

ANSWERING THE CALL: ADDRESSING THE CHALLENGE OF DELIVERING EMERGENCY MEDICAL SERVICES IN RURAL NORTH DAKOTA

PREPARED FOR

**THE CITY OF
WILLISTON FIRE
DEPARTMENT**



**FRANK BATTEN SCHOOL of
LEADERSHIP and PUBLIC POLICY**
UNIVERSITY of VIRGINIA

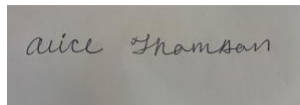
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DISCLAIMER

The author conducted this study as part of a program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other entity.

HONOR STATEMENT

On my honor, as a student, I have neither given nor received unauthorized aid on this assignment.

A rectangular box containing a handwritten signature in cursive script that reads "Alice Thomson".

A. Thomson

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EXECUTIVE SUMMARY

Emergency medical services (EMS) in the United States is currently under a huge strain due to increase call volumes and decreasing resources and staffing. The challenges that EMS faces are amplified in the rural areas of the country. Lack of access to trauma centers and hospitals that have the ability to carry out life-saving procedures are more likely to be located in areas with higher populations. That leaves rural fire departments and rescue squads with the daunting task of supplying emergency medical services over huge expanses of land with sparse populations. Agencies such as one in Williston Fire Department is one such agency that is currently under a huge strain due to lack of personnel and resources and an increase call volume.

Williston, North Dakota is a small city (approximately 7mi² in area) in the Northwest corner on North Dakota (“US Gazetteer Files,” 2012). It lies at the southern end of Williams County, an area that borders Montana and lies just below the U.S.-Canada border (“Williams County, ND”). The primary source of revenue for the area is the agricultural industry as well as the oil industry (E. Hughes, phone interview, February 2019).

The emergency medical services for the area are supplied by the Williston Fire Department (WFD). At any one time, there are three ambulances that serve not only the people of Williston, but the residents of Williams County to the North and McKenzie County to the South. Each year, the Williston Fire Department adds more square mileage to its ambulance coverage area. The volunteer rescue squads that once serviced these more rural areas are closing down at an alarming rate, leaving WFD to cover those areas. Currently, the three ambulances that are in service at any one time must cover 1,010 mi² (E. Hughes, phone interview, February 2019).

In addition to an excessive ambulance coverage area, WFD must assist the local hospital, CHI St. Alexius Health- Willison, with transfers to other facilities. The nearest level one trauma hospital is a four-hour drive away in Bismarck, North Dakota and the nearest trauma hospital that can service pediatric patients entails a six-hour transport. As a result, when a patient needs to be transported to a more specialized facility, one of the ambulances are taken out of the rotation for sometimes entire days. At times, this dismantles a fire engine, reducing WFDs ability to respond to incidents that require fire suppression units. **As a result, WFD is receiving the assistance or staffing it needs to supply emergency medical services to this unique location and population with ease.**

It is recommended that, to ease the strain on the Williston Fire Department while still maintaining its identity, a combination of new services and programs be implemented. A community paramedicine program would reduce the strain on the department by decreasing the amount and severity of medical emergencies that require an ambulance and decrease unnecessary trips to the already overcrowded emergency room. Simultaneously, the privatization of hospital transfers will increase the availability of units for 911 responses and keep fire suppression units in service more consistently.

This memorandum serves to provide information about EMS in Williston as well as around the state of North Dakota and the United States. It will ultimately analyze four policy alternatives against selected criteria and offer a recommendation on how to best increase WFDs ability to serve the residents of Williston and the surrounding areas during medical emergencies.

PROBLEM DEFINITION

The City of Williston Fire Department has a minimum staffing of three ambulances at any one time. Due to staff, volunteer, and funding shortages within the city and in the surrounding areas, the Williston Fire Department is currently left with 1,010 mi² to cover with those three ambulances. This need for resources is coupled with a population and economy that fluctuates from year to year due to oil production in the area and unique call volume due to an increase in traumatic injuries. **The government is failing to adequately respond to the unique predicament of the Williston Fire Department, an essential public service, with the resources they need to supply emergency medical services to the area with ease.**

ACRONYMS

AED- Automated External Defibrillator
CPR- Cardiopulmonary Resuscitation
EMS- Emergency Medical Services
EMT- Emergency Medical Technician
DOT- Department of Transportation
FICEMS- Federal Interagency Committee on Emergency Medical Services
IAFC- The International Association of Fire Chiefs
MD- Medical Director
ND DOH DEMS- North Dakota Department of Health Department of Emergency Medical Services
NEMSIS- The National Emergency Management System Incident System
NHTSA- National Highway Traffic Safety Administration
NFIRS- The National Fire Incident Reporting System
PELRP- Physician Education Loan Repayment Program
STEMI- S-T Segment Elevation Myocardial Infarction
USFA- The United States Fire Administration

KEY DEFINITIONS

Cardiac Arrest - “A state in which the heart fails to generate an effective and detectable blood flow; pulses are not palpable in cardiac arrest, even if muscular and electrical activity continues in the heart” (Pollack, 2019)

Community Paramedicine - “A healthcare model in which experienced paramedics receive advanced training to allow them to provide additional services in the prehospital environment, such as health evaluations, monitoring of chronic illnesses or conditions, and patient advocacy” (Pollack, 2019).

Emergency Medical Services (EMS) - “A multidisciplinary system that represents the combined efforts of several professionals and agencies to provide prehospital emergency care to sick and injured people” (Pollack, 2019).

Hemorrhagic Shock - “A condition in which low blood volume due to massive internal or external bleeding results in inadequate perfusion” (Pollack, 2019).

Fire-Based EMS System - A Fire-Based EMS System is common in the United States. Instead of having a separate rescue station or one that only houses ambulances and heavy rescue trucks, these systems combine their EMS transportation and fire service together. Having these two services combined has implications on funding and staffing for both the fire service side and the emergency medical service side of these departments. **The Williston Fire Department is a fire-based EMS system.**

Mutual Aid - The request for an outside agency to enter into another jurisdiction and deliver emergency medical or fire suppression services if the home emergency agency becomes overextended.

Myocardial Infarction - “Blockage of the arteries that supply oxygen to the heart, resulting in death to a portion of the myocardium (the heart muscle)” (Pollack, 2019). Commonly referred to as “heart attack.”

Stroke - “A loss of brain function in certain brain cells that do not get enough oxygen during a cerebrovascular accident. Usually caused by obstruction of the blood vessels in the brain that feed oxygen to the brain cells” (Pollack, 2019).

Ischemic Stroke - “One of the two main kinds of stroke; occurs when blood flow to a particular part of the brain is cut off by a blockage (for example, a clot) inside a blood vessel” (Pollack, 2019)

Trauma emergencies - “Emergencies that are the result of physical forces applied to the body; injuries” (Pollack, 2019).

Trauma Lethal Triad - “A combination of hypothermia, coagulopathy (poor blood clotting), and acidosis that is a major contributor to death in patients with severe traumatic bleeding” (Pollack, 2019).

Types of Staffing Plans for EMS/Fire Agencies

Career System - A completely career fire or EMS system is one that is given funds from a municipal government, and does not rely on volunteers for funding or staffing. Career systems maintain their own training systems and standards and function independently from any volunteer organizations.

Combination System - Combination fire/EMS systems house volunteers and paid staff. In some instances, they work on the same shifts and volunteers act as a supplement to the paid staff instituted and paid for by the municipal government. The degree to which a given department relies on volunteer firefighters and EMTs to meet adequate staffing requirements varies between organizations. In some instances, shifts are separated between volunteer and career crews, allowing for paid staff to have nights, weekends, and holidays off from work. **The Williston Fire Department is a combinations system.**

Volunteer System - A volunteer fire/EMS system is one in which all of the staffing (the administration, leadership, and the EMTs) in either an EMS or fire capacity are not compensated for their time. Although the staff often have their meals, certifications, and other training paid for, they do not receive compensation in the form of an annual or hourly wage. Although these volunteer departments do not have to pay their staff a wage, they often are responsible for their securing their own funding. Traditionally, these systems have funded their equipment, supplies, apparatus, and building maintenance through renting out their stations for public events as well as through bake sales, gun raffles and other community fundraising events, typically in more rural areas (E. Davis, phone conversation, 2019).

LOCATION AND DEMOGRAPHICS

Williston is a city in North Dakota that lies on the Western side of the state, sharing a border with Montana. Williston lies along the Southern border of Williams County¹.



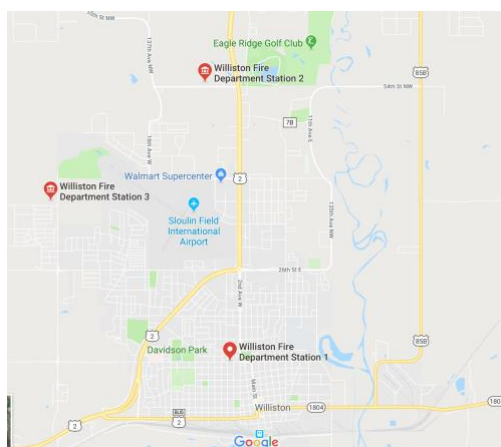
The City of Williston is approximately 7 mi² and lies at the base of Williams County in the Northwestern corner of North Dakota (“US Gazetteer Files,” 2012).

(“Williams County, ND,” 2019)



Williams County shares its Western border with the state of Montana. The entire county is 2,146mi² (“2010 Census,” 2012).

(“Williams County, ND,” 2019)



There are three local fire stations located along the perimeter of Williston. The department is currently undergoing a project to create two substations elsewhere in their jurisdiction (“Williston Fire Department”).

(“Williston, ND,” 2019)

¹ See **APPENDIX A** for more maps of the area.

BACKGROUND

To fully understand the challenges of the emergency medical services in Williston and the surrounding areas, one must understand the crisis of funding and staffing that the rest of the United States is facing in their EMS systems.

THE HISTORY OF EMS IN THE UNITED STATES

Emergency Medical Services were not supplied by local governments until the 1950s. The first transportation of the sick and injured was conducted by local funeral homes, and patients were transported in hearses to the hospital. Once the need for EMS was more established, the responsibility to provide that service was shifted onto local volunteer fire departments and hospitals due to their pre-existing infrastructure in responding to life-threatening emergencies. There was no established curriculum for emergency medical technicians until the 1960s (E. Davis, phone interview, March 2019).

The curriculum was developed by the DOT in response to the increase in fatalities resulting from traffic crashes. A report released in the 1960s concluded that, “if seriously wounded... chances of survival would be better in the zone of combat than on the average city street” (Edgerly, 2013). When EMS as an industry was in its infancy, all fire departments and rescue squads were fire-based. Although the volunteer community for fire/EMS is still quite common in the United States, especially in rural areas, combination and career systems are much more common today than they were in the 1960s, when the industry was first created (E. Davis, phone interview, March 2019).

In 2009, EMS agencies in the United States responded to **36,698,670 calls for service** (“2013 Annual Congressional Report,” 2013).

In 1965 alone, more Americans lost their lives in **traffic incidents** than U.S. soldiers lost their lives in the **Korean War** (Edgerly, 2013).

EMS IN THE FEDERAL GOVERNMENT

The representative body in charge of EMS at the federal level is composed of representatives from several member agencies, and makes up the Federal Interagency Committee on EMS (FICEMS). Representatives that serve on this committee are from the Department of Defense, Department of Health, Department of Homeland Security, the Federal Communications Commission, and the Department of Transportation. Although FICEMS does have a strategic plan and dedicated representatives from each of the aforementioned agencies, there is currently no full-time staff dedicated to the committee². The mission statement for FICEMS is as follows:

As of 2013, there were approximately **826,000 EMS providers** who have the proper credentials in the United States (“2013 Annual Congressional Report,” 2013).

² See **APPENDIX E** for the full FICEMS Organizational Chart.

“[TO] ensure coordination among Federal agencies supporting local, regional, State, tribal, and territorial emergency medical services and 911 systems to improve the delivery of EMS services throughout the nation” (“2013 Annual Congressional Report,” 2013).

Meetings that are open to the public for FICEMS are held twice a year and there have been no direct appropriations for the committee since it was established in 2006. The graphic below details the coordination between committees that, according to the 2013 FICEMS Annual Congressional Report, the communication in between the Federal agencies occurs daily, but the meetings between representatives occur monthly (“2013 Annual Congressional Report,” 2013).

According to some activist groups, there is some discontent with the slow pace that is caused by the lack of a full-time staff for FICEMS. The committee does release some position letters and analyses on matters such as the opioid crisis with information on initial patient assessment guidelines, but the ultimate the impact and effectiveness of meaningful legislation has left local EMS agencies wanting. Since the EMS industry is still considered to be under the jurisdiction of the Department of Transportation (more specifically, under the National Highway Traffic Safety Administration), the scope of legislation, appropriations, and resources that EMS has access to at the Federal level is limited.

EMS IN NORTH DAKOTA

The North Dakota Department of Health is the main governmental body that implements legislation that is relevant to EMS systems in North Dakota. This central body is a resource for local EMS agencies with regards to a plethora of issues from licensure and accreditation policies for local agencies to drug protocols that affect provider-patient interactions (“The North Dakota Emergency Medical...,” 2015).

The Rural EMS Improvement Project

In 2010, the North Dakota Department of Health conducted a project in order to lessen some of the challenges commonly faced by rural EMS agencies in North Dakota. The deliverables that were created as a result of this project was a “Rural Ambulance service Leader’s Survival Guide,” the “Volunteer Ambulance Service Sustainability: A Self-Assessment Tool”, and several others (“A Crisis and Crossroad in Rural North Dakota Emergency Medical Services,” 2011).

MISSING EMS DATA

In part due to the unorthodox start to EMS as an industry, the institutionalization and academic backing behind studies on EMS is lacking at times. There is a distinct lack of research in the field of EMS as compared to other links in the health system chain. When there is research conducted, areas like Williston are often left out of the conversation due to its secluded area and spread out population. Without a dedicated funding stream, it becomes difficult to research EMS on a national level to discover best practices for quality assessment and improvement.

There is a general issue with lack of data pertaining to fire and rescue agencies in the United States. Both lack of resources and funding attribute to the agencies being stretched so thin. Although there are national systems such as the National Fire Incident Reporting System (NFIRS) and the National

One of the main goals of FICEMS is to use evidence-based practices to improve EMS systems and many of these efforts are aimed at improving data collection. However, each state-level office of EMS is largely responsible for data collection and as well as implementing those practices. An example of the inconsistencies in EMS education and training across the United States is depicted in the image below. The map shows the lack of states that require local EMS MDs to undergo consistent continuing EMS education (“FICEMS Reports,” 2014).



SPECIAL CONSIDERATIONS FOR WILLISTON AND COSTS TO SOCIETY

A 2011 report disclosed that the volunteer EMT labor in North Dakota was worth more than \$31 million dollars a year.

Even though the declining volunteerism is part of the issue that makes providing EMS in Williston and the surrounding areas so challenging, the presence of the oil industry in the area brings about

significant challenges, too. In the same 2011 report on the state of EMS in North Dakota, it is estimated that, of the 11 ambulance services that are deemed to have had been impacted by the increase in oil extraction and exploration, there has been a 46% increase in call volume for those services- a statistic that is expected to increase exponentially as more people are attracted to the area. The Williston Fire Department is part of these systems, with a total of 11 ambulances that cover 8,746 square miles that covers four counties (“The Impact of Oil and Energy Development on Out-Of-Hospital Emergency medical Services,” 2011).

Just in March of 2011 alone, North Dakota collected \$100 million in taxes from the oil industry, and that number has since increased over the years. Even with this increase in revenue and jobs, which is extremely beneficially for the state itself, local infrastructure suffers as a result of the huge influx of people and equipment into these small communities. The impact on Williston’s population relative to the other locations in the oil impact area is seen below³.

COMMUNITY	CURRENT POPULATION	ESTIMATED PERMANENT POPULATION
New Town	2,111	2,600
Parshall	1,242	1,600
Stanley	1,532	2,000
Tioga	1,426	1,800
Watford City	1,823	2,300
Williston	16,223	20,900
TOTAL	24,357	31,200

As is shown in this graphic, Williston has taken on and will continue to take on one of the most dramatic population changes. This data was taken from 2011. According to the United States Census Bureau, the population of Williston was 25,072 in 2017- even higher than the estimated permanent population for Williston in the table above (“Williston, ND” 2017).

**As a result, the population of Williston has increased
by 35.3% in 8 years.**

Referenced in **APPENDIX C** is data that documents the call volume in Williston by month from 2015 through to the current data in 2019. Just from the years between 2015-2018, the WFD has experienced a significant increase in call volume that corresponds to the population increase noted above. In 2015, the WFD responded to 2,668 emergencies and in 2018 they responded to 3,653. This **27.4% increase** in call volume between in three years is rising alongside the increase in population noted above (“Williston Fire Department” 2019).

Cost to Society: Medical and Traumatic Injuries

Not all calls to 911 are cases in which minutes count. However, there are certain medical conditions in which minutes, and sometimes seconds count and can mean the difference between life, permanent disability, or death for the patients who need emergency medical services. The Williston

³ The table shown here was reformatted from the original and was taken from the Oil Impact Final Report produced by the North Dakota Department of Health (“The Impact of Oil and Energy...,” 2011).

Fire Department, like most EMS agencies, have specific protocols for certain serious medical emergencies (see those specific protocols attached in **APPENDIX B**). The most commonly discussed life-threatening conditions in an emergency scenario are strokes, cardiac arrest, and traumatic injuries.

STROKE

According to a 2012 study published by the American Heart Association, when medical centers are notified of an incoming stroke patient ahead of time by EMS units, the condition of the stroke patient improves and the treatment of the patient is more effective (Lin, 2012). When patients suffer from an ischemic stroke (a blood clot in the brain) the use of tissue-plasminogen activator (tPA) may only be used within a certain time frame relative to the onset of symptoms. When an EMS unit is able to notify a medical facility of their imminent arrival, the time needed to set up the medication and get the patient prepped for the medication is minimized. According to the American Stroke Association (ASA), the patient must be seen by medical professionals within a 3.5-4-hour window after the onset of stroke symptoms. According to the study, EMS may be used as a vital way to increase survivability and quality of life through increasing the chances of tPA being an appropriate treatment in order to improve the quality of care for ischemic stroke patients. The study showed that, “with EMS prenotification, the onset-to-door times were lower, and more eligible patients were treated with tPA within 120 minutes of symptom onset” (Lin, 2012).

CARDIAC ARREST

Cardiac arrest can sometimes happen without warning. The studies on the most effective action that an EMS crew can conduct in an attempt to resuscitate a patient in cardiac arrest is extensive. The main point of the research is that the early CPR, AED application, and faster transport times to the nearest medical facility will increase the chances of survival for a patient. According to studies such as the one conducted on the Scottish Ambulance Service, there are significant correlations between survival rate and ambulance response times. According to the study, “ambulance response time is a significant independent predictor of both defibrillation and survival to discharge” (Pell, 2001). The American Heart Association’s “chain of survival” consists of several features including rapid access to EMS (Pell, 2001). The implications of this are that with each minute that goes by, the odds of the patient survival decrease significantly.






TRAUMATIC INJURIES

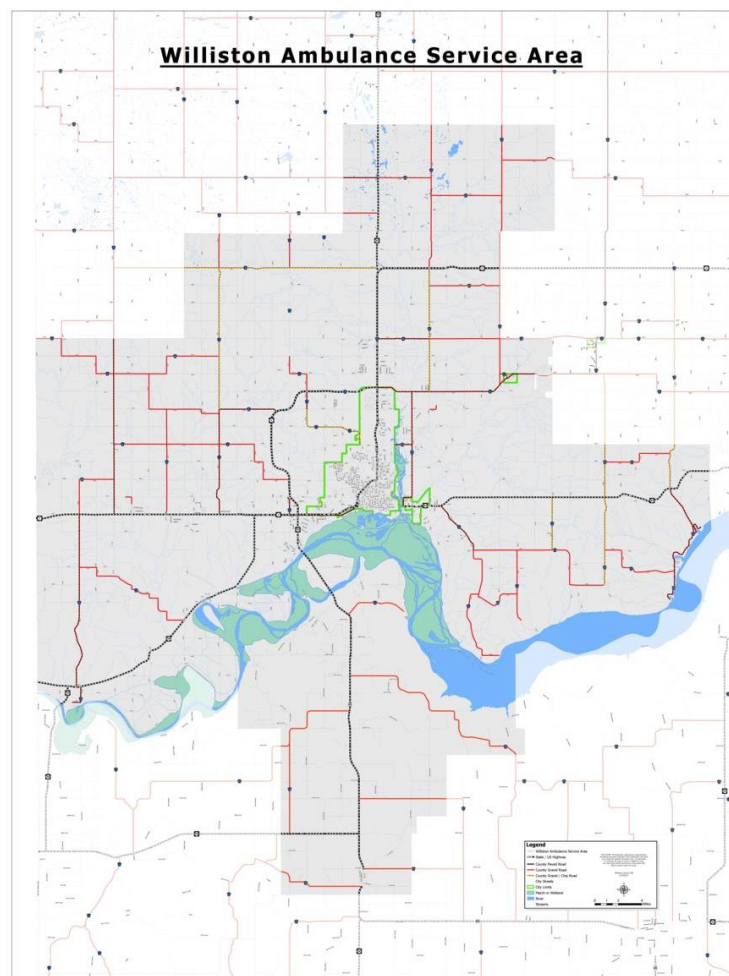
If a patient is in hemorrhagic shock, they can bleed out in as little as five minutes (“Stop the Bleed”). In addition, uncontrolled bleeding is the number one cause of death in traumatic injuries. If traumatic injuries are not handled by a medical professional within a timely manner, the trauma lethal triad will begin to set in, which is when the effects of blood loss and shock become irreversible (“Williston Fire Department”). Trauma is a large consideration for Williston. The oil and agricultural industries involve work that can sometimes be dangerous and may increase the likelihood of traumatic. In addition, WFD has recently responded to a high number of suicides in the area (“End of Year Report 2018,” 2018).

The most prevalent major EMS call type in 2018 for the WFD was traumatic injuries at 27.4% of all 911 EMS incidents (“End of Year Report 2018,” 2018).

EMERGENCY MEDICAL SERVICES IN WILLISTON

The map to the right depicts the Williston City limits in relation to the ambulance service area. The city limits are outlined in the center of the image in the bright green line and the ambulance area branches into Williams County and McKenzie County to the South (see Appendix D for a full-size version of this map) (“Williston Fire Department,” 2019). The maximum response time to the areas on the outskirts of this area are at times upwards of 40 minutes. According to a 2017 study of 2015 response time data in the United States, the average response time for EMS units is 7 minutes from the time a member of the public calls 911 to when the EMS unit arrives, which included dispatch time. The median response time for rural areas is 14 minutes, and 10% of medical emergencies that require an ambulance must wait almost 30 minutes until an EMT arrives (Seaman, 2017).

-  Williston Ambulance Service Area⁴
-  City Limits
-  County Gravel Road
-  County Paved Road
-  River



⁴ An expanded version of the key that is included as an inset in the image above.

These data show that the response times into some of the areas in which the Williston Fire Department requires a response time that is much longer than the national average. These longer transport times have large implications for the citizens that live in the unincorporated areas outside of Williston, but still rely on the city's emergency medical services in a time of need. Buford, Corinth, Hamlet, Hanks, McGregor, Trenton, and Zahl are the unincorporated communities in Williams county that rely on WFD for their potential emergency medical service needs.

Response Times (minutes)	Percentage (%)
4:59 or less	43.52
5:00-7:59	31.22
8:00-8:59	5.22
9:00-9:59	3.44
10:00-30:00	14.88

ANALYSIS

EVALUATIVE CRITERIA

The following criteria were chosen based on the unique needs of the WFD and the citizens they serve. Not only were economic costs and sustainability taken into account for these criteria, but also the continuity of care that is essential to maintain in any EMS system.

Criterion 1: Institutional feasibility⁵

The traditions and culture of the fire service are long-standing and deeply entrenched in fire departments across the country. The culture amongst those who provide emergency services differs from other public services such as education or public utilities due to dealing with extreme circumstances through a persistent threat to the life and health as well as the dedication involved in being an EMT or firefighter. These traditions have helped carry the fire service through some difficult shifts in identity, but have also served as a point of contention at times. In some areas, there is a division between the supply of medical and fire-based services that defines the culture of the departments that provide them. Volunteer-based and career departments also face a fundamental difference of opinion on certain aspects of the fire service and EMS provision. Each system has its own cultural norms that are unique to the group of first responders that serve in that particular area. Admittedly, change and growth is sometimes imminent and necessary for progress especially in response to rapid increases in population and call volume. However, in order to respect the organizational culture and identity of the WFD, the policy option should take steps to preserve that unique perspective as well as possible. **The recommendation must be sensitive to Williston Fire Department's own organizational and institutional culture, especially if a large structural reorganization is a part of the chosen solution.**

Low: The policy option would receive significant resistance from within the preexisting Williston Fire Department.

Medium/neutral: The policy option would receive a neutral response from within the preexisting Williston Fire Department.

High: The policy option would be positively received by the majority of the preexisting Williston Fire Department.

Criterion 2: Political feasibility⁶

The oil and agricultural industries are the two biggest sources of income and jobs for the people in and around the city of Williston. The city depends on these two industries for its survival, and understandably must protect the strong holds the oil companies and farm-owners have. **The chosen recommendation must fit within the parameters of the presence of these two**

⁵ The ratings of institutional feasibility in the outcome's matrix section are based on a discussion with Chief Emily Hughes, EMS Chief of the Williston Fire Department.

⁶ The ratings of political feasibility in the outcome's matrix section are based the climate of the local Williston City Council and other large stakeholders on a discussion with Chief Emily Hughes, EMS Chief of the Williston Fire Department.

industries in and around the jurisdiction as well as within the parameters of the local government in Williston- the entity that is responsible for the allocation of local taxes to the department. Much of the human capital that is already available in the area is already dedicated to the agricultural and oil industries, and the final recommendation must take that limitation into account.

Low: The policy option would receive significant resistance from the local government and other large stakeholders in the area.

Medium/neutral: The policy option would receive a neutral response from the local government and other large stakeholders in the area.

High: The policy option would be positively received by the majority of the local government and other large stakeholders in the area.

Criterion 3: Cost

The Williston Fire Department's annual budget allocated to them each year by the City Council is \$7.5 million, but there has been significant fluctuation in this allocation over the years due to the rise in population and call volume. For instance, the budget 2014 was \$4 million, whereas in 2019 it was \$9 million. There is currently a county-wide 1% sales tax that is split evenly between county and city departments⁷ (Hughes, E., email correspondence, 2019). The solution cannot significantly exceed that budget or any budget that might be allocated to the department. Even though the presence of oil companies increases the Williston population and the call volume for the fire department, the city council is often unable to increase the funds for the department in a completely proportional way since the population can fluctuate so much from year to year depending on the oil industry's revenue and workforce. **The final recommendation cannot exceed the allocation of funds given to the Williston Fire Department for emergency medical service use (which was \$9 million in the budget for 2019).**

Low: The policy option could potentially increase the cost of supplying EMS in the current ambulance coverage area.

Medium/neutral: The policy option keeps the cost of supplying EMS in the current ambulance coverage area the same as it currently is.

High: The policy option could potentially decrease the cost of supplying EMS in the current ambulance coverage area.

Criterion 4: Effectiveness

The effectiveness of the ultimate recommendation will be measured by the projected change in ambulance response times. The effectiveness of each option is based off of the degree to which that option will decrease response times in minutes. An effective option will reduce average response times either by increasing supply of resources that are available to respond to medical emergencies

⁷ The exact formula for calculating this amount is unknown by the client, as that appropriations process is completed by an entity outside of the WFD.

or by reducing demand and ultimately decreasing the call volume. **Ultimately, the final recommendation should effectively reduce response times in order to increase the chances of survival of those that rely on WFD for their EMS needs.**

Low: The policy option could potentially increase response times in the WFD ambulance coverage areas.

Medium/neutral: The policy option would have no effect on response times in the WFD ambulance coverage areas.

High: The policy option could potentially decrease response times in the WFD ambulance coverage areas.

Criterion 5: Continuity of care and service

In order to maintain the mission of answering 911 calls when the public is in need, the transition into the final recommendation must remain consistent. There must not be any gaps in the preexisting service to the citizens that rely on Williston's EMS. A failure to meet this criterion effectively would look like a substantial increase in response times or inability to staff open spots on ambulances and fire engines. As it stands, when all three regularly-staffed ambulances are dispatched to calls, staffing for another ambulance to cover the remainder of the EMS calls comes from those who are scheduled to staff fire suppression units. Therefore, the fire suppression services are affected when ambulance staffing is not adequate. **This criterion attempts to recognize that fire and EMS services must be maintained and must not be affected or diminished by the final recommendation.**

Low: The policy option could potentially decrease the units available that are supplying EMS in the current ambulance coverage area, creating an adverse effect on the citizens' that rely on WFD's EMS services.

Medium/neutral: The policy option keeps the number of units available consistent with present trends.

High: The policy option could potentially increase the units available to respond to medical emergencies in the jurisdiction.

PRESENT TRENDS: SUMMARY

The Williston Fire Department is not facing the issues of funding and staffing shortages alone. Virtually every EMS provider in the country, in both rural and urban areas, are facing a similar crisis. If present trends were to continue, then the call volume will continue to grow and the amount of EMS that Williston Fire Department is able to provide will remain stagnant and potentially even decrease. If this does happen, the current support that the fire department receives from the local government may be a good indicator that, eventually, the City of Williston may step in and appropriate more funds to the fire department.

POLICY ALTERNATIVES: SUMMARY

The following policy alternatives are suggested based on research of current best practices and case studies surrounding EMS provision in the United States.

Option 1: Community Paramedicine

The International Roundtable on Community Paramedicine (IRCP) defines “rural” as “smaller villages, settlements and less densely populated regions where resources are limited, and provision of care is challenged by longer response times, limited shared resources, low population density, and greater distances between centers.” (“International Roundtable on Community Paramedicine”). Eagle County Community Paramedics (ECCP) in Colorado has been one of the most successful paramedicine programs in the nation. The area is classified as a rural area, and they use the program to make home visits to patients who have chronic medical issues. Although this does not reduce call volume load put on EMS for traumatic injuries, it does reduce the number of residents calling 911 for a medical issue that could potentially not be time-sensitive if their chronic conditions are managed appropriately. The expansion of the EMS into a role in public health and preventative care is also a response to decreased insurance rates among the rural residents of an area. In the ECCP program, the education for the providers was offered by a local community college, and grant funding for the program came from state and local sources.

It is projected that in a 12-month period the program prevented 26 unnecessary ER visits for an average savings of \$1,969 per visit and \$280,000 in total healthcare costs saved. (“Eagle County Paramedic Services”). The challenges with implementing the program involved funding and regulatory challenges. The funding issues were due to a lack of funding streams for new startups in general, and regulatory issues arose since there was no “formal recognition in this new branch of EMS personnel.” The Rugby Community Paramedic Program is a similar program, but conducted in North Dakota and is in a much earlier stage than Eagle County Community Paramedic Program.

The Rugby program is the pilot project for the North Dakota Department of Health Community Paramedic Program. The goal of this program is to fill the gaps in the health system that naturally exist when there are so few 911 response units to respond to large rural areas. The program covers five counties whose EMS agencies all suffer from similar symptoms to Williston: low patient volume in surrounding areas, a shortage of EMS volunteers, and a population to serve that is increasingly aging. As aforementioned, Williston must also deal with the effects of the increased presence of the oil and energy industry in the area, but once the Rugby Program is considered a success, it may be easier to consider a program such as this one in Williston and the surrounding Williams county.

Typically, there is an increased number of educated individuals who are needed to institute a program such as the Eagle County or Rugby Programs. The units that go out to visit patients in some programs sometimes require a licensed nurse practitioner and a paramedic on the rig. Community Paramedicine programs are becoming increasingly popular not only in rural areas in the United States, but also in large urban cities that deal with their own limitations of getting residents (especially sick and elderly) access to the healthcare that they need.

Option 2: Privatization of Industry

As it stands, the emergency medical services are fully provided to the ambulance coverage area shown in the map in **APPENDIX D** in and around Williston by a public entity. The WFD is a 501(c)(3) organization and does not turn a profit off of the transports to the hospital. In many areas around the country, EMS is provided by a private company. These companies, as their own separate entity are able to sustain themselves off of the transports they make to the hospital and between medical centers and are not as fiscally constrained as the publicly funded agencies.

Nearby to Williston lies Richland county, home to the highest-grossing oil refinery in Montana. While there is a similar oil industry to Williston in Richland county, along with a large rural population, the Richland County Volunteer Ambulance Service is supplemented by a private ambulance service in the Sidney Health Center, the local hospital. This serves as a low-cost way for the volunteer service to stay afloat without having to worry about the cost of equipment and supplies (“Regional Impact Analysis”). It is also a well-researched fact that the privatization of EMS is more likely in small cities with limited access to hospitals (David & Chiang, 2009).

Option 3: Increase Grant Applications

Due to the high call volume in Williston as well as in the large expanse around the area, the WFD does not qualify for any state EMS grants that are usually offered to the more rural areas in North Dakota. The ND DOH published a study on how the oil industry has impacted certain EMS agencies. As a result, for additional money outside of the allocations to the WFD from the city council, the department applies for federal grants to support them. Although there are some grant programs that exist for agencies just like Williston- fire departments that provide EMS to rural areas- the competition for these grants are extremely high.

In some instances, additional money that is granted to a department has been used to create new grant programs in order to attract medical professionals to an area. Although there is no readily-available data on grant programs or subsidized education programs to get paramedics specifically to come to underserved areas, other kinds of medical professionals such as doctors, dentists, and nurses have been incentivized to work in underserved areas by having some of their education subsidized by these grant programs.

In Texas, there are programs that grant medical students funds while they are in school if they are willing to be a physician in an underserved area of the state once they graduate from medical school (“Texas Physician Education”). The Texas Physician Education Loan Repayment Program (PELRP) allows physicians in certain fields such as obstetrics, psychiatry, and geriatrics to qualify for up to \$160,000 over a four-year period as an incentive to work in some of the underserved areas in Texas.

The North Dakota Health Care Professional Student Loan Repayment Program is run by the North Dakota Department of Health and offers matching loan assistance for healthcare professionals who work in certain underserved areas. Currently, this program is only offered to professionals such as physicians, nurses, psychologists, and physicians assistants. If this program were to be expanded to paramedics that serve in the same underserved areas, the EMS world could see some of the same success that this loan repayment generates for the other professions (“North Dakota Health Care”).

Option 4: Redirect Recruitment Efforts Towards Volunteers in Surrounding Areas and Reinstatement of Volunteer Rescue Squads in the More Rural Areas

The reason why there is an increasing strain on the Williston Fire Department each year is because the volunteer rescue squads that used to service the surrounding areas are closing down. If there was a reinstatement of volunteers in these areas, then some of the strain would be taken off of the small amount of ambulances that run out of Williston.

Ultimately, a more robust volunteer workforce would assist in recreating some of the rescue squads that were not able to stay open over the last decade. The long-standing tradition of neighbors helping neighbors in their time of need has not been sustainable because the majority of the volunteers get increasingly older, while younger generations did not take over the mission of providing EMS to the area. In Williston, working for the oil industry or in agriculture is often more lucrative than having a career in EMS, and oftentimes the level of care that paramedics are capable of providing requires a 2-year long course to get certified, which many residents are not willing to go through without wage compensation in return. As a result, this option would entail some creative recruitment techniques to tap into certain populations in order to gain new volunteers. Approaches such as using the local high school to teach an EMT course so high school students have their certification right after they leave high school could potentially relieve some of the strain.

One of the issues of tapping into the population that exists in Williston, is the volatility from year to year. According to the Chief Emily Hughes, EMS chief of the WFD, people tend to follow where the most oil excavation and exploration occurs at a given time, and do not necessarily stay in the same place for too long, which would not be conducive to volunteering in fire/EMS. In addition, the WFD is already employing some of the recruitment recourses made available to them through the International Association of Fire Chiefs (IAFC), so this policy alternative would be increasing preexisting efforts of the department.

OUTCOMES MATRIX

The following graphic summarizes each of the four policy alternatives against the five criteria explained above. Although it is not a policy option, each option is compared to letting the present trends continue. The policy options are divided into two broad categories: the decrease of demand by decreasing call volume and the increase of supply of resources for the department. Decreased demand on the system is more focused on getting to the root of the high call volume and decreasing the need for more resources. Increasing the resources for the department is more focused on accumulating more funding and more staffing in order to respond to the increasing call volume in the area.

DECREASE DEMAND				INCREASE SUPPLY	
	Option 1: Community Paramedicine	Option 2: Privatization	Let Present Trends Continue	Option 3: Increase Grant Applications	Option 4: Recruit Volunteers
Political feasibility	<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>High</i>	<i>High</i>
Cost⁸	<i>Low</i>	<i>High</i>	<i>Medium</i>	<i>Medium</i>	<i>Low</i>
Institutional feasibility	<i>High</i>	<i>Low</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>
Continuity of care	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>Medium</i>	<i>Low</i>
Effectiveness	<i>High</i>	<i>High</i>	<i>Low</i>	<i>Medium</i>	<i>Low</i>

⁸ A reminder that, in this analysis, a marker of “low” for the cost criteria translates as costing more than

Weighing the Criteria Against Present Trends

Criterion 1: Institutional feasibility

Low. The institutional feasibility of this option is naturally very high, because it does not involve a change from the traditions that are already instated for the Department.

Criterion 2: Political feasibility

High. The local government is very supportive of the Williston Fire Department, and any funding that may constrain WFD is not due to a poor relationship or lack of support. The local government as well as the citizens of Williston are very supportive of the department, as there is a portion of the community that gives back their time as volunteer firefighters when they can.

Criterion 3: Cost

Medium. The cost of keeping the present trends as they are is ranked as “medium” because, although it would the average cost to the department would assumedly stay the same if no changes were implemented, it would technically not save the department or the city council any money. There is a standard formula used to determine how much money that WFD must be allocated based on previous years, population, and related call volume which would keep the cost constant if the present trends were allowed to continue.

Criterion 4: Effectiveness

Low. If present trends continue, the response times required for the area of Williston and the surrounding areas would increase.

Criterion 5: Continuity of Care

Low. Similar to the reasons why the effectiveness is projected to be lower to maintain the present trends, the continuity of care would be low for this option. The present trends show that population and call volume will continue to increase, meaning an increasing strain on the department. With higher demand and the same amount of resources, some residents of Williston may experience a decrease in WFDs ability to provide them with emergency medical care, especially if they live in some of the outlying areas of the ambulance coverage area.

Summary of Present Trends

Pros: high organizational feasibility

Cons: low sustainability; projected to increase response times in the area

EVALUATION OF OPTIONS

OPTION 1: Community Paramedicine (CP)

Criterion 1: Institutional feasibility

High. This option would maintain much of the preexisting identity of the Williston Fire Department effectively.

Criterion 2: Political feasibility

Low. The implementation of a community paramedicine program is not a new idea for the Williston Fire Department. A similar type of program has been mentioned before, but has received pushback from certain groups. Those groups see a CP program as a threat to their own status, and may need to be negotiated with if WFD were to move forward with this option.

Criterion 3: Cost

Low. Although there are costs associated with the implementation of such a new program, CP Programs also require specialized personnel such as nurse practitioners in order for the program to be effective.

Criterion 4: Effectiveness

High. The effectiveness of community paramedicine programs has been proven in many different states in the country, including elsewhere in North Dakota. The results of community paramedicine program consistently result in fewer visits to the emergency room for exacerbation of chronic conditions and an average savings in healthcare for both the patient and for those who provide their healthcare.

Criterion 5: Continuity of Care

High. The outlook for continuity of care for a CP program is good, as long as the transition period is long enough. For the first part of the programs implementation, the current system must remain in place.

Summary of Option 1

Pros: large amount of research on programs that have been implemented elsewhere

Cons: pushback from local nursing unions

OPTION 2: Privatization

Criterion 1: Institutional feasibility

Low. The institutional feasibility of privatizing the 911 emergency medical responses for Williston would be extremely low. In order to have a private ambulance service come into the area and begin to provide emergency medical services would damage the traditions and the commitment to the community that the fire department have held steadfast for so long.

Criterion 2: Political feasibility

Medium. The likelihood of a private ambulance service providing the emergency medical services for the whole area that the WFD is responsible for is uncertain. The majority of the ambulance coverage area that the WFD is responsible for is mostly made up of unincorporated areas, as other cities that are similar size to Williston can provide their own EMS, and a private service may not be legally bound to venture outside of Williston.

Criterion 3: Cost

High. The economic costs of this would not directly be attributed to the WFD. The implementation costs as well as the initial purchase of the equipment, supplies, and ambulances would come from the hospital itself or the private ambulance company that enters the market, but would also serve as a potential source of revenue for the hospital. As the City of Williston Fire Department is a 501(c)(3), the WFD does not gain any revenue from the hospital transfers that it serves for. For this reason, they technically would not be losing a profit from this option.

Criterion 4: Effectiveness

High. The effectiveness of the private ambulance service would rely heavily on the resources and budget of the company (or companies) that entered the EMS provision market. The amount of ambulances that the company was willing to supply in the area would be largely dependent on call type and area.

Criterion 5: Continuity of Care

Medium. In a similar sense as with the “political feasibility” criterion, the ability for a privatized ambulance service to service the full ambulance service area that the WFD actually does is questionable. The legal obligation that the privatized service has to those areas is not explicit, and the ties to the community that the WFD does have, makes the commitment to the areas that lie far outside of the county a grey area. It is unclear as to whether the ambulance coverage area would remain as large as it currently is if there was to be a privatized service.

It is possible that the privatized service can expand its stations into areas the Williston Fire Department was not able to reach. Further research is needed on if some of the volunteer rescue squads that have closed down are still standing, and those stations may be available for use as new substations.

Summary of Option 2

Pros: Decrease strain on the department; will keep more ambulances in the rotation for longer periods of time; will keep fire suppression units in service with more certainty

Cons: low institutional feasibility; continuity of care for residents at the outskirts of the ambulance coverage area (the unincorporated areas) is not certain

OPTION 3: Grants

Criterion 1: Institutional feasibility

Medium. Due to the preexisting time already invested in applying for grants, the institutional feasibility is medium for this option.

Criterion 2: Political feasibility

High. As aforementioned in the background section of the report, the call volume that WFD experiences disqualifies them from applying for any of the state-funded grants for emergency medical services. Although WFD does supply such a large rural area, the call volume that is increased by the city itself and the growing population disqualifies it from receiving the North Dakota State grants that are reserved for providers that supply truly rural and frontier areas. Therefor the increase in grant application is high for this criterion.

Criterion 3: Cost

Medium. The increase cost of this option would lie in the opportunity cost involved in WFD administration applying for grants rather than fulfilling other duties. There are not many other costs associated with this option.

Criterion 4: Effectiveness

Medium. Increased money doesn't necessarily mean increased people or resources. The effectiveness of this option depends heavily on the use of the grant funding. Although there are more resources and more money to buy supplies, equipment, and units, that still does not ultimately mean that there will be qualified paramedics that will not only apply for available positions, but ones that will stay there, too. The average rate of retention for the paramedics in WFD is about 2 years, and it takes about the same amount of time to become certified as a paramedic. In order to increase effectiveness, the grant money gained from this option would need to be implemented in conjunction with one of the education subsidy/incentive programs mentioned earlier in the description of this policy option.

Criterion 5: Continuity of Care

Medium. The grant application process can sometimes attribute to a high degree of variation in the resources that are available to the WFD.

Summary of Option 3

Pros: Infrastructure/administration already in place

Cons: Opportunity cost of administration time and resources, continued lack of paramedics available for hire

OPTION 4: Increase Efforts to Recruit Volunteers

Criterion 1: Institutional feasibility

High. The institutional feasibility is high for this option. The recruitment of more volunteers will not have a significant impact on the institutional feasibility of this option.

Criterion 2: Political feasibility

High. The political feasibility will also be high for this option. Gaining volunteers to increase staffing is looked upon favorably by local government as it is a low-cost option and tends to bring the community together as a cohesive unit, especially in an area in which the population may fluctuate based on the oil and agricultural industries.

Criterion 3: Cost

Low. While there are some costs associated with this option, they are negligible compared to the amount that is saved by a volunteer firefighter/EMT subsidy.

Criterion 4: Effectiveness

Low. An influx of volunteers would make more units available at a more consistent rate, and therefore decrease response times overtime. However, the lack of available people will constrain the legitimate effect that increasing efforts to recruit volunteers would have on response times.

Criterion 5: Continuity of Care

Low. Since there are so few volunteers that have their paramedic certification, the volunteers may not contribute in a significant way to the high-quality advanced life support that the residents of Williston need.

Summary of Option 4

Pros: High organizational and institutional feasibility

Cons: continuity of care and sustainability uncertain

FINAL RECOMMENDATION

This research supports the implementation of a primary option and a secondary option. Primarily, due to cost saved and improvement of long-term care in the area, there should be an institution of **Option 1, a community paramedicine** program in Williston. The effectiveness of such programs has been proven not only in both rural and urban areas in the country, but also elsewhere in North Dakota.

SECONDARY RECOMMENDATION

My secondary recommendation for the area is a reduced implementation of **Option 2: the privatization** and only the privatization of inter-facility transfers. There is a huge amount of time and resources that are taken away from the WFD through the transfers between hospitals. Using this approach would not only protect the integrity of the traditions of providing 911 response to the original ambulance coverage area, but would alleviate some of the strain on the system by taking away the hospital transfer consideration.

It is projected that both of these options together would effectively reduce the call volume on the emergency services as well as allow more ambulances to be available to respond to emergencies. Due to the high percentage of traumatic injuries that occur as a result of resident's work in the agricultural and oil industries, the availability of 911 response units is imperative to the safety and well-being of the residents of Williston.

IMPLEMENTATION

In order to implement these programs, it is recommended that further research is conducted into community paramedicine programs that cover areas that are similar to Williston. There are already programs in place in the country that cover wide stretches of rural land, and studying the process of those programs would be helpful. In addition, time will be needed to locate and hire certain professionals such as nurse practitioners and critical care paramedics in order to provide the necessary care for the residents of Williams, Williston, and McKenzie.

There are certain programs, with the proper funding and implementation that may be used to incentivize these professionals to travel to the Williston area. Since one of the issues with retaining and recruiting paramedics is the smaller hiring pool in the area to begin with, there is most likely a shortage of nurse practitioners and otherwise qualified critical care paramedics in the area, also. In attempt to rectify this process, it is recommended that more research is conducted on rural practice grants and educational subsidies for practitioners while they are in school acquiring their certification to practice. Programs such as these exist for doctors, dentists, and some nursing programs, but no such research exists on retaining critical care paramedics. In addition, a good relationship with the hospital is necessary for the implementation of both of these recommendations.

THE FUTURE OF EMS IN THE UNITED STATES: A PATH FORWARD

Emergency medical services are an essential public service. Currently, EMS does not receive the appropriations, resources, or attention from the US government that it needs to fulfill its purpose for the community. Departments such as Williston are put under tremendous strain, and the emergency medical providers must handle huge call loads on top of their already stressful career path must be better protected. To provide more resources to public agencies that provide emergency services, especially EMS, would be beneficial to the consumers of the service: every citizen of the United States that could need emergency medical attention at any time. EMS was born out of a primarily volunteer effort for neighbors to help neighbors get the help they need in times of struggle and despair. Overtime, the culture shifted and the fire service became more professional, however, the rescue squads who only provided EMS with no fire suppression capabilities were left out of the improvement of emergency services as many rural squads remained volunteer. **EMS as an entity is grappling with the need to be a professionalized and institutionalized field without the resources to allow it to get there.** Increased legislative and fiscal support in local areas such as Williston is one way in which it will get there. Creating an easier path for high school and college students to get their associates or bachelor's degree in paramedicine would not only lead to the legitimization of EMS in rural areas, but would attract future funding to the smaller departments that provide EMS to communities like the ones in the surrounding counties in Williston.

There is not a state in the United States that is not currently facing the challenges that the Williston Fire Department is facing. The county has relied the volunteerism of community members for so long, but the ability of those people to continue to serve is waning, and therefore participation is waning too. As a result, communities such as Williston are suffering and being forced to stretch their EMS resources too thin.

Lastly, although it is of the utmost importance to protect the public from injuries and medical emergencies when possible, there must also be steps taken to protect the first responders that carry out these essential public services. When there is more robust data-taking and more solid infrastructure in place, it becomes easier to for first responders to deliver compassionate and high-quality care. Therefore we must take steps to maintain the physical, mental, and emotional well-being of the fire and EMS personnel, no matter what jurisdiction they serve.

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APPENDIX

APPENDIX A: MAPS



Williston lies at the base of Williams County.

Source: ("Williston, ND," 2019)



Source: ("Williams County," 2019)

APPENDIX B: WILLISTON FIRE DEPARTMENT EMERGENCY MEDICAL SERVICE PROTOCOLS BY EMERGENCY TYPE AND TRANSPORT GUIDELINES

Stroke

Intercept Considerations (Ground and Rotor Wing)

- ALS intercept is required by BLS ambulance services for patients exhibiting stroke symptoms. Ambulance services must activate a Stroke alert for patients who meet stroke activation criteria.

Interception with medical flight resources should be highly considered in situations of illness that is of suspected neurological etiology in which a transport time of greater than 30 minutes is expected or when a patient has sustained significant blunt, penetrating, or multi-systems trauma that has potentially affected the patient's neurological system. In trauma patients with prolonged extrication time, flight to a trauma center should be considered.

Destination Determination Considerations

- A patient suffering a suspected stroke must be transported to a designated acute stroke ready hospital, primary stroke center, or a comprehensive stroke center. This may result in bypassing a closer licensed health care facility for another located farther away.

The attached map shows the small portion of our response area in which a transport time is less than 25 minutes and is highlighted in red. In this area it is assumed that all patients will be transported to the nearest CAH facility for stabilization and treatment unless severe neurological trauma has been sustained (as discussed with our medical director) in which case air medical transport will be requested if available as long as the transport is emergent and conditions are favorable for the operator of the air ambulance. Traffic density must be considered. Consult with medical direction may determine that flight is necessary in situations that would otherwise be deemed a scene transport by ground in which case flight services will be requested.

Transportation should not be delayed in situations where an intercept with Valley Med Flight is required. Rendezvous rather than scene delays will be expected from ground crews when possible.

Ambulance services must include a copy of the criteria utilized to activate / call a Stroke alert.

Trauma

Intercept Considerations (Ground and Rotor Wing)

- ALS intercept is required by BLS ambulance services for patients exhibiting traumatic injuries that meet trauma code activation criteria.

Interception with medical flight resources should be highly considered in situations of significant trauma in which a transport time of greater than 30 minutes is expected or when a patient has sustained significant blunt, penetrating, or multi-systems trauma. In trauma patients with prolonged extrication time, flight to a trauma center should be considered.

Destination Determination Considerations

- Emergency medical services may bypass the nearest designated trauma center for a higher level trauma center provided that it does not result in an additional thirty minutes or more of transport time. If the additional transport time would be greater than thirty minutes, the transporting emergency medical services personnel must contact online medical direction for permission to bypass or as defined in the transport protocol.

The attached map shows the small portion of our response area in which a transport time is less than 25 minutes and is highlighted in red. In this area it is assumed that all patients will be transported to the nearest CAH facility for stabilization and treatment unless severe neurological trauma has been sustained (as discussed with our medical director) in which case air medical transport will be requested if available as long as the transport is emergent and conditions are favorable for the operator of the air ambulance. Traffic density must be considered. Consult with medical direction may determine that flight is necessary in situations that would otherwise be deemed a scene transport by ground in which case flight services will be requested.

Transportation should not be delayed in situations where an intercept with Valley Med Flight is required. Rendezvous rather than scene delays will be expected from ground crews when possible.

Ambulance services must include a copy of the criteria utilized to activate / call a trauma code.

Cardiac

Intercept Considerations (Ground and Rotor Wing)

- ALS intercept is required by BLS ambulance services for patients exhibiting chest pain and cardiac symptoms. Ambulance services must activate a STEMI alert for patients who meet STEMI criteria.

Intercept with ALS rotor will be considered for all patients exhibiting signs and symptoms of acute MI or other acute cardiac distress if the patient's location is outside of the marked 25 minute response time area. In accordance with the direction of our service medical director, stabilization at the nearest CAH and rendezvous with flight services at the same CAH should take place if the patient is within the 25 minute response area. 12-lead ECG will be transmitted to both the receiving hospital and the PCI to aid in the continuum of care. STEMI alerts will be activated in all appropriate situations. In the event that a patient's status becomes unstable, the patient shall be transported to the nearest hospital for stabilization.

Destination Determination Considerations

- If STEMI confirmed by ALS Provider or Medical Control
 - If ground transport time < 75 minutes to PCI Center - transport direct to PCI Center
 - Transmit 12-lead to PCI Center and call ASAP with patient report
 - If ground transport > 75 minutes to PCI Center - transport to closest appropriate hospital
 - Transmit 12-lead to closest appropriate hospital, call ASAP with patient report, verify receipt of 12-lead and request activation of EMS air transport if available.
- If patient is in cardiogenic shock or in eminent respiratory failure, then transport to closest appropriate hospital and request activation of EMS air transport if available.
- A patient suffering acute chest pain that is believed to be cardiac in nature or an acute myocardial infarction determined by a 12-lead electrocardiograph must be transported to a licensed health care facility with capacity or designation for performing percutaneous coronary intervention or fibrinolytic therapy per current approved state guidelines. This may result in bypassing a closer licensed health care facility for another located farther away.

Transportation should not be delayed in situations where an intercept with Valley Med Flight is required. Rendezvous rather than scene delays will be expected from ground crews when possible.

Ambulance services must include a copy of the criteria utilized to activate / call a STEMI alert.

General Transport Guidelines

Intercept Considerations (Ground and Rotor Wing)

- ALS intercept is required by BLS ambulance services for patients exhibiting traumatic injuries that meet trauma code activation criteria, cardiac chest pain or acute myocardial infarction, cardiac arrest, stroke symptoms, severe respiratory distress, or respiratory arrest.
- ALS intercept should be considered by BLS ambulance service for pain control and any other medical condition the EMT feels warrants an intercept.

Destination Determination Considerations

- Transport medical patients to the nearest hospital. You may bypass a hospital to transport to another hospital that is more capable in treating the patient's condition with concurrence of medical control or with a physician's order.
- Patients with life threatening conditions or symptoms (i.e. airway obstruction, cardiac arrest, anaphylaxis, etc) should be transported directly to the nearest hospital.
- When the difference in estimated transport times to more than one hospital is less than ten minutes, the hospitals may be presumed to be of equal transport distance.
- If a patient's condition is stable and he/she is requesting transport to a hospital that is farther away, the ambulance may honor that request under the following conditions:

- Medical control/direction has concurred
- Additional transport time will not adversely affect the patient's condition
- The patient has been advised and understands that insurance may not cover the additional expense of a longer transport
- Weather and road conditions are acceptable
- The additional transport time will not place the service area uncovered for an unreasonable amount of time

Transport Plans			
Name of Service: Williston Ambulance Service		City: Williston	
Service Level:	<input type="checkbox"/> BLS	<input type="checkbox"/> BLS With ALS Capabilities	<input checked="" type="checkbox"/> ALS
Squad Leader: Emily Hughes		Medical Director: Wayne L. Anderson	
Resources			
ALS Ground Intercepts		ALS Air Intercepts	
		Valley Med Flight	
Trauma CAH(s)	Level	Regional Trauma Center(s)	
CHI St Alexius Williston	CAH	Trinity Medical Center	
Stroke Ready Hospital(s)		Primary Stroke Center(s)	
CHI St Alexius Williston		Trinity Medical Center	
Cardiac Capable Hospital(s)		PCI Center(s)	
CHI St Alexius Williston		Trinity Medical Center	
CAH(s)		Tertiary Center(s)	
CHI St Alexius Williston		CHI St Alexius Bismarck	
		Sanford Health Bismarck & Sanford Health Fargo	
On-Line Medical Control			
CHI St Alexius			
Trinity Medical Center (when CHI Williston is not available for online medical control)			
Medical Director Signature:			Date:
For DEMST Use Only:			
Approved By:			Date:

(E. Hughes, email correspondence, February 2019).

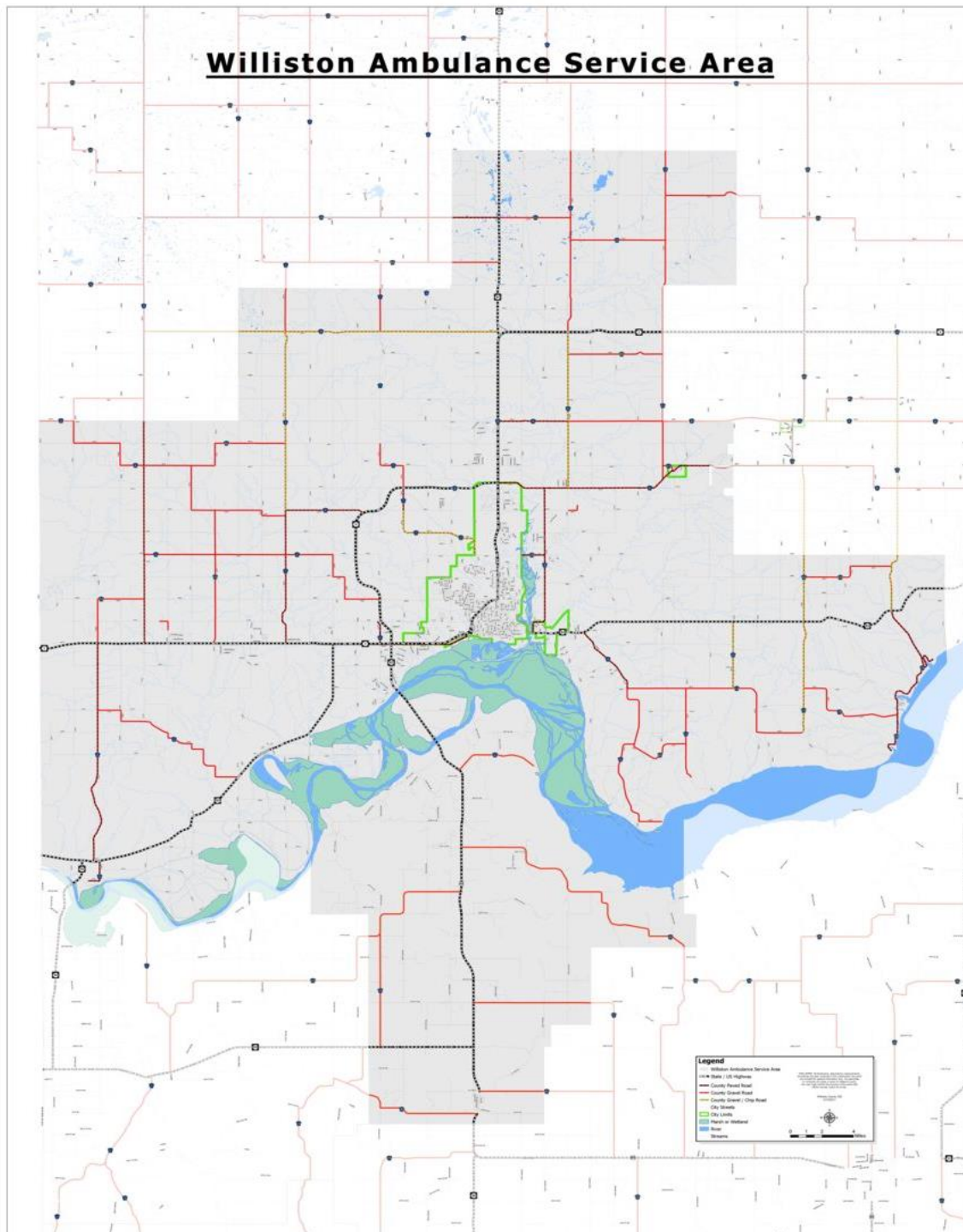
APPENDIX C: WILLISTON FIRE DEPARTMENT CALL VOLUME BY YEAR (2015 - CURRENT 2019)

2015 Incidents		2016 Incidents		2017 Incidents		2018 Incidents	
Jan	273	Jan	276	Jan	242	Jan	307
Feb	224	Feb	237	Feb	201	Feb	295
Mar	250	Mar	235	March	227	Mar	304
Apr	240	Apr	188	Apr	242	Apr	287
May	210	May	246	May	251	May	306
Jun	216	Jun	242	Jun	241	Jun	298
Jul	261	Jul	238	Jul	279	Jul	316
Aug	248	Aug	247	Aug	262	Aug	330
Sep	238	Sept	232	Sept	250	Sept	324
Oct	238	Oct	258	Oct	270	Oct	301
Nov	226	Nov	220	Nov	272	Nov	303
Dec	244	Dec	272	Dec	284	Dec	282
Total	2868	Total	2891	Total	3021	Total	3653

2019 Incidents	
Jan	318
Feb	323
Mar	316
Apr	282
May	
Jun	
Aug	
Sept	
Oct	
Nov	
Dec	
Total	1239

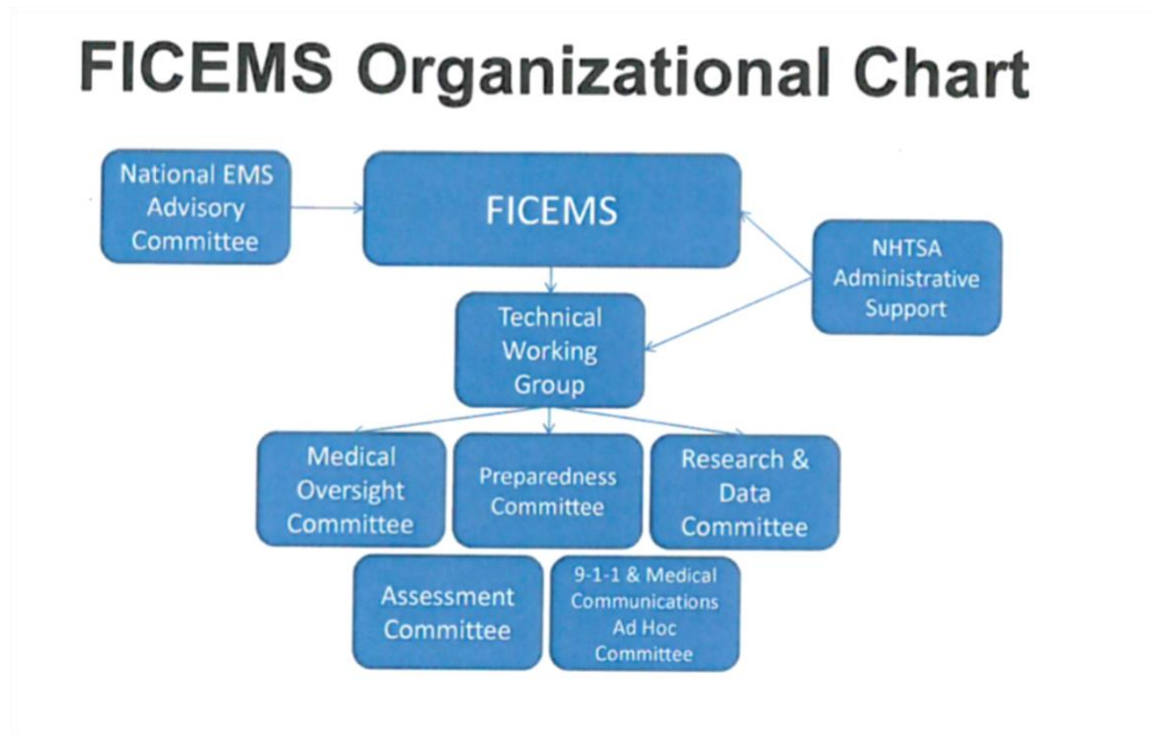
Source: ("Williston Fire Department," 2019)

APPENDIX D: ENLARGED VERSION OF THE WILLISTON AMBULANCE SERVICE COVERAGE AREA



Source: ("Williston Fire Department," 2019)

APPENDIX E: FICEMS ORGANIZATIONAL CHART



Source: ("2013 Annual Congressional Report").