CENTER FOR PUBLIC SAFETY MANAGEMENT, LLC

# EMS SERVICES ASSESSMENT

## Franklin County EMS, NC


CPSM®

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Exclusive Provider of Public Safety Technical Services for
International City/County Management Association

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Since its inception in 1914, ICMA has been dedicated to assisting local governments in providing services to their citizens in an efficient and effective manner. Our work spans all the activities of local government — parks, libraries, recreation, public works, economic development, code enforcement, Brownfields, public safety, etc.

ICMA advances the knowledge of local government best practices across a wide range of platforms including publications, research, training, and technical assistance. Its work includes both domestic and international activities in partnership with local, state, and federal governments as well as private foundations. For example, it is involved in a major library research project funded by the Bill and Melinda Gates Foundation and is providing community policing training in Panama working with the U.S. State Department. It has personnel in Afghanistan assisting with building wastewater treatment plants and has had teams in Central America providing training in disaster relief working with SOUTHCOM.

The **ICMA *Center for Public Safety Management* (ICMA/CPSM)** was one of four Centers within the Information and Assistance Division of ICMA providing support to local governments in the areas of police, fire, EMS, emergency management, and homeland security. In addition to providing technical assistance in these areas we also represent local governments at the federal level and are involved in numerous projects with the Department of Justice and the Department of Homeland Security. In each of these Centers, ICMA has selected to partner with nationally recognized individuals or companies to provide services that ICMA has previously provided directly. Doing so will provide a higher level of services, greater flexibility, and reduced costs in meeting members' needs as ICMA will be expanding the services that it can offer to local governments. For example, The Center for Productivity Management (CPM) is now working exclusively with SAS, one of the world's leaders in data management and analysis. And the Center for Strategic Management (CSM) is now partnering with nationally recognized experts and academics in local government management and finance.

**Center for Public Safety Management, LLC (CPSM**) is now the exclusive provider of public safety technical assistance for ICMA. CPSM provides training and research for the Association's members and represents ICMA in its dealings with the federal government and other public safety professional associations such as CALEA. The Center for Public Safety Management, LLC maintains the same team of individuals performing the same level of service that it has for the past seven years for ICMA.

CPSM's local government technical assistance experience includes workload and deployment analysis using our unique methodology and subject matter experts to examine department organizational structure and culture, identify workload and staffing needs, and identify and disseminate industry best practices. We have conducted more than 269 such studies in 37 states and 204 communities ranging in size from 8,000 population (Boone, Iowa) to 800,000 population (Indianapolis, Ind.).

Thomas Wieczorek is the Director of the Center for Public Safety Management. Leonard Matarese serves as the Director of Research & Program Development. Dr. Dov Chelst is the Director of Quantitative Analysis.

# CENTER FOR PUBLIC SAFETY MANAGEMENT PROJECT CONTRIBUTORS

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# EXECUTIVE SUMMARY

The Center for Public Safety Management LLC (CPSM) was retained by Franklin County, North Carolina to conduct a comprehensive study of the emergency medical services system delivery within Franklin County.

In our review, CPSM interacted extensively with County staff, the service providers, and key stakeholders to obtain and interpret certain documents, data, and information. We used this information/data to familiarize ourselves with the various aspects associated with the effectiveness of EMS and ambulance service delivery in Franklin County.

This information was used to determine the current state of EMS and ambulance service delivery in Franklin County and provide 13 recommendations for future EMS delivery in Franklin County.

Despite significant challenges faced by the County's leadership, emergency services and emergency medical services team, we have been very impressed with the level of professionalism, and dedication of Franklin County staff, and all EMS system stakeholders that we have had the pleasure of interacting with throughout this project.

Franklin County residents and visitors are provided emergency medical services (EMS) by Franklin County EMS (FCEMS), an operating division within the county's Office of Emergency Services. FCEMS is staffed with county employees providing services to 68,573 residents living in the county's 494 square miles.

Franklin County is essentially a rural county, however, like many counties in North Carolina, the desirable community, economy and area business growth, is leading to rapid population growth in Franklin County, especially in the southwestern regions of the county. Across the U.S., EMS systems, especially those in rural communities, have faced challenges with staffing and service delivery in recent years. These challenges have been profiled in numerous national media stories. The ongoing public health emergency caused by the COVID-19 pandemic has exacerbated EMS staffing challenges and has resulted in many EMS systems needing to re-evaluate how services are delivered to meet rising demand, with an increasingly limited emergency medical worker pool. All media accounts detail significant challenges with staffing and service delivery. Examples of these media reports are provided in Appendix 1.

Despite the impact of the national EMS worker shortage, and economic challenges faced by many EMS agencies, FCEMS continues to provide reliable service to the residents and visitors of Franklin County. However, like many communities, Franklin County will need to address several EMS delivery challenges in order for FCEMS to continue providing the level of service the community has enjoyed.

While a robust data analysis is provided as part of this assessment, we will highlight some of the findings in this section of the report.

# STAKEHOLDERS INPUT

CPSM would like to express our sincere gratitude to the following Franklin County EMS Stakeholders for their input and assistance in developing this report:

| | |
|---|---|
| Kim Denton | Franklin County Manager |
| William Doerfer | Franklin County Assistant Manager |
| Hendrix Valenzuela | Franklin County – Emergency Services Director |
| Dr. Barbara Stiehl | Franklin County – Medical Director |
| Jim Gusler | Franklin County – Emergency Medical Services |
| Christy Shearin | Franklin County – Emergency Communications Director |
| Michael Schriver | Franklin County Board of Commissioners – Chairman |
| Terry Wright | Franklin County Sheriff's Office – Chief of Staff |
| Christopher Neal | Town of Louisburg – Mayor |
| Jonathan Franklin | Town of Louisburg – Administrator |
| Nathan Page | Town of Youngsville – Administrator |
| Arthur Wright | Town of Franklinton – Mayor |
| Gregory Bethea | Town of Franklinton – Manager |
| Pamela Perry | Town of Bunn – Administrator |
| Donna Perry | Maria Parham Health / Duke LifePoint Healthcare – Franklin – EMS Liaison |
| Jamie Elliott | Maria Parham Health / Duke LifePoint Healthcare – Henderson – EMS Liaison |
| Bert Beard | Maria Parham Health / Duke LifePoint Healthcare – Chief Executive Officer |
| Scott Wheeler | Youngsville Rescue Squad – Chief |
| AC Rich | Youngsville Volunteer Fire Department – Battalion Chief |
| Lane Hobbs | Pilot Volunteer Fire Department – Chief |
| Dave Bowen | Wake Med ED – EMS Liaison |
| Joddy Amerson | UNC Nash General – EMS Liaison |
| Shea Earles | UNC Rex – EMS Liaison |
| Tim Gupton | White Level Volunteer Rescue Squad |
| | |

# SUMMARY OF RECOMMENDATIONS

| | | |
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| **Recommendation #2** | FCEMS should consider a number of the EMS System design changes listed above to maximize the effectiveness of EMS resources. | 11 |
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| **Recommendation #4** | The practice of dispatching FCEMS ambulances to non-primary medical responses should be substantially reduced or eliminated. | 15 |
| **Recommendation #5** | FCEMS and Franklin County 911 Center staff should evaluate processes to shorten overall dispatch and turnout times, especially during overnight hours, and report these data to the county at regular intervals. | 21 |
| **Recommendation #6** | FCEMS should assign a single resource/QRV to EMS Station 10 and EMS Station 12's districts to provide effective first medical response to these lower response volume areas without the immediate need to staff a full ambulance in these districts. | 21 |
| **Recommendation #7** | A capital improvement project should be initiated to replace the following three FCEMS stations, in this order:<br>**Immediately:**<br>Station 2 (EMS 21) – 51 Bunn Elementary School Rd, Bunn<br>**2 – 3 Years:**<br>Station 1 (EMS 11/17) – 1941 NC 39N, Louisburg<br>**3 – 5 Years:**<br>Station 6 (EMS 61) - 14 Hillsborough St, Franklinton | 24 |
| **Recommendation #8** | FCEMS should order at four more ambulances immediately and FCEMS and Franklin County Fleet Services, and the County Manager's office develop a specific capital replacement plan and forecast that would in essence create a process for ordering 1 new ambulances, every year, to continually refresh the ambulance fleet. | 28 |
| **Recommendation #9** | Franklin County should provide the necessary staffing and support to Franklin County Emergency Communications to enable them to conduct Emergency Medical Dispatch QA reviews, and continuing education, to the 911 call center staff. | 30 |
| **Recommendation #10** | The practice of Franklin County Emergency Communications dispatching EMS resources based on 'response districts' should be eliminated, and EMS units be dispatched directly to calls by the Emergency Communications personnel. | 31 |
| **Recommendation #11** | Franklin County, in collaboration with response and community organizations, should develop an "ECHO" response protocol and procedure to dispatch 'non-traditional' response resources to the most time critical EMS responses. | 32 |
| **Recommendation #12** | Franklin County, in collaboration with its contracted ambulance billing provider, should evaluate the risks and benefits of phasing in rate increases for FCEMS to enhance EMS revenue. | 35 |
| **Recommendation #13** | Franklin County, in collaboration with its contracted ambulance billing provider, should engage with area insurers to explore the potential for implementing alternative payment models for EMS delivery. | 36 |

# ANALYSIS OF CURRENT RESPONSE CAPABILITY

The FCEMS provides basic life support (BLS) and advanced life support (ALS) services to citizens and visitors 24 hours a day 7 days a week. The Franklin County EMS resources serve the community from seven locations in Franklin County, including 3 locations owned and operated by Franklin County and 4 co-located with other community organizations.

The desired daily complement of EMS staffing consists of eight (8) ALS ambulances, one ALS quick response vehicle (QRV), and a shift supervisor. Recently, due to staffing shortages, FCEMS is only able to routinely staff six (6) ambulanced 24/7, with an additional ambulance staffed 12 hours daily, during peak response volume periods.

As a result of the staffing and response volume challenges, FCEMS was provided additional ambulance resources through the Federal Emergency Management Agency (FEMA). These resources were used to augment the response capabilities of FCEMS, but is a short-term solution to a staffing challenge that will likely continue in Franklin County, absent significant investment by the County.

## EMS Staffing

There is a national crisis related to the EMS workforce, and Franklin County is a victim of this crisis. CPSM is part of a national media tracking system that in the past year has identified over 226 local and national media stories since January 2021 depicting the impacts of the EMS worker shortage.

There are likely several reasons for this current staffing crisis, including:

- Traditionally low pay compared to other healthcare or public safety positions
- The risks associated with the profession (injury, contracting illnesses and diseases)
- Less than desirable work hours, away from friends and family
- Less than desirable working conditions

The current pandemic has exacerbated the EMS worker shortage. Training programs were shut down, fewer people are willing to enter the profession, and hospitals, facing unprecedented nursing shortages, are offering premium pay to EMS workers to work in other healthcare settings, such as hospitals, which is causing a migration of EMS workers away from EMS agencies. The Texas Department of State Health Services recently reported that only 27% of the certified EMS workers in Texas had their name appear on an EMS patient care report in 2021. This likely means that 73% of the certified EMS workforce in Texas are working in non-EMS agencies.

## Scheduling Efficiency

FCEMS desires to staff 8 ambulances, 24 hours per day, 7 days a week, with an additional QRV and a supervisor available for response and scene support. Currently, they are only able to routinely staff 6.5 ambulances, yielding an 81% staffing efficiency. As a result of limited staffing FCEMS has implemented a specific schedule matrix, based on available staff:

**STATIC STAFFING GUIDE**

| STAFF / UNITS DOWN | STAFFING LEVEL | UNIT(S) OUT OF SERVICE | TRANSPORT TO CLOSEST APPROPRIATE FACILITY | REQUEST NSMT |
|---|---|---|---|---|
| -1 Staff Person (.5 Units Down) | 1 | Medic 5 | | |
| -2 Staff Person (1.0 Units Down) | 2 | EMS 12 | | |
| -3 Staff Person (1.5 Units Down) | 3 | Medic 5, EMS 12 | | |
| -4 Staff Person (2.0 Units Down) | 4 | EMS 12, EMS 91 Medic 5 to Sta. 9 | X | |
| -5 Staff Person (2.5 Units Down) | 5 | EMS 12, EMS 91, Medic 5 Medic 1 to Sta. 9 | X | |
| -6 Staff Person (3.0 Units Down) | 6 | EMS 17, EMS 91, EMS 10 Medic 5 to Sta. 9 | X | X |
| -7 Staff Person (3.5 Units Down) | 7 | EMS 17, EMS 91, EMS 10 Medic 5 | X | X |

**DYNAMIC (Real-Time) STAFFING GUIDE**

| Response Capability | County Rescue Squads: Stand Up for Calls | Resquest NSMT | Notify EM1 / EMS1 |
|---|---|---|---|
| < 2 Units In-Service in the County as a result of call volume or other issue. No Units actively returning to service from hospital or calls. | X | X | X |
| Prolonged High Call Volume (> 5 hours) | X | X | X |

This staffing crisis has caused EMS agencies, both large and small, urban and rural, to redesign service delivery models, and even change public expectations related to how EMS responds to calls. Many systems have transitioned from dual paramedic ambulance staffing to EMT/Paramedic ambulance staffing, and even away from all ALS ambulance deployment models to tiered ambulance deployment models that use both ALS and BLS ambulances as part of the delivery system.

# EMS Worker Recruitment and Retention Strategies

As EMS systems across country struggle to attract and retain quality team members, there are a number of ***employee recruitment and retention strategies*** systems have employed that may be beneficial for FCEMS to consider:

- Continually evaluate wage rates to assure they are comparable with other employers in the region.
- Implement a combination of performance and merit incentive payments to reward employees for performance, as well as time with the organization.
- Offer flexible scheduling options for employees who may need schedule flexibility for school, family obligations, or other reasons.
    - Including an option for a "Self-Scheduling" where the employee must work a certain number of hours, selected from the FCEMS schedule, but they can self-select the shifts they work.
- Offer incentive pay for difficult to fill shifts, such as weekend nights.
- Create an "Engagement Committee" that can come up with programs and events that creates 'fun' in the workplace.
- Create an EMT academy program that trains people to become EMTs, while they are employed, paying them to attend class.
    - In return, they agree to stay as an employee for a certain period.
- Undertake a significant investment in adequate stations, facilities, and vehicles to demonstrate the County's commitment to being an employer of choice for EMS workers.

## Recommendation #1:

**FCEMS should continually engage in recruitment and retention strategies outlined above designed to make FCEMS an employer of choice for an increasingly competitive EMS workforce.**

## EMS System Design Changes

Additionally, ***EMS system design*** changes have been implemented by some communities to leverage scarce EMS system resources. These include:

**Ambulance Dispatch to Medical Calls Only**

- As will be described later in this report, FCEMS responds a high number of calls that are not medical in nature.
    - These calls should be carefully evaluated, and if they typically do result in a patient on scene with a medical need, an ambulance should be eliminated from that response plan.
    - This would preserve ambulance for responses that will likely require medical assistance.

**Tiered Ambulance Deployment (ALS & BLS)**

- Typically, about 60% of 911 EMS requests can be effectively managed using ambulance staffed at the EMT level.
- EMTs are generally more available than paramedics and many systems have transitioned from an all-ALS ambulance deployment model to a tiered response model that uses ALS and BLS ambulances.
- This expands the pool of personnel resources that can be brought into the agency and increase the number of staffed ambulances.
- The MPDS system used by Franklin County Emergency Communications can be used to identify EMD determinants that would be safe and appropriate for a BLS ambulance response.
- FCEMS already deploys paramedic QRVs that can be used to back-up BLS ambulances in the field if necessary.

**QRV Response Only to Calls with Low Transport Rates**

- FCEMS should review all EMD determinants to identity determinants that have a very low transport percentage.
    - For example, in many communities, certain vehicle crashes and "Unknown Problem" call types have low transport percentages.
- These EMD determinants could receive a QRV response only to do an on-scene assessment.
- If ambulance transport will be necessary, the QRV could request a transport unit.
- This could help preserve ambulance resources for calls in which they are truly needed.

## Recommendation #2:

**FCEMS should consider a number of the EMS System design changes listed above to maximize the effectiveness of EMS resources.**

## Community Paramedic Program

FCEMS had deployed two Community Paramedics (CPs) to enhance their service level through the use of specially trained paramedics in the community caring for a special population of patients who demonstrate the need to additional services to prevent the need for acute medical care. However, due to recent staffing challenges, the Community Paramedics have been re-assigned to regular ambulance duty.

A CP program can be an exceptionally valuable added service line for patients, the community, and the healthcare system, but should only be utilized if the basic, essential EMS response reliability can be achieved and maintained.

## Recommendation #3:

**FCEMS should continue the suspension of their Community Paramedics until they are able to regularly achieve a scheduling efficiency of at least 90 percent.**

# FUTURE EMS STAFFING NEEDS

Based on the growth being experienced by Franklin County, and the current EMS response volume per capita, the number of ambulance unit hours, equivalent ambulances, and field personnel necessary to maintain services levels in Franklin County is illustrated below.

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|
| Population | 69,685 | 68,573 | 70,562 | 72,608 | 74,714 | 76,880 | 79,110 | 81,404 | 83,765 | 86,194 |
| EMS Responses | 9,058 | 9,066 | 9,172 | 9,438 | 9,712 | 9,993 | 10,283 | 10,581 | 10,888 | 11,204 |
| Ambulance Response UHU | 0.129 | 0.129 | 0.129 | 0.129 | 0.129 | 0.129 | 0.129 | 0.129 | 0.129 | 0.129 |
| Ambulance Unit Hours Needed Per Year | 70,217 | 70,279 | 71,100 | 73,162 | 75,284 | 77,467 | 79,714 | 82,025 | 84,404 | 86,852 |
| Ambulances | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 10 | 10 |
| Ambulance Personnel | 50 | 51 | 51 | 53 | 54 | 56 | 57 | 59 | 61 | 62 |

This projection presumes a 2.9% population growth rate each year, and a per capita EMS response utilization of 0.129.

## Response Volume

The COVID-19 public health emergency created a significant change in EMS response volume in many communities. In many cases, EMS response volume decreased substantially between April 2020 and January 2021. Conversely, many EMS systems experienced dramatic response increases during the months of July, August and September 2021. To account for these unusual shifts in EMS response demand CPSM analyzed three years of response volume for FCEMS in order to provide some reliability for future EMS response trends, 2019, 2020 and 2021.

In **2019**, FCEMS responded to **9,058** calls, of which 81 percent were 9-1-1 EMS calls, 18 percent were service calls assisting the fire (FD) and police (PD) departments, and 1 percent were mutual aid given calls that occurred outside Franklin County.

| Call Type | Number of Calls | Calls per Day | Call Percentage |
|---|---|---|---|
| Breathing difficulty | 968 | 2.7 | 10.7 |
| Cardiac and stroke | 1,098 | 3.0 | 12.1 |
| Fall and injury | 1,449 | 4.0 | 16.0 |
| Illness and other | 2,373 | 6.5 | 26.2 |
| Medical alarm | 151 | 0.4 | 1.7 |
| MVA | 544 | 1.5 | 6.0 |
| Overdose and psychiatric | 106 | 0.3 | 1.2 |
| Seizure and unconsciousness | 686 | 1.9 | 7.6 |
| **EMS total** | **7,375** | **20.2** | **81.4** |
| FD assist | 786 | 2.2 | 8.7 |
| PD assist | 799 | 2.2 | 8.8 |
| **FD & PD Assist Total** | **1,585** | **4.3** | **17.5** |
| Mutual aid | 98 | 0.3 | 1.1 |
| **Total** | **9,058** | **24.8** | **100.0** |

In **2020**, FCEMS responded to **9,066** calls. Of which 85 percent were 9-1-1 EMS calls, 14 percent were service calls assisting the fire and police departments, and 1 percent were mutual aid given calls that occurred outside Franklin County.

## Non-Patient Responses

The amount of service calls for police and fire that FCEMS responds to is a bit unusual. These are described by EMS officials as responses that are not primarily for medical emergencies, but may be responses such as a fire alarm, motor vehicle crash without confirmed injuries, or brush fires.

In **2019**, FCEMS responded to **9,058** calls, of which 81 percent were 9-1-1 EMS calls, **18 percent were service calls assisting the fire (FD) and police (PD) departments**, and 1 percent were mutual aid given calls that occurred outside Franklin County.

In **2020**, FCEMS responded to **9,066** calls. Of which 85 percent were 9-1-1 EMS calls, **14 percent were service calls assisting FD and PD**, and 1 percent were mutual aid given calls that occurred outside Franklin County.

Based on data supplied by FCEMS for **2021**, we found that true EMS responses, responses in which an MPDS Response Determinant was actually assigned based on the caller's identification of a primary medical call, were 6,762 responses.

During the same time, there were 1,645 responses that a FCEMS ambulance was assigned to, in which there was not a medical Response Determinant assigned. In 2021, this represents **19 percent of the total ambulance responses**.

Given the current challenge of meeting EMS response demands, we recommend that the practice of dispatching EMS resources to responses with a low likelihood of an actual patient requiring medical attention be minimized. It is our understanding that FCEMS officials are working with police and fire officials, and the county's 911 communications division to reduce these types of responses.

## Recommendation #4:

**The practice of dispatching FCEMS ambulances to non-primary medical responses should be substantially reduced or eliminated.**

## Response Duration

The total workload in 2019 was **12,696.5** hours.

| Call Type | Less than 30 Minutes | 30 Minutes to One Hour | One to Two Hours | Two to Three Hours | More Than Three Hours | Total |
|---|---|---|---|---|---|---|
| Breathing difficulty | 89 | 218 | 360 | 264 | 37 | 968 |
| Cardiac and stroke | 77 | 237 | 430 | 306 | 48 | 1,098 |
| Fall and injury | 329 | 443 | 422 | 227 | 28 | 1,449 |
| Illness and other | 211 | 617 | 983 | 486 | 76 | 2,373 |
| Medical alarm | 85 | 21 | 28 | 14 | 3 | 151 |
| MVA | 200 | 100 | 147 | 89 | 8 | 544 |
| OD | 21 | 37 | 27 | 18 | 3 | 106 |
| Seizure & UNC | 72 | 176 | 263 | 146 | 29 | 686 |
| **EMS total** | **1,084** | **1,849** | **2,660** | **1,550** | **232** | **7,375** |
| FD assist | 591 | 95 | 62 | 29 | 9 | 786 |
| PD assist | 212 | 192 | 292 | 79 | 24 | 799 |
| **FD & PD Assist Total** | 803 | 287 | 354 | 108 | 33 | 1,585 |
| Mutual aid | 37 | 11 | 33 | 16 | 1 | 98 |
| **Total** | **1,924** | **2,147** | **3,047** | **1,674** | **266** | **9,058** |

# AMBULANCE CAPACITY - UNIT HOUR UTILIZATION

By combining the response volume, along with the total number of ambulance Unit Hours (a fully staffed and equipped ambulance on-duty and available to response to an EMS call), staffed by FCEMS, hours we can develop a Unit Hour Utilization (UHU), which is a measure of activity, or time committed on responses. Generally, for an essentially rural community, a response UHU of 0.100 to 0.200 is desirable, as is represents enough EMS system capacity to provide reliable response times and prevent burnout in the EMS staff.

FCEMS *desires* to staff eight ambulances, 24 hours per day, 7 days a week. This yields a total ambulance unit hour production of 70,080 hours annually (8 x 24 x 365). This would yield a UHU of 0.129 (9,058/70,080). However, FCEMS system leaders indicate that their actual production is currently 6.5 ambulances, 24 hours per day, 7 days a week, resulting in 56,940 ambulance unit hours routinely deployed. This results in a UHU of 0.159. However, this presumes each EMS response is one hour in duration, but as represented in the table above, 55 percent of FCEMS' EMS responses last longer than one hour.

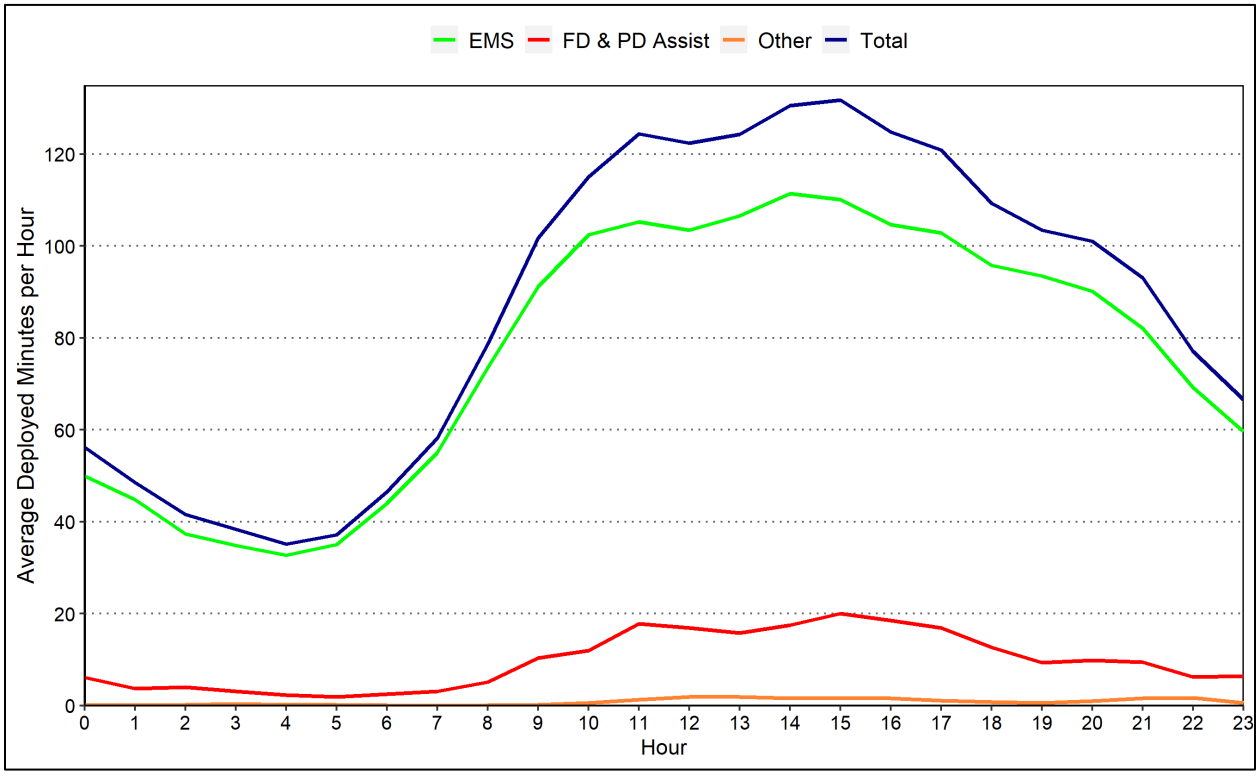
Therefore, we need to analyze the Task Time (total time committed on an EMS response) with the actual staffed Unit Hours routinely produced provides insight into the total on-duty time committed on an EMS response by FCEMS personnel. The UHU derived by the Task Time analysis in 2019 reveals a UHU of **0.247**. A Task Time UHU at this level could result in stress on the EMS workforce, and response time challenges due to lack of ambulance availability.

In 2020, FCEMS responded to **9,066** calls. Of which 85 percent were 9-1-1 EMS calls, 14 percent were service calls assisting the fire and police departments, and 1 percent were mutual aid given calls that occurred outside Franklin County. The total workload in 2020 was 12,104.9 hours.

## Average Deployed Minutes by Hour of Day

EMS response volume and time on task is generally not evenly distributed by time of day. Typically, EMS volume peaks during times when people are engaging in activity as opposed to when they are sleeping.

Below is an analysis of the FCEMS average deployed minutes by time of day.




Note that the highest response volume occurs between the hours of 9a and 9p. This is fairly typical of most communities, and an ambulance deployment strategy that produces more ambulance unit hours during these times would be desirable and allow FCEMS to strategically staff ambulances based on anticipated response volume.

Note that in this graph, between the hours of 9a and 9p, **non-patient EMS responses represent up to 20 minutes of deployed ambulance time, or 15 percent of the deployed ambulance minutes**.

## Response Time

In the accompanying analysis, we separate response time into its identifiable components.

- **Dispatch time** is the difference between the time a call is received and the earliest time an agency is dispatched. Dispatch time includes call processing time, which is the time required to determine the nature of the emergency and the types of resources to dispatch.
- **Turnout time** is the difference between the earliest dispatch time and the earliest time an agency's unit is enroute to a call's location.
- **Travel time** is the difference between the earliest enroute time and the earliest arrival time. Response time is the total time elapsed between receiving a call to arriving on scene.

In this analysis, we included all calls within Franklin County to which at least one non-administrative unit responded. We included all units from both EMS and fire agencies. Mutual aid calls were excluded. In addition, calls with a total response time of more than 30 minutes were excluded. Finally, we focused on units that had complete time stamps, that is, units with all components recorded, so that we could calculate each segment of response time.

Based on the methodology above and the 2-year's call data (2019 and 2020), we removed 184 mutual aid calls, 2,895 FD & PD assist calls, 715 nonemergent calls, 288 calls where no units recorded a valid on-scene time, 101 calls where the first arriving unit's response time was greater than 30 minutes, and 586 calls where one or more segments of the first arriving unit's response time could not be calculated due to missing or faulty data. As a result, we analyzed 13,355 calls including 6,549 in 2019 and 6,806 in 2020. The calls in 2019 are analyzed in this section.

The 6,806 calls in 2020 are compared with those in 2019 in Attachment I.

CPSM uses two response time measures to evaluate EMS response times, average and fractile. The average time represents the response time internal at which half of the responses are LESS than that interval, and half are LONGER than that interval. It is a level of performance, but not necessarily a level of reliability. The 90$^{th}$ percentile measure is a measure of reliability. A 90$^{th}$ percentile analysis determines the response interval in which 90 percent of the EMS response times fall under that interval. In other words, the response time interval in which only 10 percent of the EMS response time was ***longer*** than that 90$^{th}$ percent interval.

## Average Response Time of First Arriving Unit, by Call Type (Minutes)

| Call Type | Dispatch | Turnout | Travel | Total | Number of Calls |
|---|---|---|---|---|---|
| Breathing difficulty | 2.1 | 1.4 | 7.0 | 10.5 | 928 |
| Cardiac and stroke | 2.2 | 1.4 | 6.9 | 10.5 | 1,033 |
| Fall and injury | 2.7 | 1.4 | 6.9 | 11.0 | 1,046 |
| Illness and other | 2.8 | 1.4 | 7.9 | 12.1 | 2,215 |
| Medical alarm | 2.6 | 1.4 | 7.6 | 11.5 | 120 |
| MVA | 2.7 | 1.5 | 4.7 | 8.9 | 471 |
| Overdose and psychiatric | 3.0 | 1.4 | 8.2 | 12.7 | 97 |
| Seizure and unconsciousness | 2.2 | 1.4 | 6.6 | 10.2 | 639 |
| **Total** | **2.5** | **1.4** | **7.1** | **11.0** | **6,549** |

## 90th Percentile Response Time of First Arriving Unit, by Call Type (Minutes)

| Call Type | Dispatch | Turnout | Travel | Total | Number of Calls |
|---|---|---|---|---|---|
| Breathing difficulty | 3.3 | 2.4 | 12.7 | 16.3 | 928 |
| Cardiac and stroke | 3.5 | 2.4 | 12.7 | 16.4 | 1,033 |
| Fall and injury | 4.1 | 2.5 | 12.6 | 17.2 | 1,046 |
| Illness and other | 4.2 | 2.5 | 13.7 | 18.4 | 2,215 |
| Medical alarm | 4.3 | 2.4 | 11.2 | 15.8 | 120 |
| MVA | 4.3 | 3.3 | 8.3 | 13.5 | 471 |
| Overdose and psychiatric | 4.5 | 2.4 | 14.2 | 19.6 | 97 |
| Seizure and unconsciousness | 3.5 | 2.3 | 12.4 | 16.6 | 639 |
| **Total** | **4.0** | **2.4** | **12.8** | **17.1** | **6,549** |

The average response time to EMS calls was 11.4 minutes, and the 90th percentile response time was 17.8 minutes.

In the aggregate, an average response time of **11 minutes, with a fractile response time of 17.1 minutes is not unusual for a predominantly rural county.** We did note that the average and fractile Dispatch Time of 2.5 and 4.0 minutes respectively, as well as the Turnout Time of 1.4 and 2.4 minutes could likely be improved.

We further analyzed the response times by time of day, and by FCEMS response district, which revealed the following results.

## Average and 90th Percentile Response Time of First Arriving Unit, by Time of Day (Minutes)

| Hour | Dispatch | Turnout | Travel | Response Time | 90th Percentile Response Time | Number of Calls |
|---|---|---|---|---|---|---|
| 0 | 2.8 | 1.6 | 8.1 | 12.5 | 17.8 | 201 |
| 1 | 3.1 | 1.8 | 9.0 | 14.0 | 20.7 | 132 |
| 2 | 3.1 | 1.6 | 8.5 | 13.2 | 18.3 | 134 |
| 3 | 3.1 | 1.7 | 8.3 | 13.1 | 18.5 | 124 |
| 4 | 2.8 | 1.9 | 8.8 | 13.4 | 19.7 | 119 |
| 5 | 2.9 | 1.5 | 7.7 | 12.1 | 17.5 | 165 |
| 6 | 2.2 | 1.4 | 7.2 | 10.9 | 16.6 | 211 |
| 7 | 2.3 | 1.3 | 6.5 | 10.1 | 15.8 | 239 |
| 8 | 2.2 | 1.4 | 6.7 | 10.3 | 16.3 | 318 |
| 9 | 2.3 | 1.3 | 6.8 | 10.3 | 16.2 | 360 |
| 10 | 2.3 | 1.4 | 6.7 | 10.3 | 16.2 | 385 |
| 11 | 2.3 | 1.4 | 6.8 | 10.5 | 16.5 | 370 |
| 12 | 2.3 | 1.4 | 6.3 | 10.0 | 15.9 | 392 |
| 13 | 2.4 | 1.3 | 6.4 | 10.0 | 15.7 | 345 |
| 14 | 2.4 | 1.3 | 6.8 | 10.5 | 16.8 | 379 |
| 15 | 2.3 | 1.3 | 6.5 | 10.1 | 16.5 | 353 |
| 16 | 2.4 | 1.4 | 6.9 | 10.7 | 17.0 | 352 |
| 17 | 2.3 | 1.5 | 6.9 | 10.8 | 16.2 | 319 |
| 18 | 2.8 | 1.2 | 6.9 | 11.0 | 17.9 | 319 |
| 19 | 2.9 | 1.2 | 7.4 | 11.5 | 17.9 | 340 |
| 20 | 2.8 | 1.3 | 7.4 | 11.4 | 18.5 | 293 |
| 21 | 2.9 | 1.3 | 7.8 | 12.0 | 18.0 | 268 |
| 22 | 2.7 | 1.4 | 7.4 | 11.6 | 17.6 | 237 |
| 23 | 2.7 | 1.5 | 7.4 | 11.6 | 16.9 | 194 |
| **Total** | **2.5** | **1.4** | **7.1** | **11.0** | **17.1** | **6,549** |

The average ***dispatch times*** appear to be longer than in other analysis CPSM has performed for similar communities. Generally, the time from phone answer to first unit notification of the response is ideally less than 90 seconds. Similarly, turnout times for FCEMS appear slightly extended as well, with the ideal daytime turnout time being 45 seconds.

Note that Dispatch Time, as well as Turnout Time appears to be extended during overnight hours. Turnout times tend to be longer if on-duty EMS crews are sleeping in stations, due to the inherent time necessary to awaken and begin a response. However, dispatch times should remain consistent. We recommend a review of call load, staffing patterns and call processing procedures be reviewed, with an emphasis on overnight shifts, to try and reduce dispatch times.

## Recommendation #5:

**FCEMS and Franklin County 911 Center staff should evaluate processes to shorten overall dispatch and turnout times, especially during overnight hours, and report these data to the county at regular intervals.**

## Response Time by EMS District

| EMS District | Dispatch | Turnout | Travel | Response Time | 90th Percentile Response Time | Number of Calls |
|---|---|---|---|---|---|---|
| EMS Station 1 | 2.4 | 1.2 | 5.9 | 9.5 | 15.0 | 2,020 |
| EMS Station 2 | 2.6 | 1.5 | 7.5 | 11.6 | 17.2 | 1,236 |
| EMS Station 4 | 2.6 | 1.4 | 6.0 | 10.0 | 14.9 | 1,058 |
| EMS Station 6 | 2.6 | 1.5 | 7.0 | 11.1 | 16.9 | 963 |
| EMS Station 9 | 2.4 | 1.5 | 8.9 | 12.8 | 18.6 | 458 |
| EMS Station 10 | 2.7 | 1.4 | 11.0 | 15.1 | 21.5 | 265 |
| EMS Station 12 | 2.8 | 1.4 | 9.3 | 13.5 | 19.7 | 549 |
| **Total** | **2.5** | **1.4** | **7.1** | **11.0** | **17.1** | **6,549** |

We note that travel and overall response times are longest in EMS Station 10 and 12 districts. This may be explainable, given the relatively low response volume, and the likelihood that ambulance assigned to these districts may be reallocated to busier response volume districts. To help assure equity in response times, additional ambulance resources may be required across the county to help prevent these EMS units from being reallocated for these EMS districts, resulting in the longer response times. Additionally, FCEMS may find it beneficial to assign a single resource/QRV to EMS Station 10 and EMS Station 12's districts to provide effective first medical response to these lower response volume areas.

## Recommendation #6:

**FCEMS should assign a single resource/QRV to EMS Station 10 and EMS Station 12's districts to provide effective first medical response to these lower response volume areas without the immediate need to staff a full ambulance in these districts.**

# EMS STATION FACILITIES

EMS facilities are a reflection of the value that the community places on the delivery of EMS, and, more importantly, their EMS providers. Facilities and stations that are less than adequate, or worse yet, dilapidated or in severe state of disrepair, send a message to the EMS workers that they are not valued.

Shared resources can also be problematic, since the culture of the organizations sharing the facility can be vastly different. For example, fire stations generally tend to be staffed by personnel who are not as often called out on responses and may feel that the constant disruption of frequent responses be FCEMS personnel creates a less than desirable environment for the host agency's personnel. This can be compounded if the host agency is not also responding to the call. Similarly, EMS workers occupying a host agency's facilities are often thought of as 'squatters', not necessarily true partners. This could lead to feeling of discontent on the part of the EMS workers, and the host agency.

During interviews with FCEMS stakeholders, many mentioned that some of the current facilities used by FCEMS for ambulance stations are inadequate, with some are in a state of significant disrepair, and most are shared locations with area fire and rescue services. These stakeholders feel that this sends a message to both the EMS workers, and the community, that EMS is not valued in the community.

Given the extreme challenge attracting and retaining EMS staff in many communities across the U.S., capital investments in facilities that the EMS personnel feel recognized their value often have a positive impact on the ability to recruit and retain quality EMS practitioners.

An investment in EMS stations could dramatically improve ability of Franklin County to attract and retain employees.

**Station 1** (EMS 11/17) – 1941 NC 39N, Louisburg

- This is a dedicated facility in a strategic location in relation to response volume patterns.
- Although well located, this facility is in marginal condition and in need of either significant renovation, or replacement with a new facility specifically designed to afford EMS personnel with an adequate environment.
- The facility is relatively inadequate and should be replaced within 2-3 years with a dedicated facility, better suited to the needs of FCEMS within the next 3-5 years.
- We recommend that the new facility be in the immediate vicinity of the current structure.

**Station 2** (EMS 21) – 51 Bunn Elementary School Rd, Bunn

- This is a dedicated facility in an ideal location in relation to response volume patterns.
- The facility is in poor condition, completely inadequate for FCEMS needs, and in need of immediate replacement with a new facility specifically designed to afford EMS personnel with an adequate environment.
- We recommend that a new facility be in the immediate vicinity of the current facility.

**Station 4** – (EMS 41) - 215 NW Railroad St, Youngsville

- This is a shared facility with Youngsville Rescue.
- Due to the nature of staffing for Youngsville Rescue, it is not often occupied by volunteers.
- The space occupied by FCEMS staff and equipment is physically distant from the space utilized by Youngsville Rescue staff.
- It is in a relatively good location, based on response volume.
- This facility is currently adequate, and although not ideal, due to the shared space, is relatively functional.

**Medic 5** (Medic 5) - 8125 NC 39 Hwy S, Henderson

- This is a shared facility with Epsom Fire Department and typically houses a FCEMS Quick Response Vehicle (QRV).
- It is located in the extreme northwest corner of the county.
- Due to staffing limitations, and the remote location of this station, FCEMS has relocated Medic 5 to FCEMS Station 1.
- A location southeast of the current location may be more desirable.
- Consider changing this location to Gold Sand Rural Fire Department at 2295 Person Road, Louisburg.

**Station 6** (EMS 61) - 14 Hillsborough St, Franklinton

- This is a shared facility with Franklinton Volunteer Fire Department.
- It is in an ideal location, based on response volume.
- The facility is relatively undesirable, due to the shared nature of the facility.
- The facility is marginally adequate for the short-term, but should be replaced with a dedicated facility, better suited to the needs of FCEMS within the next 3-5 years.

**Station 9** – (EMS 91) - 2465 White Level Rd, Louisburg

- This station is shared facility with White Level Volunteer Fire Department.
- It is in a relatively good location, based on response volume.
- Ideally, this station could be relocated to an area slightly to the northwest, if new a new facility is contemplated in the future.
- This facility is suitable for FCEMS use, and due to the nature of occupancy by a volunteer fire department, there is little concern regarding personnel interactions.

**Station 10** (EMS 10) - 4125 NC 581, Spring Hope

- This station is shared facility with Justice Volunteer Fire Department.
- It is in an ideal location, based on response volume.
- This facility is in good condition, and suitable for FCEMS use, and due to the nature of occupancy by a volunteer fire department, there is little concern regarding personnel interactions.

**Station 12** – (EMS 12) - 440 Airport Dr, Louisburg

- This station on the property of Triangle North Executive Airport, and is a shared space with an aviation company.
- It is in a relatively good location, based on response volume.
- This facility is in reasonable condition, and marginally suited for FCEMS use, however, the commercial nature of the facility and occupancy, it is not ideal.

## Recommendation #7:

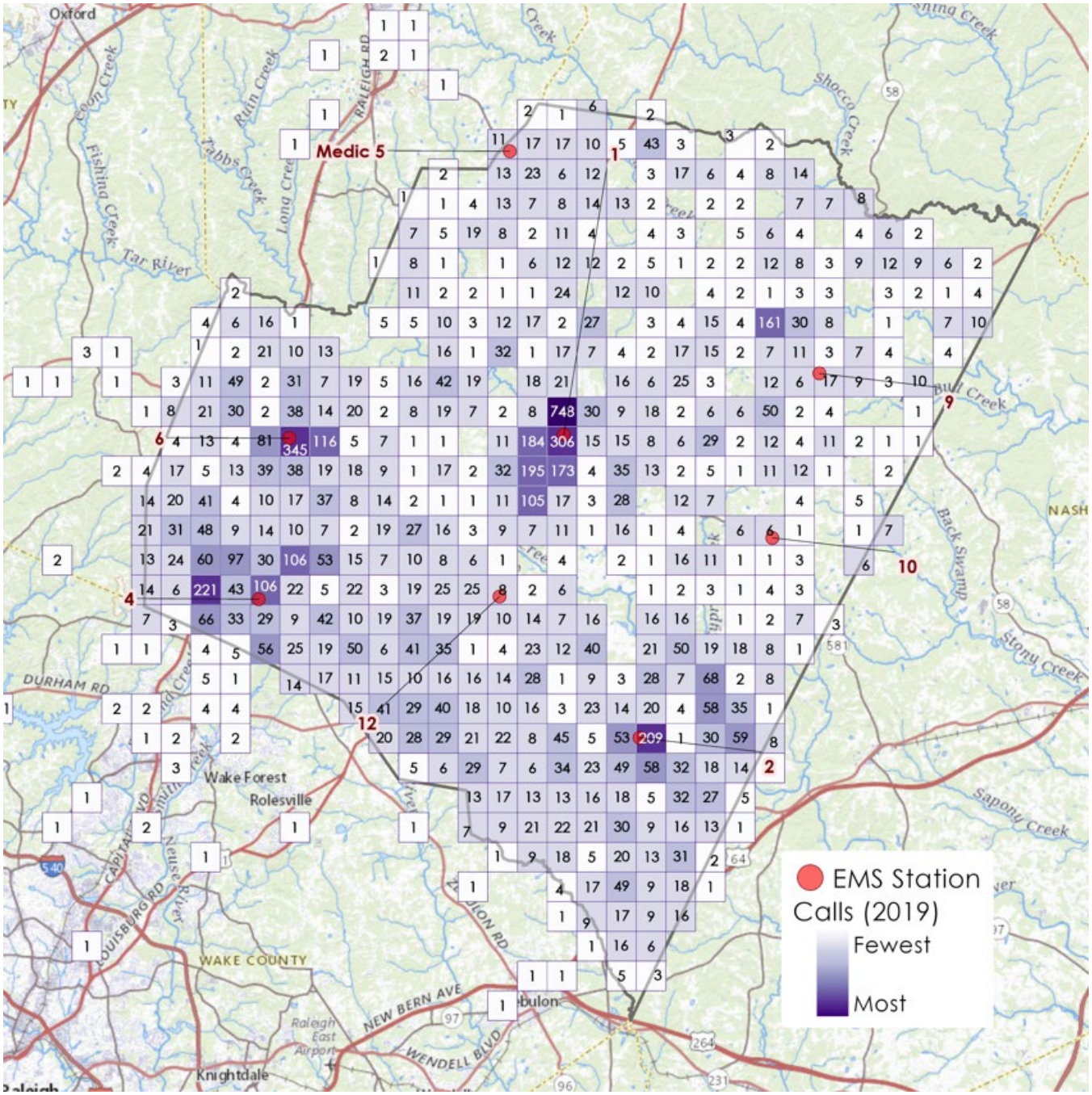
**A capital improvement project should be initiated to replace the following three FCEMS stations, in this order:**

- **Immediately:** **Station 2** (EMS 21) – 51 Bunn Elementary School Rd, Bunn
- **2 – 3 Years:** **Station 1** (EMS 11/17) – 1941 NC 39N, Louisburg
- **3 – 5 Years:** **Station 6** (EMS 61) - 14 Hillsborough St, Franklinton

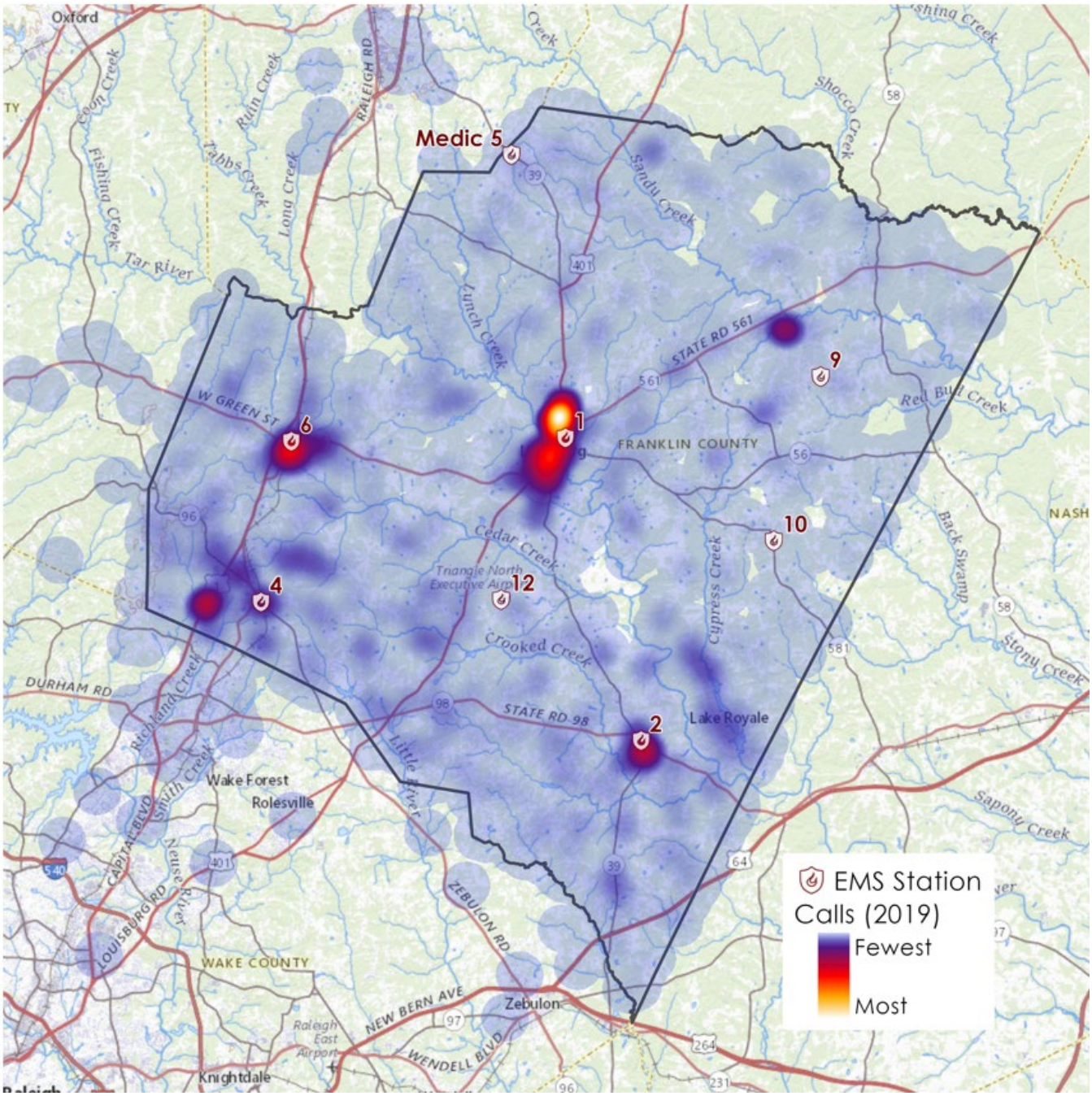
# GEOGRAPHIC DISTRIBUTION OF EMS RESPONSES

EMS responses tend to follow population centers. Below is a grid map representing the concentration of EMS response volume by geography in the county, with the locations of current EMS stations indicated on the map.

**Grid Map:**



**Heat Map:**




Reviewing this geographic response volume distribution, we note that, in general, the current EMS stations are appropriately located, based on response frequency.

# CURRENT EQUIPMENT AND ANY IMMEDIATE NEEDS

## Medical Equipment and Supplies

Overall, an assessment of FCEMS' medical equipment reveals the department has an adequate inventory of essential medical equipment to fulfill its mission and comply with medical protocols. Commendable is the investment in mechanical CPR compression devices to assure excellence in CPR chest compressions with limited personnel on the scene of medical responses.

Also commendable is the investment in power cots and auto-load stretchers to enhance personnel safety while moving patients into and out of ambulances.

National and international supply chain issues, specifically related to essential and desirable medical supplies remains an issue for EMS agencies. Drugs like epinephrine, dextrose, and recently, Fentanyl, as well as supplies such as saline flushes, are in short or even non-existent supply.

FCEMS should continually work with its suppliers to assure adequate flow of medications and supplies. If a specific drug or supply is, or is anticipated to be, in short supply, this would allow the department to work with their medical director, or other suppliers, to determine appropriate alternative solutions to supply challenges.

## Vehicle Inventory

Assuring a reliable ambulance fleet is essential to quality patient care and helps assure community and employee trust. Like EMS Stations, maintenance of an attractive and reliable ambulance fleet can serve an excellent recruitment and retention strategy.

FCEMS currently maintains a fleet of 15 ambulances and 6 support vehicles. Industry standard practice is to maintain a 35% reserve ambulance fleet. For FCEMS, with a staffing goal of 8 ambulances, this would result in 11 ambulances on hand and available to be used on primary ambulance response. From a number of ambulance perspective, FCEMS has a more than adequate ambulance fleet.

Industry standard is that in-service ambulances should be retired from primary, front-line service, once the vehicle reaches 5 years, or 250,000 miles. The average mileage of the FCEMS ambulance fleet is 168,000 miles, with the lowest mileage vehicle having 55,000 miles, and the highest having 285,000 miles. FCEMS has three ambulances which are older than five years old, and/or have mileage in excess of 250,000 miles. These ambulances should not be used for primary, front-line service, but solely as temporary back-up units. FCEMS has two units that are approaching the end of their functional life as primary response units as well.

Mileage and age record analysis reveals that on average, FCEMS logs 26,000 miles per ambulance annually. Using this analysis, it is likely that ambulances in the FCEMS fleet with generally not 'wear' out due to use, but rather become obsolete due to enhancements in technology and manufacturing standard improvements.

| Department | Make | Model | Asset Number | VIN | Plate | Year | Mileage |
|---|---|---|---|---|---|---|---|
| EMS | CHEVROLET | G4500 | TRUCK 2 | 1GB6G5CL8C1148277 | 49865-V | 2012 | 285,109 |
| EMS | CHEVROLET | G4500 | TRUCK 1 | 1GB6G5CL3F1171485 | 82841 V | 2015 | 273,186 |
| EMS | CHEVROLET | G 4500 | TRUCK 4 | 1GB6G5CL5E1110489 | 61104-V | 2014 | 261,465 |
| EMS | CHEVROLET | G4500 | TRUCK 3 | 1GB6GUCL2G1236175 | 94062-V | 2016 | 214,017 |
| EMS | CHEVROLET | G4500 | TRUCK 10 | 1GB6GUCL4G1250286 | 97707-V | 2016 | 203,113 |

FCEMS recently took delivery of two new ambulances, with two more pending delivery. However, given the age of the fleet, and the significant lead time necessary for ambulance orders due to on-going supply chain challenges. The best estimate from ambulance manufacturers is that the lead time from order to delivery is at least 18 months, optimistically.

This likely means that an order today of four new ambulance would mean delivery of the ambulances in the summer of 2023.

## Recommendation #8:

**FCEMS should order at four more ambulances immediately and FCEMS and Franklin County Fleet Services, and the County Manager's office develop a specific capital replacement plan and forecast that would in essence create a process for ordering 1 new ambulances, every year, to continually refresh the ambulance fleet.**

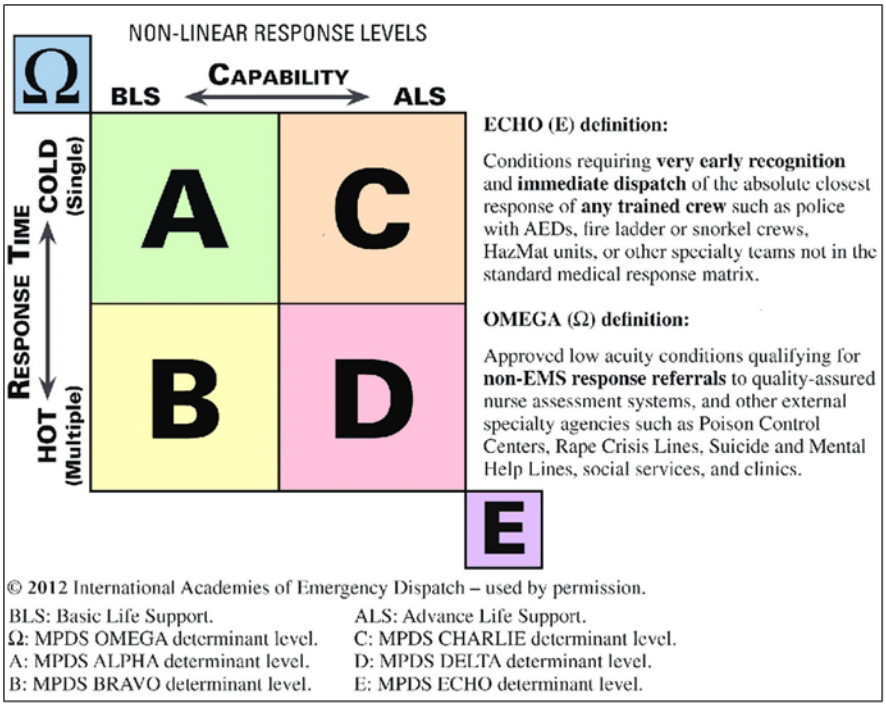
# DISPATCH OPERATIONS

## Emergency Call Taking

EMS 911 call taking and dispatch of FCEMS units is managed by Franklin County Emergency Communications, the county's Public Safety Answering Point (PSAP). The PSAP employs the use of the Priority Solutions® Medical Priority Dispatch System® (MPDS) for Emergency Medical Dispatch (EMD). This system is a highly respected EMD system and is used most by progressive EMS dispatch agencies.

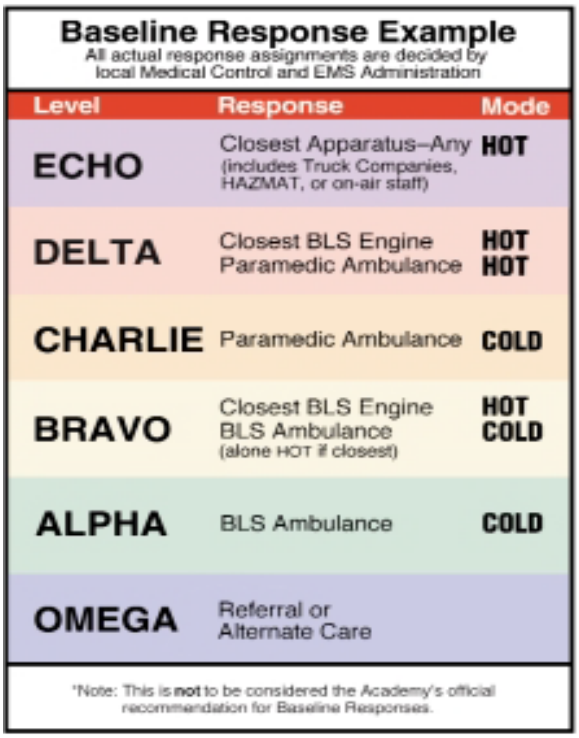
The PSAP follows evidence-based clinical protocols and call taking processes to assign a response determinant to the EMS request. These response determinants are alpha-numeric codes that inform the responding units specifically what type of medical call they are responding to. If approved by local protocol, the MPDS system can also be used to assign response priorities and modes of response, as well as make determinations regarding the response configuration for the EMS response.

An example of a response matrix based on MPDS EMD response determinants is below.






BLS: Basic Life Support.
ALS: Advance Life Support.
Ω: MPDS OMEGA determinant level.
C: MPDS CHARLIE determinant level.
A: MPDS ALPHA determinant level.
D: MPDS DELTA determinant level.
B: MPDS BRAVO determinant level.
E: MPDS ECHO determinant level.



**Baseline Response Example**

All actual response assignments are decided by local Medical Control and EMS Administration

| Level | Response | Mode |
|---|---|---|
| ECHO | Closest Apparatus–Any (includes Truck Companies, HAZMAT, or on-air staff) | HOT |
| DELTA | Closest BLS Engine<br>Paramedic Ambulance | HOT<br>HOT |
| CHARLIE | Paramedic Ambulance | COLD |
| BRAVO | Closest BLS Engine<br>BLS Ambulance (alone HOT if closest) | HOT<br>COLD |
| ALPHA | BLS Ambulance | COLD |
| OMEGA | Referral or Alternate Care | |

*Note: This is **not** to be considered the Academy's official recommendation for Baseline Responses.

The MPDS system enables the use of an evidence-based process for the provision of pre-arrival instructions during the time EMS units are responding to the call.

Appropriate use of the MPDS system typically includes a robust quality assurance (QA) process, which helps assure that EMD call taking, EMD determinant assignments and pre-arrival instructions are being conducted appropriately and reliably. During interviews with the Franklin County Emergency Communications leadership, they shared that due to mission critical staffing constraints, they are unable to currently devote resources to the QA process. The ability to accurately determine the nature of the EMS call, assign appropriate response priorities, and provide life-saving pre-arrival medical instructions to callers while EMS units are responding is an essential component of 911 call processing and a QA process is crucial to assuring that these processes are done correctly.

## Recommendation #9:

**Franklin County should provide the necessary staffing and support to Franklin County Emergency Communications to enable them to conduct Emergency Medical Dispatch QA reviews, and continuing education, to the 911 call center staff.**

## Response Assignment

When assigning EMS units to a response, Franklin County Emergency Communications staff essentially dispatch, or alert, the 'Station', or district in which the response scene is located, as opposed to dispatching a specific EMS unit, based on their proximity to the call. Field EMS staff then determine amongst themselves which unit is closest to the scene. This is a less than effective method for assigning EMS units to a response. It essentially requires field EMS units to be continuously aware of each other's location, as well as the specific location of the response, to 'self-dispatch' to EMS calls.

The field EMS staff are also responsible for moving themselves around through the county, based on the number of available units, in an attempt to maximize geographic and temporal coverage.

This process has the potential for significant error and places an undue burden on the field EMS staff.

A safer and more effective process would be to enable the PSAP with the ability to see the location and status of all EMS units, in real time, through the use of an Automated Vehicle Location system. The PSAP's Computer Aided Dispatch (CAD) system could then be used to make recommendations of the most appropriate EMS unit to dispatch to the call, based on real time information regarding EMS unit status, availability and proximity to the EMS call. The system could then make recommendations for EMS unit deployment for geographic coverage based on real-time information about the current status and location of all EMS units.

This would not only help assure more reliable responses to EMS calls, but also alleviate the burden on field EMS staff. It would also provide a platform to record all EMS system activity to QA EMS dispatches and refine how EMS units are dispatched to EMS calls.

It would require that all EMS units be equipped with an AVL device, and that device be incorporated into the PSAP CAD. We understand that due to the rural nature of Franklin County, cellular data connections in some part of the county may be sporadic, however, systems such as FirstNet® by AT&T are becoming more common in rural areas to enhance coverage, and newer high-power user equipment (HPUE) solutions are available to help ensure connectivity, even in rural locations.

## Recommendation #10:

**The practice of Franklin County Emergency Communications dispatching EMS resources based on 'response districts' should be eliminated, and EMS units be dispatched directly to calls by the Emergency Communications personnel.**

## Response Units

Franklin County has a limited number of agencies that provide formal first response services to medical calls. This means that FCEMS is generally the sole responder to EMS requests. While this is generally adequate for the majority of EMS calls, there are some EMS response types that are time-life critical, such as a cardiac arrest or severe airway compromise. When these calls occur, due to the limited first response resources, FCEMS often needs to dispatch a second ambulance to help manage these calls. This places additional strain on an ambulance response system already struggling with limited resources. The MPDS response determinant classification for these types of responses is an "ECHO" response. ECHO response should receive resources in addition to FCEMS in order to have a positive impact on the patient's outcome. Interventions such as CPR for a cardiac arrest victim, or treatment for a choking victim are best when performed as soon as possible.

Franklin County and area fire, rescue, law enforcement agencies, and even community groups should collaborate on the development of an "ECHO" response system that includes all these resources to respond to ECHO calls. 'Non-traditional' responders could also be part of this response, such as county or municipal employees, or even bystanders who enroll in "CPR Needed" notification APPs such as PulsePoint® or GoodSam®, or even deployed through the use of the County's "CodeRed" program.

The application of an Automated External Defibrillator (AED) is an evidence-based intervention that has a dramatic impact on patient survival from cardiac arrest. An enhancement to the ECHO response process described above would be to equip all police and even county/city public works vehicles with AEDs to use in the event of their deployment for an ECHO response. Some of the APPs referenced above, also allow willing participants to register AEDs to they can be notified through the APP of an EMS response which may need an AED at the scene.

For example, if an ECHO determinant is reached for a specific 911 call, in addition to the closest FCEMS unit being dispatched, the closest fire rescue and law enforcement agency would also be dispatched, and the selected bystander notification APP activated. This would speed personnel to the scene who can initiate life-saving, time-critical interventions, such as CPR, and perhaps even bring an AED to the patient's side.

The development of this ECHO response plan could have a significant impact on patient survival from cardiac arrest in Franklin County. It also could help alleviate the need for multiple ambulance assigned to the most critical calls, depleting EMS response resources.

## Recommendation #11:

**Franklin County, in collaboration with response and community organizations, should develop an "ECHO" response protocol and procedure to dispatch 'non-traditional' response resources to the most time critical EMS responses.**

# AMBULANCE REVENUE ANALYSIS

FCEMS contracts billing services with EMS | MC, a very well respected, North Carolina based EMS billing agency. EMS | MC provided revenue data for analysis.

## Payer Mix

Franklin County enjoys a relatively stable payer mix, with patients covered by Medicare and Medicare Advantage currently representing the patient classification at 48%. This is typical for most EMS agencies.

Currently, 19% of the patients cared for by FCEMS are responsible for the bill as a self-pay category, and patients covered by Medicaid and Medicaid MCOs represent 15% of the patient population.

This payer mix has been relatively consistent over the past three years.

| **Payer Class** | **2019** | **2020** | **2021** |
|---|---|---|---|
| Medicare | 34% | 28% | 25% |
| Medicare Advantage | 18% | 20% | 23% |
| Patient | 18% | 22% | 19% |
| Insurance | 13% | 13% | 14% |
| Medicaid | 15% | 14% | 11% |
| Medicaid MCO | 0% | 0% | 4% |
| Other Govt. Payers | 1% | 1% | 2% |
| TPL | 1% | 1% | 1% |
| Facility | 0% | 0% | 0% |
| **Total** | **100%** | **100%** | **100%** |

Medicare and Medicaid ambulance payments are based in fee schedules approved by federal and state governments. Commercial insurers generally pay a percentage of what's referred to as the "Usual and Customary Rate", or UCR for services provided in regional geographic areas.

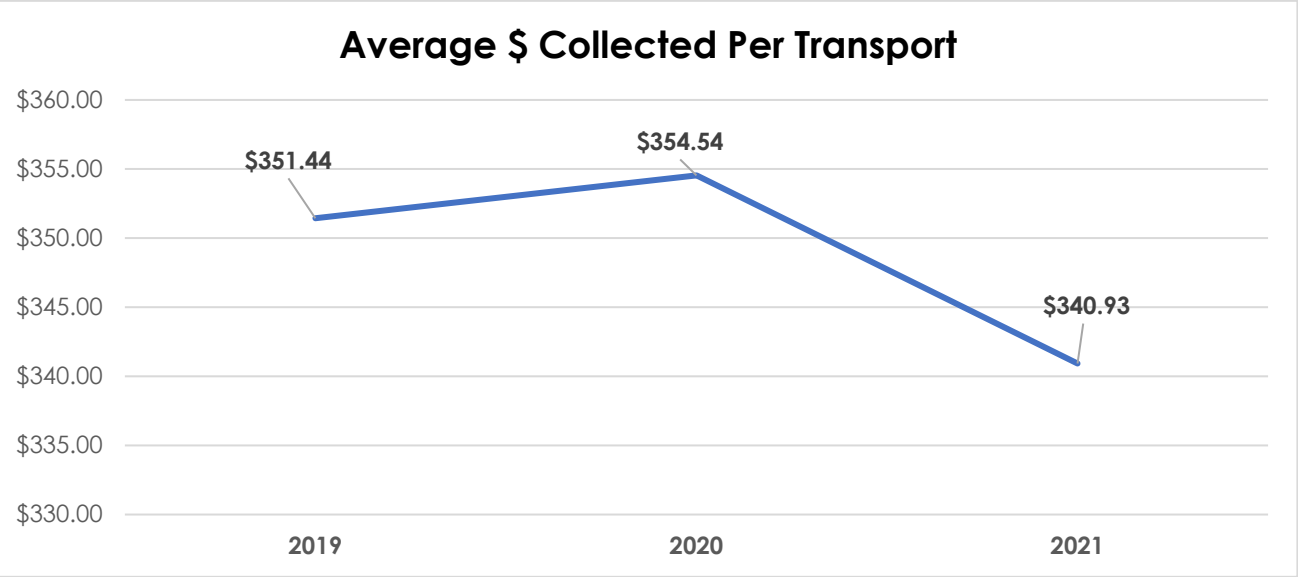
For patients without insurance coverage, many do not pay for the services provided. You can see this reflected in the average payments received by EMS | MC for FCEMS services.

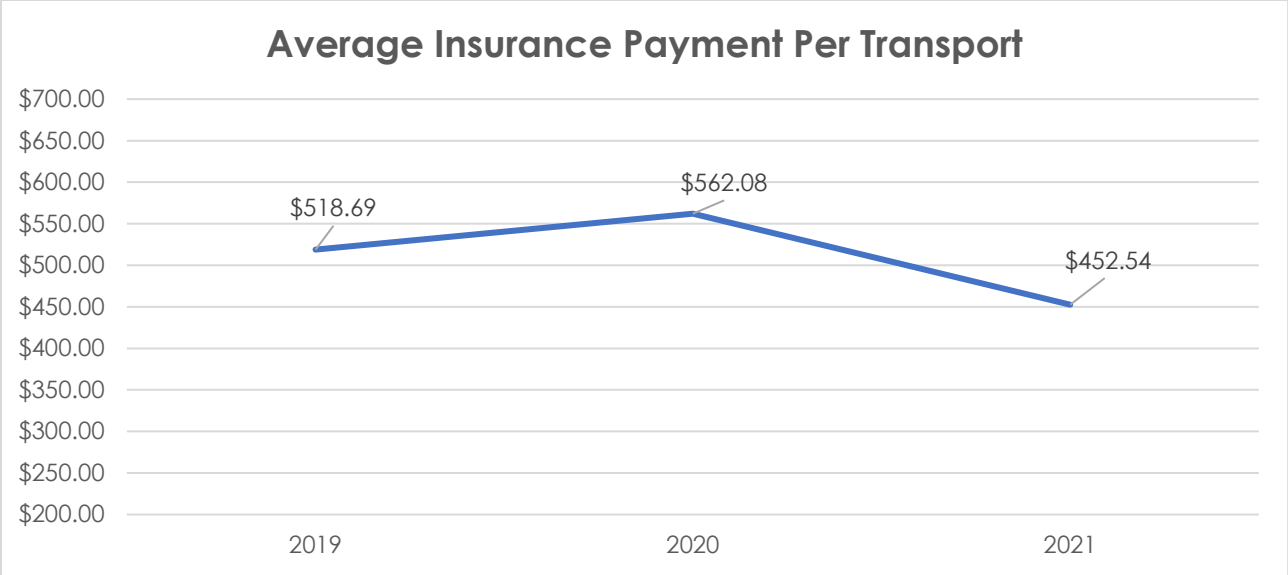
Like many EMS agencies across the country FCEMS is experiencing a general decrease in reimbursements for their services. Historically, Medicare increases their ambulance reimbursement amount by 1% - 2%, depending on inflation and other medical market factors. In 2022, Medicare increased allowable payments to ambulance agencies by 5.6%, which is a large increase in terms of historical increases, however, with current consumer price indexes climbing at rates of 6% - 7%, the net impact on ambulance rates is negative.

Further, due to pre-established federal government Medicare sequestration, and provisions contained in the America's Rescue Plan Act (ARPA), absent Congressional action, Medicare ambulance payments may actually be reduced by 6% (2% from sequestration and up to 4% due to the ARPA provisions), meaning ambulance reimbursement may actually decrease come the summer of 2022.

Medicaid agencies do not often rates, unless instructed by state legislatures, so Medicaid rate increases are slow, if at all.

Analyzing payment and reimbursements for FCEMS over the past three years, we note that the average amount collected for ambulance transports have actually been trending down from $351.44 in 2019 to $340.93 in 2021. Evaluating the payer trends, we found that the biggest change in reimbursement amounts appear to be in the Commercial Insurance payer classification.






To maximize revenue derived from third party reimbursement, we recommend that FCEMS and County Administration evaluate the risks and benefits of phasing in rate increases for FCEMS. Rate increases will generally not impact patients with Medicare and Medicaid as these reimbursements (since those fees are set by the federal government), not will the impact private-pay patients (the majority of those patients do not pay). However, for commercial insurers who pay the 80% of UCR, there may be the opportunity to generate additional revenue.

A review of the FairHealth data, a well-respected and widely-used benchmark for medical fees, of the average ambulance payment in the region reveals that the reimbursement rate in neighboring Wake County is $642 for an ALS-Emergency transport, and $540 for a BLS emergency transport. FCEMS' gross ambulance fees are currently $765.63, seeming to indicate they are consistent with Wake County.

The County may wish to evaluate the economic benefit of a rate increase to enhance ambulance fees for collected. However, due to the payer mix, and FCEMS' commercial payer mix and call volume, the added revenue would be likely only $25,000 – $30,000 in additional revenue annually.

## Recommendation #12:

**Franklin County, in collaboration with its contracted ambulance billing provider, should evaluate the risks and benefits of phasing in rate increases for FCEMS to enhance EMS revenue.**

FCEMS should also discuss with area payers to provide value-enhanced services that also bring in additional review to the agency. An example could be payment for patients treated on scene, and not transported to the hospital. Several agencies have deployed this model in their community and are getting reimbursed for NOT transporting patient to an emergency department, if clinically appropriate to do so.

## Recommendation #13:

**Franklin County, in collaboration with its contracted ambulance billing provider, should engage with area insurers to explore the potential for implementing alternative payment models for EMS delivery.**

# FINANCIAL AND CAPITAL PLAN

Based on the findings and recommendations contained in this report, we can provide some estimated financial projections, including capital costs over the next 5 – 6 years.

| Budget Classification | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| Expenditures | $6,802,566 | $6,975,504 | $7,014,335 | $7,224,765 | $7,441,508 |
| Responses | 9,058 | 9,066 | 9,172 | 9,438 | 9,712 |
| Cost Per Response | $751.00 | $769.41 | $764.76 | $765.50 | $766.25 |
| Transports | 6084 | 5986 | 6165 | 6305 | 6487 |
| Cost Per Transport | $1,118 | $1,165 | $1,138 | $1,146 | $1,147 |
| Unit Hours | 70,217 | 70,279 | 71,100 | 73,162 | 75,284 |
| Cost Per Unit Hour | $96.88 | $99.25 | $98.65 | $98.75 | $98.85 |

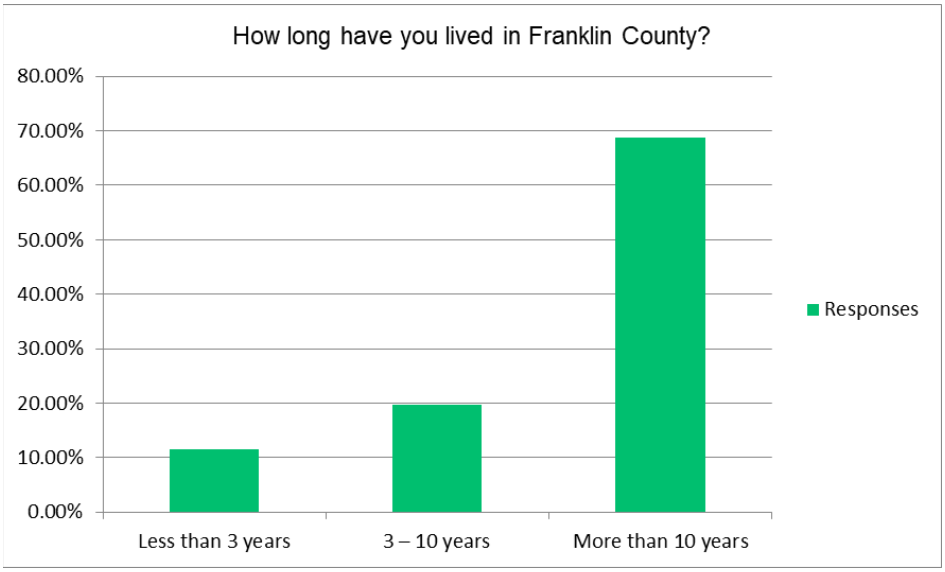
| Budget Classification | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|
| Expenditures | $7,664,753 | $7,894,696 | $8,131,537 | $8,375,483 | $8,626,747 |
| Responses | 9,993 | 10,283 | 10,581 | 10,888 | 11,204 |
| Cost Per Response | $766.99 | $767.74 | $768.48 | $769.23 | $769.98 |
| Transports | 6676 | 6869 | 7068 | 7273 | 7484 |
| Cost Per Transport | $1,148 | $1,149 | $1,150 | $1,152 | $1,153 |
| Unit Hours | 77,467 | 79,714 | 82,025 | 84,404 | 86,852 |
| Cost Per Unit Hour | $98.94 | $99.04 | $99.13 | $99.23 | $99.33 |

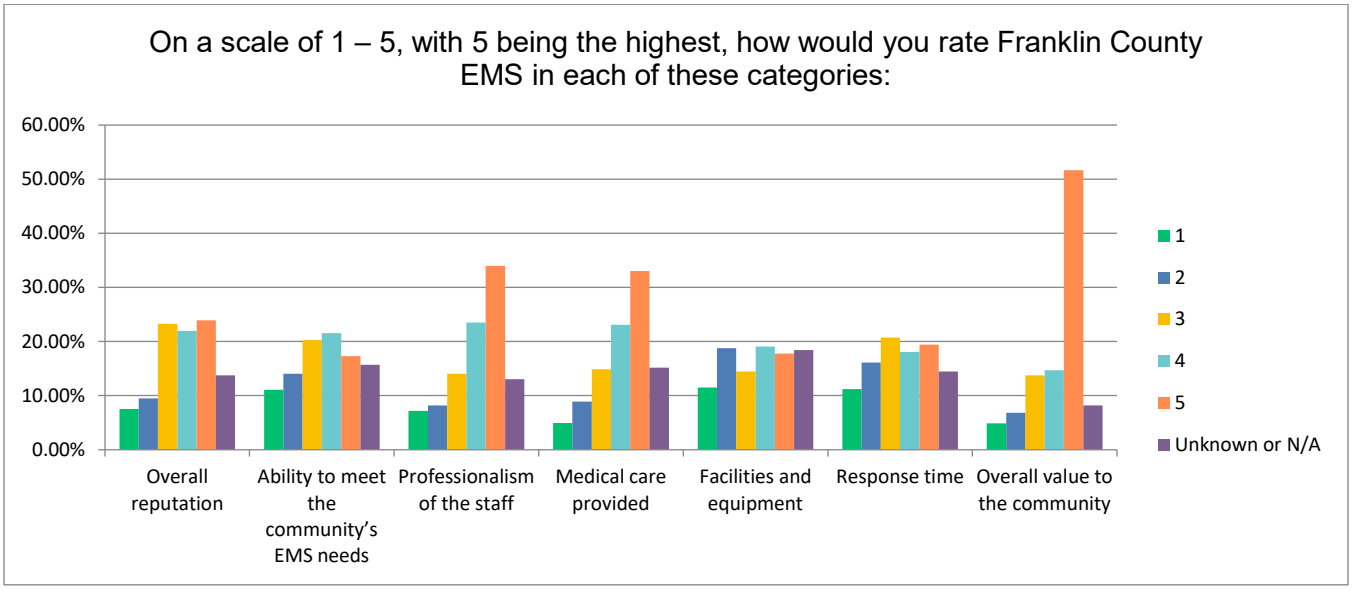
| Capital Plan | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | Total |
|---|---|---|---|---|---|---|---|---|
| Ambulances (1 per year) | $310,000 | $317,750 | $324,105 | $333,828 | $340,505 | $350,720 | $361,241 | **$2,338,149** |
| Monitors (2 per year) | $70,000 | $72,100 | $74,263 | $76,491 | $78,021 | $79,581 | $81,173 | **$531,628** |
| MCDs (2 per year) | $38,000 | $38,380 | $38,764 | $39,151 | $39,543 | $39,938 | $40,338 | **$274,114** |

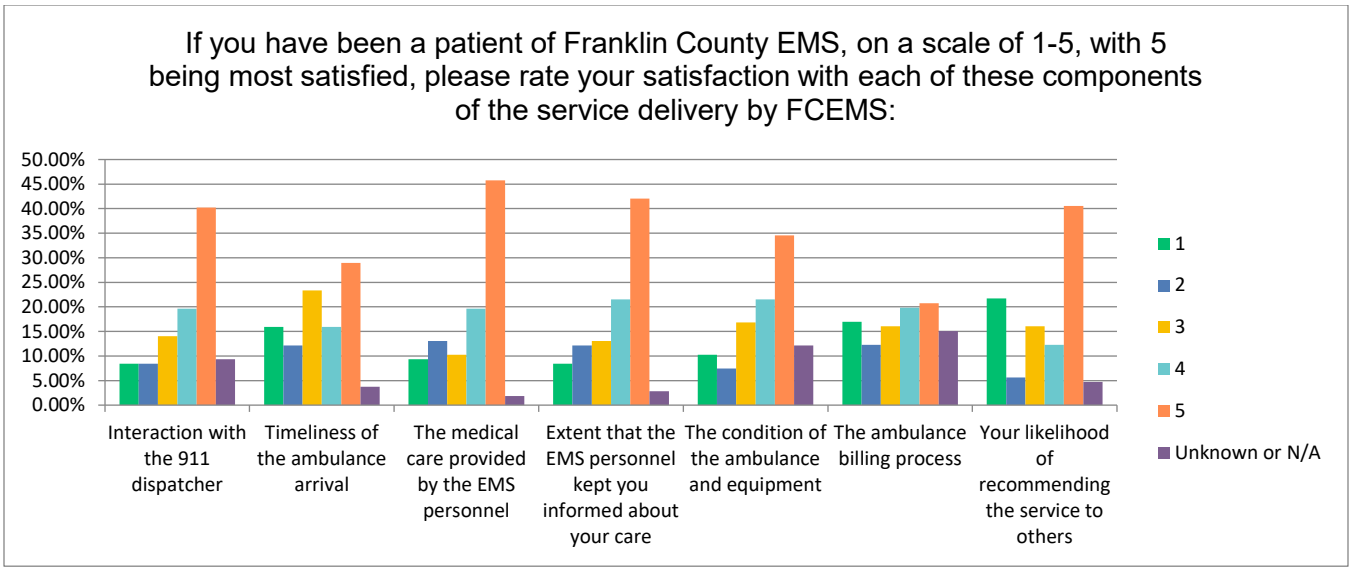
| **Stations** | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | Total |
|---|---|---|---|---|---|---|---|---|
| **Station 2** | | $1,100,000 | | | | | | **$1,100,000** |
| Est. Square Feet | | 5,500 | | | | | | |
| Est. Cost Per Square Foot | | $200 | | | | | | |
| **Station 1** | | | | $2,550,000 | | | | **$2,550,000** |
| Est. Square Feet | | | | 10,000 | | | | |
| Est. Cost Per Square Foot | | | | $255 | | | | |
| **Station 6** | | | | | | $1,292,500 | | **$1,292,500** |
| Est. Square Feet | | | | | | 5,500 | | |
| Est. Cost Per Square Foot | | | | | | $235 | | |

# COMMUNITY PERCEPTION SURVEY RESULTS

As part of this engagement, CPSM developed, and Franklin County distributed, a survey asking Franklin County residents about their perceptions of FCEMS. The results from this survey indicate a high degree of respect for FCEMS, but also identifies a general feeling that FCEMS is struggling with staffing, and is under-resourced, especially in capital improvements for stations and vehicles.






## Community Survey - Select Open Ended Comments

- Investment needs to be made in our EMS system.
- A well-funded EMS system adds real value to our community and should be funded similar to our Fire Departments.
- Desperately needs facilities.
- The county needs more trucks to provide adequate coverage across the county. Response times are poor as a result.
- Terrible that the trucks have to come from all over the county to respond to a call since there isn't enough truck in the county.
- Its services are definitely needed throughout the county. I am glad that they are in service and thankful for all that they do for the residents of Franklin County.
- There need to be more units on the western side of the county. They also need proper EMS stations.
- EMS needs their own buildings. They also need better pay and better leadership. If you are going to be the director of something you should know something about it.
- It concerns me that the EMS teams do not have their own dedicated facility. I have heard stories of them being treated poorly by fire staff in the shared facilities. EMS should be a separate independent agency/division to facilitate positive changes in their programs. There appears to be a disconnect due to the lack of EMS knowledge from the Emergency Management Director. The county needs to show that they value our EMS professionals by providing competitive salaries for all staff and implementing incentives for those long-term employees to encourage them to remain in the county.

- I hope I never need to call/use the services of the EMS, but I have heard great things from those that have and know things would be the best they could.
- They need a new building in Bunn and more equipment, plus a new ambulance.
- Need more available units as well as improved facilities. Those guys deserve better stations. Instead of a dumb ass radio system they need improvements
- Had to call them on 1/2/2022 for my brother. Response time was great! They took really good care of him.
- Thank you for your service! You all need a HUGE raise!
- Franklinton needs their own station. It is absurd that the town has an ambulance but no station. The fire department should not have kicked them out years ago and the county should have done something about it then.
- Very professional and caring
- They are amazing people! So thankful for them.
- The equipment and facilities are aging and it shows. They are under staffed which causes delays etc. however the professionalism and care is a highly valuable tool for FCO
- They are appreciated, but our county could do more to support and supply them.
- They need stations of their own, more units for growth in western FC, and a local hospital with more than just a free standing ER.
- We are very thankful for your services. You take the call not knowing or caring who you'll be saving, and I feel safer ❤️
- Thank you for your service, and for enduring the many problems you all face every day, thank you.
- I hope that the services will continue to meet the challenges as our communities expands!
- They came out for my father several times. All times they were very professional and very kind. I am very satisfied with their care and treatment. They spoke with my dad with such care and concern
- They need there own stations. Need more units for the rise in population.
- My grandmother has been assisted by EMS several times and they have always done a great job with her.
- Franklin County has an outstanding EMS program with high-level care, provided by professional individuals. The living conditions of Franklin County EMS Station 2 are deplorable. No one should be expected to "live" in an old, moldy, condemned house for 24 hours at the time. If there were a family living in that house, there would be a cry of outrage, but our local selfless, professionals are expected to stay there and no one bats an eye. Franklin County should be ashamed at the living conditions they expect Franklin County EMS personnel to "live" in when stationed at Station 2.

- All the staff needs raises. Much respect to them all.
- EMS stations are needed.
- Neighbor needed service and personal who came were quite professional and caring.
- My husband has been transported by Franklin County EMS and the service was very professional and took great care of him.
- It's time the county spends money for EMS stations.

# MEDIA REPORTS ON EMS STAFFING CRISIS

## Delayed: Ambulance Response Times Suffer From EMS Worker Shortage

*A nationwide shortage of EMS workers is having a trickledown effect on ambulance response times during medical emergencies, according to figures reviewed by the NBC10 Investigators*

By Ryan Kath and Jason Solowski

**February 15, 2022**

https://www.nbcboston.com/investigations/delayed-ambulance-response-times-suffer-from-ems-worker-shortage/2644611/

When you call 911, every second can count.

But around Massachusetts, it's taking longer for ambulances to respond to people in need of medical care.

Leaders at private ambulance companies and local fire departments point to a shortage of EMS workers — created by low pay and pandemic burnout — as the primary driver of the delays.

Chelsea's fire chief, Leonard Albanese, has noticed the delays in recent months when an ambulance is needed at fires, car crashes or a patient having a heart attack.

"There's been a noticeable drop-off where we've seen delays in response times," Albanese told NBC10 Boston.

Fire crews respond to every call and are often the first on scene to provide that initial patient contact. All are trained as first responders and many are emergency medical technicians (EMTs).

But more often, the department's public safety resources are getting tied up longer at locations.

During a medical call on Feb. 3, dispatch audio provided an example:

"It's going to be a very delayed response," the dispatcher told first responders. "They have no units in the area. Please provide patient care."

On calls with life-threatening injuries or health problems, the target response time for an advanced-life support (ALS) ambulance is within a six minute window.

Less serious injuries and other minor calls — also known as "cold responses" — have less stringent time deadlines.

In a perfect world, Albanese would like to see 90% of ALS calls arrive within six minutes. That's not realistic during some of the challenges of the pandemic, he said, but the recent trend is concerning.

According to monthly response time reports obtained by NBC10 Boston, the response time percentage stayed consistently around 80% from February through June of last year.

However, the figures started slipping in July before bottoming out in November at 58%.

One call posted by the Twitter handle @chelseascanner described one particularly difficult situation last October when no ambulances were available for a medical call and "they do not even have a guess" of when one could respond.

"I'm not aware of any direct negative outcomes like, God forbid, we lose patient that otherwise could've been saved," Albanese said. "But we are doing what we can to ensure that we provide the best service possible."

In Somerville, ambulance response data provided via public records request showed similar delays last November, when about 62% arrived within the six-minute window.

Revere's data did not separate between ALS calls and less serious "cold responses," but a review of the figures showed about 72% of the calls took at least seven minutes last November.

In one instance, it took an ambulance 30 minutes to respond after a pedestrian was struck by a vehicle and sustained head injuries, according to the dispatch audio.

Dennis Cataldo is president of Cataldo Ambulance, which provides service to 18 Massachusetts communities, primarily along the North Shore. NBC10 Boston asked about the drop in response times.

"A lot of that has to do with the availability of staff," Cataldo said. "There is no other way to try and answer that question."

Prior to COVID-19, there was already a high turnover rate among EMS workers. But the pandemic has exacerbated the shortage with some workers leaving the industry from burnout, and fewer recruits coming onboard.

Prospective workers can make similar wages in less stressful, less risky environments like department stores or fast-food chains.

"The pay is certainly not commensurate with the responsibility," Cataldo said.

Ambulance companies say their revenue is dependent on reimbursement rates from the state and federal government, along with commercial insurers. Until those are increased, don't expect EMS salaries to show much of bump.

So as people call 911 with greater frequency for issues big and small, the Massachusetts Ambulance Association estimates there are 30% fewer ambulances on the road because there simply aren't enough EMTs and paramedics to staff them.

In Massachusetts, the National Guard has been called upon to assist with patient transfers from hospitals or long-term care facilities to free up the resources of private ambulance companies.

"I think it's a critical issue," Cataldo said. "People should be concerned that in the future, we need to find a way to solve for this."

# Mercer EMS providers in crisis mode, ambulance shortage becoming more severe

The challenges stem from a lack of manpower, to not receiving proper pay for their work.

**Monday, February 21st 2022**

https://www.wfmj.com/story/45916604/mercer-ems-providers-in-crisis-mode-ambulance-shortage-becoming-more-severe

Emergency medical services across Pennsylvania are in crisis mode, trying to find ways to continue services.

The challenges stem from a lack of man power, to not receiving proper pay for their work.

The majority of the patients they service are on medicaid or medicare and reimbursements for service total just $200 dollars.

"We are losing more EMS providers faster than we can train them," said Doug Dick, Chief at Superior Ambulance Service and President of the Mercer County Pre-Hospital Care Council. "We cannot afford to pay our people what they deserve, we cannot afford to keep on spending the money we're spending to provide the services," he said.

Less manpower means less ambulances on the road and longer wait times.

In several instances this month alone, there's been only one ambulance available for the entire county.

If an ambulance becomes available while others are preoccupied and it's leaving Sharon Regional Medical Center, for example, but there's a call in Sandy Lake, you're looking at a 40 minute wait time.

Dick's plan to fix this issue includes an increase in sales tax. He believes a one percent sales tax increase will help tremendously and tells 21 News by the end of this year, it would generate more than $16 million dollars, if granted.

"We do not have any time to waste, we're standing on a cliff looking over the cliff," Dick said.

Mercer County Commissioner Matthew McConnell opposes the idea. McConnell says EMS does need reimbursement for their services, but they're a "for-profit" entity, so it shouldn't come from a sales tax increase.

McConnell instead suggests a change in insurance reimbursement rates.

Dick says something needs to happen quickly, before someone dial's 9-1-1 and doesn't receive an ambulance.

# Rural ambulance agencies also dealing with longer wait times at hospitals

by Steve Maugeri

**September 29th, 2021**

https://cbs6albany.com/news/local/rural-ambulance-agencies-also-dealing-with-longer-wait-times-at-hospitals

CAPITAL REGION (WRGB) — Albany County Sheriff Craig Apple says that wait times are increasing due to short staffing at hospitals, and rural county ambulances are having that same problem, since they have a longer trip to a larger hospital like Albany Med. Sheriff Apple was not available for an interview Wednesday night. CBS 6 did speak to the emergency management director, Steve Santa Maria.

He says that his EMS agencies are already dealing with their own staffing shortages. He says that their hospital is also seeing some staffing shortages, which causes longer drop off times. He says the vaccine mandates at hospitals likely play a factor in this, since employees are getting suspended for not getting the shot. But he says the problems can compound when his ambulances have to take someone to a hospital out of the area. Wait times only go up, which can lead to longer response times.

Santa Maria says that one call can leave an ambulance unavailable for hours.

"*Typically, a couple hour trip on average has turned into closer to three now and that's being a little generous. Those trips have been extended. The longer wait times are not just for our ambulances but they're for most of the agencies you talk to*," Santa Maria said.

We've previously reported on how the city of Troy is seeing wait times increase which keeps their fire department ambulances held up. And we've reported how smaller municipalities like Poestenkill have to rely on private companies for EMS service since they don't have their own.

Santa Maria says that the city of Johnstown in Fulton county is about to get another ambulance, which can help respond to new calls, But won't affect wait times at the hospital.

# Report: Rural areas wait longer for ambulances

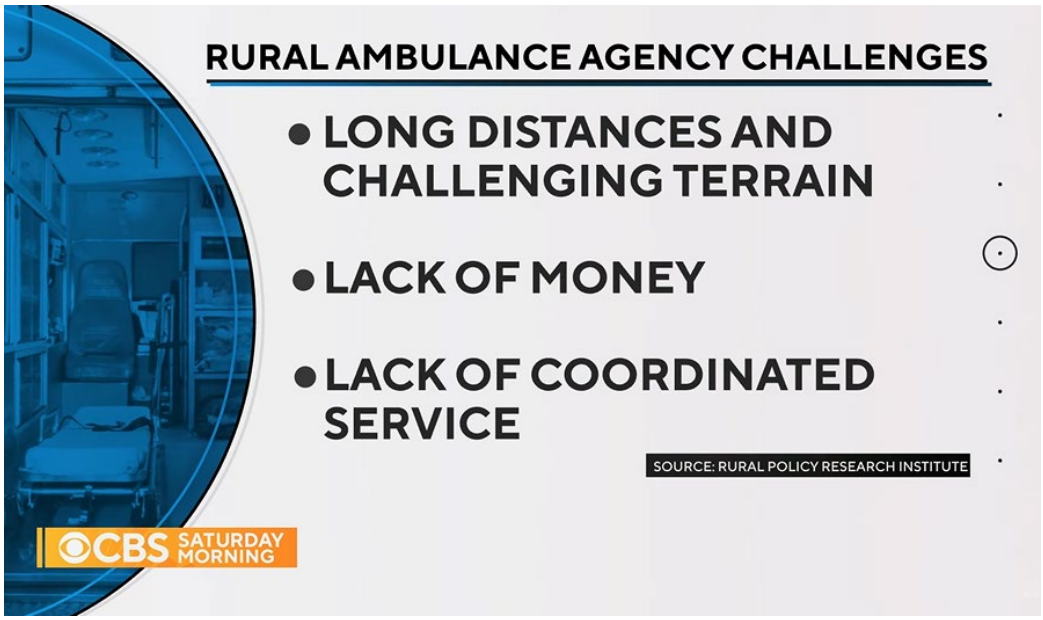
**September 25, 2021**

The latest census report finds that 60 million Americans live in rural areas. The Centers for Disease Control and Prevention reports that they tend to be older, sicker and poorer than the average American.

According to a study by the Rural Policy Institute, there are not enough ambulances to help in an emergency.

Note: No written transcript is available for this TV news report, however, the 5 minute video is compelling and can be viewed here.

In the report, Alan Morgan, the director of the National Rural Health Association, states that the failing rural ambulance system may be contributing to the falling life expectancy in rural communities.



# What if you call 911 and no one comes?

*Inside the collapse of America's emergency medical services.*

By Erika Edwards

**Oct. 22 2019**

NBC NEWS

https://www.nbcnews.com/health/health-care/there-s-shortage-volunteer-ems-workers-ambulances-rural-america-n1068556

The night of June 15, 2016, was perfect for a softball game in Hebron, North Dakota. The temperature had reached almost 80 degrees that day, and even though Jerrid Soupir had been feeling pretty lousy — like maybe he was catching a summer cold — he was itching to get out on the field.

It was a doubleheader that night. Soupir, then 46, was playing shortstop in the second game. He remembers helping his teammates make a double play, getting two players out.

He turned to walk back to his position, went limp and fell straight to the ground.

Soupir had gone into cardiac arrest, meaning his heart stopped working suddenly. It's often fatal if the victim doesn't get help quickly.

There is no hospital in Hebron. In fact, when someone calls 911, there isn't even a law that requires anyone in Hebron to answer the phone. Like so many other low-income, rural communities across the country, the small town's ambulance runs on altruism alone.

And those ambulance services are closing in record numbers, putting around 60 million Americans at risk of being stranded in a medical emergency. Because so many emergency medical services (EMS) agencies have been struggling financially, some states are stepping in with funding. But emergency medical experts say it's not enough to cure the dire situation.

Organizing and providing emergency medical care is left to the people living in Hebron, which has a population of 677. Luckily for Soupir, the softball field was the right place to be when he collapsed.

At the game that night were not one, but two people who worked with the local ambulance service. A third player had a CPR kit in his car. A fourth emergency worker happened to be out on her evening walk by the park.

The softball team turned makeshift emergency department got Soupir to the hospital in Bismarck — 60 miles away — and saved his life that night. "If there had been no ambulance, and people wouldn't have acted the way they did," Soupir said, "I wouldn't be alive."

Like so many other small towns in America, Hebron relies almost exclusively on volunteers, making it difficult to keep its EMS going.

"We struggle getting enough staff to cover every shift, 24 hours a day, seven days a week," Steven Maershbecker, squad leader of the Hebron ambulance service, said.

Maershbecker, 54, also owns the town grocery store, called Jack & Jill Grocery, on Main Street. Working full time and donating any extra time to the community is just what people in towns like Hebron do.

"The way I was brought up, you give it your all. You give 120 percent all the time," Maershbecker said.

Two hours to the southwest of Hebron, close to the state's border with Montana, the EMS situation in the tiny town of Marmarth, North Dakota, (population 143) is so dire that it's at risk of shutting down.

"We are literally one person away from closing," said Erick Hartse, a volunteer paramedic with the Marmarth ambulance service.

There are 12 EMS personnel in Marmarth, and they each take 12-hour shifts. Two people must be on call at the same time: usually one to drive the ambulance and another to administer more advanced medical care. All 12 donate their time, without compensation of any kind. That means they must also work a full-time job to support their families.

"We've been relying on volunteers to be the backbone in EMS for a long time, and unfortunately, that needs to change," Hartse, 30, said. "Could you imagine being a volunteer doctor? It's unfathomable."

Still, Hartse, a third-generation paramedic, can't imagine any other way of life.

"It was something that was ingrained in me at a very young age," he said. "It's a strong sense of community and a strong sense of being willing to help other people. You take a little bit of time out of your day to help somebody else that's having the worst day of their lives."

**Shrinking, aging populations**

The situations in Hebron and Marmarth aren't isolated; they come at a time when demand for health care in rural America far exceeds the supply of people necessary to provide that care.

According to the U.S. Census Bureau, in 1900, 60 percent of the population was considered "rural." By 2010, that percentage had fallen to 19.3 percent. (The Census Bureau defines a rural community as one with a population of less than 2,500.) However, the vast majority of land in the U.S. — more than 95 percent — is rural.

Younger, healthier members of the community often leave small towns for urban areas, leaving behind aging, often poor, older adults who tend to be the ones calling 911 with heart attacks, strokes and other health emergencies.

That leaves few people available — and willing — to volunteer as emergency medical personnel.

"As the population in these communities shrinks, you've got a finite pool of people who are willing to volunteer," said Wayne Denny, chief of Idaho's Bureau of Emergency Medical Services and Preparedness.

EMS volunteer work requires hours of initial training that costs hundreds of dollars, even at the most basic levels. In North Dakota, for example, emergency medical responders need 50 to 60 hours of training to learn how to drive an ambulance and assist with basic CPR and first aid. Those classes can cost at least $600, which must be shouldered by the unpaid volunteer.

Training commitment hours and costs rise steadily as the volunteers become more skilled, climbing the ranks from basic emergency medical technician to advanced emergency medical technician to paramedic. And every two years, volunteers need continuing education.

Maershbecker, of Hebron, is an emergency medical responder, or EMR. That role requires 16 hours of additional training every two years. Emergency medical technicians, or EMTs, need at least 40 hours.

"We only need 16, but all of us are taking 40-plus because we want to be able to assist our EMTs as fully as we possibly can," Maershbecker said. "The more we know, the more we can help them."

"The more we know, the more we can help them," Maershbecker said. (Ackerman + Gruber / for NBC News)

In many shrinking rural communities, agencies like the ones in Hebron and Marmarth are "hanging on by the skin of their teeth," said Andy Gienapp, head of the Office of Emergency Medical Services for the Wyoming Department of Health.

"The reason that they're managing to hang on is that some of the volunteers just look around and say, 'Well, good grief, if I don't continue to do this, who will?'" Gienapp said.

Hartse in Marmarth, North Dakota, agrees. "Can you imagine sitting in a place and dialing 911 and not having anybody show up?" he asked. "That's very difficult for me to sit back and try to accept."

When one EMS agency closes, even temporarily, it puts a tremendous strain on surrounding services that must travel farther to help those in need.

"In Idaho, like other western states, it's not like there's a neighboring community five miles up the road. It might be 30 miles. It might be 50 miles," Denny said.

Adding to the strain, a report from the University of North Carolina Cecil G. Sheps Center for Health Services Research found that 118 rural hospitals across the country have closed since 2010, though that number does not take into account small facilities that had to shut their doors temporarily and then reopened. Many of those hospitals are in states that did not expand Medicaid under the Affordable Care Act.

"We've never had this many hospitals close this fast in this country," said Nikki King, a member of the National Rural Health Association, a nonprofit organization that advocates for rural health issues.

Fewer rural hospitals mean ambulances need to travel even farther distances, often in rough terrain or on unmarked roads.

"You're talking about an older, sicker, poorer population that's more likely to rely on EMS that is now farther and farther away from health care," King said.

What's more, most EMS programs get paid by each emergency call they go on, through reimbursements from Medicare, Medicaid or private payers. Longer drives mean fewer calls, and consequently, less money.

And EMS services respond to calls regardless of patients' ability to pay.

"Mixed in with those patients who have private insurance, or the financial means to pay an ambulance bill, is a fair amount of underinsured or those who have no insurance whatsoever," Gienapp explained.

Very often, EMS funding cannot cover the cost of having a working ambulance and crew on standby, waiting for an emergency call. Some calls end up with no patient to bill: the call could be canceled; the person may refuse to go to the hospital; or the patient may die before going to the hospital.

Other funding can come from a variety of sources, but usually not the state legislature. A majority of states do not consider local emergency medical services "essential" by law, as they do for fire and police.

Sometimes money comes from local taxes, a well that's drying up with the shrinking rural population. In Idaho, for example, there is a 25 cent fee on motor vehicle registrations that's allocated for EMS in each county.

"But in these smaller counties that are very rural, the number of motor vehicle registrations they have every year is small," Denny said.

King said communities are forced to support their EMS agencies in any way possible.

"We have critical care emergency services being funded by fish fries and spaghetti dinners."

**How did we get here?**

In the 1950s, it was funeral homes that actually provided many of the country's ambulance services because they had vehicles — namely, hearses — that could accommodate a person who needed to lie down. It was an ominous predictor of what was to happen over the next decade.

As the U.S. highway system modernized and flourished, motor vehicle fatalities increased. By 1962, tens of thousands of people were dying in car accidents.

Four years later, the National Academy of Sciences published what is now considered to be a landmark report, called "Accidental Death and Disability: The Neglected Disease of Modern Society."

It laid the groundwork for a system of pre-hospital medical care by spotlighting unnecessary deaths and disability from accidental injuries — in particular, motor vehicle accidents. Lives could be saved, the report concluded, if injured drivers and their passengers could get to a hospital quickly.

"All ambulance services really began with the concept: how do we get somebody off the highway from a motor vehicle crash and get them to a hospital?" Gienapp, of the Wyoming Department of Health, said.

But in 1960, just a handful of states had developed standardized courses for emergency rescuers, and fewer than half of all EMS personnel had even minimal first aid training.

Over the following years, the system evolved to transport people who have had other medical emergencies, such as heart attacks and strokes. As a result, EMS fell under the National Highway Traffic Safety Administration, not the Department of Health and Human Services.

EMS "grew up overnight," Gienapp said. "In rural America, it was very easy. If you wanted an ambulance service, you just got two or three of your friends together and went out and got a truck." Dorothy Baron did just that.

In 1977, Baron and a few other residents in her hometown of Moorcroft, Wyoming, (population 1,009) saw a gap in emergency health care, and took it upon themselves to take the necessary training courses and then start their own volunteer ambulance service.

Their first "ambulance" was a used Chevy Suburban with a board in the back that acted as a gurney. It stuck so far out of the vehicle's backend that Baron's crew couldn't get the door closed.

As emergency medicine technology evolved, so did Baron. Over time, she became an advanced EMT, and her EMS agency was able to purchase real ambulances.

She did this in addition to raising seven children. "It was just something I could do to contribute to the community," Baron explained.

Baron, who turns 82 this month, continues her volunteer EMS work to this day. She had to cut her interview for this story short; a call about a car accident demanded her attention.

**Pensions for the unpaid**

Recruiting and holding on to people like Baron who spend decades serving their community can be difficult.

There is no 401K that comes with volunteer work, no big payout at the end of service, and very often, no benefits other than the satisfaction of helping neighbors in need. Gienapp estimates that nearly three-quarters of the EMS workers in his home state of Wyoming are either grossly undercompensated, or receive no pay whatsoever.

"Really, what we're talking about is that 70 percent to 74 percent of the emergency medical services are provided by people for whom that is not their full-time job," he said.

Some communities try to offset the compensation gap by offering volunteers modest stipends or breaks on property taxes. Others utilize what are called Length of Service Award Programs. These are like pensions, but under the current tax code, contributions from an employer for retirement plans can't be higher than compensation. That's a problem if your compensation is zero.

A bipartisan bill before the U.S. Senate aims to change that, so Length of Service Award Programs can function like traditional employer retirement plans.

The Volunteer Emergency Services Recruitment and Retention Act, sponsored by Sens. Susan Collins (R-Maine) and Ben Cardin (D-Maryland), would allow higher contributions and make those contributions into the program tax deferred, guaranteed and eligible for rollover to a different plan.

"If you're serving your community through volunteer service as either an emergency medical person or firefighter," Cardin said, "you want to make sure that your family is protected later in life because you're giving up some of your ability to put resources away with a traditional employer."

"We gotta make it easier for volunteers to serve," he said.

**Pride versus profit**

Still, it's unclear whether bills like this one are enough to solve the problem.

Gienapp and other rural health experts say a system that relies exclusively on the goodwill of people is simply unsustainable. EMS agencies need money to recruit and retain qualified workers, and for upkeep of the equipment.

When they don't have sufficient funding, they close.

Solutions to a broken rural health care system require sensitivity in communities that have deep emotional ties to their volunteer EMS workers. The idea of folding or contracting ambulance services from other towns or companies is often met with resistance, because the services don't feel "hometown" anymore, Gienapp said.

So, rural EMS agencies need to get creative. One immediate option is to seek out work that's sure to result in payment.

That's how the EMS system serving Campbell County Memorial Hospital in Gillette, Wyoming, went from losing money to turning a profit within the past three years.

"We started partnering with different departments in the hospital to either help them deliver their service line or do it more effectively, more efficiently," said Christopher Beltz, EMS director for Campbell County Health. This includes transporting patients between facilities if they require specialty care, such as patients with kidney disease who must travel for dialysis treatments.

But this is not a salve for all rural EMS systems. The agency in Gillette is affiliated with a major hospital, and is able to pay its staff a modest salary. Even then, Beltz said it's difficult to compete with higher-paying jobs.

"As a rural EMS agency, it's hard to get people just to walk in the door and apply for a job," he said. "We are in the heart of coal country here in Wyoming and people can make a lot more money per hour working in the coal mines."

**Serving their own**

Rebecca Bumgardner helps support her family by working 40 hours a week at a motel in Baker, Montana. She and her husband also volunteer with their local fire department. And they have a two-year-old daughter who goes to work with Bumgardner at the motel.

"I've got a few irons in the fire," she joked.

But every Tuesday, Bumgardner leaves her family and her day job to work the night shift — 6 p.m. to 6 a.m. — as a volunteer EMT in Marmarth, North Dakota, the town in danger of losing its ambulance services.

"I'm spread thin. But it's something that matters to me," said Bumgardner, 26. "So even if it's only one night a week, I make it work."

A strong connection to community is illustrative of another element of rural EMS agencies that sets them apart from many others in the country.

"Almost every time this ambulance leaves," Hartse, the volunteer Marmarth paramedic, said, "we know the person we're gonna go help."

It gets to the root of Hartse's biggest fear about losing the local emergency medical service.

"What happens if my family's the one that needs the ambulance, and there's nobody here?"