few buildings with 24-hour access possibilities aside from residential halls. Plus with its numerous available rooms, it has more than enough room to accommodate such an office/EMS room. However, the room would need to be on the first floor for more rapid availability for response and would preferentially need to be by an entrance. Given the two choices of either the "A" side versus the "E" side of the science building, the best side to be on would be the "E" side since it is closest to road known as 2nd/Speight which is a major artery that leads straight to the heart of campus. The "A" side opens up to an elevated bridge which is often an area of high traffic flow during class hours which would cause a bottle neck effect and would hinder the response time. It would be required that the first responders on duty would not be allowed to leave the campus area, for obvious reasons since that would defy the point of having the responders on campus and ready to respond to calls. The EMS room would also serve a purpose as a place for those who live off campus to spend their shift without having to leave campus. Considering all of the new dining options that have recently gone into effect on campus, and in the science building for that matter, it is only getting easier for people to remain on campus for longer periods of time. Theoretically one could even place a table and a few chairs, aside from those that would be required to make it the salaried position's office, and then that room could also serve as a study area for those who are on-duty.

Aside from the salaried supervisor position, all other positions within the organizational structure would be filled and held by volunteer students who were certified at the minimum level of Emergency Care Attendant, or ECA, which is the lowest level of state certification for someone to be trained in emergency medical services. The design

behind this program is to have at least two volunteers 'on-call' 24 hours a day, 7 days a week, ready and able to respond to any on-campus medical emergency in which an ambulance was being dispatched to as well. In this theoretical model, the two students on duty would be equipped with a radio and a Minitor pager, which will be discussed in more detail in the communication section. When a 911 call is made, they would both simultaneously be notified by their pager and radio, and they would then proceed to respond to the location of the injured person. The best mode of transportation for these first responders would be a pair of all-terrain vehicles, such as the Kawasaki Mules or Gators which are used currently on Baylor's campus by various other departments and programs, in which they could store their equipment and respond rapidly anywhere on campus. The all-terrain vehicle would mean that the first responders were no longer confined to operating on the often confusing, and not easily navigable, internal road network found on Baylor's Campus. Where ambulances and patrol cars would need to navigate the long roads around the campus, the all-terrain vehicles would have the ability to quickly traverse through parking lots, over curbs, on sidewalks, which allows them to cut right through the middle of campus to save time in their response. In the interest of first responder safety, 911 calls that are considered assaults, or other potentially dangerous situations by the 911 call taker, will not be handled via the Baylor volunteer first responders. In these circumstances, the dispatcher is trained to know not to dispatch Baylor's volunteer first responders to those types of calls. Those types of instances will be further detailed in the next subsection.

Communication and Dispatch

For this theoretical model, communication and dispatch is very critical. Without radio communication or without being dispatched, the entire first response program would not be able to function. For this theoretical model, the best case scenario is to have a dual dispatch system; one in which ETMC can dispatch the first responders to all 911 calls placed through their call center, as well as one in which the Baylor Police Department could request their services as well for calls placed through their call center. With Baylor Police Department able to dispatch the first responders it would save time in their response. This would be accomplished by eliminating the time it takes for notifying ETMC, who would then notify the first responders and the ambulance, by notifying both simultaneously. ETMC is the logical first choice for dispatching the first responders since they would be the ones sending the accompanying ambulance to the scene, and it is currently unknown whether or not Baylor Police Department is notified, or dispatched to, all of the 911 medical emergencies on campus. ETMC currently dispatches Waco Fire Department as a first response program to Baylor University as well as in various other areas of the City of Waco. The limitations of course with this is that the fire department has a primary objective, above being a first responder, and this is to fight fire, hazardous materials incidents, technical rescues, and to deal with motor vehicle accidents. As much respect as possible should be given to the fire department. However, the truth of the matter is that even though they currently could first respond to incidents on campus, there is the possibility that they would be unavailable for first responding due to prior obligations. They also would not have as intimate of knowledge of the inner workings and layout of the campus whereas a student based program would. Response times for the

first responders would also be faster than those from the fire department since the student first responders would already be on campus and could navigate the area faster since they would be more familiar with that area. Thus in instances where time is of the most critical factor, the student first responders would always be available to respond to calls, would already be on campus, and would thus most likely have a faster response time than the fire department alone as a first responder.

The first responders in this theoretical model would use Minitor's to alert them to a call. A Minitor is a brand of pager that, when on, is silently listening to the radio channel for a special radio tone to be sent out to activate it. When activated, the model will either alert the user with a tone or via vibrate, and will then turn the speaker on to relay the dispatch information that will follow that special radio tone. The dispatch center can easily send out the tone and it should be noted that most volunteer fire departments use a similar if not exact method such as this if their members are not going to be constantly listening to a radio or at the station. Once the Minitor goes off and notifies the first responder of the impending emergency, the individual would then use their radio to communicate with dispatch that they are en route and have received the information. At this point they may request any and all additional information such as exactly where in a building or location the patient may be so as to quicken their response. A second alternative to notify first responders of an emergency is what is known as an alphanumeric pager, however those have more limitations than a Minitor. An alphanumeric pager basically receives a text message and the pager then displays the information and notifies the user with either a tone or via vibration. However like with phones, messages may be delayed, miss-sent, never received, and the amount of text

available for display is severely limited. Responders could also receive text messages directly to their phones however the same potential problems would be encountered as with the alphanumeric pagers.

The communication with the dispatch center and the ambulance can provide valuable time saving information for the responding ambulance to quickly get to the patient. The first responders would also act in a way that could request additional support from ambulances and fire trucks sooner should those additional units be needed. Since they would be arriving on scene before the ambulance, the first responders would be able to quickly identify the need for additional support and thus be able to quickly get the needed support dispatched and sent to the emergency. Once the patient is transported, as stated previously, the first responders would communicate with the dispatch center and would notify the center that they were available for the next call, thus repeating the cycle. As stated previously, the first responders would not be dispatched to dangerous calls, such as assaults, or other potentially dangerous situations as determined by the 911 call taker and dispatcher. This would typically include anything that would require a law enforcement officer to secure the scene and to make sure the area is safe for those responding. In these instances, Baylor University volunteers will not be called for as medical first responders. This is so that first responders are kept safe and because by the time law enforcement officers secure the area, the ambulance should be nearby awaiting approval to enter the area which would thus eliminate the need and purpose of a first responder. The safety of the volunteer first responders would be paramount.

Response to Emergency Calls

Although much of how a typical response will occur has already been discussed, a few more specific details should be mentioned. First responders who are on duty would only respond to emergencies in their all-terrain response vehicle since that is where all of the equipment and supplies would be stored. The storage unit, in this theoretical model, would be a metal truck bed toolbox like unit in which access could be controlled through a lock and key. This would keep the supplies safe from the weather, and from being stolen or lost. Furthermore, it would prevent the individual first responders from having to carry all of the equipment with them wherever they go. This is especially important when one considers that a typical first responder takes with them a large trauma bag full of supplies, an oxygen bottle, and an automated external defibrillator, all of which are not things one would want exposed to the elements or to be stolen. Responding with lights and sirens, also known as a Code 3 response, would not be permitted primarily because it is unnecessary. Secondly, it would not be allowed because of the close proximity to the pedestrians. More specifically, the lights and sirens of the vehicle and thus, the loud noises and bright lights could disrupt class and cause unnecessary alarm/disruption for those not directly involved. However it would be beneficial to equip the response vehicles with lights and sirens, just in case they needed to use them as either a signaling device or for scene safety. Although responding to a call with the lights and sirens would not be allowed, it potentially would serve as an excellent location marker once they have arrived at the scene for the responding ambulance to know where to go to, especially at night when it is difficult to see things and when call information may be unclear as to the exact location.

The first responders should first and foremost make safety a priority when responding to emergencies. Not only do they need to keep themselves safe and out of harm's way, they also need to protect and keep pedestrians safe as well. The first responders should travel with haste to the emergencies. That being said, responder and pedestrian safety are paramount and should never be compromised. Responders should make every attempt to use the internal roads and pathways when available. However, due to the often confusing layout of the campus and the roadways going "off road" (i.e. surfaces other than established roads) may be required in order to quickly respond to an emergency. If going off road is required, the responders should make attempts to stay on pathways, such as sidewalks, as opposed to tearing up expensive grass or flowerbeds.

It is suggested, and probably should be required, that every single responder undergo some form of driver safety training in the use of the response vehicles on campus and their skills should be verified by the salaried position in order to further ensure safety for the responders and pedestrians. Whether this course and training is given by the Department of Public Safety or created internally by the paid salary position should be at the discretion of the University.

Training

The members of the first response program should undergo monthly, if not biweekly, training to maintain their skills and to address any field concerns or problems that may have arisen. The training session need only be approximately an hour long. However, it would allow for a review of any and all previous 911 calls that the program had responded to which allows others to learn from the calls and should help to create a

uniformity in proper report writing etiquette. The training could also serve, if taught by a licensed EMS instructor, as continuing education, also known as CE, which is something that is required for all EMS personnel. This continuing education would benefit not only the students of the first response program but would also potentially benefit those working for the local ambulance company that need CE's as well. That would create a free opportunity for expanded community involvement as well as potentially opening doors towards having guest lecturers come and present various topics on emergency medicine which would be available to any and all pertinent parties who are interested. The regular training sessions should include the practicing of skills, as well as the learning of new and relevant material that responders may potentially encounter in the field. This is to ensure that all volunteer first responders stay on top of their knowledge and skills so that they are prepared and ready for any situation that they may be placed in during an emergency situation.

The salaried position should also be responsible for establishing and maintaining an ECA training program as well as potentially an EMT-Basic program. The creation of a yearly or semester based class would help increase the number of students on campus who would be trained in emergency medicine and would almost ensure a continuous supply of new volunteers for the program. This would be extremely beneficial for the university since more students on campus would be trained in how to handle various medical emergencies that may arise. Whether or not they choose to volunteer with the program, they would still be on campus with the knowledge and training of how to handle various emergencies should they ever be placed in a situation requiring those skills and knowledge.

Why does Baylor University, or any College or University for that matter, need a first response program? One answer is that it is simply too invaluable not to have one. A University may be doing "just fine" without one, however when a true emergency happens, the university may, in retrospect, wish that something had been in place to be able to respond and to handle it to the best of anyone's ability. Hindsight vision is almost always 20/20 and it is always better to over prepare than to be unprepared. It is quite often the case that many universities are not completely aware of the benefits of a localized first response system. Not every university necessarily needs a program such as this. However, because Baylor has a continually expanding campus, in addition to having a current student body size of over fifteen thousand (15,029) students and nearly one thousand faculty members (935), Baylor truly has a need for a first response program ("Baylor university admissions"). According to the Waco Chamber of Commerce, Baylor University also employs 2,583 employees ("Waco chamber commerce," 2012). Therefore, Baylor's campus has approximately eighteen thousand people on campus during a normal weekday ("Baylor university admissions"). This population density is only logically more dense in the academic buildings during the day and currently 38% of student body lives in the dormitories on campus at night ("Baylor 2012 imperative"). Baylor University is also seeking to increase the percentage of those living on campus from 38% to at least 50 % according to their 2012 initiative ("Baylor 2012 imperative").

Although the 2012 initiative is approaching its end, according to the new strategic plan, that Baylor University is still in the progress of drafting, the University seeks to further increase the percentage of students that currently live on campus although no exact percentage goal has been stated ("Aspirational statement one"). This

is found under a section titled Student Life Programming, where one of the goals listed is to "Continue to increase the percentage of undergraduate students who live on campus and who participate in exemplary living and learning and residential college communities" ("Aspirational statement one"). Also found within this new strategic plan are numerous other goals and statements that a first response program would fulfill and satisfy. In a section titled "Leadership and Experiential Learning," under the Aspirational Statement One, Baylor University states that "we understand leadership as one's ability to influence others while maintaining a commitment to doing what is right and what is best, even in the face of competing priorities" ("Aspirational statement one"). The first response program would be creating numerous positions for students to fill in which they would be placed as leaders. They would be leaders as defined by Baylor University itself in that they would be doing what is right and what is best for the safety and welfare of their fellow students all while faced with the competing priority of school. By placing more students in these roles of responsibility and leadership, they would be influencing others by doing the right thing and by showing their commitment to a noble and worthy cause.

Under Aspirational Statement Three, some additional goals stated by Baylor include:

- Pursue academic partnerships with local, national, and global constituents that are focused on human flourishing
- Form stronger, more strategic community partnerships that improve the quality of life for all Central Texans
- Support local research that provides a foundation for effective solutions to community concerns
- Integrate service into the fabric of campus life
- Create educational opportunities that benefit the community and Baylor alumni ("Aspirational statement three")

Every single one of those goals, which just so happens to be every single goal listed under Aspirational statement three, can be exemplified by the creation of the first response program. The program would be pursuing a direct partnership with a local entity for providing emergency care, as well as being able to also work with the local fire department and the local police department, all of which would be to the benefit of humankind. The program could also serve as a research model to be expanded upon and learned from on a national scale for other universities that are interested in establishing such a uniquely beneficial program. It would also create a strategic community partnership that, in times of emergencies, could benefit everyone and not just the direct Baylor community. The whole program is designed to be a service to the campus and to increase the safety of life on campus. The program also has the potential to host numerous forums and educational events with speakers from various backgrounds and on widely ranging topics that would provide ample educational opportunities to not only members of the program but to the entire community as well.

The fact of the matter is that a primarily student based operation would yield Baylor University a relatively low cost, yet still effective, way to provide emergency first aid coverage to its students, to its faculty and employees, and to any and all visitors to the campus. This is beneficial not only at the time of the emergency but also prior to any emergencies by easing the fears of parents who are sending their children to be students at the university. It also allows for the volunteer student first responders to gain invaluable field experience while remaining in the relative safety of the campus. The program relies heavily on students to volunteer and to dedicate their time and efforts into the service of providing first response emergency care at a moment's notice. This

reliance on students will create numerous leadership positions and opportunities for leadership roles all of which help to build the character of the students that will one day be graduates of the university. It is also potentially possible and theoretical that the program could evolve enough to allow for it to be a part of the universities federal work study program since one of the few requirements for those jobs is that " the work performed must be in the public interest" ("Federal work-study," 2009). Considering that the student body, or in other words the general public, is the primary recipient of the services of the first response program it is possible that the program may be potentially eligible for federal work-study.

The Physical Need for a First Response Program

Baylor Police records show that the Baylor Police Department responds to medical calls that are placed on campus. These records were obtained via email correspondence with the Chief of Police, Jim Doak, in the month of July in 2011. The total number of medical calls are listed directly below:

School Year	Number of Medical Calls
2008-2009	128
2009-2010	108
2010-2011	113

Further information regarding the type or nature of the calls is not currently available since this type of information is not recorded by the Baylor Police department. The Chief of Police did, however, state that the "vast majority of [their calls] relate to minor injuries of someone falling, athletic related [injuries] or sick calls" (Doak, 2011).

Although the information that was provided by Baylor Police Department is insightful, the only true way to know the full extent of the physical need for such a program would be directly from the responding ambulance company itself.

ETMC was contacted numerous times via phone, email, and open records requests, regarding the number of EMS calls that their ambulances responds to on or around the Baylor Campus area. However, access to that information was denied and was claimed to be "proprietary" information (Petty, 2011). Information regarding the number of 911 calls placed in the city of Waco in general were also denied due to the same reason as that information was classified as "proprietary" (Petty, 2011). According to Mr. Andrew Petty, who is the Director of Clinical services for ETMC, the only information that he was able to release was that "there are several thousand calls in the Waco area per year" (Petty, 2011). Now although there is currently no direct way to know the exact number of EMS calls that occur on the Baylor Campus, there is an indirect method that should give a generalized idea of how many calls could be expected each year.

Although ETMC would not disclose their "proprietary" information, the Waco Fire Department was more than helpful in the release of their statistical data. According to the Waco Fire Department, there are three potential fire stations, out of the current 12 active duty stations, that could possibly first respond to emergency medical calls on Baylor's campus. Attached in the appendix section are multiple graphs that statistically show the data that was collected for those three fire stations. Directly below are the total number of EMS calls that the Waco Fire Department has responded to by year (Lowrey, 2012).

Year	Number of EMS Calls
2011	5051
2010	4228
2009	3957
2008	3982
2007	4651

According to this data, the average number of first response EMS calls that the Waco Fire Department responds to is approximately 4,374 per year. The city of Waco has approximately 84.2 square miles of land that the Waco Fire Department covers, with approximately 11.3 square miles of water as well ("Waco, Texas," 2012). This means that per square mile of land, the Waco Fire Department will run approximately 52 EMS first responder calls per year. Now Baylor University's campus is quoted at being approximately 1.25 square miles ("Baylor university," 2012). However, it is not known as to whether or not that includes the athletic complexes and facilities that are not quite a part of the main campus, but are very close to it, since the quote is for the main campus itself. Due to this lack of clarity, in addition to factoring in the recent land purchases that Baylor University has made for its planned expansions, 1.5 square miles is a justifiably fair and reasonable measure of the area of Baylor University. Based solely off of the statistical data presented by the Waco Fire Department, one could theoretically anticipate roughly 78 medical calls per year to occur on Baylor University's campus when one multiplies the average number per square mile by the 1.5 square miles of area that is Baylor University. Now the exciting part of this comes from the fact that the Waco Fire

Department does not respond to every single EMS call, nor should it be required to as previously explained due to its other priorities. As was already seen with the Baylor Police Department data, this rough estimation only accounts for about half of the minimally known number of medical calls that the police department has handled. Knowing that the police department does not respond to every single call means that this rough estimation maybe as little as only one fifth of the true number of 911 EMS calls that occur on Baylor University's campus. Even though the actual number of yearly EMS calls placed on Baylor University's campus cannot be known at this point in time, if one were to extrapolate given the assumption that the Waco Fire Department data is only one fifth of the true number, it would come to an approximate average of 1EMS call per day on Baylor's Campus. Although this is merely a statistical extrapolation, it is possible that there could be even more than this. Even assuming that one hundred percent of the number of medical calls was handled by the Baylor Police Department that is still only about one medical call per two days, when using an academic school year of 220 days with the police data averaging at 110 calls per year. However it is extremely unlikely that the Baylor Police Department responds to every single 911 EMS call placed on the Baylor University campus.

It is also possible to compare population densities in relation to the predicted number of EMS calls per square mile. The city of Waco has a population density of approximately 1,482 people per square mile, not accounting for the square miles of water found within the city ("Waco, Texas," 2012). Factoring in the area of water into that calculation brings the population density to 1,350 people per square mile however it is unlikely that many people live on the water and thus the more accurate and relative

population density is 1,482 people per square mile ("Waco, Texas," 2012). Based off of the number of students and employees found within the 1.5 square miles of campus (17,612) , Baylor University has its own population density of 11,741 people per square mile. This population density should be noted that it does not account for the numerous visitors that Baylor University has per day and on the weekends when it hosts large events for prospective students and the like. That population density is however approximately 8 times that of the surrounding city of Waco. This potentially means that the number of EMS related calls that may occur in the Baylor Campus area could be as high as 8 times that of any other given square mile of land found within the city of Waco. That would thus translate into a higher incidence of 911 EMS calls for the Baylor University campus area than would be typically expected elsewhere within the city. If these aforementioned estimations are approximately accurate, this could mean that approximately 416 EMS calls will be placed per square mile of Baylor University per year (that being calculated from the Waco Fire Department average of 52 EMS calls per square mile per year), and based off of the 1.5 square miles for the campus, that could equate to approximately 624 EMS calls per year. That in and of itself justifies the need to have a first responder program on the campus of Baylor University.

According to a 1994 Baylor Lariat article, the former Baylor EMS program was quoted at having "responded to 437 calls" in the academic school year of 1992 to 1993, which was "an increase of 54 percent from the previous year" (Baylor Lariat, 1-19-1994). Now according to the Baylor Institutional Research and Testing Department, for that school year, there were 12,056 students enrolled at Baylor University with approximately 590 employed faculty members ("Baylor trends fall," 2002). There were

also only 12,054 students enrolled in the Fall of 1993 and 601 faculty members according to the same source ("Baylor trends fall," 2002). The number of total employees was not recorded or accounted for in the IRT's data. An additional Baylor Lariat article stated that in 1993 Baylor EMS "responded to 477 calls plus 103 special-events calls" (Baylor Lariat, 3-30-1994). Although the second article did not specifically state the time frame that was included for the generalized statement of "1993", what can be taken from both of those articles is that in roughly one year there was about 450 times that the Baylor EMS program was needed and responded to calls. Now comparing the number of students from those two particular years, which are approximately the same, versus the number that are currently enrolled should present a proportionally equivalent expectation for the number of EMS calls that could potentially occur. The percent increase of enrolled students and faculty members from 1992/1993 to present day is approximately 26.15%. This means that statistically there should also be a 26.15% increase in the expected number of EMS calls from 1992/1993 to the current year. Since the number of total employees is not known for the 1992/1993 school year, only the number of students and faculty members can truly be used for an accurate comparison. To determine this percentage, the number 12,655 was used to represent the number of students and faculty members from 1992/1993 ("Baylor trends fall," 2002), and the number 15,964 was used as the current number of students and faculty currently enrolled ("Baylor university admissions"). Applying the 26.15% increase in the number of students and faculty to the average EMS calls from 1992 and 1993, of approximately 450, leads to an expected increased total to be approximately 568 EMS calls per year. This proportional increase is

additionally supported by the previously calculated population density anticipated number of EMS calls of approximately 624 EMS calls per year.

Now, although it cannot be proved that there would be approximately 600 EMS calls per year, it can however represent and show the inherent need that is present for a first response program. What should also be considered and factored into the equation is the residual fact that the anticipated 600 EMS calls per year that would happen on campus is based off of the Waco Fire Department data which is not all inclusive of the total number of EMS calls that occur in the City of Waco. That thus means that the anticipated number of EMS calls that could occur on Baylor University's campus is on the lower end of the potentially possible number since the Waco Fire Department does not respond to every EMS call. If the percentage of EMS calls that the Waco Fire Department responded to in comparison to the total number of EMS calls for the Waco area was known then one could determine the range of the number of potential EMS calls that may occur on campus. However since the ratio is not known it would simply be pure speculation to estimate the maximum number of potential EMS calls that could occur on the Baylor Campus per year. But what can be taken away from this data is that statistically there should be at least 78 EMS calls per year on Baylor's campus when population densities are not factored in, and potentially up to 624 EMS calls per year when population densities are factored in as a variable.

Cypress Creek EMS Data

Since ETMC would not release any of their information regarding annual call volumes or response times, an analogous service would need to be substituted in order to

better illustrate the benefits of first responders in an established EMS system, specifically looking at the response times. Cypress Creek EMS is a Houston based EMS System that covers approximately 250 square miles in the northwest quadrant of Houston Texas ("Cypress creek ems," 2011). Cypress Creek EMS is justifiably an analogous ems system to look at due to their size and similar structure to that of the East Texas Medical Center ems system that currently serves the Waco/McLennan County area . Cypress Creek EMS has 10 EMS stations, with up to 16 ALS ambulances and two Supervisors on duty for most of the day, and a communications center that dispatches not only their own ambulances but the local fire departments as well ("Cypress creek ems," 2011). The volunteer first responder system that is in place with Cypress Creek EMS involves first responders being assigned "districts" that correspond to the associated ambulance station within that district (Nealy, 2011). The volunteers are typically placed in the district in which they live, although they can request to work in other districts (Nealy, 2011). The communication center dispatches first responders on a general tone-out, using tones that activate their pagers and a text message is also sent to their cell phones, regardless of whether or not the dispatchers know if they are available. The general tones and texts are done so as to give the first responders the opportunity to respond if they are available and close to the call (Nealy, 2011). First responders are not required to respond to every call that happens in their district, however instead they choose when they individually are available to respond to calls and thus which calls they want to first respond to (Nealy, 2011). This leads to a bit of uncertainty as to whether or not first responders will be responding to calls; however, it is designed to allow those who volunteer for the program to respond and to help when available. Each first responder is equipped with a trauma bag

of supplies, an AED and oxygen, and are permitted to have lights and sirens on their vehicle if they so choose; in addition they are required to wear identification badges that identify them as first responders with Cypress Creek EMS (Nealy, 2011).

Wren Nealy, who is the Director of Special Operations for Cypress Creek EMS, was more than willing to provide information regarding call volumes and response times for their ambulances and first responders. In a five month period of time, from May 1st of 2011 to October 1st of 2011, Cypress Creek EMS responded to a total of 14, 443 calls (Nealy, 2011). There were a total of 6,731 dispatches for available first responders, with 429 of those calls being answered by various first responders. When calculated, as is shown below, the average response time for the Cypress Creek EMS first responders is 4 minutes and 11 seconds where the average response time for the ambulance was 8 minutes and 6 seconds.

Time Period = 5/1/2011-10/1/2011
Total CCEMS Calls = 14,443
Total Calls calculated = 11,735
Total First Responder Dispatches = 6,731
Total First Responder Responses = 429
Total First Responder Responses Calculated = 367
Average First Responder Response Time = 4 minutes 11 seconds
Average ambulance Response Time = 8 minutes 6 seconds

This information serves multiple purposes. The first purpose is to show that even on a large scale, a first responder based system yields times that are not only desirable but are faster than the responding ambulance and in this case study the times are nearly half that of the responding ambulance time. The first responder times in this case study are also under the 5 minute mark -- a goal when responding to cardiac arrest incidents since

that is when brain damage can start to occur (Cardiopulmonary resuscitation, 2011).

Although it is difficult to determine the exact size of each district, on average it can be expected that each district should be approximately 25 square miles, which is based off of the 250 total square miles of area covered and then that is divided by the 10 stations that make up the individual districts. Even with the area of coverage for first responders being up to 25 square miles, they still are averaging only 4 minutes in response times.

Ambulance times are higher because it is extremely possible that the responding ambulance to a call is not the ambulance assigned to that district. It often happens that ambulances have to cover multiple districts at once when other ambulances are already on calls or at hospitals (Nealy, 2011). Thus the reason why the times are lower for the first responders could be that the first responders are limited to only calls that occur within their area around them, which also means that they could potentially be more familiar with the layout of the area than a responding ambulance crew would be. Both of those factors only serve to quicken response times for the first responders.

A collegiate setting is much smaller than the districts that can be found in Cypress Creek EMS's area of coverage which would thus lead to a justifiable conclusion that, in theory, a collegiate based first responder system would have response times of less than 4 minutes due to the reduced size. Theoretically that time could potentially be reduced even further to only two minutes for a response time due to the large size difference and the close proximity of responders versus the location of the 911 call.

It is widely known that ETMC no longer has official stations that ambulances are based out of in the city of Waco, and this transition out of the stations occurred within the

past two years. Instead, they have their ambulances constantly 'posting' which means that the ambulances are parked or positioned at key intersections around town, constantly being rotated around, so that if a call occurs near them they can get onto a major roadway that would take them to the call. Although this means that potentially an ambulance could be closer to a call when positioned at a 'posting' location versus a station, it also means that one never knows where an ambulance will respond from and thus that can lead to an extremely variable response time. This is because there may not be an ambulance 'posted' near a call and thus the responding ambulance would have to travel great distances to respond to the medical emergency. Even if ETMC were to respond with an average response time of 8 minutes, as is the case with Cypress Creek EMS, a collegiate based first response system could and would easily beat that response time, as evident from the first responder times provided by Cypress Creek EMS for their own first responder program.

Itemized List and Costs for the First Response Program Start up

1. (2-3) Kawasaki Mules--- The primary mode of transportation for the first responders. They have an MSRP at \$7000 each. This could be circumvented or at least reduced by having the maintenance department, which currently uses those exact models, donate older models of their current inventory to the program contingent upon them purchasing newer ones in the near future. Thus, by having the vehicles donated, both programs would benefit since the first response program would be getting vehicles to use and the maintenance department would have additional reasons to purchase and upgrade to newer models for their own use. Money would also need to be allocated to cover the associated fuel costs for the vehicles or a fuel allowance should be created to allow the vehicles to

refuel using the gas that is stored at the maintenance compound. Additional features for the response vehicles would also need to be purchased.

- A mini light bar for each Mule will cost approximately \$500 per light bar. No additional power source would be needed since the light bars could plug into the 12V DC port that comes standard on Mules.
- A siren for each Mule will cost approximately \$100 per siren
- A speaker for each siren on each Mule will cost approximately \$70 per speaker

The need for such additional features for each response vehicle may not be immediately apparent. Although the first responders would not be using lights and sirens in their response to on-campus emergencies, they may however need to have a means of 'scene signaling'. The need for such scene signaling is especially high at night when visibility is low, or when the location of the patient may not be easily viewable or accessible for the responding ambulance crews. The light bar, and potentially siren, would easily serve that purpose to fulfill that need for scene signaling. Would it be necessary to provide scene signaling for every call? No, certainly not. But some emergencies may warrant the use and thus the first responders should have the option available. The use of a light bar and a siren also would increase the safety for the responding ATV vehicles when they are on busy roadways by increasing the vehicles visibility and whereabouts to the other motorists. This could come into factor when crossing busy roads to reach the athletic complexes that are not directly apart of the main campus. So where one may think that the lights and sirens would be an additional liability risk, there are in fact a measure for addition safety measures for the first responders.

2. (4-5) Portable handheld Radios-- These will be the primary method for communicating with dispatch and the responding ambulance or any other personnel that may be

responding as well. Refurbished models could potentially be purchased for a total of \$600-700 dollars each. This will of course vary by model and by new vs. refurbished. New portable radios often cost as much as \$500 each however 5 new radios could be purchased for as little as \$1000.

3. (4-5) Minitor pagers-- New and refurbished models cost anywhere from \$300 to \$400. These Minitor pagers would be the primary method for signaling the first responders that there was an emergency call to respond to. A Minitor amplifier should be considered for purchased as well so that it can be placed in the office of the paid salary position / EMS room. This would allow for a Minitor to be constantly scanning without worrying about having to charge a battery and allows for a redundant backup system should a first responders pager battery die without their knowledge.

4. (4) First Aid Trauma Bags would need to be acquired which are estimated at approximately \$100 each for simply the bag. Initial supplies may need to be purchased to stock the kits as well, however, since the local ambulance service would be on what is known as a one to one exchange ratio for used items it is possible that they could initially provide the supplies. This would ensure that the supplies being used were compatible with what the ambulance service uses and would help to reduce the startup cost of the program. However should that not be the case, a fully stocked EMS trauma kit, stocked at the basic level, would cost approximately \$500 dollars per kit.

Some of the supplies typically used by first responders include:

- blood pressure cuff and stethoscope
- portable spO2 monitor for measuring blood oxygen saturation
- oxygen bottle

- automated external defibrillator
- bag-valve mask
- blood glucose meter
- general trauma supplies which include but are not limited to: gauze, sterile gauze, roller bandages, triangle bandages, petroleum gauze, cervical restriction collars, eye wash, sterile water for irrigation, trauma shears, pen light, small bandages, gloves, splints, ice packs, heat packs, and pressure bandages.

5. A computer and printer with an associated work desk inside of an office. This would be necessary so that the first responders could type up their reports and then print them out for further review and record filing. A storage / filing unit would also be needed in order to store and organize all reports that would need to be filed. A shelving unit for the storage of additional medical supplies would also need to be available as well. This could be potentially cost roughly \$2500 dollars for the necessary office supplies in this category if everything needed to be purchased including computer, printer, desks, chairs, filing unit, and storage shelves. However this could be offset by using previously used supplies, such as older computers and desks, furnished by the university. The office space would most likely need to be donated by the University however if this space needs to be physically purchased then only the University would know how much that would cost.

6. Yearly liability insurance would also need to be purchased to protect the University and the program itself from any liability that may occur and is inherent when providing medical care. Currently, the Baylor Medical Service Organization, which has a general liability insurance policy identical to what would be needed for a program such as this, pays approximately \$700 dollars annually for its insurance policy. This policy provides a three million dollar general aggregate ceiling coverage with an additional one million

personal and bodily injury ceiling. This policy also protects and covers all of the volunteers who volunteer for the organization.

7. The cost of a training program is one that is difficult to accurately determine since there are numerous factors involved in determining the associated costs. These factors include the type of course being taught, which determines the duration of a course. An EMT course is typically 120 hours of course work whereas an emergency care attendant (ECA) course is typically only 50 hours. That difference in hours equates to a difference in the amount that would need to be paid to an instructor. It is also possible that a joint training venture could be established with the local ambulance service, which again would also reduce other costs especially in the areas of providing training supplies and materials. The factor of whether or not the students who will be taking the course pay for a course tuition cost as well or if the program itself would pay for this would also need to be determined. Under a theoretical model where the program pays for the cost, and estimating approximately 30 students for an EMT class, it would cost approximately \$3000 for a class set of textbooks, and then would probably cost a minimum of \$2000 to pay for an instructor to teach the course over the duration of 120 hours. The cost of supplies as well as for miscellaneous expenses would need to be factored in as well. Typically a student looking to undergo EMT training at an academy or school can pay anywhere from \$500 to \$800 each. At an anticipated cost of \$500 per student, and for a class size of thirty students, it is feasible that \$15,000 would cover all expenses incurred from teaching the course, if the program was to pay for the training in its entirety.

8. Uniforms for the volunteers would also need to be purchased to create a look of uniformity and distinction for those who are on duty. It only makes logical sense that volunteers that join the program would be rewarded with a program supplied uniform at no additional cost to them. This, however, would cost money and thus a uniform allowance would need to be allocated for the program should this be the case. It does not make sense to have volunteers of the program, who are already donating their time and energy to volunteering for the program, to have to buy their own uniform. The actual cost of the uniforms will ultimately be determined by what is chosen to serve as the uniform. Such choices include a regular T-shirt versus an actual uniform shirt or polo, and whether or not EMT pants would be required or not. From the most professional of standpoints, an actual uniform shirt coupled with EMT pants would create a more distinct and more professional look than would a simple T-shirt and varying pants or shorts. Identification cards should be created and used as well as further identification. A uniform shirt, with a Texas Department of State Heart Services patch sewn into it costs approximately \$25. A pair of EMT pants costs about \$50 dollars. Two shirts and one pair of EMT pants should be allotted per volunteer, which would make the cost of uniforms per volunteer to be at \$100, and for an anticipated 30 members that would total \$3000 to supply uniforms. Uniform shirts should be replaced as needed, however two shirts should be able to last a year depending on the amount of wear and the same can be said about the pants as well.

In total, the approximate startup cost for this program will be based on numerous factors however, and assuming that everything would need to be purchased, the approximate startup cost would be estimated at approximately \$50,000 for the vehicles, the communication devices, the medical supplies, the training, the uniforms, and the

office supplies. However, should the major costs associated with the program be negated or reduced as previously mentioned, such as the Mules being donated and not having to purchase the medical supplies or much of the office supplies, and if the students paid for their own training, the startup cost could be reduced to a mere \$12,000 dollars. Both of those estimates include the cost of communication devices, uniforms, insurance, and of the associated costs for the lights and sirens for the response vehicles. This estimate does not include the cost of the associated salary for the paid supervisor position, which as mentioned previously should be around \$80,000 to \$100,000 for this theoretical model.

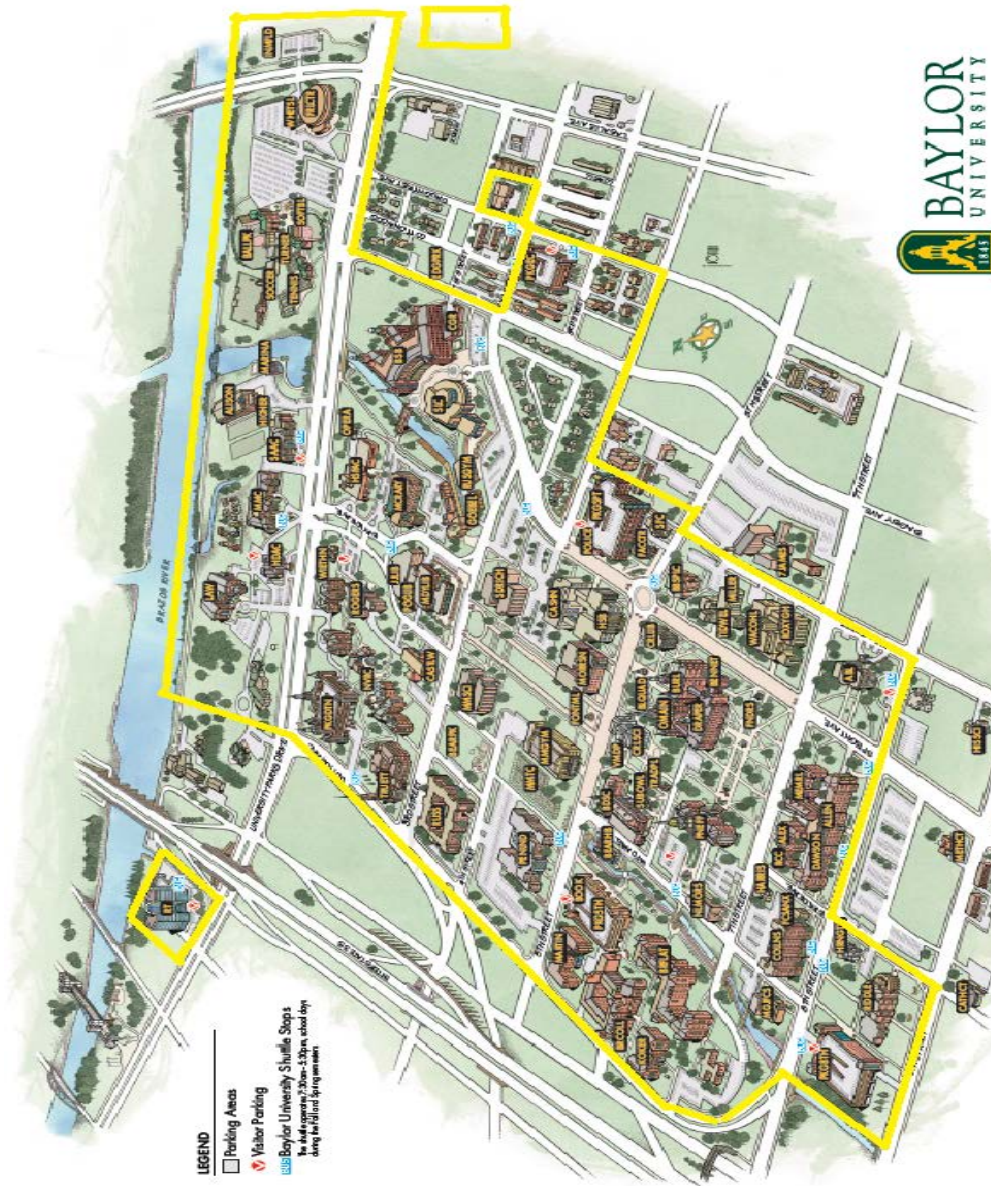
Conclusion

In summary, after analyzing the history of Baylor EMS, following a literature review of first response programs, and after a look at collegiate EMS systems in Texas, it is the conclusion of this thesis that every university and collegiate institution should implement some form of a first response program on campus. The benefits of such a program far outweigh any costs or potential liability issues that the university or collegiate system may face. The program serves to provide numerous volunteering and clinical experiences for the students involved while simultaneously providing improved emergency medical care and coverage to everyone on the campus. A first response program in the state of Texas is even more beneficial since the first response program and the university would be completely immune from liability.

APPENDICES

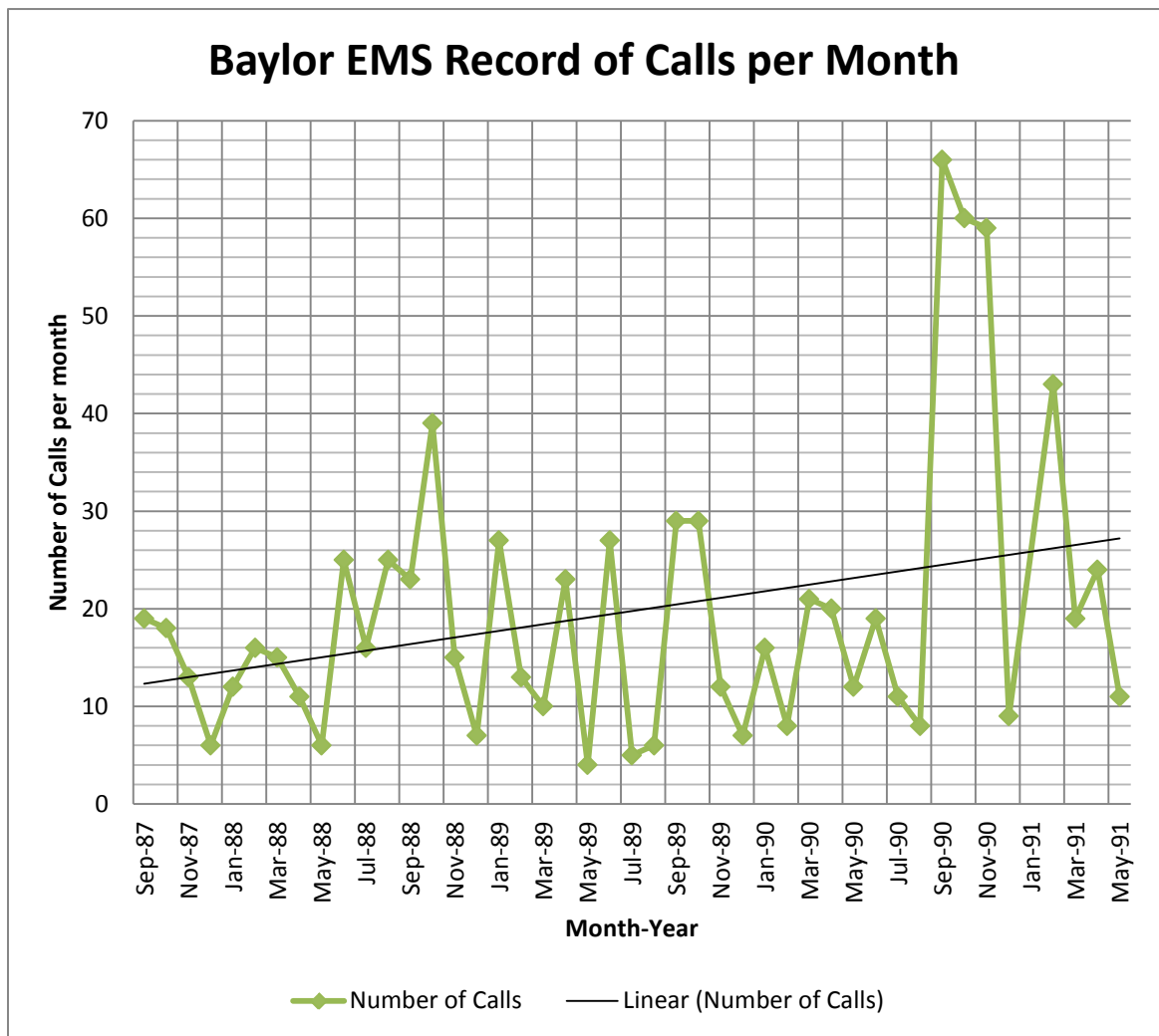
APPENDIX A

Coverage Map



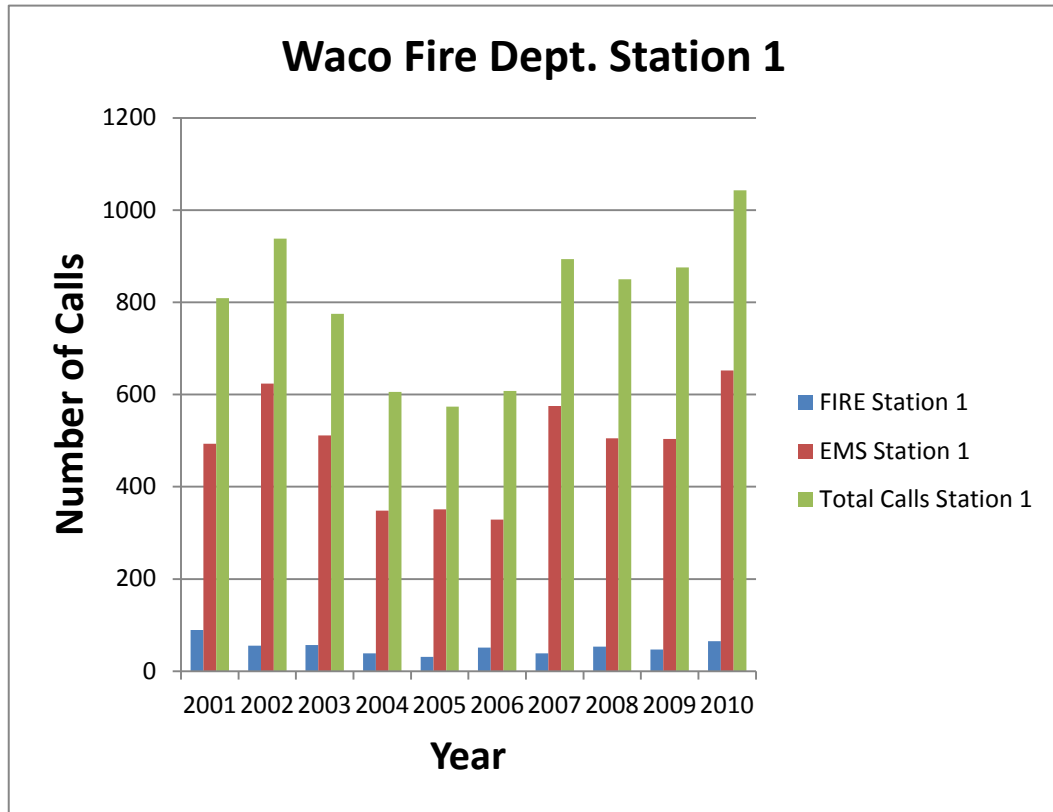
APPENDIX B

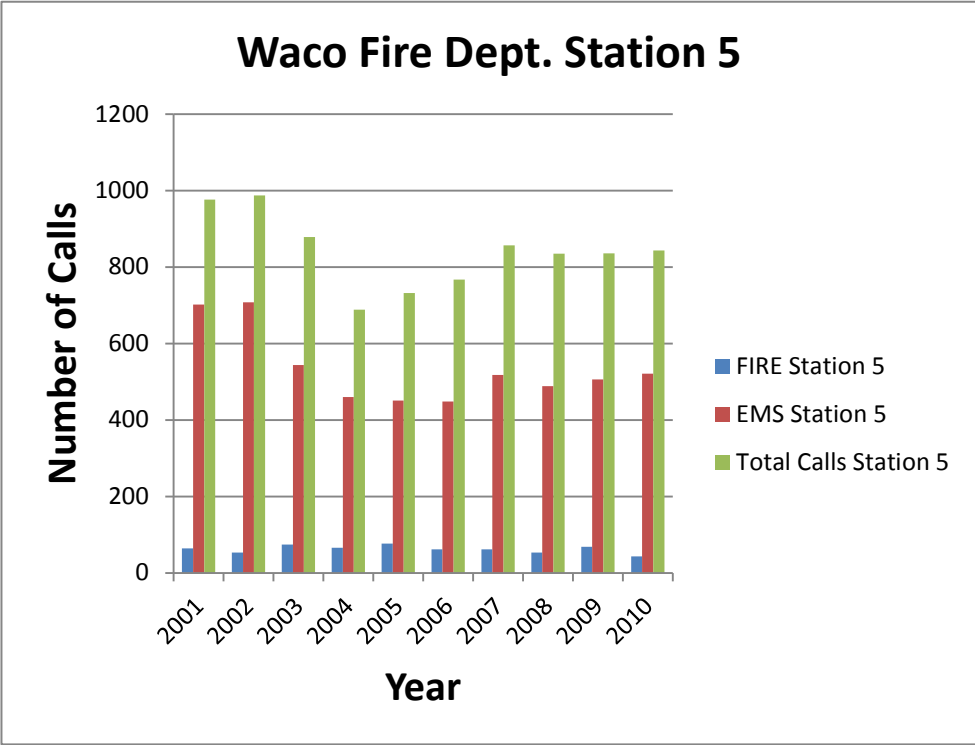
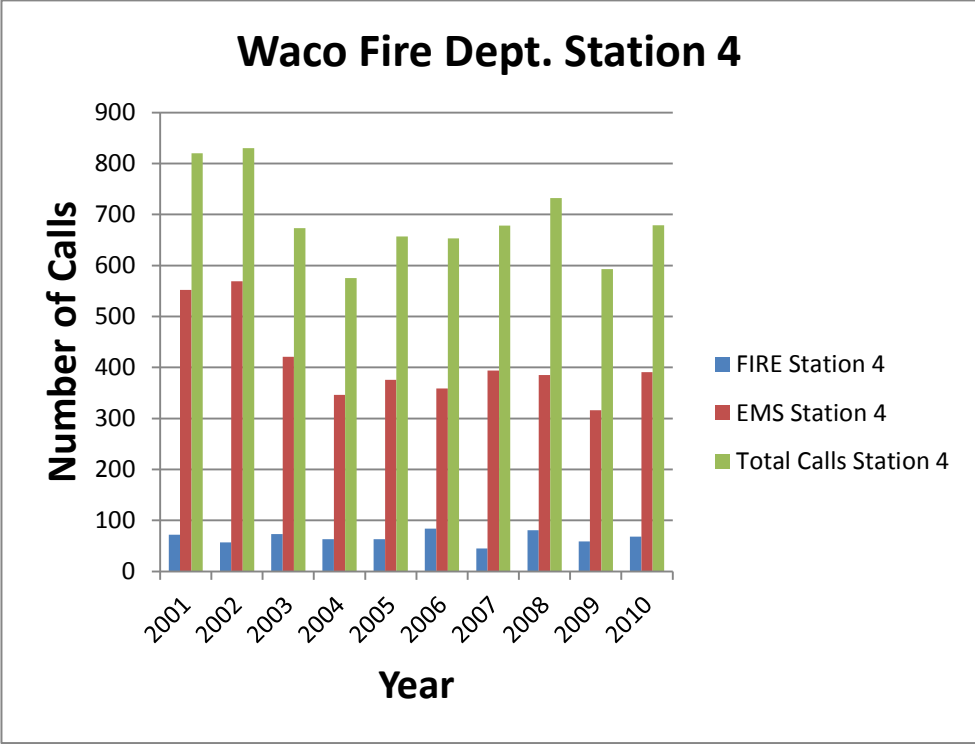
Baylor EMS Record of Calls per Month



APPENDIX C

EMS Calls to Waco F.D.





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