



Mecklenburg County Emergency Medical Services System Assessment

JUNE 2026

***In cooperation with the Mecklenburg County
EMS Agency & System Stakeholders***

Developed by
Healthcare Strategists, Inc.
www.healthcarestrategists.com

***HEALTHCARE
STRATEGISTS***

Table of Contents

Executive Summary	4
Introduction.....	6
Mecklenburg County, North Carolina	6
Mecklenburg County EMS System	6
Mecklenburg EMS Agency	8
EMS Industry Innovation.....	8
EMS System Assessment Scope of Work.....	9
Method of Assessment	10
Materials Reviewed	10
Field Observations	10
Interviews Completed.....	10
Discussions, Findings, and Recommendations.....	12
The EMS Decision Triangle.....	12
1. EMS System Review	13
Current EMS System	13
EMS Comparison Systems.....	15
2. Roles and Responsibilities.....	19
Statutory Roles and Responsibilities.....	19
First Responder Role	22
Legal Requirements and Best Practices	23
3. Service Delivery Model	25
Current Service Delivery Model	25
EMS System Comparison	27
Areas of Recommended Improvement	34
4. Patient Outcomes	35
Clinical Protocols, Oversight, and Performance	35
Findings & Recommendations	35
Clinical Quality Assessment Summary	40
Current Performance Comparison.....	47
5. Current EMS Goals and Performance Standards.....	48
Response Times	48
Response Configuration and Protocol Methodology	49

Proposed Changes	49
Measuring Compliance	51
6. Response Zone Analysis	52
Zones.....	52
Deployment Centers	53
Raw vs. Corrected Response Time Compliance.....	54
Response Times	55
7. Historical and Current Performance Analysis	57
Compliance Analysis Statement	57
System Status and Deployment Plan Analysis.....	57
8. Systemwide Operations Review	59
Communications Center	59
System Efficiencies.....	63
Community Education	66
Ambulance Fleet Size	66
9. Customer Experience Evaluation	67
10. EMS System Funding Model	71
Financial Statements.....	71
Costs for Services	71
Funding Sources and Distribution.....	71
First Responder Expenses	73
11. Funding Levels and Distribution	75
12. Budget and Sustainability	77
Conclusion	78
Attachments	80
Attachment A: Comparable High-Performance EMS Systems Comparison Data	81
Attachment B: North Carolina EMS System County Comparison Data	87
Attachment C: CARES Data	88
Attachment D: EMS Standards, Core Measures, & Benchmarks.....	89
Attachment E: Community Survey.....	93
Attachment F: Acronyms	104

EXECUTIVE SUMMARY

The consulting team from Healthcare Strategists, Inc. (HCS) comprises highly trained individuals working in all aspects of emergency medical services (EMS) with no less than 35 years of experience. They invited over 70 EMS stakeholders from throughout Mecklenburg County (County) to share their input, in addition to spending time in the field observing the system at work. The County EMS Agency (Medic) and all stakeholders were open and engaging in sharing their agencies' demographics, strengths, and opportunities for improvement.

HCS consultants found that the County EMS system encompasses highly trained and passionate individuals. They share a mission and vital role in providing the prehospital continuum of care for people in need. The overall tone of discussions indicated a desire for significant but balanced change, recognizing both the strengths and potential inflexibilities of the current system. All parties acknowledge that maintaining the status quo is likely untenable given strong concerns from municipal partners; constructive structural change, particularly in interagency collaboration, should be a focal point as the system develops into the future.

System Highlights

- Some of the highest cardiac arrest survival rates in the country
- Superior clinical oversight and performance
- Response times clinically appropriate for patient acuity with tiered response using advanced life support (ALS) ambulances, basic life support (BLS) ambulances, and fire first responders
- 100% implementation of Medical Priority Dispatch System® (MPDS) and Emergency Medical Dispatch (EMD)
- Significant financial contribution by the County beyond patient revenue

System Challenges

- Operating under a 30-year-old provider agreement
- Insufficient ambulance resources to meet the established performance goals
- Lack of response time standards matched to call or population density
- Lack of stakeholder transparency, especially in deployment plans, unit locations, and compliance data
- Substantial difference between raw and contract response time compliance due to frequent exemptions
- First responder dissatisfaction due to a system designed with long scene times for low acuity calls
- First responder partnership agreements with dated formulas to reimburse first responders for services provided are under review or a notice of cancellation received
- Dispatch limitations on customized response plans for each fire agency

- Inefficient dispatch process due to dispatch connectivity, unit location tracking, resource allocation, and call information
- Call processing times are longer than industry standards
- Lack of detailed measures of stroke and trauma center performance

Key Recommendations

- Determine the realistic response time performance goals and provide ambulance resources to maintain them
- Update the provider agreement to reflect the desired service performance levels
- Adjust response time standards to match call density and set realistic expectations
- Implement transparency tools for data sharing, deployment, compliance, and performance
- Eliminate exemptions from the agreement as the system is consistently exempt based on concurrent call load
- Develop first responder fee agreements that utilize a consistent formula that shares the County cost savings when first response reduces ambulance unit hours
- Customize fire and EMS deployment plans within the dispatch center for each fire agency
- Improve connectivity between dispatch centers, greater technology for location tracking, unit recommendations, and real-time situational awareness for all agencies
- Strengthen EMS quality assurance processes for specialty stroke and trauma receiving centers to ensure continuity of care from 911 to discharge

Targeted Recommendations

The above-stated recommendations are by nature broad and generalized; following input from key stakeholders, the following are targeted recommendations

- Provide first responder subsidies equal to the benefit provided, \$1.28M
- Adjust Priority 1 response times from 10:59 to 11:59 minutes to attain 90% compliance at current performance
 - Faster response times are not clinically justified
 - The system is performing well clinically with the actual response times (i.e., very high cardiac arrest survival rates)
 - Some increase of subsidy and/or base rates will likely be needed independent of system changes to maintain the status quo; Any move toward faster response times will magnify that need.
- Adjust Priority 2 response times by 8:00 minutes, Priority 3 by 1:00 minute, and Priority 4 as best effort
 - Faster response times are not clinically justified, especially when lower acuity
 - Calls have been triaged by the dispatch center as not being a medical emergency
 - First responders can clear (or remain on scene and available for the next call) after assessment and determine that the 911 call is non-emergent

INTRODUCTION

Mecklenburg County, North Carolina

The County is in the southwestern region of North Carolina (NC) and is the most populous county in the state, with over 1.1 million residents across 544 square miles. Anchored by the City of Charlotte, North Carolina's largest urban center, the County serves as a major economic, cultural, and transportation hub in the Southeastern United States. It encompasses both urban and suburban communities, and is characterized by a diverse population, a growing economy, and a commitment to sustainability, innovation, and quality public services.

The County is home to multiple professional sporting venues and teams, many college campuses, two major lakes, a busy international airport, several major business centers, one nuclear power plant, and a growing population. Current estimates count 115 people moving to Charlotte daily.

In addition to the City of Charlotte, the County includes six incorporated towns. Each town contributes its own distinct character and strengths to the region:

- Cornelius is a lakeside town on the shores of Lake Norman, known for its recreational amenities, residential communities, and growing commercial base
- Davidson, home to Davidson College, is a historic college town with a strong emphasis on education, walkability, and community engagement
- Huntersville is one of the fastest-growing towns in the County, offering a blend of suburban development, retail centers, and access to Lake Norman
- Matthews maintains a strong sense of community with a historic downtown, active civic life, and a growing business environment
- Mint Hill offers a mix of suburban and rural settings with a family-oriented atmosphere and expanding commercial development
- Pineville, located just south of Charlotte, is known for its retail destinations, historic downtown, and proximity to major transportation corridors

The County operates under a commission-manager form of government, providing a broad range of services including public health, social services, parks and recreation, environmental protection, public safety, and infrastructure development. The County is recognized for its forward-looking governance, data-driven decision-making, and collaboration with local municipalities and regional partners to support economic growth and community well-being.

Mecklenburg County EMS System

EMS within the County is led by the Mecklenburg EMS Agency - commonly known as Medic - the busiest EMS provider in North Carolina. Fiscal year (FY) 2025 was a record year for 911 calls received, responses, and transports. Volume is expected to continue growing based on the County growth estimates and aging population.

Medic was established in 1996 as a NC joint governmental agency formed by the County and the Charlotte Mecklenburg Hospital Authority (CMHA) which is Atrium Health. Novant Healthcare subsequently joined the agreement as well.

In the state of NC, each county is responsible for providing EMS according to state statutes NC GS 143-517, NC GS 153A-250.

Each county shall ensure that emergency medical services are provided to its citizens. Nothing in this Article affects the power of local governments to finance ambulance operations or to support rescue squads. Nothing in this Article shall be construed to allow infringement on the private practice of Medicine or the lawful operation of health care facilities. (1973, c. 208, s. 11; 2001-220, s. 1. Additional guidance is created by NC OEMS regulation 10A NCAC 13P .0201. County governments shall establish EMS Systems. Each EMS System shall have: (1) a defined geographical service area for the EMS System. The minimum service area for an EMS System shall be one county. There may be multiple EMS Provider service areas within an EMS System. The highest level of care offered within any EMS Provider service area shall be available to the citizens within that service area 24 hours a day, seven days a week.

Medic provides 911 emergency medical response via a two-tiered system design with ALS and BLS ambulances. The County EMS system relies on 13 fire departments providing emergency medical technicians (EMT) as BLS first responders. These fire departments include the municipal departments of Charlotte, Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville. The County receives further support from fire departments located in the extraterritorial jurisdictions (ETJ) which are collectively referred to as the “County fire departments” and include Carolina, Cooks, Long Creek, Robinson, Steele Creek, and West Meck. Overall, these fire departments have 96 staffed first response apparatus across the County.

The EMS service area includes the entire County spanning approximately 544 square miles, covering Charlotte and surrounding municipalities with a population of over 1.1 million, and experiences significant surges due to commute traffic, tourism, and special events.

In FY2025, Medic responded to 178,005 calls, transporting 121,904 patients, with around 18% of 911 transports classified as life-threatening or potentially life-threatening. 911 calls for EMS are routed directly to Medic’s Central Medical Emergency Dispatch (CMED) after being received and triaged by Charlotte-Mecklenburg Police Department (CMPD), the County’s primary public-safety answering point (PSAP). CMED is the only secondary Medical PSAP in the state, which handles both EMS and County fire dispatch (for areas outside Charlotte city limits). CMED is an Accredited Center of Excellence (ACE) by the International Academies of Emergency Dispatch (IAED) for excellence in emergency dispatch.

Medic uses system status management, positioning ambulances based on predictive modeling of call volume to maintain coverage and dispatch efficiency across the County. Response time goal for Priority 1 (i.e., the highest acuity) calls is 10:59 at least 90% of the time, even in low population density areas. Medic utilizes a dynamic deployment model with the number of ambulances staffed in the County at any one time dependent upon the time of day, day of week, and historically projected call volume.

To provide optimal coverage and allow for the quickest response times possible given the resources available, ambulances are strategically located throughout the County. This distribution creates an ability to respond, stabilize, and transport the most critical patients (i.e., Priority 1) to the appropriate medical facility as quickly as possible.

For cardiac arrest cases, Medic and first responders utilize a focused cardiac arrest protocol which successfully achieves return of spontaneous circulation (ROSC, 72%) and survival to hospital discharge (45%) for Utstein criteria cardiac arrest patients, placing Medic among top performers in the national Cardiac Arrest Registry to Enhance Survival (CARES) database.

In April 2023, Medic adjusted its response configuration to prioritize high-acuity calls: lowering lights-and-sirens responses from 76% to 21% and extending target times for low-acuity calls from 30 to 60 minutes. Early data (from May-December 2023) indicates less than one percent of low-priority calls subsequently required lights-and-sirens transport. These reforms aim to reduce resource strain, minimize ambulance accidents (which are down 33%), and align response levels to severity more safely and efficiently.

Mecklenburg EMS Agency

Medic is accredited by the Commission on Accreditation of Ambulance Services (CAAS) and operates under oversight of an Agency Board of Commissioners (ABOC) appointed by the Mecklenburg Board of County Commissioners (BOCC), with representation from Atrium Health, Novant Health, and local county government.

Though Medic is often associated with the ambulances seen in the field, the organization is a far more complex response and preparedness system than the public recognizes:

- Medic's 911 dispatch center received 195,426 calls for service in FY2025
- Medic's responses resulted in 121,904 patient transports in FY2025
- Medic's average scene time for Priority 1 trauma patients (the most serious) was 09:39 minutes for FY2025
- Medic currently has more than 650 employees, consisting of paramedics, EMTs, 911 telecommunicators, fleet and logistics staff, clinical and quality improvement, and administrative staff
- Medic had an adopted FY25 combined operating and capital budget of \$97,320,495
- Medic transports patients to 17 emergency departments in the County
- Of patients served, 63.5% rate their experience as "Excellent" or top box

EMS Industry Innovation

Throughout 2017 and 2018, EMS professionals, stakeholders, and public members shared ideas through collaborative encounters to update the National EMS Advisory Council (NEMSA) "EMS Agenda for the Future," initially released in 1996. The new vision, the "EMS Agenda 2050," aims to unite everyone with a role in EMS around a singular purpose: a people-centered EMS system. EMS Agenda 2050 provides a framework and vision for the next generation of EMS

Advancement.¹ This EMS System of the future includes the following qualities:

- Adaptable & Innovative
- Inherently Safe & Effective
- Integrated & Seamless
- Reliable & Prepared
- Socially Equitable
- Sustainable & Efficient

In this new system, EMS professionals must be prepared to play a more significant role in managing a patient's and the community's health. Achieving this vision will require deliberate actions of stakeholders at every level of EMS: individuals, EMS services of all models and sizes, public officials from local regulators to the federal government, and national associations. It will require “bold collaboration with our partners: our communities, local volunteers, payers, healthcare systems, social services, public health, and partners in public safety.” The guiding principles illustrated in EMS Agenda 2050 should guide all decisions, from day-to-day EMS care and operations to system-wide strategic efforts like this system assessment.

EMS System Assessment Scope of Work

The comprehensive goal of the assessment is to provide recommendations to improve the effectiveness, efficiency, performance, and financial sustainability of the existing EMS system that align with North Carolina statutory rules and regulations for roles and responsibilities for County EMS systems, and for municipal fire departments providing first responder services. The components will include:

1. **EMS System Review**
2. **Roles and Responsibilities**
3. **Service Delivery Model**
4. **Patient Outcomes**
5. **Current EMS Goals and Performance Standards**
6. **Response Zone Analysis**
7. **Historical and Current Performance Analysis**
8. **Systemwide Operations Review**
9. **Customer Experience Evaluation**
10. **EMS System Funding Model**

¹ <https://www.ems.gov/assets/EMS-Agenda-2050.pdf>

Method of Assessment

The HCS consulting team comprises EMS consulting experts with over 35 years of industry experience. The consultants met with EMS stakeholders throughout the County and spent field time observing the system at work. All providers were open and engaging in sharing their agencies' demographics, strengths, and opportunities for improvement.

Materials Reviewed

- ABOC meeting minutes
- Agency management committee meeting minutes
- Ambulance offload time reports
- Ambulance responses
- Clinical quality metrics
- EMS policies, procedures, and protocols
- Finance committee meeting minutes
- First responder activity reports
- First responder only responses
- Interfacility transports
- Key performance indicators
- Maps
- Medical control board meeting minutes
- Ambulance organizational documents
- Payer mix
- Quality management committee meeting minutes
- Response compliance data
- Unit hours

Field Observations

- Medic Ambulance
- Medic Supervisors
- Charlotte Fire Department
- Huntersville Fire Department
- Medic Communications Center (CMED)

Interviews Completed

- Medic Ambulance
- Medic Medical Director
- Charlotte Fire
- Davidson Fire
- Huntersville Fire
- Cornelius Fire
- Mint Hill Fire
- Pineville Fire

- Matthews Fire
- Volunteer fire departments
- Gaston County EMS Agency
- Receiving hospitals
- PSAP dispatch centers
- County leadership
- Town managers
- Police departments
- ABOC Members
- State lobbyist

High Performance EMS System Comparison

- EMS Authority, Oklahoma
- Guilford County EMS, North Carolina
- Reno EMS Authority, Nevada
- Richmond Ambulance Authority, Virginia
- Sunstar Paramedics, Florida
- Three Rivers Ambulance Authority, Indiana
- Wake County EMS, North Carolina

North Carolina County EMS System Comparison

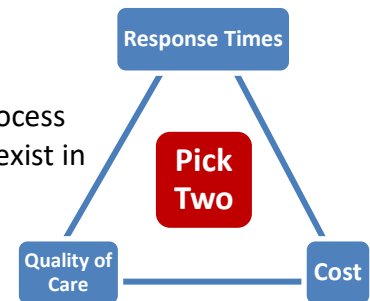
- Cabarrus
- Catawba
- Gaston
- Guilford
- Iredell
- Lincoln
- Randolph
- Rowan
- Stanly
- Union
- Wake

DISCUSSIONS, FINDINGS, AND RECOMMENDATIONS

The EMS Decision Triangle

The EMS stakeholders of the County are considering how to ensure and enhance the reliability of its EMS system. It is admirable to question the status quo and truly improve the community's pre-hospital care. The process also requires an “eyes wide open” approach to the three variables that exist in all EMS systems: 1) response times, 2) quality of care, and 3) costs.

Unfortunately, only two of the three are achievable. It is possible to have an extremely fast, high-quality system, but it will not be low-cost. A less expensive system will be slower but can maintain high quality.



Most systems are unwilling to compromise on the quality of care provided for obvious reasons. This leaves response times and cost as the two opposing factors. County leadership, EMS stakeholders, and the community must balance the two variables to deliver acceptable speed at a reasonable cost. System components that may be used to accomplish this balancing act include tiered (ALS/BLS) response, faster response times for high acuity calls and longer times for low acuity, nurse navigation at dispatch, holding non-emergency calls until system levels allow, allowing first responders to triage calls prior to sending ambulances, fire agencies providing surge capacity during unpredictable peak demand, telemedicine with non-transport, assess and release first responders pending transport, and many other concepts from other communities.

1. EMS System Review

Current EMS System

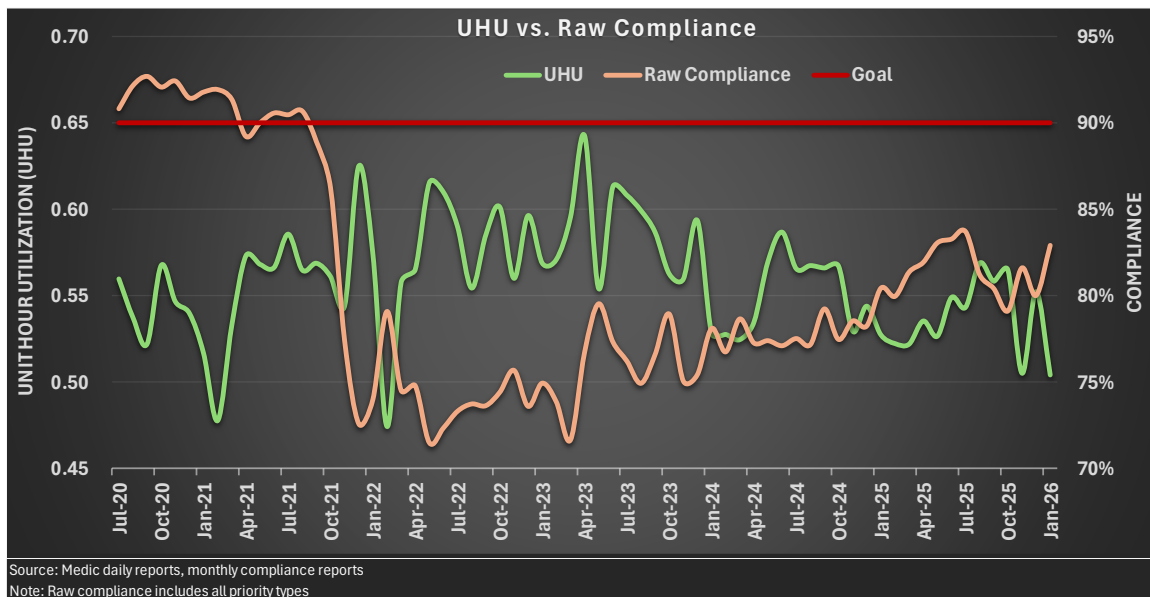
The current EMS system has many high performing characteristics comparable to high performing traits seen within other EMS providers nationally:

- Using a tiered response approach to 911 calls, including ALS and BLS ambulances and first response vehicles operated by the local fire agencies
- Operating a communications center that consolidates ambulance and town fire department dispatching
- Trained EMD staff to properly allocate resources based on patient acuity
- County investment into the EMS system beyond patient revenue for greater performance
- Clinical patient outcomes are monitored and reported, including through the national CARES Program with superior results
- Robust research program for cutting edge clinical interventions

These attributes place the County significantly above average for EMS systems nationally.

Response Unit Hour Utilization (UHU)

This is a calculation of staffed unit hours divided by the number of responses. It can be determined on a daily, weekly, or monthly basis, and is a key indication of EMS system efficiency. A system with a 0.50 response UHU would indicate an ambulance runs one call every two hours (this assumes an average time on task [i.e., assigned to available] of one hour). The following chart shows the response UHU from June 2020 through January 2026.



Most 911 providers look for performance levels in the 0.30-0.40 response UHU range. This is highly dependent on the county size, geography, call volume, average time on task, and other factors.

Finding: The County EMS system is highly efficient with 0.53 average response UHU over the last five years. However, that negatively impacts the system's effectiveness to attain the 90%

compliance standard set by the County. Over the same period, raw compliance has averaged 81%. There are many factors that led to this, mainly the workforce shortage that increased exponentially during and following the COVID-19 pandemic. The high response UHU rate causes burnout in employees and creates greater wear and tear on the ambulances, leading to increased employee turnover and faster ambulance replacement.

Recommendation: Any EMS system needs to be funded with enough unit hours (i.e., EMTs, paramedics, and ambulances) to maintain an effective response UHU that delivers the performance desired. As described in the EMS Decision Triangle, the County can choose to increase unit hours or change the compliance standard. One significant step already implemented is focusing faster response times on the calls where time has the greatest impact. Examples would include heart attacks, strokes, and severe trauma. Those calls evaluated through an EMD process to not have a likely correlation between time and patient outcome receive slower response times. This has become a standard in many EMS systems nationally. For an analogy, emergency departments routinely triage patients and treat them in the order of acuity. The local fire departments have also stepped up and provide fire-only responses to medical calls with a lower likelihood of needing an ambulance, freeing ambulances for high acuity calls. Response time raw compliance has improved since this program was implemented in 2023. While not as common, it is a typical practice seen in high performance EMS systems. One of the most reputable EMS systems in the country, King County/Seattle (WA) Fire's Medic One, sends a BLS fire engine to nearly 80 percent of its calls before assigning an ambulance.²

The County should continue to evaluate opportunities to focus faster responses on high-acuity calls while also exploring alternatives to sending fire and/or ambulance resources to every call. An example is utilizing the current provider-at-dispatch most often conducted by a nurse (i.e., Omega calls), to determine if a 911 response is needed at all. Community paramedicine programs target frequent 911 callers and have proven effective at reducing unnecessary calls. Funding the unit hour needs of the system is a short-term solution, while these opportunities can provide long-term solutions to the 911 needs of the community. The two local healthcare systems are part of the ABOC. They may have membership needs that would marry well with the EMS needs and should be seen as a community paramedicine partner in these endeavors. The same EMS high users are likely frequent visitors to the emergency department. Multiple models exist between hospital systems and EMS providers for reducing high system users, supporting post-discharge follow-up, and other innovative programs. Some community paramedicine programs co-staff EMS and hospital personnel to meet the need.

Omega Calls

Finding: The County offers a solution for 911 callers whose symptoms do not appear to warrant first responders or ambulances. During FY25, nearly three out of every four Omega calls were handled by something other than a 911 resource. Using the MPDS process, medical calls that meet this criterion are referred to a nurse triage system for further evaluation. Following scripted protocols, the nurse can determine the best disposition for the caller. This can include referring back to 911 dispatch for a fire and/or ambulance response, recommending calling

² <https://kingcounty.gov/en/dept/dph/health-safety/health-centers-programs-services/emergency-medical-services/reports-publications>

their healthcare provider, or sending a rideshare vehicle at the County's expense. Many times, the patient's condition is not critical but may still need medical care, but they do not drive or have someone to drive them. The patient can always turn down the alternate solution, and a typical 911 response is sent. At an estimated cost of \$16 per use, it is a far less expensive option than a 911 response totaling hundreds of dollars. Alternate dispositions for 911 medical calls is considered a best practice as they deliver the right resources, for the right solution, in the right time, to the right patient. Most EMS systems use nurses, but some use EMTs and paramedics to triage calls. This can include holding calls until sufficient resources are available for low acuity calls.

Omega Calls		
Nurse	1,574	37.6%
Ambulance	1,120	26.7%
Rideshare	552	13.2%
Crisis	537	12.8%
Law	257	6.1%
Poison	142	3.4%
Other	5	0.1%
Total	4,187	100.0%

Source: FY25 Omega data

Recommendation: The County should continue the Omega program, identify additional MPDS categories that may be applicable, and evaluate the calls returned to 911 for other solutions.

Total EMS 9-1-1 call volume, 9-1-1 transport volume, and 9-1-1 Unit hours in 2024				
EMS System, Location	9-1-1 Call Volume	Transport Volume	Unit Hours	Unit Hour Utilization
EMS Authority (EMSA) Tulsa and Oklahoma Counties, OK	258,336	193,570	390,351	0.66
Sunstar Paramedics Pinellas County, FL	247,022	186,873	420,741	0.59
Medic Mecklenburg County, NC	180,798	122,019	335,222	0.54
Wake County EMS Wake County, NC	138,582	95,860	327,561	0.42
Reno EMS Agency (REMSA) Washoe County, NV	92,806	60,324	152,719	0.61
Guilford County EMS Guilford County, NC	83,100	51,445	296,437	0.28
Richmond Ambulance Authority (RAA) City of Richmond, VA	45,791	32,214	96,852	0.47
Three Rivers Ambulance Authority (TRAA) Allen County, IN	41,319	26,914	74,428	0.56
Average	135,969	96,152	261,790	0.52

Note: Systems use different periods for fiscal years, UHU is a response UHU

EMS Comparison Systems

Seven EMS systems were surveyed to compare with the County ([see Attachment A](#)). They were selected based on size and reputation as a high performing EMS system. According to a recently completed study for Cabarrus County (NC) on the 12 largest EMS systems in the state, Mecklenburg is the busiest by a significant amount. Its billable call percentage is consistent with the average across the counties surveyed ([see Attachment B](#)). Billable calls are most often calls that result in a transport with a marginal addition for treat and release calls.

County	Call Volume	Billable Calls	Billable %
Mecklenburg	195,426	122,019	62%
Wake	141,306	102,445	72%
Guilford	85,006	51,800	61%
Gaston	64,824	38,397	59%
Iredell	41,323	17,140	41%
Cabarrus	38,247	21,912	57%
Catawba	34,598	20,917	60%
Average	85,819	53,519	62%
Randolph	27,856	13,712	49%
Rowan	26,846	18,985	71%
Union	25,855	17,763	69%
Stanly	17,233	7,705	45%
Lincoln	16,627	12,208	73%

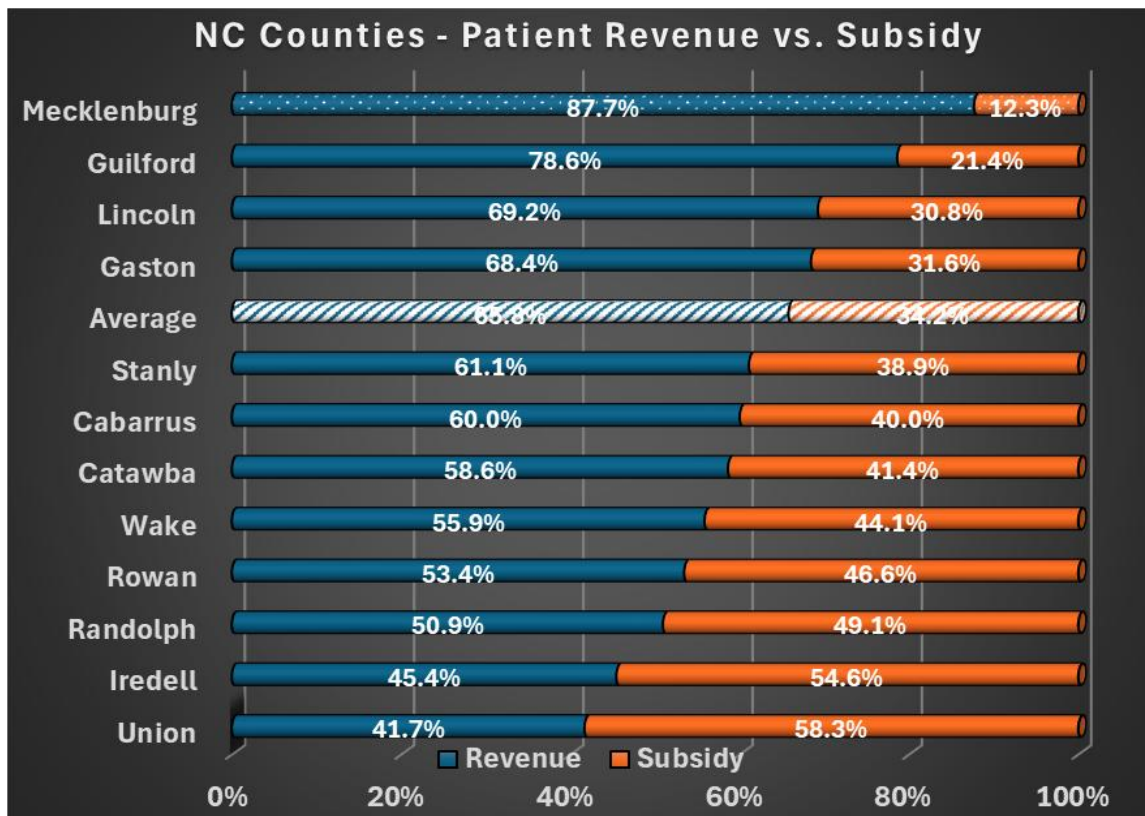
Source: Cabarrus County, Feb-26

Funding

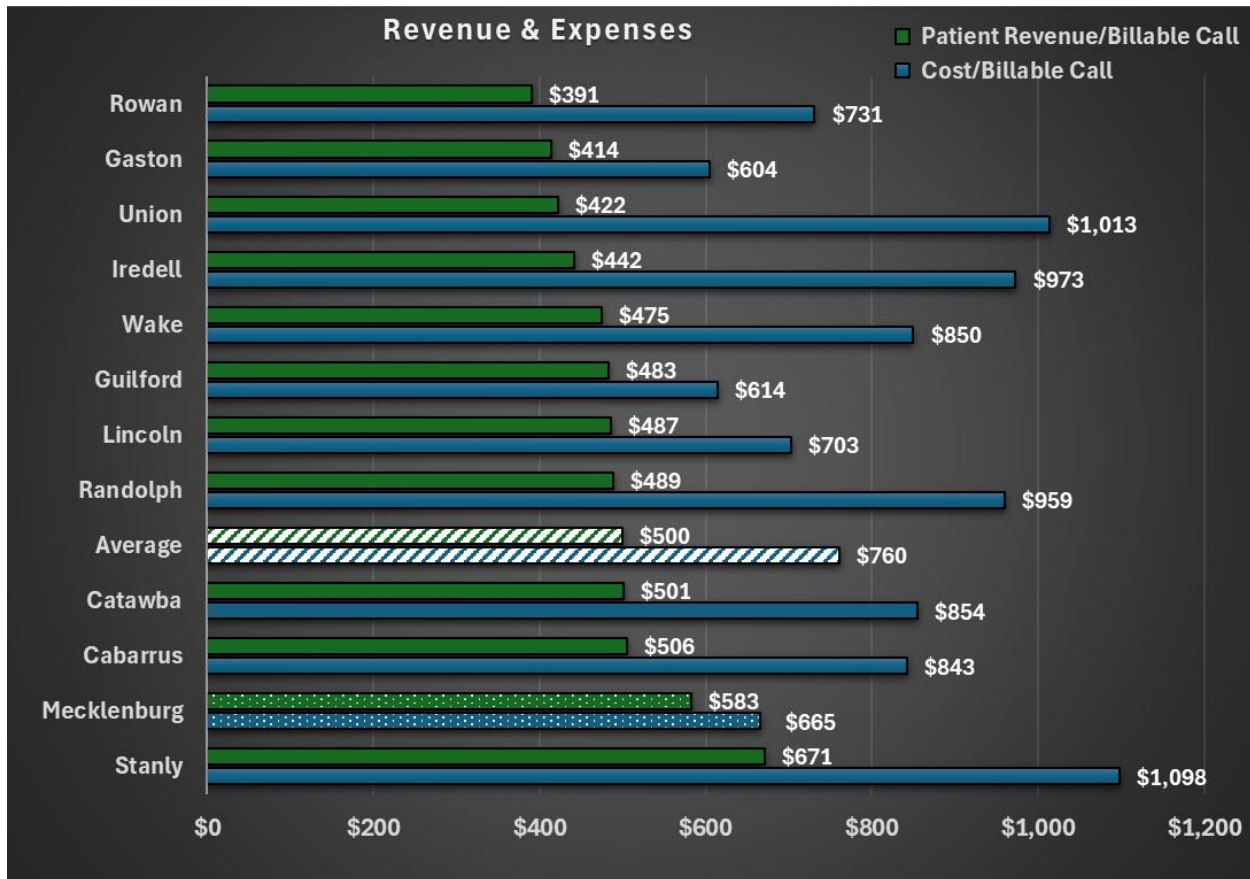
The County currently subsidizes the EMS system to provide more resources than patient revenue alone. This is consistent with the 15 EMS systems studied within North Carolina and nationally. Sunstar was the only exception. Many EMS systems that were once fully funded through patient fees are now deciding between maintaining the same response time goals or subsidizing the EMS providers. Similarly, the County will need to choose between increasing the subsidy or changing the performance standards.

2024 Expenses, Percentage of revenue from patient fees, Base rate						
EMS System	Expenses	Pt. Revenue	ALS-E	ALS-N/E	BLS-E	BLS-N/E
EMSA ¹	\$93,672,234	86%	\$ 1,300	\$ 900	\$ 1,300	\$ 900
Sunstar Paramedics	\$90,000,000	100%	\$ 967	\$ 967	\$ 934	\$ 907
Medic	\$81,148,864	88%	\$ 1,194	\$ 892	\$ 1,194	\$ 892
Wake County EMS	\$75,741,092	55%	\$ 1,087	\$ 751	\$ 632	\$ 632
REMSA ²	\$67,169,243	82%	\$ 2,010	\$ 1,660	\$ 2,040	\$ 1,675
Guilford County EMS	\$31,800,000	71%	\$ 1,051	\$ 664	\$ 885	\$ 553
TRAA	\$22,706,807	93%	\$ 2,093	\$ 1,583	\$ 1,763	\$ 1,102
RAA	\$20,952,551	72%	\$ 1,789	\$ 942	\$ 1,507	\$ 942

¹ Same rates since 2012 and may increase in May-26, ² includes air and other operations



The County EMS system produces the highest patient revenue per billable call than any other North Carolina system, except for Stanly. Its costs per billable call are almost \$100 lower than the average.



A review of EMS system revenue and expenses identified that Wake County had the highest expenses in the state, even though it does not have the highest number of calls. Not only does the County generate the most patient revenue per call but also the most revenue overall of any EMS system in the state.

County	Pt. Revenue	Expenses
Wake	\$ 48,635	\$ 87,076
Mecklenburg	\$ 71,162	\$ 81,149
Guilford	\$ 25,000	\$ 31,800
Gaston	\$ 15,882	\$ 23,209
Cabarrus	\$ 11,081	\$ 18,467
Union	\$ 7,500	\$ 18,000
Catawba	\$ 10,476	\$ 17,872
Iredell	\$ 7,575	\$ 16,676
Average	\$ 8,638	\$ 15,366
Rowan	\$ 7,419	\$ 13,881
Randolph	\$ 6,700	\$ 13,154
Lincoln	\$ 5,939	\$ 8,578
Stanly	\$ 5,166	\$ 8,457

Source: Cabarrus County, Feb-26

Note: (dollars in 000)

Governance Structure

EMS systems are overseen through numerous approaches nationally. The most common is local (e.g., city, town) or county government oversight. Of the seven high-performance systems studied, the structure varies between government run, non-profit entities, and quasi-government agencies. For those with governing boards, they typically include local and county government as well as hospital representatives.

Describe your governance structure.	
EMS System	Governance Structure
EMSA	An Oklahoma Public Trust with two Beneficiary Cities; Ten trustees appointed by the cities, and one CEO that reports to the Board of Trustees
Guilford County EMS	County government department reporting to Assistant County Manager
Medic	Joint governmental agency formed by the County and the Charlotte Mecklenburg Hospital Authority; Agency Board of Commissioners appointed by the Board of County Commissioners, with representation from two health systems and local county government
RAA	RAA is a quasi-governmental 501(c)(3) authority; governed by an 11-member Board of Directors appointed by the Richmond City Council
REMSA	Community owned non-profit 501(c)(3); governed by a volunteer Board of Directors (3 from regional hospitals, 1 legal, 1 accounting, 1 consumer rep, 1 at large)
Sunstar Paramedics	Public Utility Model
TRAA	Private for-profit company but are a not-for-profit unit of local government; the 2024 Board comprised 4 mayor appointments, 4 County Commissioner appointments, and 1 EMS Foundation appointment representing local hospitals. In 2025, Commissioners withdrew from interlocal and lost their board appointments.

Finding: In North Carolina, similar to other states, the law requires counties to oversee and govern their EMS systems. Within this County, EMS system governance is a combination of hospital and county representatives functioning within the ABOC. The local city and town leadership does not have a role. In this County, as in most EMS systems, the hospitals do not have a financial relationship with the EMS providers. As such, they are unbiased in their decision-making, valuing the patient's needs first. Hospital representation also emphasizes the focus on patient care and the critical role of pre-hospital providers in healthcare.

Recommendation: The current governance model is generally consistent with the EMS systems studied. The noted exception is the lack of local government representation. The County may want to consider appointing one town and one city representative to the ABOC. Another solution could be representation through a pre-hospital/EMS advisory committee that provides input to the ABOC. For the latter to be effective, the committee needs to have valued participation so that the municipalities' interests are represented.

2. Roles and Responsibilities

Statutory Roles and Responsibilities

In general, North Carolina EMS statutes are consistent with most other states. It has a few distinctive features regarding NC Office of EMS (NCOEMS) rules and regulations. Listed below is a framework that describes the distinctive features of EMS statutes, rules, and credentialing framework within the state.

Credentialing Structure and Authority

North Carolina's EMS system is governed under NC General Statutes, which create a regulatory environment that is more centralized and prescriptive than in many states.

Unusual or Distinctive Elements

Dual Credentialing Requirement

North Carolina requires both:

- State-level EMS credentialing
- Agency-level credentialing

Many states require only state certification/licensure; NC's mandatory agency credentialing, with documented competency verification, is notably more stringent.

Medical Director Oversight Codified in Rule

While most states rely on medical directors for protocol oversight, NC explicitly assigns medical directors' statutory responsibility for:

- Credentialing decisions
- Scope-of-practice authorization
- Ongoing competency evaluation

This is more formalized than in many states, where medical director's authority is policy-based rather than rule-based.

State Authority to Suspend Agency Credentialing

NCOEMS may suspend or revoke an individual's agency credentialing independent of their state credential. This dual-track enforcement mechanism is uncommon nationally.

Initial Education Requirements

North Carolina follows national education standards but adds several state-specific requirements.

Unusual or Distinctive Elements

Mandatory State-Approved Educational Institutions

All EMS educational programs must be approved, and NC maintains tighter oversight than many states, including:

- Required educational institution audits
- Mandatory reporting of student outcomes
- State-defined instructor qualifications beyond national minimums

State-Specific Psychomotor Testing for Advanced EMT and Paramedic

While NC now accepts National Registry EMT (NREMT) psychomotor exams, the state historically maintained its own psychomotor testing process longer than most states. Some legacy processes and documentation requirements remain embedded in rule.

Emergency Medical Responder (EMR) Programs Must Be Sponsored by Recognized Agencies

Unlike many states where EMR training can be delivered by a wide range of institutions, NC restricts EMR education to approved entities with specific operational ties.

Continuing Education and Recertification

North Carolina uses a state-defined continuing education model, not the NREMT National Continued Competency Program (NCCP) model (unless the provider chooses to maintain NREMT separately).

Unusual or Distinctive Elements

State-Mandated Topic Hours

NC prescribes specific hour requirements and topic categories in rule, rather than adopting the flexible NCCP structure used by most states.

Credentialing Cycle Tied to Agency Affiliation

A provider's active status is tied to:

- Completion of state Continuing Education (CE)
- Maintenance of agency credentialing
- Medical director approval

This creates a three-part recertification dependency that is more complex than in most states.

State-Required Skills Verification

NC requires documented skills verification at each renewal cycle, not just during initial education. Many states rely solely on CE hours or NREMT renewal.

Scope of Practice

North Carolina's scope of practice is more prescriptive than the national model.

Unusual or Distinctive Elements

Scope of Practice Is Agency-Dependent

Even though the state defines the maximum allowable scope, the medical director determines the actual operational scope for each provider.

This creates variability between agencies that is uncommon in states with a single statewide protocol set.

Paramedic Scope Includes Certain Skills Not Universally Allowed Nationally

Depending on medical director authorization, NC paramedics may perform:

- Rapid sequence induction (RSI)
- Blood product administration
- Mechanical ventilator management
- Advanced airway procedures beyond standard national model

While not unique to NC, the statewide allowance for these skills (pending medical director approval) is broader than many states.

EMT Level Has Several State-Specific Additions

NC EMTs may perform certain skills that are not universally permitted at the EMT level nationally, such as:

- Epinephrine administration via autoinjector or manual draw
- Nebulized bronchodilators
- Blood glucose monitoring

These are becoming more common nationally but were adopted earlier in NC and remain codified in rule rather than left to protocol.

Differences from NREMT Requirements

NC accepts NREMT for initial credentialing but diverges significantly in ongoing requirements.

Unusual or Distinctive Elements

NREMT Not Required for Renewal

NC does not require NREMT certification for recertification at any level.

Many states require NREMT for paramedics; NC does not.

State CE Requirements Do Not Mirror NCCP

Providers renewing only their NC credential follow state CE rules, not NREMT's national model.

State Credentialing Can Be Suspended Independently of NREMT

A provider may remain NREMT-certified but lose their NC credential due to:

- Agency issues
- Medical director decisions
- State disciplinary action

Additional Distinctive System Features

Statewide EMS Performance Improvement System

NC maintains a robust, mandatory performance improvement (PI) system, requiring:

- Agency-level PI plans
- Medical director participation
- Submission of data to the state EMS data system

This level of mandated PI infrastructure is more comprehensive than in many states.

EMS Peer Review Protections

NC provides statutory protections for EMS peer review activities, similar to hospital peer review protections; not all states extend peer review privilege to EMS.

Specialty Credentialing Pathways

NC offers state-recognized specialty credentials (e.g., EMT-Responder, EMT-Transport, Paramedic-Transport) that differ from the standard national tiered model.

Conclusion

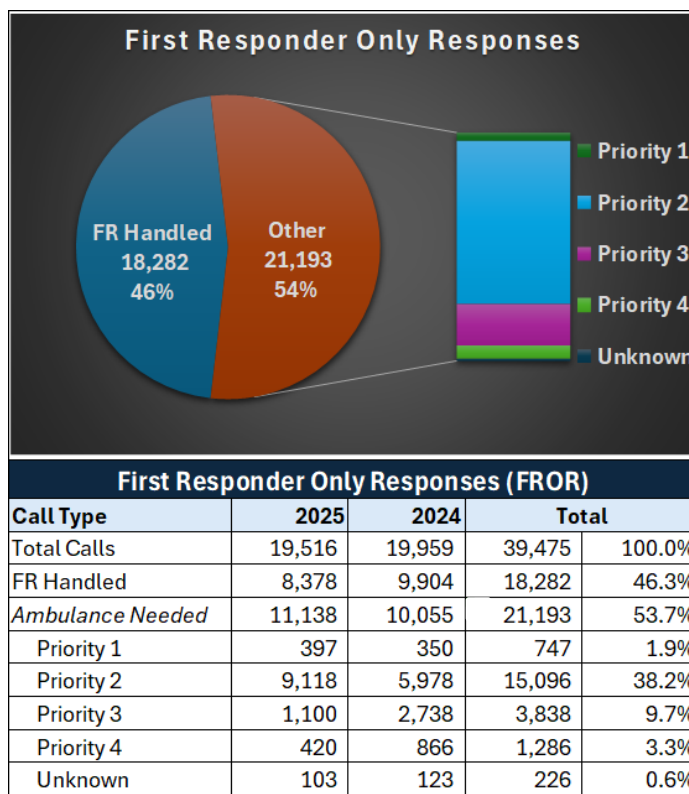
North Carolina’s EMS regulatory framework is distinguished by its dual credentialing system, strong medical director authority, state-specific continuing education requirements, and agency-dependent scope of practice. These elements create a system that is more structured and prescriptive than many states and diverges in meaningful ways from the NREMT’s national standards.

First Responder Role

Municipal fire departments are an integral part of the EMS system. Fire stations are typically closer to most medical calls and can stabilize patients sooner. The recent changes in EMT licensure have dramatically expanded BLS capabilities to deliver life-saving treatments. There is less need to have ALS first responders with the expanded scope now available to EMTs. Further, the County EMS Medical Director has adopted many of the optional EMT scope items, further enhancing the skills of first responders.

The fire service is ultimately responsible to its local government leaders and the communities they represent. As such, the municipal leadership should decide how best to deliver services. This looks very different nationally. Some fire departments do not respond to any medical calls, others go to everyone, and others lie somewhere in-between. In general, the fire service responds to most medical calls. It may not be necessary when the 911 caller is a healthcare facility, such as a doctor’s office or nursing home, where trained medical staff are already delivering care equivalent to the first responders. This is currently the case in this County. Some municipalities without the financial means to keep pace with the demand for their fire resources have opted to not respond to medical calls deemed non-emergency. Each community should decide on the services provided by its fire department – medical and others.

Due to the workload impact, some of the fire agencies are requesting to reduce the number of low-acuity call types currently included in the EMS plan. At least two have provided notice that they want to cancel their subsidy agreements for first response.



Legal Requirements and Best Practices

Finding: It is not an industry standard nor a customary practice for an EMS system to pay for or reimburse towns, cities, and counties for first response. None of the other systems within North Carolina provides a first responder subsidy. Three of the national systems surveyed (including the County) offer some level of subsidy for first response. The survey did not request what was provided in exchange for compensation. Three (37.5%) of the high-performance EMS systems surveyed send first responders to certain calls without an ambulance initially; typically, those where it is unclear if there is a medical component. In this County, known medical calls with a low probability of transport receive a fire response only until the patient is triaged and determined to require ambulance transport.

When first responders reduce costs to the system, such as by allowing more time for ambulances to respond or by triaging calls before dispatching an ambulance, EMS systems across the nation share the cost savings with first responders. In this County, the latter scenario occurs when first responders triage 911 calls without an ambulance in concurrent response. North Carolina is unique in that it requires each county to develop an EMS plan that mandates which calls are handled by which pre-hospital providers. This allows counties to determine the medical calls needing the first response services of the fire departments. The County changed the first responder use significantly within the City of Charlotte during 2017 and throughout the County in 2023 by sending them to roughly 10% of medical calls without an ambulance. The call types were determined based on being minor in nature and not likely needing transportation. The goal was to improve ambulance response times for life-threatening calls, which has been effective. The unintended result was an increase in time on task for the firefighters when an ambulance was not concurrently dispatched. In just over half the cases, an ambulance was still needed. Because of the delay (or absence) of sending an ambulance on the initial dispatch, firefighters are spending more time on these calls.

Recommendation: While the County is legally responsible for the EMS plan and the role of each provider type, there should be collaboration between all EMS stakeholders. A systemwide approach to determining which EMS resources manage which calls is common in high-performance EMS systems. The data-driven and clinically justified process implemented in 2025 should be collaborative with all EMS stakeholders moving forward. This is done through using MPDS determinants, critical interventions performed, need for ALS procedures, and likelihood of transport. This approach engages all pre-hospital providers when done using data, with process transparency, and clear understanding of the overall system benefit. Specific to first responders, the fire chiefs can utilize this data to justify their EMS role to their communities. If municipalities want to respond to other medical call types beyond those clinically justified (e.g., Delta and Echo calls), that should be an acceptable practice.

Recommendation: Not sending an ambulance to every call is an emerging best practice. The County should provide compensation for the triage role provided by first responders in lieu of dispatching an ambulance concurrently. There is cost avoidance available to the County EMS system when the first responders reduce the number of ambulance responses. The Medic One system (Seattle/King County, WA) has proven effective for decades at reducing the need for ambulances through BLS first responders performing initial patient assessment and triaging to

the most appropriate disposition. Its EMS system is supported by a property tax levy to offset the ambulance service cost and partially funds BLS first responders.³ Another benefit of fewer paramedics in an EMS system is concentrating the procedures completed per provider. Studies have shown greater proficiency, likely due to the repetition of skills. It is expected that first responders will operate effectively within the EMS system. The firefighter/EMTs should commit to fully and confidently utilizing their full scope of practice to maximize patient outcomes.

EMS systems have legal restrictions on how they can reimburse first responders for cost avoidance through fewer ambulance unit hours. The generally understood approach is based federal anti-kickback statutes and the “substantially-in-excess” rule. The accepted interpretation is an entity that receives federal funding (e.g., Medicare, Medicaid) cannot pay more than the value of what it receives. Anything beyond cost avoidance is considered a kickback to the local government agency.

³ <https://kingcounty.gov/en/dept/dph/health-safety/health-centers-programs-services/emergency-medical-services/about-us/fact-sheet>

3. Service Delivery Model

Current Service Delivery Model

The current EMS delivery system is working well in many respects. An example is one of the highest cardiac arrest survival rates in the country. This is accomplished through many innovative and progressive components.

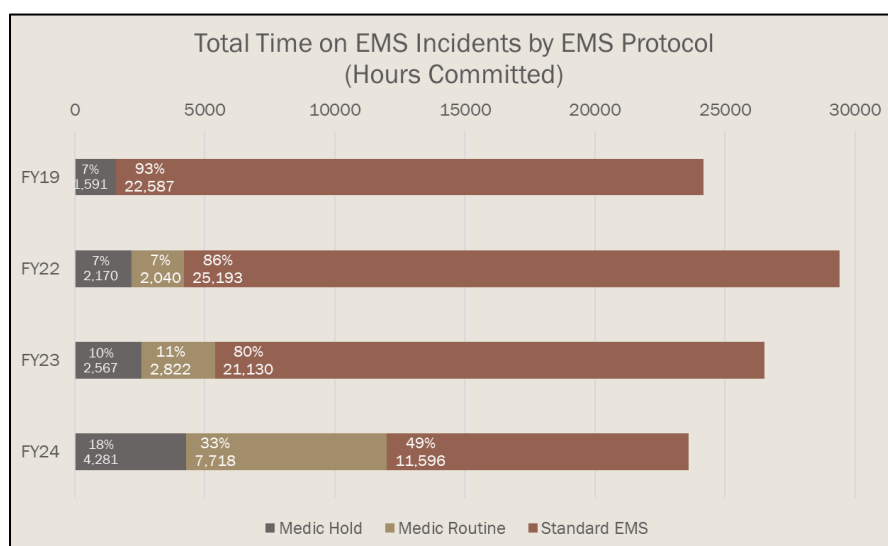
Resource Optimization

The right amount of resources is dispatched to the right patient acuity. Historically, EMS used the “kitchen sink” approach sending fire and ambulance units to every call. Medical calls with limited chance of transport are now assigned a non-transport resource, such as a fire engine (e.g., medical alert with no voice contact, minor traffic collision). Lower acuity calls that do not require a first response assessment and treatment are only sent an ambulance (e.g., abnormal lab values, medical facility call). This maximizes the efficient use of the limited resources within the EMS system.

Tiered Response

As an industry, EMS has seen a decrease in the number of available personnel, especially paramedics. The COVID-19 pandemic accelerated the crisis with cancelled EMS courses, limited internships, early retirements, and career changes. Many EMS systems now use a combination of ALS and BLS ambulances to match available resources to the high and low-acuity needs. This approach reserves ALS ambulances for the most critical patients. Interestingly, academic research has shown that fewer paramedics in an EMS system actually improves patient care. The hypothesis is that it is a result of the number of ALS procedures increasing per paramedic, leading to greater skill proficiency. A similar approach is used by limiting trauma centers per county, so that fewer surgeons treat more cases than if cases were distributed to all hospitals.

The fire service is an important element of tiered response. 911 calls that are unlikely to need an ambulance, such as a medical pendent alarm activation or lift assist, can often be handled by first responders. During Fiscal Year 2025, over nine percent (19,516/207,662) of 911 responses were handled by local fire agencies. Data from Charlotte Fire indicates that changes implemented in May 2025 reduced fire engine time on task between 2.1 and 5.5%.⁴ Reviewing the minutes committed for all medical calls, the overall result was 55

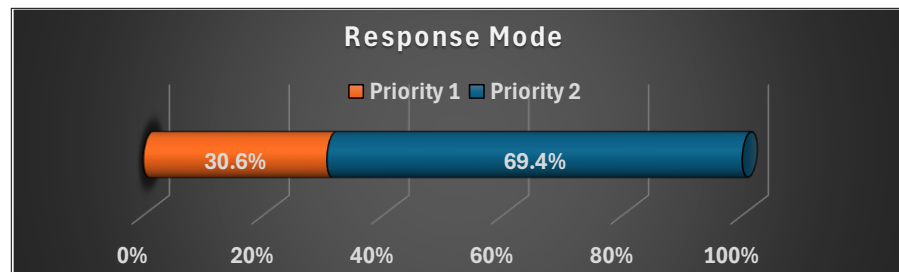


⁴ CFD MedicAnalysis.pptx, slide #5

fewer minutes spent on medical calls per day.⁵ While CFD is responding to 16% fewer calls, the time on task has only dropped by 2%. This is due to longer on scene times for Medic Hold calls and shorter times on fire and ambulance concurrent responses. The following chart demonstrates that Charlotte Fire is spending fewer hours on medical calls over a four-year period. It is important to note that a large portion of this savings is based on not sending fire engines to medical calls that are not likely to need a first response.

Limited use of Lights-and-Sirens (Priority 1)

The County identified that an emergency response does not have a direct correlation to patient outcomes – only in limited circumstances. According to a study, it increases the chance of a traffic accident by four-

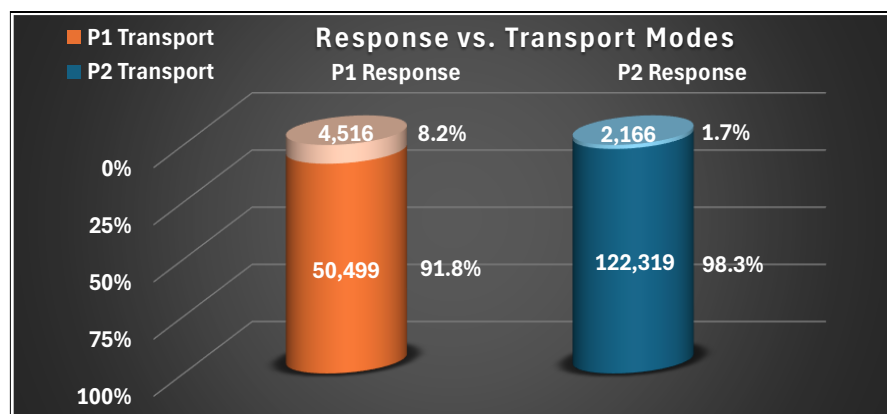


Source: FY25 CAD data, PCR data
Note: only ambulance responses, unknown ignored

fold. This creates an unnecessary danger to the driving public and the responding fire and ambulance crews. As a result, the County has reduced the use of lights-and-sirens to only 30.6% of 911 calls. This was accomplished through a comprehensive review by the EMS medical director and Medic staff of the MPDS categories for the likelihood of needing a life-saving intervention (e.g., cardiopulmonary resuscitation (CPR), severe bleeding control, allergic reaction with airway compromise, Narcan, insulin shock). However, first responders were not part of the decision process, which led to a lack of clinical understanding of the appropriateness.

Finding: Based on CAD data, this approach is effective. Of the 122,319 calls dispatched as non-emergency, only 2,166 (1.7%) required a lights-and-siren return to the hospital. While looking at critical interventions performed is the most accurate, transport mode is readily available and a reasonable surrogate for patient severity.

Systemwide, only 3.7% of patients were transported with lights-and-sirens to the hospital.



	Priority 1 Response		Priority 2 Response		Total	
P1 Transport	4,516	8.2%	2,166	1.7%	6,682	3.7%
P2 Transport	50,499	91.8%	122,319	98.3%	172,818	96.3%
Total	55,015	30.6%	124,485	69.4%	179,500	100.0%

Source: FY25 CAD data, PCR data
Note: only ambulance responses, unknown ignored

⁵ IBID, slide #10

Recommendation: Continue the use of emergency response by EMS providers for only those patient types (i.e., MPDS categories) which indicate a high chance for a life-saving intervention. Involve both ambulance and first responders in the data review and decision-making process to fully understand the data-driven approach to the use of lights-and-sirens. Establish acceptable risk thresholds based on critical treatment interventions performed (or emergency transport percentage, at a minimum) by MPDS category.

EMS System Comparison

As part of the assessment process, similar high-performance systems across the country were surveyed. The complete survey is available in [Attachment B](#). The EMS systems selected were based on size and reputation for high-quality service. They included:

- EMS Authority (EMSA), Tulsa and Oklahoma Counties, OK
- Guilford County EMS, Guilford County, NC
- Reno EMS Agency (REMSA), Washoe County, NV
- Richmond Ambulance Authority (RAA), City of Richmond, VA
- Sunstar Paramedics, Pinellas County, FL
- Three Rivers Ambulance Authority (TRAA), Allen County, IN
- Wake County EMS, Wake County, NC

Volume and Response UHU – They range in 911 call volume from 41,000 to 258,000 responses using 74,000 to over 420,000 unit hours. The response UHU rates ranged between 0.28 and 0.66, with the County at 0.54 (this includes all responses). This is slightly above the average of 0.52.

Total EMS 9-1-1 call volume, 9-1-1 transport volume, and 9-1-1 Unit hours in 2024				
EMS System, Location	9-1-1 Call Volume	Transport Volume	Unit Hours	Unit Hour Utilization
EMS Authority (EMSA) Tulsa and Oklahoma Counties, OK	258,336	193,570	390,351	0.66
Sunstar Paramedics Pinellas County, FL	247,022	186,873	420,741	0.59
Medic Mecklenburg County, NC	180,798	122,019	335,222	0.54
Wake County EMS Wake County, NC	138,582	95,860	327,561	0.42
Reno EMS Agency (REMSA) Washoe County, NV	92,806	60,324	152,719	0.61
Guilford County EMS Guilford County, NC	83,100	51,445	296,437	0.28
Richmond Ambulance Authority (RAA) City of Richmond, VA	45,791	32,214	96,852	0.47
Three Rivers Ambulance Authority (TRAA) Allen County, IN	41,319	26,914	74,428	0.56
Average	135,969	96,152	261,790	0.52

Note: Systems use different periods for fiscal years, UHU is a response UHU

Tiered System – All systems use both BLS and ALS ambulances to meet their call demand. The percentage of ALS units ranges between 60 and 90% with Medic at 68%. The County should monitor the number of BLS calls completed by ALS units to determine opportunities for a greater percentage of BLS units, while ensuring sufficient ALS units for ALS calls.

Do you operate a tiered response system? If so, ratio of ALS to BLS units on average?			
EMS System	Tiered System	ALS	BLS
EMSA	Yes	70%	30%
Guilford County EMS	Yes	70%	30%
Medic	Yes	68%	32%
RAA	Yes	69%	31%
REMSA	Yes	75%	25%
Sunstar Paramedics	Yes	90%	10%
TRAA	Yes	60%	40%
Wake County EMS	Yes	85%	15%

Non-Emergency Transport (NET) – All systems provide inter-facility transportation, except Wake County EMS. NET is funded through patient transport fees. The hospitals within the EMSA system are unique as they accept financial responsibility if no other funding source is available.

Does the service provide non-emergency interfacility transports (NET)? Is there a formal agreement for providing this service? Do hospitals make a financial contribution to the EMS system in any way?			
EMS System	NET	Formal Agreement(s)	Hospital Financial Contribution
EMSA	Yes	Yes, by City ordinance	Responsible payor for NET
Guilford County EMS	Yes	Yes	No
Medic	Yes	Yes	Yes. In kind, Board Leadership
RAA	Yes	No, by ordinance	Patient fees only
REMSA	Yes	Yes, County franchise	Yes. In kind, Board Leadership
Sunstar Paramedics	Yes	No	No
TRAA	Yes	No, by ordinance	No
Wake County EMS	No	N/A	No

Funding – Every system is subsidized by its local government, apart from Sunstar Paramedics, which is 100% patient-fee funded. The transport revenue percentage ranges between 55 and 93% for the remaining systems with the County at 88%. The transport base rates vary dramatically from under \$1,000 to over \$2,000 per system. This is likely due to the difference in expenses due to geographic location, salaries, benefits, etc.

2024 Expenses, Percentage of revenue from patient fees, Base rate						
EMS System	Expenses	Pt. Revenue	ALS-E	ALS-N/E	BLS-E	BLS-N/E
EMSA ¹	\$93,672,234	86%	\$ 1,300	\$ 900	\$ 1,300	\$ 900
Sunstar Paramedics	\$90,000,000	100%	\$ 967	\$ 967	\$ 934	\$ 907
Medic	\$81,148,864	88%	\$ 1,194	\$ 892	\$ 1,194	\$ 892
Wake County EMS	\$75,741,092	55%	\$ 1,087	\$ 751	\$ 632	\$ 632
REMSA ²	\$67,169,243	82%	\$ 2,010	\$ 1,660	\$ 2,040	\$ 1,675
Guilford County EMS	\$31,800,000	71%	\$ 1,051	\$ 664	\$ 885	\$ 553
TRAA	\$22,706,807	93%	\$ 2,093	\$ 1,583	\$ 1,763	\$ 1,102
RAA	\$20,952,551	72%	\$ 1,789	\$ 942	\$ 1,507	\$ 942

¹ Same rates since 2012 and may increase in May-26, ² includes air and other operations

Dispatch – Most ambulances are dispatched by a secondary PSAP center; two are part of a consolidated county dispatch center. The latter centers, along with local government, dispatch the first responders. The only exception is this County’s first responders, who are dispatched by Medic through its secondary PSAP.

Who dispatches the transport and first responder agencies?		
EMS System	Transport	First Responder
EMSA	Secondary PSAP with CAD to CAD	Police PSAP
Guilford County EMS	Guilford Metro 911	Guilford Metro 911
Medic	Secondary PSAP	Secondary PSAP
RAA	Secondary PSAP	City of Richmond
REMSA	Secondary PSAP providing EMD and ground ambulance dispatch	City and County are primary PSAP
Sunstar Paramedics	Secondary PSAP	Local Government
TRAA	Secondary PSAP	Consolidated Communications Partnership
Wake County EMS	Raleigh Wake Emergency Communication Center	Raleigh Wake Emergency Communication Center

First Response – Only three of the counties studied have first responder agreements, including this County. None of the systems extend the ambulance response time standard based on first responders arriving within a given timeframe.

Fire response: Are there written agreements for fire agencies to provide EMS? Do first responders extend the ambulance response time clock?		
EMS System	First Response Agreements	Extend Ambulance Response Clock?
EMSA	No	No
Guilford County EMS ¹	Yes	No
Medic	Yes	No
RAA	No	No
REMSA	No	No
Sunstar Paramedics	Yes	No
TRAA	No	No
Wake County EMS	No ²	No

¹ Legacy contract from 2013 requires fire response. Evaluating giving credit for their rapid response to calls.

² Wake County has a First Responder Manual under the authority of the medical director outlining roles and responsibilities for First Responders operating in the EMS System.

Of the eight systems, three (37.5%) provide some level of subsidy to first responders, including this County. The subsidy amount ranges from \$0.4M to \$1.6M with EMSA also providing some supplies and equipment. The survey results did not identify the benefit provided by the subsidy payments as none of the systems utilize first responders to extend the ambulance response time clock.

Does the County or transport agency provide reimbursement to first responders? If so, how much?		
EMS System	Reimbursement provided	Amount provided
EMSA	City of Tulsa only	\$1.6M, supplies, equipment
Guilford County EMS	No ¹	\$0
Medic	Yes	\$0.9M
RAA	No	\$0
REMSA	No	\$0
Sunstar Paramedics	No ²	\$0
TRAA	Yes	\$0.4M to City Fire ³
Wake County EMS	No	\$0

¹ Guilford County provides supplies and equipment exchange used on medical responses.

² Pinellas County has a property tax to support fire and EMS.

³ Should be ALS, but not always available.

There is significant variability in first responder standards and responses. Only two systems have time standards for first responders; this is presumably tied to longer response times for ambulances due to a guaranteed performance metric for first response. Other than REMSA, fire agencies do not respond to every medical call. Many fire departments have been forced to make this move due to an increasing number of calls as they have become all-hazard agencies without the funding for additional staffing. Three of the study group have fire responses without an ambulance. In two systems, these are for calls with an unknown medical need. The County includes low-acuity medical calls with a lower likelihood of transport and probably has the highest percentage of calls initially dispatched with only a first responder, at nearly 10%.

Is there a response time standard expected for first responders? Does fire respond to all medical calls or only certain types? Does fire respond to any medical calls without the ambulance provider?			
EMS System	Fire Response Time Standard	Fire Response to all Medical Calls	Fire Response to Medical Calls without Ambulance
EMSA	Unknown	No	No
Guilford County EMS	No	No ¹	Yes ¹
Medic	No	No	Yes, 9.8%
RAA	No	No	No
REMSA	Yes	Yes	No ²
Sunstar Paramedics	Yes	No	Yes ³
TRAA	No	No ⁴	No
Wake County EMS	No	No ⁵	No

¹ County Fire responds to most calls; City Fire is more restrictive. Fire only for medical alarms.

² Fire agencies respond without the ambulance in approved areas where they can use their own ambulance.

³ Low-frequency, low-transport NAEMD-coded calls; example traffic collision with unknown injuries.

⁴ All Priority 1 and some Priority 2.

⁵ Respond to 54% of EMS incidents today, and will drop to 44% by June 2026.

Response Time Standards – The systems surveyed are roughly split using population density to determine response times. This is unusual as it, or using call density, is standard in most EMS systems nationally. Expecting the same response time in a remote town and a metropolitan city is unrealistic. All EMS providers use different response time expectations based on patient acuity. Two systems only have time standards for emergency calls. The use of lights-and-sirens varied between 78 and 31%. The latter represents the Medic service. It is significantly lower than the industry and considered an excellent trait for high-performing EMS providers.

Are ambulance response times based on population or patient acuity? What percentage of calls receive a lights and siren response?			
EMS System	Population Based	Patient Acuity Based	Lights and Siren
EMSA	No	Yes	60%
Guilford County EMS	No	Yes	60%
Medic	No	Yes	31%
RAA	Yes	Yes for P1, P2, P3	62%
REMSA	Yes	Yes for P1	50%
Sunstar Paramedics	No	Yes	78%
TRAA	Yes	Yes	50%
Wake County EMS	No	Yes	75% ²

¹ Four areas of the city require 80% compliance

² Lights and siren responses expected to drop to less than 30% by June 2026

The highest priority 911 response time standards range from 8:30 to 12:00 minutes in an urban/high-call density area. Some systems reduce the standard up to 59:59 in rural/low-call density regions. All systems have longer response times for calls that are less acute in nature. This is a typical standard in most progressive EMS systems. RAA is the only exception with no response time expectation for non-emergency responses.

Ambulance Response Time Standards				
EMS System	P1	P2	P3	P4
EMSA	10:59	24:59	60:00	N/A
Guilford County EMS	8:59/10:59 ¹	12:59	14:59	15:59
Medic	10:59	15:00	30:00	60:00
RAA	10:59-59:59 ²	14:59	59:59	N/A
REMSA	8:59-30:59	N/A	N/A	N/A
Sunstar Paramedics	12:30	20:30 (downgraded)	20:30	N/A
TRAA ³	8:30	10:30	20:00	20:00
Wake County EMS ⁴	12:00	17:00	30:00	60:00

¹ Includes Delta and Echo calls

² life-threatening (P1) are broken into response zones divided equitably by population with a sub-performance response time target @ 90% overall and, additionally, 87.5% within each zone.

³ Within the city geographical zones only, P2-P4 are unofficial requirements.

⁴ Moving to these standards in June 2026. Currently, 12:00 minutes for Echo/Delta calls and best effort for all others.

Ambulance Response Time Standards: call or population density based				
EMS System	High/Urban	Medium/Suburban	Low/Rural	Minimal/Remote
EMSA	N/A	N/A	N/A	N/A
Guilford County EMS	N/A	N/A	N/A	N/A
Medic	10:59	10:59	10:59	10:59
RAA	10:59 ¹	14:59	59:59	N/A
REMSA ²	8:59	15:59	20:59	30:59
Sunstar Paramedics	N/A	N/A	N/A	N/A
TRAA ³	8:30	10:30	20:00	20:00
Wake County EMS	N/A	N/A	N/A	N/A

¹ See prior table footnote.

² RAA uses Zone A-D to indicate call/population density

³ Within the city geographical zones only, P2-P4 are unofficial requirements

Compliance – The chart demonstrates the response time compliance per system. Some combine into a single percentage per zone, while others report by patient acuity type. The compliance varies significantly between the providers surveyed. Many are not achieving the 90% standard seen in most EMS systems. Four of the eight (50%) systems allow exemptions. The ability to request exemptions is more typical with for-profit entities, and less common for government entities. Most systems experienced exemption requests between 1-3%. Medic is a significant outlier at 17.5%.

What was compliance with all response time standards in 2024? Are response time exemptions allowed, if so, what percentage were exempted in 2024?			
EMS System	Compliance in 2024	Exemptions allowed?	Exemptions in 2024
EMSA	P1, 92.0%	No	N/A
Guilford County EMS	Omega, 49.3% Alpha, 55.0% Bravo, 68.3% Charlie, 70.7% Delta, 67.3% Echo, 66.6%	No	N/A
Medic	97.3%	Yes	17.5%
RAA	83.5%	No	N/A
REMSA ¹	90.7-92.9%	Yes	1.3-1.4%
Sunstar Paramedics	P1, 89.5% P2, 96.2% NET, 99.9%	Yes	3%
TRAA	P1, 87.7% P2, P3, P4: >90.0%	Yes	<1%
Wake County EMS	Zone D/E: 75.3%	No	N/A

¹ Ranges per zone.

Report Sharing – All systems reported that they publicly share their response time data, with Wake County being the only exception. However, when asked how the data is shared, it is by request or with local government leadership. While this is technically accessible to the public, they would be required to ask for it through a Freedom of Information Act (FOIA) request. Only EMSA and REMSA publish their performance data to a website.

Are response times publicly reported? What is reported, how is it accessible to the public?			
EMS System	Publicly Reported	What Is Reported	Accessible where?
EMSA	Yes	P1-P4 for all jurisdictions	Website, Board Meetings
Guilford County EMS	Yes		Board of Supervisors
Medic	Yes	All priorities	County Manager
RAA	No ¹	P1 by zone and priority	By request
REMSA	Yes	Monthly report	Website, oversight body
Sunstar Paramedics	Yes	Monthly report card	By request
TRAA	Yes	All response times	Board Meetings
Wake County EMS	No	N/A	N/A

¹ RAA has put less emphasis on response times. Reported monthly to Board of Directors and City Leadership on a monthly basis and are available to the public upon request.

Quality Improvement – Due to recognition as a high-performing EMS system, it is no surprise that all collect and track robust continuous quality improvement (CQI) measures. Most systems do not share this data publicly unless asked; it is more for internal use.

What patient outcome and clinical quality measures are used? Can you provide the data?		
EMS System	Measures Used	Provide data?
EMSA	- AIMHI quarterly measures - Patient disposition - Transport by trauma triage - Top 10 impressions - Trauma by acuity - Whole blood administration - Airway management	Current: AIMHI and Medical Director Planned: Community reports by the end of 2026
Guilford County EMS	- Some for the IMPACT project - Refusal > 70% - Cardiac arrest < 5% - Emergency transport < 10% - Some trends on primary impressions vs EMD determinant - Some outcomes	
Medic	- Sys: Avg Time 911 to PCI - Trauma Priority 1 Average Scene Time - Trauma: P1 Avg Prehospital Time - Monthly Count Supraglottic Airway Placement - Proportion of Successful SGA Placement - Patient ETT Attempts - Proportion of Successful ETT Placement - CARES: Cardiac Arrest data	Yes
RAA	- Average scene time for AMI and STEMI - FirstPass® (software) success rate for endotracheal intubation - Out of hospital cardiac arrest - Bystander CPR - Benzodiazepine administration - ePCR evaluation	Yes, upon request
REMSA	Medical Director: - Cardiac arrests - Pediatric patients - Advanced airways - STEMI alerts - Deliveries and neonatal resuscitation - Advanced airway success rates Comm center: IAED measures	Yes
Sunstar Paramedics	- STEMI, stroke, and trauma alerts - FirstPass® used for chart review	No
TRAA	- Utstein, STEMI, trauma, cardiac - Blood administration - Antibiotic administration outcomes - Time to transport - Time to cath lab - Time to 12 lead - Provider IV, IO, ETT skills	Yes
Wake County EMS	- STEMI bundle compliance - Stroke bundle compliance - OOHCA process and outcomes	Publicly reported at quarterly peer review meetings

Areas of Recommended Improvement

Specific to the comparison with other EMS systems, there are certain takeaways worth noting.

Best Practices

- The County performs at a response UHU higher than the average (note: while efficient, it is not effective for attaining contract compliance)
- Uses tiered response to maximize limited paramedic resources, similar to everyone surveyed
- The ambulance provider currently needs less subsidy to breakeven than most systems
- Consolidated Fire/EMS dispatch center not seen in everyone surveyed
- Lowest use of lights-and-sirens of the systems surveyed
- Strong CQI program for improved patient outcomes

Opportunities for Improvement

- Other EMS systems use call/population density to set different response time standards and expectations; this should be a consideration moving forward
- The low subsidy impacts the County's ability to attain current response time standards
- The County should publicly report response time compliance for greatest transparency

4. Patient Outcomes

Clinical Protocols, Oversight, and Performance

EMS protocols refer to the standardized clinical scope, procedures, and policies for delivering EMS care in the County. These documents are written and promulgated by the County EMS Agency under the authority of the EMS Medical Director as specified by the North Carolina Administrative Code (NCAC), section 10A NCAC 13P .0403.

EMS clinical oversight and performance refer to the processes and systems in place to ensure that EMS providers deliver high-quality patient care and meet established performance standards, as detailed in EMS protocols, procedures, and policies.

Clinical oversight involves monitoring and evaluating EMS providers' clinical performance, including adherence to protocols, guidelines, and best practices. This oversight ensures that EMS providers are delivering safe and effective care to patients in emergencies. It may involve reviewing patient care reports, conducting case reviews, and providing feedback and education to EMS providers.

Performance measurement and improvement are integral components of EMS clinical oversight. Metrics, such as response times, patient outcomes, and patient satisfaction, are regularly monitored to assess the effectiveness and efficiency of EMS services. This data is used to identify areas for improvement and implement strategies to enhance overall performance.

EMS clinical oversight and performance also involve CQI initiatives. These initiatives aim to enhance the quality and safety of EMS care by continually assessing, analyzing, and improving processes and practices. Quality improvement activities may include regular audits, training and education programs, and the implementation of evidence-based practices.

By implementing effective clinical oversight and performance management strategies, EMS agencies can ensure their providers deliver the highest standard of care to patients in emergencies. This ultimately leads to improved patient outcomes and increased public trust in the EMS system.

The scope of work for this assessment asks four specific questions pertaining to clinical outcomes and quality assurance. The following lists general findings and recommendations, followed by a summary assessment specific to each question.

Findings & Recommendations

The findings and recommendations below were generated following an interview with EMS Medical Director, Dr. Swanson, a review of existing EMS protocols, policies, and procedures, and an assessment of the current systems and programs in place for quality assurance, data collection, and measurement. Specific documents reviewed include the following:

1. Patient Care Protocols – ALS Protocols 2025-01-01
2. BLS Protocols 032025
3. Patient Care Protocols- First Responder Protocols 2024-07-01
4. Employee Handbook, June 13, 2025
5. Standard Operating Guidelines: Communications (undated)

6. Standard Operating Guidelines: Operations (undated)
7. QMC QA Report 2025-12-02
8. EMS Systems Study - Combined Charts
9. FY21-FY25 CARES Data
10. Key Performance Indicators
11. Quality Management Committee Minutes (August 2023 through August 2025)
12. Medical Control Board Meeting minutes (August 2023-December 2025)
13. North Carolina Administrative Code
14. North Carolina Office of EMS website
15. Quality Improvement Plan, Updated January 2026
 - a. Appendix A: FY 2026-2028 Strategic Business Plan
 - b. Appendix B: Mecklenburg EMS Agency Strategic Planning Process 2024
 - c. Appendix C: *Untitled*
 - d. Appendix D: *Untitled*
 - e. Appendix E: From Idea to Project
 - f. Appendix F: Roles and Responsibilities of Teams
16. QI Plan Overview
17. Clinical Measures List
 - a. STEMI Measures
 - b. Trauma Measures
 - c. Chart Review Reports
 - d. CQI Reviews and Feedback
 - e. Improvement Methodology
 - f. Project Charter and Project Map
 - g. Additional Clinical Measures (Examples)
 - h. Response Configuration (EMD)

EMS Protocols, Policies, and Procedures

Finding: The EMS patient care protocols in the County are comprehensive and reflect exacting standards for prehospital medicine. They are subdivided into ALS, BLS, and first responder documents, each of which includes adult and pediatric protocols that cover universal treatment, medical, trauma, obstetrics and gynecology, toxicology, environmental, and special situations.

The six sections within each protocol cover response procedures, scope of practice, multi-casualty incident (MCI), transfer of care, destination criteria, patient-related policies, clinical care protocols, clinical procedures, medications, and appendices.

A key strength of the EMS protocols is that they are countywide and based on statewide standards as published by the North Carolina College of Emergency Physicians (NCCEP).⁶ These serve as statewide, evidence-based standards for pre-hospital care, regularly updated, and allowing for local customization. This dramatically enhances continuity within and across counties in the state, facilitates the integration of new EMS providers into the County who may

⁶ <https://oems.nc.gov/systems>

have worked elsewhere in North Carolina, and enables consistent metrics for statewide quality assurance and improvement.

Quality clinical data is essential for appropriately documenting care and for understanding clinical care. The EMS protocols contain two comprehensive protocols specific to documentation: 1) *EMS Documentation and Data Quality* (NCCEP Documentation -1) pp 86-88 and 2) *Documentation of Vital Signs* (NCCEP Documentation-2) p89.⁷ These two documents clearly outline expectations for PCR completion, vital sign standards, and documentation requirements for specific procedures and clinical conditions.

Recommendation: It may be helpful within some individual protocols to identify key documentation elements and performance measures. One notable example is the consistent use of primary and secondary impressions, which can vary widely for some clinical conditions. The advantage of listing key elements within the protocol is that it may be more likely to be seen by EMS personnel as they consult that clinical topic. Additionally, specifying which data elements are essential within the context of that clinical protocol, including the NEMSIS field codes, can ensure data is input into the proper field, minimize data variability and prevent the sole use of the narrative section for documenting critical elements, all of which would otherwise make quality assurance challenging. These changes can be incorporated as protocols are revised and updated; however, it would be helpful to prioritize revising those protocols emphasized in the quality improvement plan (see below).

Clinical Quality Assurance

The quality assurance program consists of key performance indicator (KPIs) operational measures, including but not limited to worker compensation claims, preventable motor vehicle crashes, response UHU and time on task measures. Clinical KPIs include monthly Utstein measures for out-of-hospital cardiac arrest and ST-Elevated Myocardial Infarction (STEMI) 911-to-lesion treatment. Each KPI uses control charts with upper and lower control limits, enabling quality managers to systematically detect performance changes. A comprehensive list of additional clinical quality measures used by Medic is included later in this section.

More comprehensive clinical measures are found in the EMS systems study-combined charts document and the Quality Management Committee Quality Assurance Report. These include measures for prehospital stroke screening, aspirin for STEMI, 911 to PCI time intervals, trauma scene times, seizure and respiratory care management, advanced airway management, cardiac arrest, and droperidol administration. Those clinical areas include STEMI management measures of prehospital sensitivity and specificity, time to radio notification, scene times, arrival to ECG times, and 911-to-PCI statistics at individual STEMI-receiving centers.

In addition to the clinical measures listed, Dr. Swanson provides summaries of individual case reviews, performed at the rate of 1.8 per month. These cases appear to be selected based on reports of adverse outcomes.

⁷ <https://www.medic911.com/wp-content/uploads/2020/05/Mecklenburg-EMS-Agency-Patient-Care-Protocols-ALS-Patient-Care-Protocols-2020-05-01.pdf>

Finding: The use of system-level metrics that matter to patients, such as 911-to-PCI (percutaneous coronary intervention), is impressive. This reflects the overall system performance across all time elements and potential rate-limiting steps throughout the continuum of care that can delay prompt intervention and reperfusion in STEMI. The sole use of this metric, however, could obscure opportunities for improvement that might otherwise go unnoticed. A comprehensive set of process measures includes scene times, arrival to ECG, and ECG to STEMI notification focus on prehospital performance. For example, excellent prehospital care such as appropriate dispatch, scene-to-electrocardiogram (ECG), appropriate ECG interpretation, immediate prenotification, and appropriate destination, may not be evident if hospital performance is lackluster. The converse is also possible.

Recommendation: Continue incorporating measures of specific pre-hospital STEMI performance alongside system-level metrics. For example, a common rate-limiting step to PCI is the delayed prehospital recognition of STEMI. Measuring ALS scene arrival to ECG acquisition for all suspected cardiac ischemia patients can improve understanding of missed or delayed STEMI recognition.

Recommendation: In addition to 911-to-PCI for STEMI patients, an analogous system measure to consider is 911 to needle/intervention for stroke.

Finding: Other than scene time, the listed clinical indicators have limited measures of trauma performance. Any delay to definitive trauma care is deleterious, and scene time is one appropriate measure for that purpose. However, it may not measure the rate of inappropriate trauma triage, which is another significant delay in care. Under-triage, particularly when it results in transport to a non-trauma center, is a significant contributor to increased morbidity and mortality.

Recommendation: Include an indicator that measures prehospital trauma triage accuracy. Those who are identified as trauma patients in the prehospital care report potentially represent only a subset of all prehospital trauma patients. A convenient source of data when linked to prehospital events is trauma registries, which can provide injury severity scores and disposition as proxies for appropriate triage. Registries also include cases that originate from other hospitals and can provide an indication of trauma patients inappropriately triaged to a non-trauma center by EMS.

Finding: The medical director incorporates a highly structured process for reviewing Individual cases representing high risk or high yield case types. These are selected using dynamic triggers built into the ImageTrend CQI module. An appraisal of these case reviews reveals thoughtful and salient analysis and is helpful for educational purposes or quality assurance. However, since they represent a subset of all cases, this process is coupled with a more systematic assessment of performance indicators for overall quality assurance.

Recommendation: Continue medical director case reviews at the current rate and staff chart reviews of randomly selected cases at a rate of 5-10% per month. Random chart reviews can reveal recurrent issues that are not otherwise brought to the attention of the medical director and provide an opportunity to institute a quality improvement process.

Recommendation: Continue to integrate EMD providers into the quality improvement program and continuously and systematically link EMD, patient care report (PCR), and when possible, hospital outcome data. This provides a local understanding of the relationship between these isolated data depositories and patient care.

Finding: Sending everyone to everything is a luxury that many systems can no longer afford. Performing intensive data analysis linking dispatch data to patient outcomes and/or prehospital interventions is required, and confidence in the reliability of the EMD process is essential. Medic conducts a comprehensive five-year review of dispatch determinants and cases with no dispatch determinants to validate the disposition rates (e.g., transport, refusal, pronounced, canceled, non-transport) associated with each determinant. This provides confidence in the reliability of the EMD process and valuable data to optimize initial response configuration, and the current response configuration reflects the determinant level evaluation of transport likelihood, intervention rates, and patient outcomes.

Recommendation: Continue measuring transport rates and time-sensitive ALS interventions to rank high-priority dispatch determinants for unit dispatch recommendations and mode of response. Low transport rates for certain EMS determinants may be good candidates for modifying initial dispatch recommendations of transport units. In some cases, they may include only a first-responder dispatch for low-acuity calls, whereas in outlier cases, transportation may be necessary.

Finding: EMS Performance Improvement Guidelines are published by the NCCEP, and the County Quality Improvement Plan Overview describes the local quality assurance process in general terms. Much more detail is found within the provided Appendices A through F. Overall, these documents reflect a thoughtful assessment of challenges and strategic priorities following the pandemic and beyond. Detailed within these documents are a mix of clinical and operational KPIs, and an emphasis of capacity and capability that ensure appropriately prioritized and resourced strategies that are intended to achieve the best EMS care.

Impressively, these documents emphasize proven statistical quality control and quality management processes as developed by W.E. Deming nearly a century ago. The quality management roles and responsibilities of various agency staff are clearly outlined; however, the documents do lack a detailed description of the six quality management steps commonly employed during healthcare improvement activities, namely: set aims, establish measures, select changes, test changes, implement changes, and spread.

Quality assurance relies on continuous performance monitoring, enabling quality leaders to immediately detect trends, identify causes, and evaluate the impact of small, iterative tests of change. In many cases, this will require weekly data reporting, using control charts, which enable systematic analysis of performance. Medical incident reviews offer valuable learning opportunities but rarely yield systematic insights that drive consistent improvement.

Recommendation: Quality improvement is entirely dependent on reliable data and Medic has incorporated processes built into the ePCR software that provide a scoring system that was built, tested, and validated in-house. Continue to evaluate these processes to ensure that they remain relevant and new clinical measures are added.

Recommendation: When a performance expectation is not consistently met, use established quality improvement practices, such as those described by the Institute for Healthcare Improvement (IHI).⁸ This stepwise process starts with the identification of a measurable, time-based quality aim, the systematic evaluation of the factors that contribute to performance, and small tests of change that, when coupled with short-term quality reports (control charts), can identify sustainable solutions. The EMS Agency developed and employs processes consistent with this methodology.

Finding: There does not appear to be adequate staffing for comprehensive quality assurance. For example, data collection for stroke and trauma systems has been limited due to staffing limitations. Furthermore, for such a large, high-performing, complex EMS system, a part-time medical director of 32 hours/week (24 hours to ground EMS and eight hours to flight programs) may not be adequate. Many systems of this size and complexity have a combination of full-time medical directors and/or assistant medical directors.

Recommendation: Consider augmenting the medical director's capability by increasing weekly hours and/or the addition of an assistant medical director.

Recommendation: Consider augmenting quality assurance staff to improve surveillance of the stroke and trauma systems. Many systems have staff dedicated to specialty systems such as stroke, STEMI, and trauma.

Recommendation: The Quality Improvement plan represents a high-level framework for this task. The EMS Agency provided an improvement methodology document that demonstrates this deeper, more comprehensive approach using IHI methodology. A sample improvement project that demonstrates these steps would be helpful for staff to refer to as a reference.

Clinical Quality Assessment Summary

Professional Opinion on Medic's Patient Outcome Methodology

The County has a robust program for evaluating clinical performance, including field performance and EMS-to-hospital intervention time intervals for example. Below is a comprehensive list of process and outcome clinical performance measures:

Clinical Measures
Clinical Performance Indicators
Seizure – BGL
Seizure – Versed
Pulmonary edema – CPAP
Pulmonary edema – NTG
Bronchospasm – Albuterol/Duo-Neb
STEMI – ASA

⁸ <https://www.ihi.org>

Clinical Measures
Cardiac Arrest
CPR Metrics
Depth in mm
Avg. defib. time
Flow time
Avg. compression rate
Avg. compression depth
Time to first defib.
Post-ROSC scene time
Post-ROSC 12-lead
ROSC to depart scene
Time to first Epi
Time to first compression (T-CPR)
Utstein ROSC
Utstein Survival
Bystander CPR
Trauma
P1 scene time
Prehospital time
% time off scene in <10 minutes
Count
STEMI
System
Count
TRUE
False activation
Avg. time – 911 to PCI
Radio notification to PCI
Response time
STEMI scene time
Avg. time to ECG
Avg. time to radio notification
PCI Facilities
Count
TRUE
False activation
Avg. time – 911 PCI
Radio notification to PCI page
Depart scene to CL table
Radio notification to Dr. ready
Radio notification to CL ready
Radio notification to PCI

Clinical Measures
Stroke
TTT
LVO Destination Criteria
Counts
Medical Incident Reviews
Count by presumptive category
Count by definitive category
Count by call type
CMED Clinical Measures
2.731% Annual Medical Calls reviewed (Random)
2.731% Annual Fire Calls reviewed (Random)
Focused reviews by call taker
Focused reviews by trends
Medical Director Ordered Review
Medical Director/Fellow Review
All P1 Transports
48 hour recidivism
Cancelled Calls with significant scene time
Focused refusals
Ketamine usage
Additional non-reported Clinical Measures
NEMSIS Performance Measures Comparison
Administration of Beta Agonist for Asthma
Treatment Administered for Hypoglycemia
Respiratory Assessment
No use of Lights and Sirens During Response to Scene
No use of Lights and Sirens During Transport
Blood Glucose Evaluation
Patient with Status Epilepticus Receiving Intervention
Suspected Stroke Receiving Prehospital Stroke Assessment
Pain Assessment of Injured Patients
Effectiveness of Pain Management for Injured Patients
Documentation of GCS, SBP, and Respiratory Rate
Hospital Outcome Based High Acuity (Sens, Spec, NPV, PPV)
Pulmonary Embolus
Hyperkalemia
Stroke
STEMI
Sepsis
Pneumothorax
Traumatic Brain Injury
General Illness EMS PI- Hospital Finding

Clinical Measures
Average Vital Sign Finding by Condition
Interventions
Pain Management
(1) By demographic
(2) By provider level
All interventions Counts
(1) Success rates
(2) Time to intervention
Delayed Life Saving Interventions
(1) SADS report
Vital signs Pre/Post Intervention
Crew Performance
Call disposition by employee
Trauma Scene time by employee
Documentation Scores
CQI Scores- Inside ImageTrend
Clinical rules applied to each ePCR to generate a clinical documentation score for each incident
1) Utilized for focused call review
2) Also utilized for FTO performance review
3) Utilized to identify system level documentation training needs.

As is common in EMS, most of these are process measures rather than outcome measures. Process measures are specific to system performance against an accepted standard of care. An example of a process measure is the time of arrival to ECG in a STEMI case. In this situation, the sooner a STEMI is recognized, the sooner reperfusion can be achieved through rapid entry into the STEMI system. In this time-critical setting, rapid reperfusion in the interventional catheter lab is known to improve patient outcomes for most patients. Process measures, such as this, do not directly measure patient outcomes but are related to factors known to increase the probability of improved outcomes.

Outcome measures, such as Utstein survival, are more challenging to perform because patient care records are siloed between EMS and hospitals. Patient outcomes are typically not evident at the time of handoff to the hospital care team, and EMS relies on hospital data, which can be difficult to obtain systematically in order to determine outcomes. In addition to cardiac arrest, we see an opportunity to strengthen the ability to measure patient outcomes in other key areas, such as STEMI, stroke, and trauma care. By developing patient registries in cooperation with these specialty centers, EMS can develop a longitudinal record of patient care that can ultimately be used to improve EMS performance.

Outcome measures are ideal but generally difficult to obtain and therefore are usually reserved for specialty systems of care. Medic has successfully implemented new software that enables the collection of outcome data. Appropriate process measures, such as those used currently, are a practical substitute when outcome data are unavailable.

Compare EMS Service Outcomes

As described above, EMS systems look at process measures as patient outcomes are impacted by many variables, both in and outside the pre-hospital environment. The system measures many of the critical processes that influence positive patient outcomes. The CARES database is an excellent example of the excellent outcomes for cardiac arrest patients within the County, which scores in the top five of all systems nationally ([see Attachment C](#)). The following table compares the County to progressive EMS systems and national/international organizations with a role in defining high-quality pre-hospital care (also available in [Attachment D](#)).

Identify and Assess National Benchmarks and Standards

The following table lists key performance indicators used by various EMS agencies and EMS organizations. This is not a comprehensive list and is subject to change. To ensure adequate bandwidth and appropriate focus, we recommend that agencies avoid using too many measures at one time. For many agencies, this may be less than 10. Generally, performance measures should be limited to those that meet all three of the following criteria:

1. Measurable: The data can be readily and reliably collected and analyzed.
2. Improvable: Actionable quality improvement steps are possible.
3. Meaningful: The measure reflects direct or indirect value patient care.

EMS Standards, Core Measures, & Benchmarks											
Key Performance Indicators	Agencies					Organizations					
	Mecklenburg	Las Cruces	Merced	SCEMS	MedStar	EMSA	NEMSIS	Compass	NHS-UK	AHA	CMS
Cardiac Arrest											
Response interval < 5 minutes for CPR/AED	•				•						
Bystander CPR rate	•			•	•		•			•	
Bystander AED rate	•			•	•		•			•	
Appropriate airway management	•	•		•	•						
End-tidal CO2 monitored	•	•	•	•			•			•	
Pit crew/focused CPR	•			•							
Chest compression fraction (CCF) greater than 60%	•	•									
Transport to “Resuscitation Center”			•		•						
ROSC percentage	•			•	•	•	•		•		
Survival to discharge (e.g., overall, Utstein)	•			•	•	•	•		•		
Complete documentation (see System QI P&P)			•	•							
Hypoglycemia											
Glucose recorded before treatment	•	•						•	•		
Hypoglycemia corrected through treatment	•	•						•			
Glucose recorded after treatment		•							•		
Correct disposition (e.g., transport, referral, home)									•		

EMS Standards, Core Measures, & Benchmarks											
Key Performance Indicators	Agencies					Organizations					
	Mecklenburg	Las Cruces	Merced	SCEMS	MedStar	EMSA	NEMESIS	Compass	NHS-UK	AHA	CMS
Pain Management											
Offered pain meds prior to movement					•	•					•
Pain score decreased		•			•			•			•
Respiratory Distress (e.g., asthma, intubation)											
Mental Status			•	•	•						
Resp. rate, SpO2, PEFR recorded before treatment		•			•		•		•		
Oxygen administered (if appropriate)					•				•		
Bronchodilators with wheezing (peds and/or adult)	•	•	•	•		•		•			
Beta2 agonist administration for adults	•		•		•	•			•		
Pulmonary Edema (CPAP/Nitro)	•										
Endotracheal intubation success rate					•	•	•				
End-tidal CO2 performed on any successful ET intubation		•	•	•	•		•				
Other confirm techniques (e.g., visualize chords, chest rise, auscultation)			•								
Complete documentation (see System QI P&P)			•	•							
Seizure											
Glucose recorded	•							•			
Received intervention as appropriate	•							•			
Seizure, Febrile											
Glucose recorded	•								•		
SpO2 recorded									•		
Anticonvulsant administration	•								•		
Temperature management									•		
Sepsis											
Protocol completed (HR, BP, resp, temp, fluids started, O2, hospital alert)					•						
STEMI											
Recognition	•				•					•	
ASA administration	•	•	•	•	•	•	•		•	•	•
NTG administration		•			•				•	•	
Appropriate analgesia given					•				•	•	
Two pain scores recorded					•				•	•	
SpO2 recorded			•	•			•		•	•	
ECG acquired	•			•			•		•	•	
ECG acquired within X minutes (e.g., 5-10)	•				•					•	•
12L acquired (within X minutes)	•	•	•	•	•	•	•			•	
12L transmitted	•				•					•	
Scene time (e.g., < 10 minutes)	•	•	•	•	•	•				•	
STEMI recognition	•	•									

EMS Standards, Core Measures, & Benchmarks											
	Agencies					Organizations					
Key Performance Indicators	Mecklenburg	Las Cruces	Merced	SCEMS	MedStar	EMSA	NEMESIS	Compass	NHS-UK	AHA	CMS
Transport to STEMI center rate (with notification)	•		•	•	•	•	•		•	•	•
911-to-balloon time	•			•							
Sensitivity/Specificity	•										
Complete documentation (see System QI P&P)			•	•							
Stroke											
Time last seen normal	•	•	•	•	•		•		•	•	
Use of a stroke scale (e.g., NHS, FAST, MEND, CPSS, LAPSS, MASS)	•	•	•	•	•		•	•	•	•	
Blood glucose documented		•	•	•	•	•	•		•	•	
Blood pressure documented		•			•		•		•	•	
Appropriate O2/airway management				•	•						
Scene time (e.g., < 10 minutes)		•	•	•	•	•	•				
Transport to a stroke-capable facility (and alerted)	•	•		•	•	•	•		•	•	
911-to-needle time				•							
Complete documentation (see System QI P&P)			•	•							
Trauma											
Over-triage rate										•	
Under-triage rate										•	
PAM (physio/anatomic/mechanism) scale recorded			•	•							
Scene time (e.g., < 10 minutes)	•	•	•	•	•	•					
Trauma center destination	•	•	•	•	•	•		•			
Complete documentation (see System QI P&P)			•	•							
Skills											
IV success rate		•									
ePCR Submission Compliance											
At time of patient drop off (over 90 days)			•								
High acuity (ROSC, STEMI, Stroke, Trauma) cases at time of drop off			•								
Completed within 24 hours			•								
QA/CQI Performed (e.g., 80% of charts)		•									
NON-CLINICAL STANDARDS, CORE MEASURES, BENCHMARKS											
Efficiency Domain											
Cost per patient contact					•						
Cost per transport					•						
Cost per unit hour	•				•						
Employee turnover rate			•								
System Response UHU	•										
Total Task Time	•										
Unscheduled Vehicle Repairs	•										

EMS Standards, Core Measures, & Benchmarks											
	Agencies					Organizations					
Key Performance Indicators	Mecklenburg	Las Cruces	Merced	SCEMS	MedStar	EMSA	NEMSIS	Compass	NHS-UK	AHA	CMS
Employee Satisfaction	•										
Patient Safety											
Drops per 1,000 patient contacts											
Employee injuries per 10,000 hours worked	•		•								
AMA to new call within X hours (e.g., 24-72)	•				•				•		
AMA to hospital within 24 hours	•										
Mission failures per X responses/miles					•						
Ambulance crashes per X responses/miles	•										
Chart Review (random, manager, MD)	•										
Protocol compliance rate (note: this can be overall or individual)			•								
Patient Satisfaction (use standardized questions to allow inter-agency comparison)											
Communication by medics (patient and family)			•								
Care shown by the ambulance crew			•								
Skill and professionalism of ambulance crew			•								
Cleanliness of ambulance			•								
Ride of the ambulance			•								
Patient Satisfaction (General)	•										
Total Standards	45	26	35	32	39	16	19	8	25	22	5

Legend:

Mecklenburg: Mecklenburg County, North Carolina

Las Cruces = Las Cruces/Dona Ana County EMS, NM Merced = Merced County EMS System, CA

SCEMS = Santa Cruz EMS System, CA

MedStar = MedStar Mobile Integrated Healthcare (Fort Worth, TX) EMSA = California EMS Authority (2015)

NEMSIS = National EMS Information Systems (version 3.0)

Compass = EMS Compass produced by National Association of EMS Officials (NASEMSO) NHS-UK = National Health Service-United Kingdom (version 1.31, 2016)

AHA = American Heart Association

CMS = Centers for Medicare and Medicaid Services (ED standards applicable to EMS)

Current Performance Comparison

The quality assurance program includes a broad range of KPIs, comparable to those of other agencies and organizations, including those listed above. The reported performance across these KPIs demonstrates appropriate quality of care, with opportunities for improvement in trauma and stroke care. The Utstein survival rates are excellent (approximately double the national rate), demonstrating a high-functioning EMS system.

5. Current EMS Goals and Performance Standards

Response Times

The definition of response time can differ between EMS systems. To the patient, the response time is from the time of incident until EMS resources reach the patient's side. However, most systems measure the response time of the EMS provider from unit assigned (dispatched) until on the scene. The National Fire Protection Association (NFPA) established a guideline of 5:00 minutes for first responders and 8:00 minutes for ambulances. However, that definition does not account for differences in urban and rural resources. What is achievable in downtown Charlotte is not realistic for rural locations in the County. It also does not consider patient acuity. Someone with a sprained ankle does not need the same timely response as chest pain.

Multiple clinical research papers have shown that there is no causality between response times and patient outcomes with limited exceptions. The time elapsed from medical incident to patient care is much longer than just the unit response time. When combining the time between medical event, calling 911, answering the phone, processing the call, selecting a unit, dispatching it, and going enroute, it can easily exceed six minutes before the response occurs. This is further complicated by the time it takes once on the scene to grab the necessary equipment and find the patient, which can add another minute. A fire engine or ambulance response time of six to ten minutes becomes a patient-experienced response time of 13 to 17 minutes, respectively. With brain death occurring at six to ten minutes without oxygen, other solutions become more vital to patient outcomes, such as CPR. Bystander hands-only CPR programs have some of the best results in improving cardiac arrest survival rates. The County has excellent CARES results in no small part because of its community involvement. Recent programs, such as Stop the Bleed, are educating the public on how to control bleeding until help arrives. Public Narcan distribution methods have saved numerous opioid overdose cases.

Response times are more a factor of community expectations, not a clinical one. Overall, response times should be influenced by two factors: acuity and call density. 911 calls determined to be Priority 1 should receive the fastest response times in the EMS system. The response time goals should be further refined by call-density. An urban goal should be the fastest and increased proportionally to determine the suburban, rural, and remote goals.

Sharing performance should happen on a monthly or quarterly basis. It should be broken down by zones. For simplicity, pushing this data to the EMS Agency's website is a logical solution for the public, stakeholders, and government leadership to access on demand. This has been done previously, but technical challenges with the County website prevent it currently. Multnomah County (Portland, OR) is one example of how response time performance can be shared.⁹

Finding: The County currently uses "phone pick up" to "Medic arrival" times to calculate compliance. This approach combines two processes, dispatch and response, into one. It does not allow each process to be monitored separately to identify improvement opportunities. Currently, there are 30 seconds allotted for call processing time. This may be sufficient for high-acuity calls but does not fully value the EMD process for lower-acuity calls.

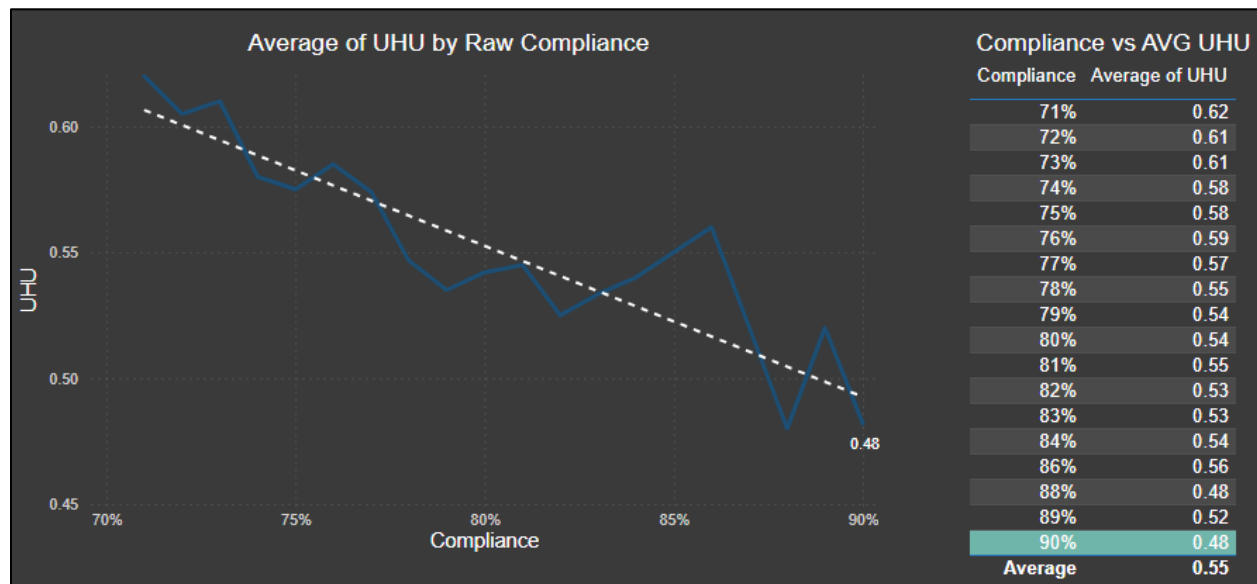
⁹<https://public.tableau.com/app/profile/claire6430/viz/AmbulanceContractCompliancePublicReportInteractive/UrbanLifeThreateningResponses>

Recommendation: Separate call processing times (i.e., “Start Call Taking” to “Time Call Entered Queue”) from response times and report each individually. Set a new call processing time goal. The Accredited Center of Excellence (ACE) publishes actual processing times within its accredited communication centers.

Response Configuration and Protocol Methodology

There are two approaches to ambulance deployment: static and dynamic. Static systems place ambulances at specific locations and do not move them unless there is a call for service. This is most often utilized in rural areas where the goal is to cover the geography. They typically always have the same number of ambulances on duty. Some urban systems use static deployment, however, they usually need a substantial subsidy to cover the cost. Dynamic EMS systems use historical data to predict call demand. The ambulance staffing schedule is then matched to the call demand. This allows for more units in the system during the peak times of the day and week, with fewer units at the slowest periods. The goal is to offer consistent response times across any hour of the day or day of the week. Dynamic systems are usually less expensive because there are fewer unit hours overall compared to a static system. In counties with very remote communities that cannot be easily served by roving units, sometimes a static unit will be staffed there, and the rest of the system remains dynamic. Regardless of the system design, the number of staffed ambulances is dependent on the response time goals established by the county leadership and funding to achieve them. Response UHU is a common tool to determine the appropriate unit hours needed to meet response times.

Proposed Changes



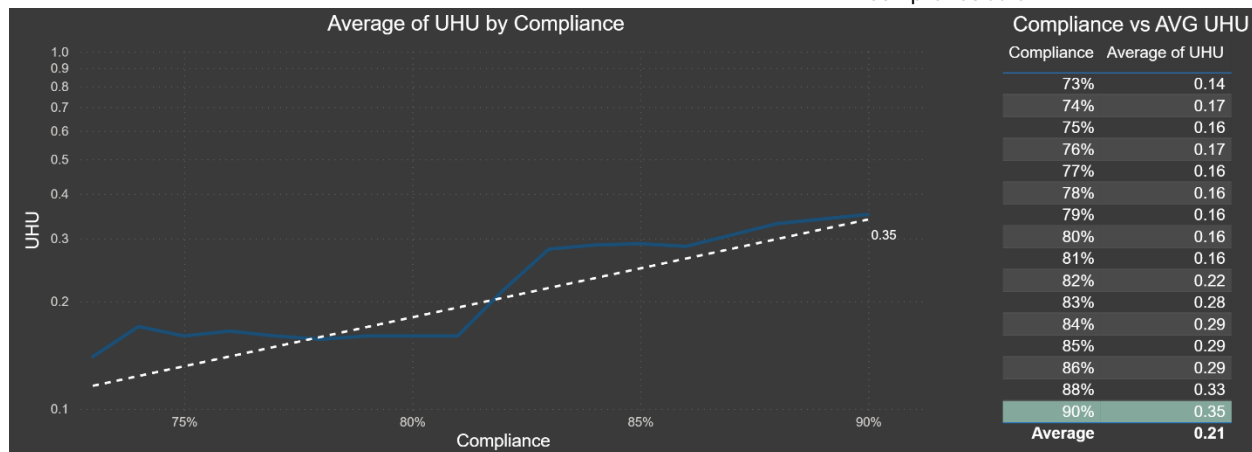
Finding: The current number of ambulance hours is insufficient to meet the response time standards in the current contract. Historical data can determine what is needed to meet current response time standards if no other system changes are made. Using July 2020 through January 2026 compliance and response UHU data, the forecasted UHU to reach 90% compliance is between 0.47 and 0.49. Using 0.48 response UHU with the FY25 call volume identifies the EMS

system would need 41,500 (12%) additional unit hours. At a direct unit hour cost of \$144.67, the new annual investment would be just over six million dollars. Since there are no additional patients being transported, this would need to be completely subsidized by the County. The annual subsidy would increase from \$22.5M to \$28.5M (27%). While this solution is scalable, it is likely not feasible due to cost and could not be sustained.

A similar analysis was conducted for Priority 2 and 3 calls. The data indicated that 58,250 additional unit hours would be needed to reach 90% compliance for Priority 2 and 3 calls. Based on the direct unit hour cost from FY25, the additional funding required would be \$8.4M.

Priority 1 90% Raw Compliance using Current Standards	
FY25 Responses	180,798
FY25 Unit Hours	335,222
FY25 UHU	0.54
Goal UHU	0.48
Additional Unit Hours Needed	41,500
Direct Unit Hour Cost	\$ 144.67
New Costs	\$ 6,003,763

Source: Response, unit hour, and raw compliance data



Assuming no additional subsidy is available, another option is to adjust the time standards to achieve 90% raw compliance. The following table demonstrates the standards required, based on FY25 call data, by priority type. Priority 2 has the greatest gap, with an additional 8:00 minutes needed to reach 90% compliance. No change is necessary for Priority 4.

Priority	1	2	3	4
Patient Acuity	High	Moderate	Low	Minimal
Current Standard	10:59	15:00	30:00	60:00
Meet 90% Compliance	12:00	23:00	31:00	60:00

However, this retains the expectation that an urban and rural resident will receive the same response time. Like a law enforcement response, someone choosing to live in a rural community is likely not expecting the same response as living in the city.

Priority 2 & 3 90% Raw Compliance using Current Standards	
FY25 Responses	53,671
FY25 Unit Hours	335,222
FY25 UHU	0.16
Goal UHU	0.35
Additional Unit Hours Needed	58,250
Direct Unit Hour Cost	\$ 144.67
New Costs	\$ 8,426,969

Source: Response, unit hour, and raw compliance data

Targeted Recommendation: Consider adopting longer response times for all priorities, such as those estimated to reach 90% compliance with current ambulance resources. Faster response times are not clinically justified, especially for lower-acuity calls. The EMD process has decades of success in identifying the correct response priority using conservative algorithms, with patient safety as a top priority. First responders provide an additional layer of protection through their initial assessment and ability to upgrade the ambulance when needed.

Finding: The County EMS system is already performing at a level higher than what is covered by patient revenue. The County provides a subsidy to cover the difference, which delivers faster response times than if the ambulance provider was a standalone service. The ambulance provider is highly efficient, exemplified by the very high response UHU rate. It is unrealistic to expect more performance from the ambulance crews. Therefore, the EMS system needs to maximize its effectiveness with the available patient revenue and County subsidy. This requires adjusting something other than funding and response UHU performance.

Recommendation: The County EMS system should consider moving away from contracted response time standards, as compliance is completely dependent on the subsidy provided. Without additional subsidy, there are minimal opportunities to improve upon the current standards. Those goals can be based on 90th percentile or use an average, which is more easily understood by the general public. The County should monitor the efficiency (i.e., response UHU) and clinical performance (e.g., CARES, KPIs) of the ambulance service as the key indicators of an effective and efficient provider.

Measuring Compliance

Finding: Many systems now utilize an online compliance utility (OCU) to independently calculate and report compliance. The OCU software accepts an unedited download of CAD data in real time. It compares the response times to the goals based on priority type and zone location. Being an independent third-party, staff responsible for system oversight are assured of objective compliance reporting. One of the leading OCU providers is FirstWatch¹⁰ with 25 years of EMS industry experience.

Recommendation: Consider implementing an OCU solution. It improves system transparency through an objective, data-driven process.

¹⁰ www.firstwatch.net

6. Response Zone Analysis

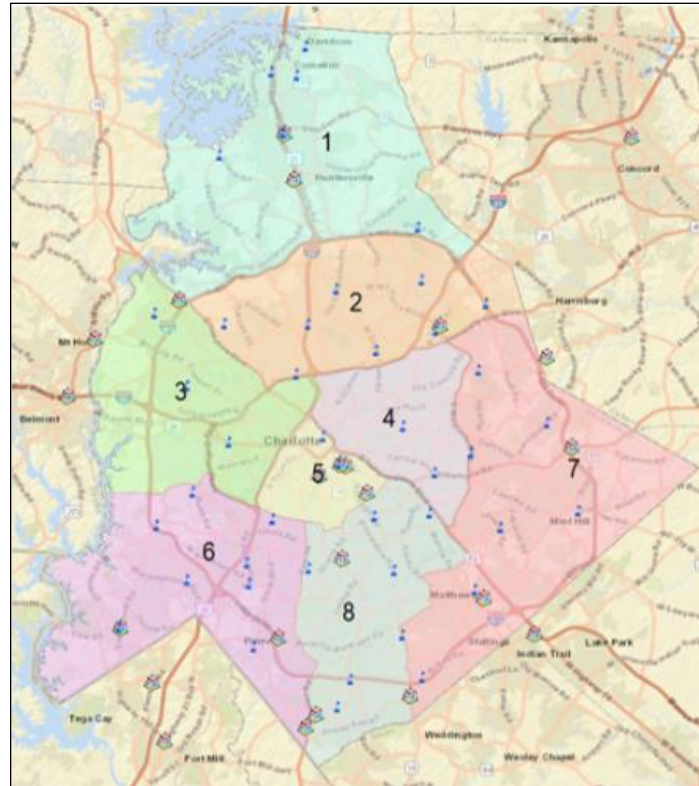
Zones

The County is currently divided into three response zones. EMS stakeholders expressed a desire for additional zones up to the number of municipalities (8) or zip codes (34) to further breakdown performance.¹¹ Recent work by Medic identified an eight-zone model and analyzed the historical performance. The goal of zones is to promote equity in response times and patient outcomes in each zone.

Current 3-Zone Compliance			
Zone	Responses		Compliance
North	19,263	26.3%	83.5%
Central	23,912	32.6%	84.8%
South	30,081	41.1%	83.3%
Total	73,256	100.0%	83.8%

Source: Jan-Jun 2025 CAD data, cancelled calls omitted

The proposed eight compliance zones would create a higher level of performance to attain the response time goals than the three zones. A review of the responses per zone indicates that three and four are significantly busier than the others. The system could consider splitting these two zones into three to create greater parity across the County.



Proposed 8-Zone Compliance					
Zone	Responses		Square Miles	Responses/square mile	Compliance
1-NN	5,437	7.4%	102	53	79.3%
2-N	9,165	12.5%	65	141	85.5%
3-W	12,724	17.4%	64	199	84.6%
4-CE	12,753	17.4%	36	354	86.0%
5-C	8,824	12.1%	17	519	88.2%
6-SW	9,129	12.5%	82	111	82.4%
7-E	7,948	10.9%	102	78	78.7%
8-S	7,233	9.9%	58	125	82.1%
Total	73,213	100.0%	526	139	83.8%

Source: Jan-Jun 2025 CAD data, cancelled calls omitted

City/Town Compliance			
Zone	Responses		Compliance
Charlotte	63,233	87.2%	84.4%
Cornelius	1,048	1.4%	83.5%
Davidson	503	0.7%	74.6%
Huntersville	2,776	3.8%	81.2%
Matthews	2,599	3.6%	79.3%
Mint Hill	1,328	1.8%	80.6%
Pineville	981	1.4%	79.7%
Total	72,480	100.0%	83.9%

Source: Jan-Jun 2025 CAD data, cancelled calls omitted

Compliance was also calculated by city/town within the County. It demonstrates that 87.2% of the calls occur in the City of Charlotte. The next closest is Huntersville at 3.8%. Raw compliance ranged between 75% and 84% across the municipalities for all priority types, not just Priority 1. This is based on unit assigned to on scene time.

¹¹ <https://worldpopulationreview.com/zips/north-carolina/mecklenburg-county>

Another requested approach to reporting compliance was using zip codes. This methodology produced 32 zones (one zip code had no responses). The slowest zip code had 13 responses and 28208 received 8,341 requests for service – twice as busy as any other zip code. Due to the number of zones and volatility of responses, compliance ranged between 72% and 91%.

Finding: The current zones, city/town approach, and zip code approach are based on geography without considering call distribution or population density. To be effective and set realistic expectations, zones should be based on call distribution with minimal adjustment for geography and access (e.g., highways). Too many zones, such as using zip codes, create unrealistic benchmarks due to the volatility of calls. There are similar concerns when using geopolitical zones. When implemented in other EMS systems, municipal leaders whose compliance is lower than an adjoining community will request equity. The EMS provider then adjusts the system status plan to meet the customer request, which will cause a different community to fall lower, and those leaders will ask for similar changes. Given the fluctuating nature of call volumes, achieving consistent equity among all municipalities is a challenging endeavor. The proposed eight compliance zone model incorporates population density and call distribution, including balanced workload.

Zip Code Compliance			
Zone	Responses		Compliance
28031	1,047	1.4%	83.5%
28036	504	0.7%	74.2%
28078	2,768	3.8%	81.2%
28104	22	0.0%	81.8%
28105	2,596	3.6%	79.3%
28107	13	0.0%	76.9%
28134	985	1.4%	80.0%
28202	3,220	4.4%	86.5%
28203	1,293	1.8%	88.9%
28204	1,359	1.9%	90.9%
28205	3,771	5.2%	87.2%
28206	3,508	4.8%	89.3%
28207	415	0.6%	88.2%
28208	8,341	11.5%	85.3%
28209	1,026	1.4%	84.5%
28210	2,554	3.5%	82.7%
28211	2,039	2.8%	88.2%
28212	2,695	3.7%	84.5%
28213	2,789	3.8%	84.3%
28214	2,372	3.3%	77.1%
28215	3,385	4.7%	79.3%
28216	4,221	5.8%	88.2%
28217	2,912	4.0%	86.4%
28223	177	0.2%	85.9%
28226	1,702	2.3%	77.7%
28227	2,763	3.8%	81.2%
28262	3,512	4.8%	86.0%
28269	3,807	5.3%	80.9%
28270	841	1.2%	79.8%
28273	2,637	3.6%	85.1%
28277	2,175	3.0%	79.2%
28278	1,035	1.4%	71.9%
Total	72,485	100.0%	83.9%

Source: Jan-Jun 2025 CAD data, cancelled calls omitted

Recommendation: Based on the size and call volume of the County, six to ten response zones are likely the correct amount. They should be divided into equal sections based on call volume as that is a more accurate approach than population density (e.g., no one lives on freeways or in stadiums, but they do produce EMS calls). Once organized by call volume, minor adjustments should be made to match geographic boundaries, such as mountains, lakes, and freeways. Predicted response and transport UHU rates and population density may play a secondary role in the final zone composition.

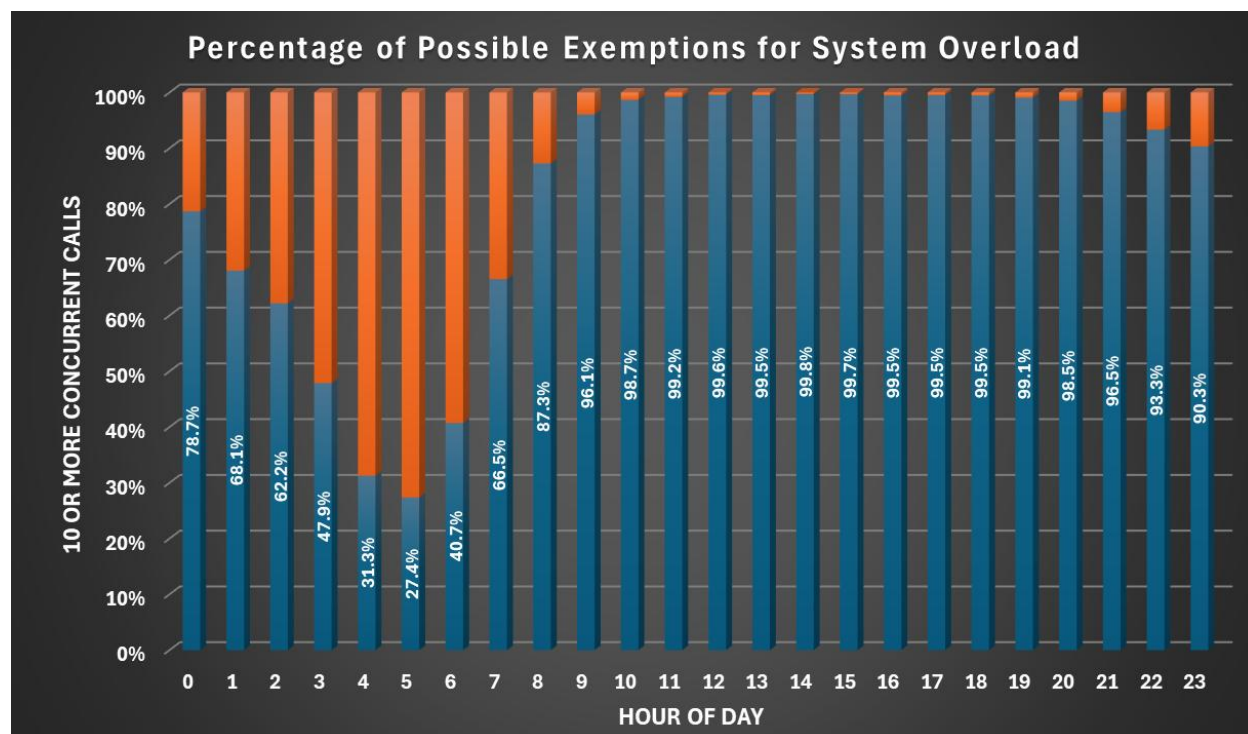
Deployment Centers

Currently, all ambulances begin and end their day at the Medic headquarters building in the central zone. This offers significant efficiencies due to centralizing supplies, equipment, maintenance, unit exchange, employee connection, etc. However, it has one major drawback: distance to other zones. This leads to unproductive time when traveling to and from further zones at the start and end of shift. Some EMS systems have found a positive impact on compliance by placing a satellite station in areas with challenging response times. This was the case for MedStar in Fort Worth, TX, which then placed a second deployment center in its northern zone and saw an improvement in compliance numbers.

Raw vs. Corrected Response Time Compliance

Many EMS systems allow ambulance contractors to exempt certain ambulance responses from time standards due to factors beyond their control. Common exemptions include traffic related to a car crash, train crossing, severe weather, and unusual system overload. The objective is to prevent penalizing a contractor if it cannot predict the delay. This industry approach creates a “raw” or unadjusted compliance and a corrected or contract compliance percentage.

Finding: The allowable exemption types have not been evaluated in many years, possibly as far back as the original 1996 contract. Since that time, the number of 911 responses has grown substantially. The contract considers unusual system overload any time there are ten or more concurrent responses. However, that is most of the time now (88.6%). Examining the possible exemptions due to unusual system overload by hour of the day, it exceeds 99% from 11:00am through 7:00pm. This level of concurrent calls is no longer unusual.



Recommendation: Exemptions should be eliminated from the contract. As Medic is a joint government agency, not a private provider, it is less applicable. Response time compliance should be measured in actual performance, which is what the patient experiences, and not manipulated for contract performance.

Recommendation: Response time compliance goals should be set by the County and then funded to meet that goal. The County funds roughly 25% of the EMS system. As such, it controls the number of unit hours available per day which in turn determines the response time compliance. Medic is a highly efficient and functioning ambulance provider. Increasing performance would take either additional funding or reducing the call volume. A countywide compliance goal should be set with slightly lower goals per zone to accommodate call fluctuation (e.g., XX% overall less 5-10% per zone). The EMS system should continue to have different goals based on patient acuity type.

Targeted Recommendation: Adjust the Priority 1 response time goal from 10:59 to 11:59. This would deliver 90% raw compliance using the existing system resources, which consistently achieve some of the best CARES (i.e., cardiac arrest) survival rates in the country. Clinical studies have shown that response times play a far smaller role in patient outcomes than previously believed. As such, financially investing in faster response times than those experienced today cannot be clinically justified. Any available funding should be utilized where it will produce the greatest benefit to the patients.

Response Times

In 2023, the current EMS system established different time standards based on patient acuity. This innovation follows the path of other progressive EMS providers in the nation. Similar to a patient arriving at a hospital emergency department or a request for law enforcement, the response is dictated by the urgency. A headache or theft report does not require the response speed of a heart attack or home invasion.

Finding: The current approach to match response time goals to patient acuity is appropriate. It prioritizes life-threatening calls over non-urgent ones. In an industry with finite resources, this is a progressive and necessary step for cost-efficient and effective system delivery. It is consistent with most high-performance EMS systems nationally.

Recommendation: Continue the response time goals established in 2023. The percentage of lights-and-sirens ambulance transports should continue to be monitored to identify dispatch categories that may be assigned to the wrong priority level. The current standard of one percent (1%) is consistent with other EMS systems who have similar categories. Another metric to track is lights-and-siren upgrade requests by first responders who have assessed a patient and determined a faster ambulance response is warranted. If the upgrade resulted in critical interventions, ALS skills, or lights-and-sirens transport, then the relevant MPDS category should be monitored and resources changed if it is a consistent issue.

Finding: The EMS system has one time standard regardless of call location within the County. A Priority 1 call in downtown Charlotte has the same response time standard as on Lake Norman. This is unrealistic and sets an unachievable expectation for town leaders, first responders, and patients. The vast majority of high-performance EMS systems have different response time goals based on where people choose to live.

Recommendation: Establish response time goals that not only match patient acuity, but also their location. Many EMS systems break down using urban, suburban, rural, and wilderness population areas. Progressive systems have moved to call density definitions to properly describe the demand, not just where people live. This approach may include high, medium, low, and minimal descriptions. Each region would have a different goal. One methodology would be adding three to ten minutes to each priority response time goal based on location. A sample compliance chart is included for reference.

Current and Proposed Response Time Goals					
Call-Density	Current Standard	Proposed Call-Density Goals			
		High	Medium	Low	Minimal
Priority 1	10:59	12:00	15:00	20:00	30:00:00
Priority 2	15:00	20:00	25:00	30:00	45:00
Priority 3	30:00	35:00	40:00	45:00	Best Effort
Priority 4	60:00	Best Effort	Best Effort	Best Effort	Best Effort
Priority 11	90:00	90:00	90:00	90:00	90:00

Sample Compliance Chart					
Zone	High	Medium	Low	Minimal	Total
Goal	12:00	15:00	20:00	30:00	
1-NN	91.2%	90.9%	92.0%	97.7%	93.0%
2-N	90.0%	90.1%	91.1%	96.5%	91.9%
3-W	89.1%	92.5%	93.3%	95.5%	92.6%
4-CE	92.4%	91.0%	95.5%	92.2%	92.8%
5-C	92.3%	93.4%	91.5%	94.3%	92.9%
6-SW	94.0%	88.9%	90.7%	93.4%	91.8%
7-E	90.5%	90.7%	91.9%	89.8%	90.7%
8-S	91.5%	93.3%	92.2%	90.5%	91.9%
Average	91.4%	91.4%	92.3%	93.7%	92.2%

7. Historical and Current Performance Analysis

Compliance Analysis Statement

Regarding the zone performance analysis, it should be reiterated that contract compliance data was not evaluated based on the significant difference to raw compliance because of exemptions. The compliance by MPDS call type identifies that Charlie-level responses have the worst performance and low priority calls (i.e.,

Omega, Alpha, Bravo) are close to or at 90% compliance. The Priority 1 responses (i.e., Delta, Echo, and some Charlie) were 85% compliant during FY25.

Raw Compliance							
Call Type	Late	On-Time	Cancel	Total		Standard (minutes)	Raw Compliance
Alpha	850	21,137	3,013	25,000	14.5%	60	96.1%
Bravo	1,195	14,571	6,366	22,132	12.8%	30	92.4%
Bravo - NFR	2,175	12,992	2,006	17,173	10.0%	30	85.7%
Bravo-BLS COLD		2		2	0.0%	30	100.0%
Bravo-BLS HOT		1		1	0.0%	30	100.0%
Charlie	10,116	21,300	7,716	39,132	22.7%	15	67.8%
Charlie - NFR	7,076	20,453	3,346	30,875	17.9%	15	74.3%
Delta	4,591	25,190	3,835	33,616	19.5%	10.98	84.6%
ECHO	366	2,741	419	3,526	2.0%	10.98	88.2%
Omega Transport Only	64	916	140	1,120	0.6%	90	93.5%
Total	26,433	119,303	26,841	172,577	100.0%		81.9%

Source: FY25 CAD data, 911 calls only (no NET)

System Status and Deployment Plan Analysis

To assist in response time compliance and deployment of resources the agency utilizes EMS software. MARVLIS (Mobile Area Routing and Vehicle Location Information System¹²) is a suite of GIS-based software by Bradshaw Consulting Services designed for public safety agencies (e.g., EMS, fire, police) to optimize emergency response. It uses real-time data, Geographic Information System (GIS), and GPS to improve vehicle deployment, calculate accurate travel times, and reduce response times.

MARVLIS is used for deployment in conjunction with a third-party vendor to provide detailed, 168-hour (i.e., per hour of day and day of week) historical analyses to drive staffing/scheduling. Medic does not strictly follow the dynamic posting as suggested by MARVLIS. A balance between unit movement and crew fatigue was found rather than autocratic implementation. Currently, the goal is to place units at one of the 40 primary posts with the goal of maintaining stability rather than minute by minute posting. This is realistic for a system running such a high response UHU. MARVLIS appears to improve Priority 1 (i.e., high-acuity) response times, particularly since new versions/deployment monitors were implemented. This was especially true for Echo-determined responses; the FY2025 data supports this assertion. The current system uses historical impedance data, and there are imminent plans to enable a live traffic module via TomTom, recognizing the added value of real-time optimization.

¹² www.bcs-gis.com/marvlis.html

Static Deployment Model

The system requested an estimate if ambulances were deployed from static locations, like how fire trucks respond from fire stations. As existing fire stations are generally distributed equally throughout the County, they offer one approach how ambulances could be distributed effectively. There are 62 fire stations not including four which have significant overlap (i.e., between Charlotte and the County stations). Placing an ambulance in each location 24 hours a day requires 543,120 unit hours. That is 62% more hours than the system staffed in FY25 (i.e., 335,222). The increase in annual expense is \$52.7M.

Ambulance Deployment Models				
Model	Dynamic (current)	Static	Difference	
Fire Stations-City		45		
Fire Stations-Towns		14		
Fire Stations-County ¹		3		
Hours per Ambulance per Year		8,760		
Unit Hours per Year ²	335,222	543,120	207,898	62.0%
Cost/Unit Hour	\$ 253.71	\$ 253.71		
Annual Expense	\$ 85,048,169	\$ 137,793,348	\$ 52,745,179	62.0%

Notes: ¹There is some overlap between 4 Charlotte and 4 County fire stations, 4 units total would be sufficient

²Dynamic unit hours represent FY25

This approach has significant advantages for faster response times, reducing crew fatigue, and increased employee recruitment and retention. However, most cities and counties cannot sustain the greater expense to attain these advantages without substantial tax subsidies.

8. Systemwide Operations Review

Communications Center

Dispatchers are the first link in the chain of survival between the public and the healthcare system. They are critical in identifying emergencies and non-emergencies early, assigning appropriate resources, and providing life-sustaining interventions like dispatcher-assisted CPR. However, EMD training and protocols alone will not guarantee the delivery of this vital component of the EMS system. Only through monitoring compliance with EMD protocols and the ability of the communications center to measure and correct performance can the objectives of EMD be obtained.

MPDS is a proprietary EMD program used by 71% of the major U.S. cities. Jeff Clawson, MD, originally developed MPDS, which is now guided by the International Academy of Emergency Dispatch (IAED). Using EMD by professionally trained dispatchers helps ensure the timely delivery of potentially lifesaving care.¹³ To become certified in EMD, dispatchers must complete 24 hours of classroom training, obtain a CPR certification, and achieve a passing score on the final exam.

EMD is a system that:

- Includes a set of scripted, focused questions for rapid assessment
- Categorizes and prioritizes emergency calls
- Identifies patients who require rapid care
- Provides “zero-minute” response time to initiate lifesaving support
- Has a goal to provide an appropriate and timely prehospital response
- Measures effectiveness when linked with electronic patient care reports (ePCRs)
- Constantly reviews itself for quality improvement opportunities

With MPDS, 911 callers are asked a series of scripted questions that include the patient’s level of consciousness, age, chief complaint, and other complaint-specific questions. The answers allow 911 calls to be categorized into one of five levels, Alpha through Echo. Alpha is non-emergent (e.g., possible broken toe), and Echo is life-threatening (e.g., cardiac arrest). A sixth category, Omega, is gaining popularity for calls that may not require a 911 response and can be referred to a nurse or other healthcare provider for an alternate destination (e.g., urgent care center, clinic). The County is taking advantage of it.

The five main categories are further delineated into 37 complaint-based protocols, which are further classified and may be assigned a numerical subgroup and a modifier, providing responders with more specific details. The consistent and predictable use of a uniform, medically managed, and supported EMD protocol ensures each 911 caller receives instructions consistent with current standards of care. The categories allow the EMS Medical Director to recommend lights and siren for life-threatening classifications. A retrospective review of critical clinical interventions performed per MPDS classification will enable recommendations to be adjusted as needed.

¹³ www.emergencydispatch.org

Fire Response Protocols

Finding: During the interview process, multiple fire agencies identified that they would change which medical calls they are dispatched to. Some are newer municipality-based fire departments that are charging the residents for fire services and want the opportunity to respond to all calls, even when not clinically needed, based on the MPDS determinant. Others may not be interested in responding to medical calls to assess patients prior to an ambulance being dispatched. Those fire departments that are concerned with overworking the firefighters want the option to not respond when the medical call is identified as low acuity by dispatch. In conversations with the dispatch center, it appears that the current dispatch computer may not be able to customize per fire department, or the workload to achieve this goal is beyond the resources of the dispatch center. Medic leadership shared that new dispatch computer systems will be evaluated shortly.

Nationally, most fire departments determine the level of service to be provided – which calls to run, how fast, etc. North Carolina is unique in its approach, as each county determines the calls that require first responders. This is typically at the direction of the county EMS medical director for calls that may benefit from the BLS skills of firefighter/EMTs.

Recommendation: Formalize fire response plan governance and document expectations. At a minimum, first responders should be dispatched to any medical call that the EMS Medical Director determines to be life-threatening and could benefit from BLS care. Each fire service should have the option to include additional calls if it feels there is a benefit to its residents. Dispatch and fire leadership should collaborate and develop clear protocols on response plan expectations, including multi-incident district coverage rules and paging practices. These expectations should be reflected in the CAD and supported by a clear change-control process. Ideally, this would be consistent across all fire agencies. If consensus cannot be reached, each fire department should submit its desired needs for concurrent calls, move up policies, and other operational needs. A recurring review schedule should be adopted so expectations stay current and inconsistencies are resolved quickly.

Recommendation: Fire departments are customers of the dispatch center and should be able to request the services necessary to meet the needs of their communities. If the dispatch computer software is too antiquated to provide individual options, the fire service should develop a fire dispatch committee and identify a uniform approach to meet the immediate needs of the fire service. As new dispatch computer solutions are evaluated, fire representatives should be included to share its needs and ensure the future dispatch computer meets all the fire service needs.

Technology Integration

Finding: During ride-alongs with the firefighters, it was identified that the current dispatch computer does not dispatch the closest unit. While the fire engines have the technology to share their locations (i.e., FirstDue, Tablet Command), the dispatch computer does not have access to it. This becomes a larger issue when a second call occurs in the same fire station response area. Currently, the engine already committed to a call is dispatched to the concurrent call. This requires the engine captain to lose focus from the first incident, contact dispatch, and recommend a cover engine. The impact is an extended response time before an

available fire resource is assigned and the engine captain possibly missing critical information at the first incident. This also impacts fire crews' ability to see the ambulance locations and real-time dispatch notes, which is a significant concern for situational awareness.

Recommendation: The dispatch computer should recommend an available unit at the time of dispatch, ideally the closest unit. If the current dispatch computer cannot import engine location data, this should be a required feature in the new computer.

Quality Assurance Structure and Timeliness

Finding: Quality Assurance (QA) is not consistently integrated into day-to-day operations. Specifically, QA is reportedly working largely remote and away from the dispatch floor. The call review feedback is often not delivered in a timely manner, which reduces its effectiveness as a coaching tool. Limited in-person contact can make feedback more difficult for staff to receive.

Recommendation: Set clear service expectations for QA turnaround times (for example: feedback delivery targets by call type and priority). Increase QA visibility on the dispatch floor through scheduled in-person time, joint coaching sessions, and routine engagement with staff and supervisors. The goal is to improve timeliness, context, acceptance of feedback, and overall trust in the process.

Finding: Supervisors do not have direct access to performance data needed to identify trends, intervene early, support performance evaluations with objective data, and respond to performance concerns raised by stakeholders. There is a lack of supervisor access to AQUA (i.e., the EMD QA tool), limiting their abilities to monitor and coach employees effectively.

Recommendation: Provide supervisors with appropriate access to performance dashboards and EMD QA tools (including AQUA) so they can identify trends, coach early, and support evaluations with objective data. Establish a standard set of metrics and reporting intervals that are automatically shared with supervisors and leadership.

Training and In-Service Development

Finding: New employees are receiving approximately three weeks of initial training. The training coordinator is primarily focused on new hires, and has limited capacity for structured in-service training for existing dispatchers.

Recommendation: A longer and more comprehensive training pathway is needed for new dispatchers. This education should follow national standards for in-service training for all dispatchers.

MPDS Process

Finding: Certain determinant categories have been trimmed down, which may affect reporting detail. The value of reporting can be reduced when access and transparency to data are limited. One example is the use of EMD determinants to guide referrals for routing Omega-level calls to a nurse triage line. This results in frequent "bounce-back" calls that result in ambulance needs and delays.

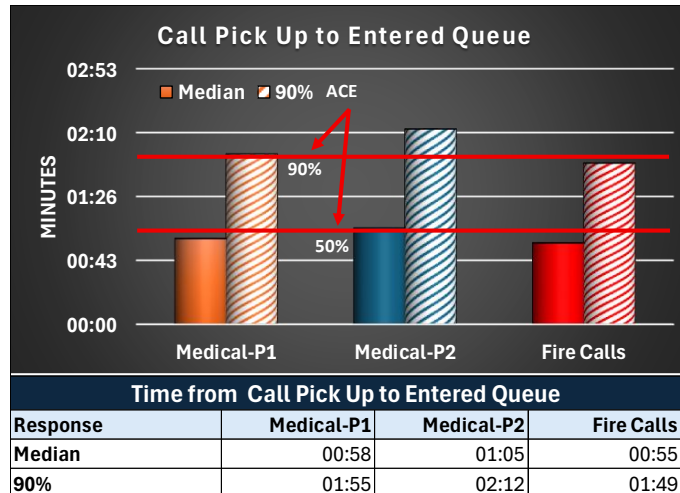
Recommendation: The QA process should include a review of bounce-back frequency to send the right resources the first time and improve workflow efficiency.

Call Process Times

As part of the EMS assessment, the process times related to dispatch were reviewed. In FY25, on average it took roughly one minute for a call to be answered (“Call Pick Up”), EMD to be completed, and ready to be dispatched (“Entered Queue”). The 90th percentile is two minutes. At first glance, this appears longer than ACE benchmark times, which average 1:12 from the starting MPDS questions to call processing completion, with a 90th percentile of 2:01.¹⁴

However, this comparison reflects a difference in measurement methodology rather than a direct protocol-processing deficit. ACE benchmark times begin at MPDS launch, while the center’s reported metric begins at 911 answer and includes the time spent obtaining and confirming address and callback information before MPDS is initiated. As a result, the center reports approximately 27-second average difference shown in the analysis should largely be understood as the inclusion of this front-end verification process, which is consistent with the center’s internal goal of completing address and phone number confirmation within 30 seconds. Accordingly, for benchmark comparison purposes, this pre-MPDS interval should be treated as outside the scope of the IAED call processing time.

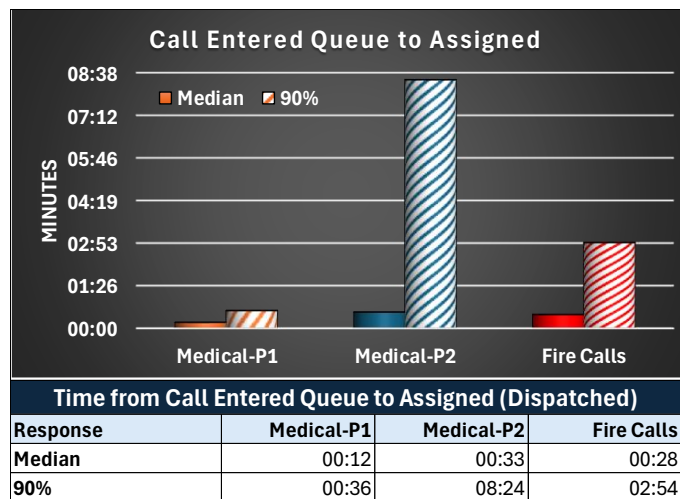
When viewed in that context, the table reflects strong performance rather than deficiency. The center appears to be meeting benchmark



Source: FY25 operations performance data, CAD fire data, 911 calls only (no NET)

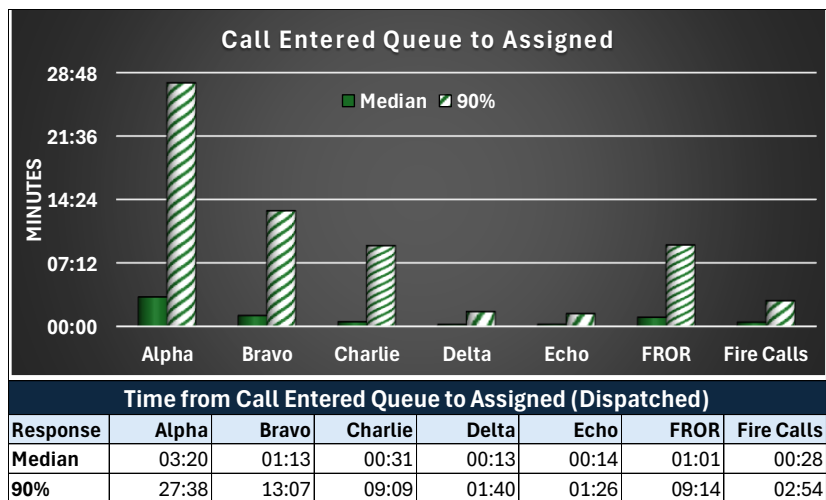
Notes: 30 seconds deducted for Call Pick Up to start of EMD process

Times longer than 4:00 minutes excluded due to likely data error



Source: FY25 Operational Performance data, CAD fire data, 911 calls only (no NET)

Note: Times longer than 30:00 minutes excluded due to likely data error



Source: FY25 CAD data, 911 calls only (no NET)

¹⁴ <https://www.emergencydispatch.org/the-science/data-center>

expectations at a high rate, particularly while consistently completing the critical front-end task of confirming address and callback information before MPDS launch. This is an important operational strength, as it supports both caller safety and dispatch accuracy, and it should be recognized as a practice the center is doing well and should continue to maintain.

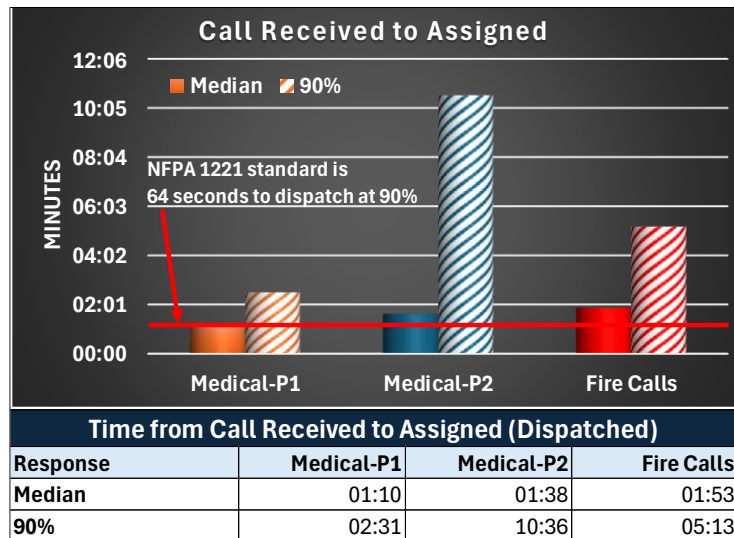
A review of times from when a call is queued to assigned to a unit identified lengthy processing times at the 90th percentile. While lower for Priority 1 and fire calls, it was still significant at 90%. A deeper analysis by MPDS category determined a typical pattern where high-priority calls get assigned units faster than low-acuity ones. While the initial impression of extended assigned times for Alpha calls may appear concerning, these are the least acute calls and progressive EMS systems often hold these calls to maintain a certain minimum number of ambulances in the system for high acuity calls before dispatching Alpha calls. Again, this indicates an opportunity for greater analysis of the transfer from call ready to call assign process.

When combining the time from call received to call assigned, NFA recommends 64 seconds at least 90% of the time. However, this does not vary for non-emergency calls that may have longer processing times. Some progressive systems are using 90 seconds across all priorities to modernize the NFA guideline. This allows for a more thorough EMD process, especially for low-acuity calls. Using either 64 or 90 seconds, the total dispatch process is taking significantly longer than recommended. No Priority 1 call should be held for 2.5 minutes, much less 10% of them.

System Efficiencies

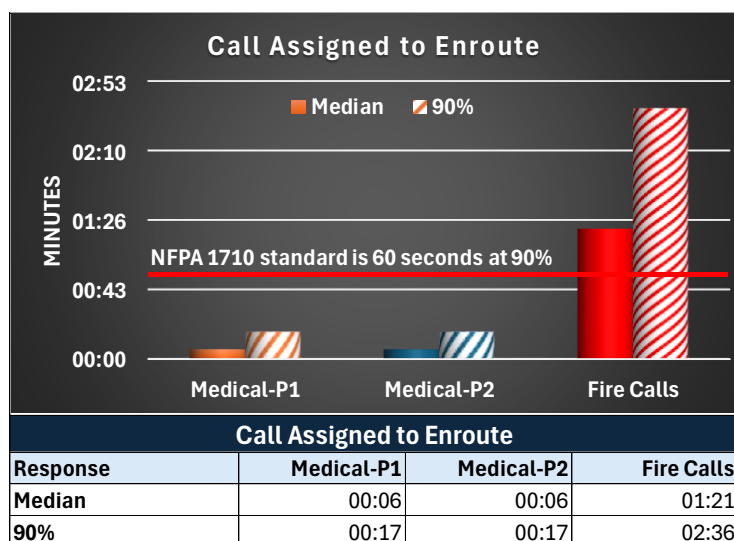
Chute Times

An analysis of the time between call assignment to unit enroute (i.e., “chute time”) identified excellent times for medical calls. A similar analysis of fire calls demonstrated a longer chute time. The NFA standard is 60 seconds, regardless of priority. There appear to be opportunities to examine fire engine enroute processes to reduce this time.



Source: FY25 CAD data, 911 calls only (no NET)

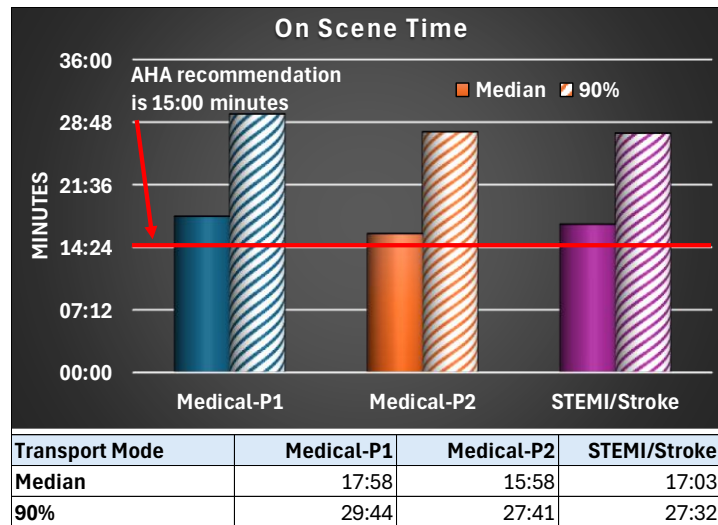
Notes: 30 seconds deducted for Call Pick Up to start of EMD process



Source: FY25 CAD data, 911 calls only (no NET)

On Scene Times

On scene times are a proven clinical differentiator for patient outcomes. The sooner a patient suffering from a STEMI, stroke, trauma, or sepsis event arrives at definitive care (e.g., trauma center, comprehensive stroke center, heart center), the better the outcome achieved. The American Heart Association (AHA) recommends no more than 15 minutes on scene. Within the County, there was little difference in on-scene time between calls dispatched as Priority 1, 2, or a possible STEMI/Stroke incident. The latter call type exceeded the 15-minute AHA standard. The clinical team may want to consider systemwide education on the value of shortened on scene times to positive patient outcomes.



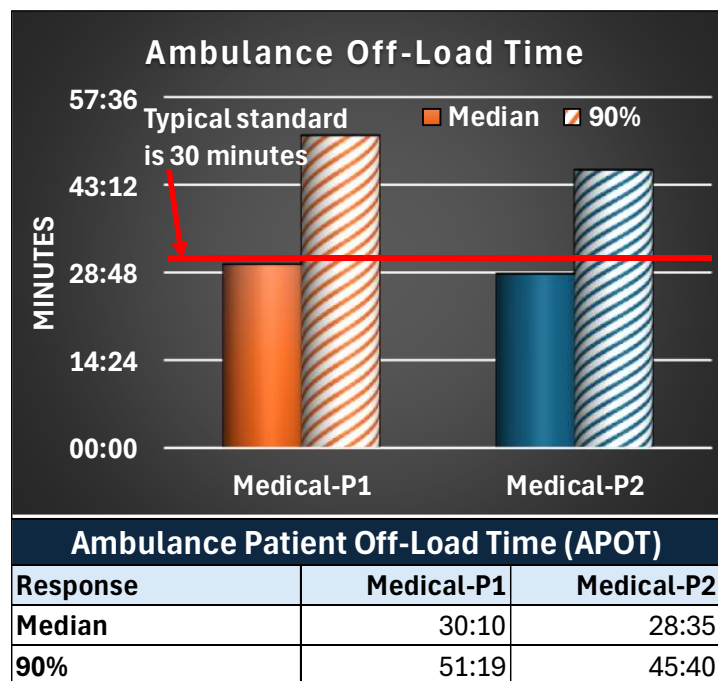
Source: FY25 CAD data, 911 calls only (no NET)

Notes: STEMI and Stroke are defined using MPDS 10x and 28x determinants

Ambulance Off-Load Times

Interviews with EMS stakeholders did not identify delays off-loading patients to the emergency departments. The FY25 data identified the average ambulance off-load time was 30 minutes or less. When units are at the hospital, they are unavailable for 911 and NET calls. During FY25, ambulances were committed to 8,221 hours beyond 30 minutes. Using the marginal ambulance cost per hour, that equates to \$1.2M in unproductive hours – or 23 unit hours per day.

The 30-minute average off-load time is a good starting goal and commitment from the hospitals. Every minute that can be saved is directly available to the EMS system. Many EMS systems set a goal of 90% within 30 minutes. This metric should be monitored as it directly affects ambulance availability within the County.



Source: FY25 CAD data, 911 calls only (no NET)

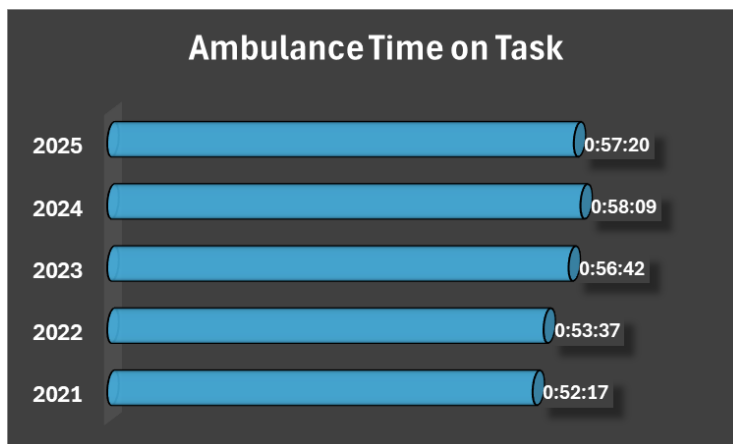
APOT Expense	
	Quantity
Time lost (Off-load>30 minutes) (in hours)	8,221
Ambulance Cost/Unit Hour	\$ 144.67
Potential Annual Savings	\$ 1,189,276
Additional Unit Hours/Day	23

Source: FY25 ambulance patient off-load data, Medic unit hour cost

Note: receiving facilities with >100 transports

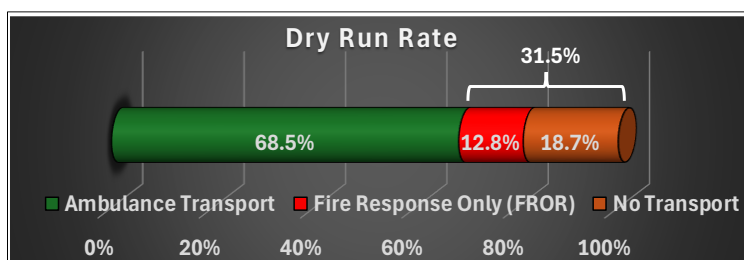
Time on Task

A review of ambulance time on task (i.e., assigned to available) showed an average of just under one hour. That is expected for most EMS systems. It should be noted that it has increased by 5:04 minutes (8.8%) over four years, which has a negative impact on response UHU. The Medic leadership should monitor time on task and identify the reasons for any changes. For example, it may have increased when first responders handled roughly 10,000 calls in FY24 and FY25 that would have been dry runs for the ambulance (i.e., shorter task time without hospital transport).



Dry Runs

All EMS systems experience some level of dry runs. The County has a rate of 31.5%, which is consistent with other EMS providers. Within this EMS system, it is a combination of ambulance and first responders cancelling the call because of the first responder only responses (FROR, i.e., Medic-Hold) program.



911 Call Disposition		
Disposition	Calls	
Ambulance Transport	104,810	68.5%
Fire Response Only (FROR)	19,516	12.8%
No Transport	28,658	18.7%
Total	152,984	100.0%

Source: FY25 CAD data, 911 calls only (no NET)

Treat and Release Pending Transport

EMS systems are perpetually being asked to do more with the same or fewer resources. When the funding does not permit status quo to rising call volume, it requires a fundamental review of some held tight doctrines – this includes the definition of patient abandonment. Since the first day of EMT school, students are told they cannot leave a patient until relieved by a higher medical authority. EMS medical directors have started to examine the abandonment concern in greater detail. As an analogy, emergency departments routinely assess and send low acuity patients back to a waiting room pending available hospital resources. It also occurs during MCIs when there are more patients than providers. An EMS system can be loosely compared to an MCI; when there are more patients than providers, the providers should attend the patients needing the most immediate care. This has led to protocol changes that enable first responders to assess patients, determine they do not have a life-threatening emergency, delay ambulance arrival until system levels permit it, and leave the scene prior to ambulance arrival.

What is critical to remember with treat and release protocols is that they are written and approved by the EMS medical directors and their licenses. Every EMT and paramedic operates under the doctor's license and the approved protocols. The medical director, not the pre-hospital provider, is risking their license if they were to allow unsafe practices. Systems in

Oregon, Wisconsin, California, and likely many other states have been doing this for years, even decades. Often, the greatest roadblock is entrenched practices without understanding the underlying goal.

Finding: The County has a protocol that allows first responders to assess patients for life-threatening conditions and, if stable, leave the patient before the ambulance arrives. However, firefighters are hesitant to exercise this option due to concerns about patient abandonment.

Recommendation: First responders should utilize the protocol and leave a stable patient pending transport. At a minimum, the fire truck can place itself “available at scene” to be ready should an emergency occur within its coverage area, such as a structure fire, traffic collision, or high-acuity medical call. The County EMS Medical Director and his team should provide in-service education to first responders to increase comfort and utilization of the protocol.

Community Education

As demonstrated by the 62% rate of bystander CPR within the CARES data, it is likely the most impactful tool on patient outcomes. Since July 2022, over 15,000 community members have been trained. The EMS stakeholders should continue to focus on expanding access to hands-only CPR; one California fire department added a CPR video to its movie theater ads to increase access. Middle and high school programs are excellent opportunities for this public education.

The County has implemented PulsePoint to further connect the public to patients needing CPR. It is a free smartphone app that allows the public to be notified when they are in close proximity. There is a first responder edition that includes private residence calls. The community members are the closest responders to every medical emergency. Beyond CPR, EMS stakeholders could expand public training to include bleeding control (e.g., direct pressure, tourniquets), helping choking victims, Narcan administration, etc.

Ambulance Fleet Size

As part of the assessment, the ambulance fleet size was reviewed. Competitively bid EMS systems typically include a requirement for 130-140% of peak ambulance staffing to ensure sufficient fleet depth to cover routine maintenance, repairs, and crashes. This does not include special events that exceed the peak system demand. Medic noted that it can have up to ten special event requests during high school football season. It has a contract requirement for 130% of peak staffing. It is typical to see contract requirements between 130% and 140% of peak unit demand; however, that is for the 911 system and does not include interfacility or special-event needs. Of the North Carolina EMS systems that shared their fleet data, Mecklenburg has the least number of reserve ambulances available at 127% (current fleet is 77 with five units on order). It is likely that unit availability has or will impact the County’s ability to fully staff the peak 911 demand times, special events, and upstaffing during disasters.

Ambulance Fleet Size				
Agency	Peak 911 Units	Lowest 911 Units	Fleet Size	Fleet depth
Guilford	23	11	65	165%
Lincoln	8	6	18	156%
Randolph	11	9	21	148%
Wake	53	35	95	144%
Stanly	7	5	12	142%
Iredell	13	11	21	138%
Rowan	14	8	22	136%
Cabarrus	13	11	20	135%
Mecklenburg	60	20	82	127%
Average	22	13	40	143%

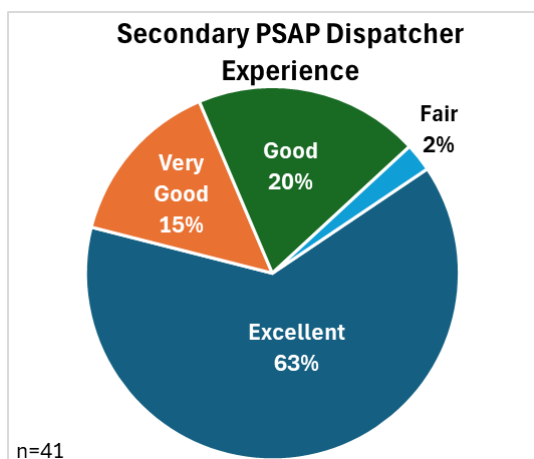
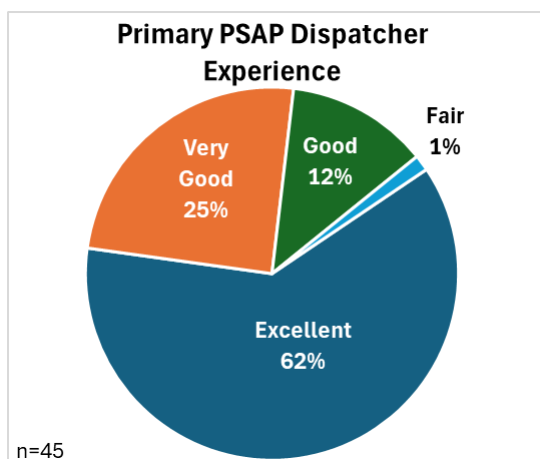
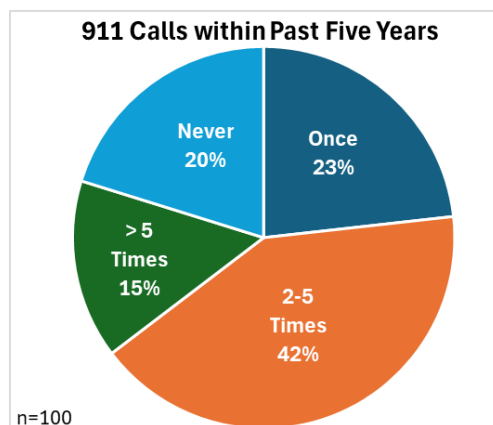
Source: NC counties

Note: this is 911 staffing only, no special events

9. Customer Experience Evaluation

To gain the perspective of the community, 100 people completed a survey about 911 medical services. Of those contacted, 80% had used the 911 system for a medical emergency.

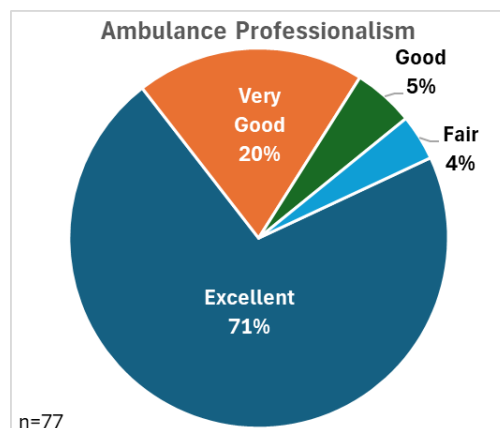
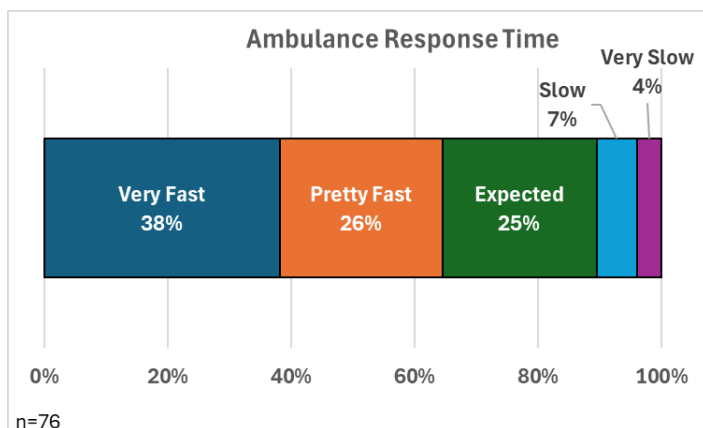
In general, they rated their experience with the first 911 dispatcher (i.e., primary PSAP) and second dispatcher (i.e., secondary PSAP) as around 80%. However, less than half of the respondents could recall an opinion for either dispatch interaction.



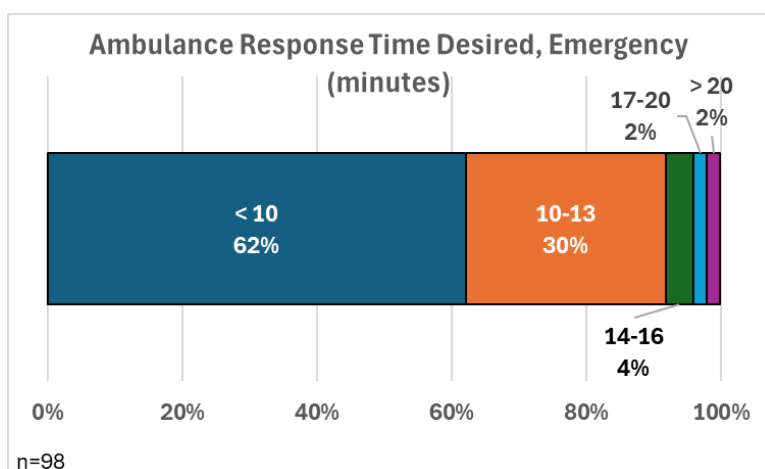
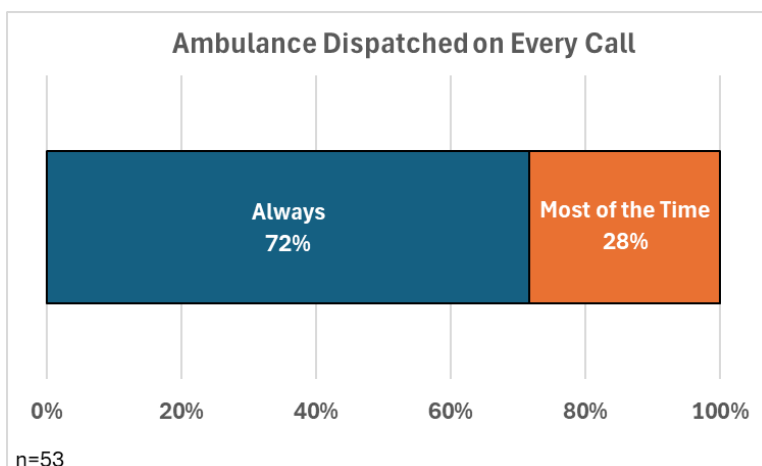
The survey found the fire response time met caller expectations or faster at 93% and the experience with the firefighters as excellent or very good at 92%.



For 89% of those who answered the question (n=76), customers felt the ambulance response time met or exceeded their expectations. The ambulance crew professionalism and courteous was rated at 91%.

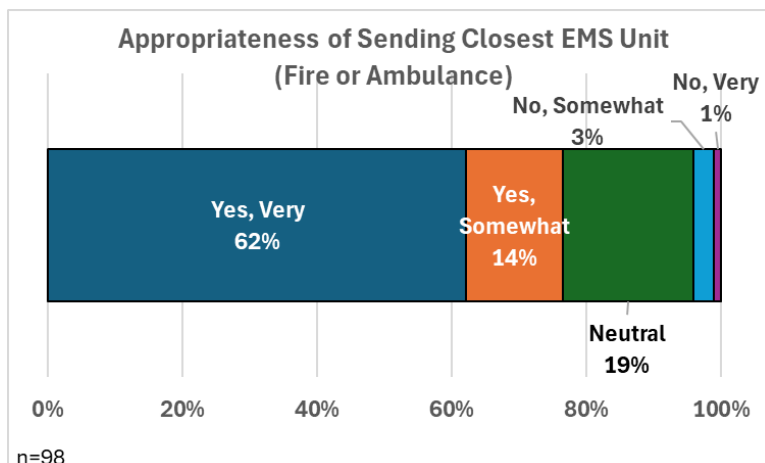
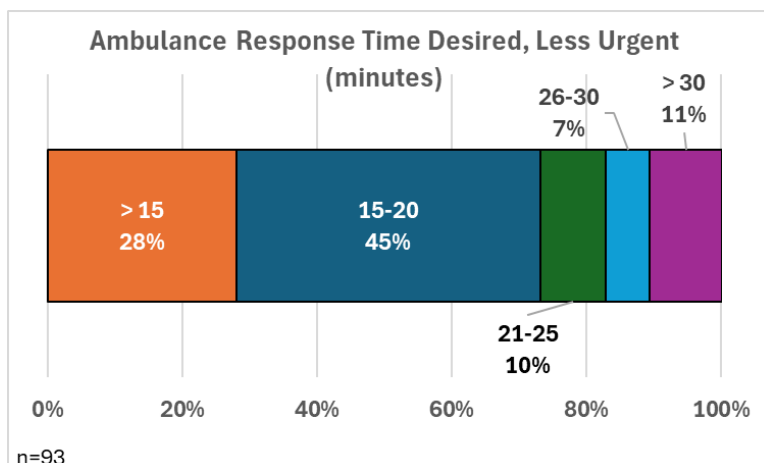


When asked if an ambulance should be dispatched simultaneously with the fire truck, 72% felt it should be every time.



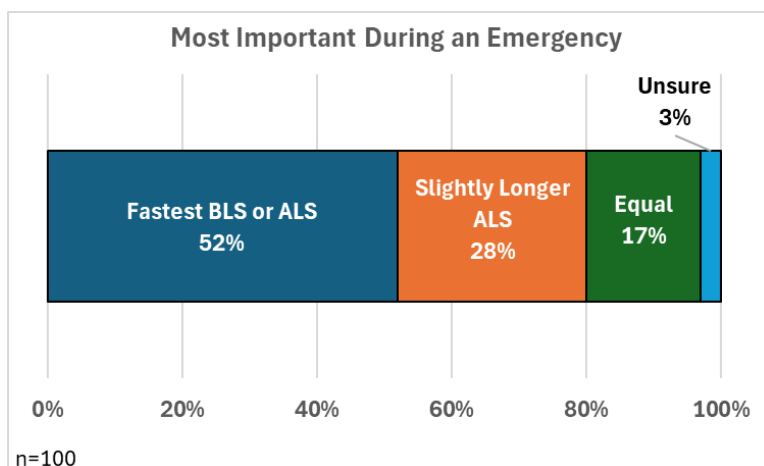
Respondents were asked to share their desired response times for a life-threatening medical emergency. The majority stated less than 10 minutes and 92% wanted it within 13 minutes.

For less urgent medical situations, the survey participants stated that up to 15 minutes would be okay 28% of the time. Forty-five percent were okay with 15 to 20 minutes for response times.



When asked how appropriate it is to send the closest EMS resource (i.e., fire truck or ambulance), 86% felt it was very or somewhat acceptable. Four percent felt it would be inappropriate at some level and 10% had no opinion.

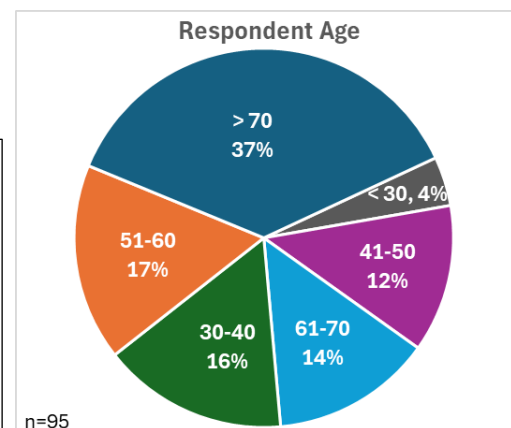
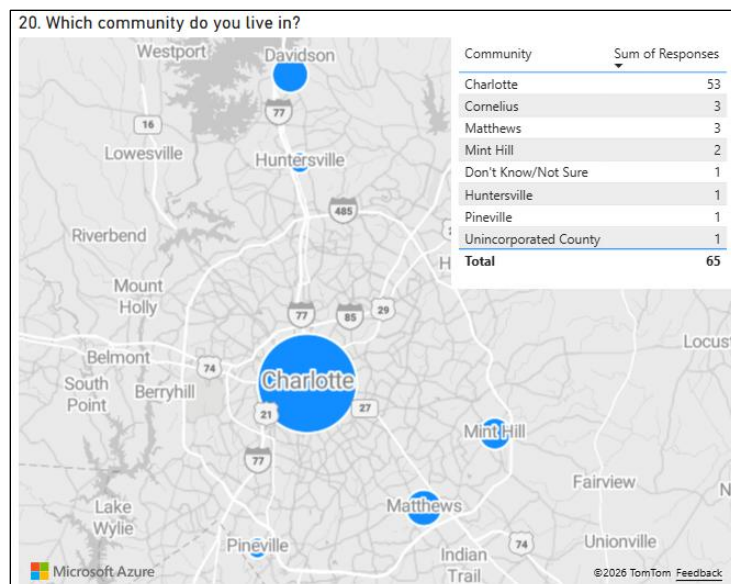
The survey asked respondents to rate what was most important during an emergency – speed or level of care (i.e., BLS or ALS). Over half (52%) stated the fastest response was most important. A smaller percentage (27%) was okay waiting for the higher level of care.



The survey allowed comments along with most of the questions. The general theme of comments is listed below; all comments are available in [Attachment E](#).

Survey Comment Key Takeaways
Primary PSAP (1st Dispatcher)
Highly professional, courteous 911 operators
Staying on the line provides critical emotional support
Emergency stress affects specific detail recall
Second PSAP Comments
Fire truck response times exceed or meet expectations
Second operators provide critical emotional support
Professional and courteous interactions throughout
Firefighter Comments
Firefighters are consistently professional, knowledgeable, and courteous
Ambulance response times meet or exceed expectations
Firefighters provide valuable emotional support during emergencies
Ambulance Crew Comments
Ambulance crews are consistently professional and courteous
Crews provide calming presence
Strong medical competence with clear communication
Several mentions that ambulances should always be dispatched
Additional Comments
Overwhelmingly positive perception of local EMS system
Response time is critical; speed praised, delays criticized
EMS personnel are highly respected for professionalism and compassion

Most survey participants were over 70 (37%) with 58% at least 60 years of age. The City of Charlotte residents represented the largest percentage at 82%.



10.EMS System Funding Model

Financial Statements

Mecklenburg Emergency Medical Services provided audited financial statements for 2021, 2022, 2023, 2024, and 2025. As with all government entities, Mecklenburg EMS uses fund financial statements to properly track government fund balances.

Costs for Services

The financial statements include shared costs and expenses offset by payments from third parties booked as revenue. To properly analyze Medic's true costs and an ambulance provider, adjustments were made to produce the cost summary below. For further visibility key metrics were calculated to evaluate reasonableness and to isolate potential issues.

Medic Key Metrics		
Field Operations	127.08	Per Unit Hour
Crew Wages and Benefits	107.98	Per Unit Hour
Dispatch (Medic Portion)	37.83	Per Trip
Billing	23.62	Per Trip
Medical Supplies	13.91	Per Trip
Total Expense	707.83	Per Trip
Net Ambulance revenue	589.65	Per Trip

Medic Expense Summary	
Field Operations	42,601,088
Special Operations	1,199,317
Dispatch (Medic Portion)	4,594,019
First Responder fees	895,382
Fleet	7,470,337
Facilities	1,291,052
Billing	2,868,581
Medical Supplies	1,688,737
All Other	23,351,475
TOTAL EXPENSES	85,959,988

Direct expenses such as dispatch, medical supplies and billing charges appear reasonable and like other large systems. Field operations as well as crew wage and benefits per unit hour are not concerning and should decrease with improved staffing. All other

expenses, which are mostly overhead, represent 27% of total expenses. A system this large requires significant support but efficiencies in this area may be an area to explore.

Funding Sources and Distribution

Revenue includes a mixture of revenue from operations, grants, and funds to offset expenses, interest, and County Appropriations to cover the gap between revenue and expense. Below is a summary of revenue adjusted for expense offsets and without County Appropriations and capital investment. Additional funding sources are listed below.

Medic Revenue Summary	
Charges for services	69,725,932
Other income	1,881,810
TOTAL REVENUE	71,607,742

Medic Additional Funding	
Mecklenburg County Appropriations	22,450,687
Interest income	397,905
Operating Grants (offset Expense)	617,640
Capital	3,379,207
TOTAL ADDITIONAL FUNDING	26,845,439

Payor Mix

From FY21 to FY25, Medic has seen improvements in payor mix with a steady increase in commercial payors. Currently, 13.2% of its billings are to Commercial insurers. This is higher than usual for a large metropolitan area such as Charlotte. Medicaid patients have increased since FY22 with the implementation of the Affordable Care Act, from 18% in 2022 to 20.3% in 2025. The shift to Commercial and Medicaid comes from charity care and private payors. This is a positive trend. Using this information and revenue modeling software, it calculated a realistic net revenue per trip – providing assurance that the data is likely accurate.

Payor Mix					
Payor	FY21	FY22	FY23	FY24	FY25
Medicare	22.67%	19.67%	18.23%	15.98%	15.37%
Medicare HMO	18.23%	21.36%	24.08%	25.55%	27.03%
Medicaid	17.96%	11.46%	11.50%	10.31%	2.81%
Medicaid HMO	NA	7.51%	8.00%	8.80%	17.44%
Private	16.00%	15.39%	12.98%	12.20%	10.19%
Commercial	8.30%	8.42%	8.63%	11.99%	13.20%
BCBS	8.74%	8.96%	8.56%	7.91%	7.55%
Charity	3.57%	2.89%	3.53%	2.81%	1.59%
Facility	2.10%	1.63%	1.58%	1.30%	1.39%
Tricare/VA/Hospice	2.43%	2.72%	2.91%	3.15%	3.42%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

Notes

Traditional Medicare population shifted to Medicare HMO.

7/1/2021-Medicaid Managed Care effective date

12/1/2023-NC Medicaid expansion effective date; more individuals qualifying for Medicaid/Medicaid HMO

7/1/2024-Medicaid Tailored Plans effective date, move the IDD/BH members from Traditional Medicaid to a Tailored (Managed Care plan)

1/1/2025-NC DHHS medical bad debt relief (hospitals) impact charity

Moving forward, 2026 will see additional changes. There are no anticipated rate increases, and the CMS CPI¹⁵ rate increase is only 2%, which affects 40% of current payors; this is 2% lower than historical average over the past few years. The Affordable Care Act phases out at the end of 2026 (part of the Big Beautiful Bill) and the state is not likely to have the ability to fund the gap. Medic estimates the negative impact will be approximately \$2M in 2027.

Rate Increase Potential

In many geographic areas, rate increases are limited in their ability to create significant new net revenue. However, the County's current payor mix is favorable to rate increases with high commercial insurance, low private pay, and low charity. Higher rates are funded primarily by private insurance and, to a smaller degree, private and some contracted payors. Government payors (e.g., Medicare, Medicaid, CARE CAID HMOs) will continue to pay according to the CMS fee schedules.

¹⁵ Center for Medicare and Medicaid Services Consumer Price Index

County Rates									
Level of Service	ALS E	ALS NE	ALS2	BLS E	BLS NE	SCT	Mileage	ALS T&R	BLS T&R
Cabarrus ¹	\$ 1,577	\$ 996	\$ 2,282	\$ 1,328	\$ 830	\$ 2,697	\$ 27.99	\$ 200	\$ 200
Gaston	\$ 1,500	\$ 1,200	\$ 1,800	\$ 1,000	\$ 850	\$ 2,400	\$ 23.50	\$ 375	\$ 375
Wake	\$ 1,449	\$ 1,449	\$ 1,449	\$ 1,449	\$ 1,449	\$ 1,449	\$ 17.88	\$ 200	\$ 150
Mecklenburg	\$ 1,194	\$ 892	\$ 1,194	\$ 1,194	\$ 892	\$ 1,440	\$ 29.00	n/a	n/a
Average	\$ 1,144	\$ 889	\$ 1,381	\$ 994	\$ 786	\$ 1,606	\$ 19.65	\$ 275	\$ 275
Guilford	\$ 1,051	\$ 664	\$ 1,522	\$ 885	\$ 553	\$ 1,798	\$ 18.66	\$ 350	\$ 350
Rowan	\$ 777	\$ 490	\$ 1,124	\$ 654	\$ 409	\$ 1,165	\$ 13.86	\$ 250	\$ 250

Source: Cabarrus County, Feb-26

Notes: ¹Cabarrus rates are proposed, base rates rounded to the nearest dollar, T&R=Treat & Release, NE=Non-Emergency, E=Emergency, SCT=Specialty Care Transport

Finding: The County ALS rates are slightly above the average for EMS systems surveyed in the state. This may provide an opportunity to increase rates. Utilizing the current payor mix, average volume from the last four years, and other assumptions calculated from other sources, the increased net revenue per \$1 increase in gross charges is 12 to 14 cents. Therefore, a four to five percent increase in rates could result in \$1 million in new net revenue. This is an initial estimate using limited information and further exploration with more comprehensive data would confirm the exact revenue impact.

Recommendation: The County should consider a rate increase to increase patient transport revenue that could financially support the assessment recommendations.

Finding: Of the counties surveyed, only Mecklenburg does not charge for a treat and release call. While not a frequent event, it is recognized by government payors as a legitimate charge under certain circumstances (e.g., diabetic issue, cardiac arrest). Some EMS systems charge an assessment fee when the call does not result in transport. Some community members have learned that they can receive a professional and comprehensive evaluation within minutes instead of waiting for hours in the emergency department. The latter is not recognized by government payors.

Recommendation: The County should consider charging when the ambulance crew treats patients and do not transport. Some EMS systems are concerned that an assessment fee may create an unintended consequence of people not calling 911 when they are having a true, life-threatening emergency. This needs to be clearly understood before considering it.

First Responder Expenses

There are multiple ways to calculate the expenses associated with medical first response currently performed by the fire departments in the County. This includes everything from the fully loaded cost per call (i.e., total department expense divided by total call volume) to the marginal expense per call (e.g., fuel, supplies, vehicle maintenance). The project scope of work defined the cost of services as “Total Fire departmental costs and Fire costs that are specifically attributable to first responder services.”

For first responder services, the expense line items that vary with the number of calls run were analyzed. This included 1) training/licensing, 2) vehicle expenses (e.g., maintenance, fuel, oil), and 3) supplies. Details within these categories were not available, and some expenses may be fixed regardless of the number of responses (e.g., a new fire truck). The table below indicates that the average direct cost per medical call is just under \$60, with a total cost of \$5.85M.

First Responder Direct Costs per Medical Call								
FY25	Charlotte ²	Cornelius	Davidson	Huntersville	Matthews	Mint Hill ³	Pineville	Total/Avg.
Total Expenses	\$ 197,718,347	\$ 4,937,305	\$ 2,685,437	\$ 7,540,442	\$ 5,586,490	\$ 7,103,559		\$ 225,571,580
Direct Cost-All Calls								
Training/Licensing	\$ 286,425	\$ -	\$ 8,147	\$ 3,248	\$ 41,400	\$ -	No Info	\$ 339,220
Vehicle Expenses ¹	\$ 6,862,333	\$ 659,202	\$ 65,852	\$ 247,969	\$ 128,828	\$ -	Received	\$ 7,964,184
Supplies	\$ 58,882	\$ 133,660	\$ 12,284	\$ 20,504	\$ 5,000	\$ -	or Located	\$ 230,330
Total	\$ 7,207,640	\$ 792,862	\$ 86,283	\$ 271,721	\$ 175,228	\$ -	Online	\$ 8,533,734
Direct Cost-Medical Calls								
Training/Licensing	\$ 195,595	\$ -	\$ 5,469	\$ 2,330	\$ 26,068	\$ -	No Info	\$ 229,462
Vehicle Expenses ¹	\$ 4,686,159	\$ 432,369	\$ 44,203	\$ 177,917	\$ 81,119	\$ 44,748	Received	\$ 5,466,515
Supplies	\$ 40,210	\$ 87,667	\$ 8,246	\$ 14,712	\$ 3,148	\$ 4,864	or Located	\$ 158,846
Total	\$ 4,921,963	\$ 520,036	\$ 57,918	\$ 194,959	\$ 110,336	\$ 49,612	Online	\$ 5,854,824
Medical Calls	86,097	1,746	829	3,193	2,326	2,125	1,732	98,048
Direct Cost/ Medical Call	\$ 57.17	\$ 297.84	\$ 69.86	\$ 61.06	\$ 47.44	\$ 23.35		\$ 59.71

Sources: FY25 CAD and FD call data; FD fiscal data

Notes

Direct cost calculated using 2025 year-end fiscal data for variable costs and applying to the percentage of medical calls

¹Vehicle Expenses may contain capital equipment as some are higher than others

²Charlotte FD provided an estimate of a \$2.8M reduction in operational costs without Medic-Hold calls

³Mint Hill is FY26 budget

11. Funding Levels and Distribution

Funding Formula

The current approach to subsidizing the first responders for services provided is roughly 30 years old and EMS stakeholders are unclear what the original intent was when the subsidy agreements were created. The agreement language generally states the fire duties as responding to all dispatches, whenever and wherever requested by CMED. The Charlotte Fire agreement includes a flat subsidy of \$499,035 with no description of how this amount was determined. The town subsidies include a base amount plus a per incident response. The monthly base is \$1,100-\$1,200 and \$21-23/response.

During FY25, the first responder subsidy totaled \$895,382. The County also paid \$250,978 to the City of Charlotte for use of its radio infrastructure in FY25. Of the systems surveyed, 50% provide some level of first responder funding. It ranges between \$0.4M-1.6M annually. Within North Carolina, the survey determined there were no other counties providing first responder subsidies.

First Responder Subsidy	
Town/City	FY 2025
Charlotte	\$ 499,035
Cornelius	\$ 51,278
Davidson	\$ 31,243
Huntersville	\$ 107,240
Idlewild	\$ 31,377
Matthews	\$ 72,242
Mint Hill	\$ 53,502
Pineville	\$ 49,465
Total	\$ 895,382

Source: Medic FY25 subsidy report

First Responder Funding

As described previously, the County is limited by virtue of it accepting federal funding for transport in what it pays for first responder services related to the ambulance system. It is possible to justify the financial value of first responders through the cost avoidance achieved by the ambulance service. During FY25, the fire service completed 4,749 hours on Medic Hold (i.e., FROR). If Medic had staffed the same in ambulance hours, the cost would have been \$687,064.

However, this approach matches the known hours needed based on historical data. To adequately staff enough ambulance units, the roughly 20,000 Medic-Hold annual calls need to be added to the current deployment plan.

Based on the modeling completed, the system would need

FROR Valuation	
FROR Calls	19,516
Calls Needing an Ambulance	53.7%
Additional Ambulance Unit Hours Needed	8,870
Ambulance Direct Cost Per Unit Hour	\$ 144.67
Cost of Additional Ambulance Unit Hours	\$ 1,283,191

Sources: FY25 CAD data, financials

8,870 additional ambulance unit hours to be ready to meet the need of these calls. The cost avoidance to the County is \$1,283,191. This is a more accurate representation of the value provided by first responders. In exchange for the available funding, first responders should maximize the complete EMT scope of practice to improve the outcomes of their patients.

Medic-Hold/FROR Activity		
Provider	Calls	Hours on Task
Concord	1	0.26
Carolina	37	8.13
Long Creek	84	16.04
Robinson	97	17.59
Cooks	133	26.74
West Meck	164	32.33
Steele Creek	189	38.01
Davidson	203	44.72
Pineville	277	65.38
Cornelius	387	80.81
Idlewild	405	101.19
Mint Hill	486	110.28
Matthews	873	214.86
Huntersville	1,403	289.36
Charlotte*	16,063	3,703.53
Total Hours	20,802	4,749.21
Ambulance Direct Unit		
Hour Cost	\$ 144.67	
FROR Value	\$ 687,064	

Source: FY25 CAD FROR data, Medic FY25 financials

Notes: * Task Hours from CFD report

All towns and unincorporated communities use Medic (i.e., CMED) for fire dispatching. The City of Charlotte operates its own communications center. The fire stakeholders requested an assessment of the value provided for this service. The FY25 cost for dispatch was \$9.8M. The cost per response was \$57.30, which is consistent with other dispatch centers nationally. Using responses as a benchmark, 14.07% were related to fire events. This determined a value of \$1.39M to the fire service.

Targeted Recommendation: When the County receives services that reduce its ambulance service costs, it is appropriate to compensate the first responders. For example, if a fire department provides 10% of the cost savings realized through the Medic-Hold program, then it should receive 10% of that value (i.e., \$128,319).

If a fire department is interested in providing initial medical call triage without an ambulance, an agreement is necessary to set clear expectations regarding current system goals and the subsidy formula, which is based on the value provided to the County. If there is no interest in the Medic-Hold program, a first responder agreement is not necessary.

Estimated Value of Dispatch Services				
FY25 Dispatch Expense			\$9,845,849	
Provider	Responses		Value	
Mountain Island	5	0.00%	\$286	
Carolina	199	0.12%	\$11,402	
Robinson	499	0.29%	\$28,591	
Cooks	641	0.37%	\$36,728	
Long Creek	656	0.38%	\$37,587	
Idlewild	663	0.39%	\$37,988	
Davidson	1,235	0.72%	\$70,762	
Steele Creek	1,285	0.75%	\$73,627	
West Meck	1,464	0.85%	\$83,883	
Pineville	2,301	1.34%	\$131,841	
Cornelius	2,662	1.55%	\$152,525	
Mint Hill	2,824	1.64%	\$161,808	
Matthews	3,694	2.15%	\$211,656	
Huntersville	6,053	3.52%	\$346,820	
Fire Total	24,181	14.07%		\$1,385,505
Medic911	147,657	85.9%		\$8,460,344
Total	171,838	100.0%		\$9,845,849
Per Response				\$ 57.30

Source: First Responder Activity Report with First Due Field, FY25 data

Notes: FY25 dispatch expense is fully loaded

12. Budget and Sustainability

In 2025, Medic Revenue less Medic Expenses created an operating loss of \$12,979,024. Considering the need for additional capital and replenishing existing fund balances, County Appropriations of \$22,450,587 were necessary. Year to date results in 2026 are not as favorable as 2025: volume is down, expenses are going up, and reimbursements will be lower due to changes in Medicaid. Wage increases are in discussion and will further grow expenses. Under the current model, the gap between Medic Revenue and Expenses will continue to widen in 2026 and future years requiring higher appropriations from the County.

CONCLUSION

The Mecklenburg County EMS System is comprised of highly trained individuals working in all aspects of EMS who have a shared mission and vital role of providing a collective continuum of care for people in need. Medic and the fire service play a critical role in the EMS system. The countywide use of EMD and MPDS provides excellent 911 caller support and resource management opportunities. Patient care standards are high with superior continuous quality improvement that delivers positive patient outcomes.

The EMS system efficiency is so high that it negatively impacts response times. There are marginal improvements available, but not enough to attain the response time standards currently in place, unless additional funding can be identified. The County EMS system faces challenges requiring initiative-taking measures and strategic planning. This report contains recommendations for the stakeholders to consider. They can address these issues by setting realistic response time expectations for rural and urban communities. The current time standards have been in place for decades, before clinical research has shown that response times are not directly related to patient outcomes, with limited exceptions. First responder resources are a valuable tool, which must be used in a mutually agreeable way that is compensated in a legal manner by the County. Through innovative approaches and technological advancements, the EMS system can enhance its effectiveness, improve resource allocation, and continue delivering high-quality EMS to the County residents and visitors.

The County Commissioners should be commended for financially supporting the EMS system beyond the revenue for transport. This commitment has absolutely saved lives through highly trained staff, equipment, and clinical innovation as demonstrated by the some of the highest cardiac arrest survival rates in the nation. The dedication was clearly articulated during a 2025 County Commission meeting when one Commissioner stated, “the safety of the people shall be the highest law.”

Targeted Recommendations

The above-stated recommendations are by nature broad and generalized; following input from key stakeholders, the following are targeted recommendations

- Provide first responder subsidies equal to the benefit provided, \$1.28M
- Adjust Priority 1 response times from 10:59 to 11:59 minutes to attain 90% compliance at current performance
 - Faster response times are not clinically justified
 - The system is performing well clinically with the actual response times (i.e., very high cardiac arrest survival rates)
 - Some increase of subsidy and/or base rates will likely be needed independent of system changes to maintain the status quo; Any move toward faster response times will magnify that need.

- Adjust Priority 2 response times by 8:00 minutes, Priority 3 by 1:00 minute, and Priority 4 as best effort
 - Faster response times are not clinically justified, especially when lower acuity
 - Calls have been triaged by the dispatch center as not being a medical emergency
 - First responders can clear (or remain on scene and available for the next call) after assessment and determine that the 911 call is non-emergent

ATTACHMENTS

Attachment A: Comparable High-Performance EMS Systems Comparison Data

Total EMS 911 call volume, 911 transport volume, and 911 Unit hours in 2024				
EMS System, Location	911 Call Volume	Transport Volume	Unit Hours	Unit Hour Utilization
EMS Authority (EMSA) Tulsa and Oklahoma Counties, OK	258,336	193,570	390,351	0.66
Sunstar Paramedics Pinellas County, FL	247,022	186,873	420,741	0.59
Medic Mecklenburg County, NC	180,798	122,019	335,222	0.54
Wake County EMS Wake County, NC	138,582	95,860	327,561	0.42
Reno EMS Agency (REMSA) Washoe County, NV	92,806	60,324	152,719	0.61
Guilford County EMS Guilford County, NC	83,100	51,445	296,437	0.28
Richmond Ambulance Authority (RAA) City of Richmond, VA	45,791	32,214	96,852	0.47
Three Rivers Ambulance Authority (TRAA) Allen County, IN	41,319	26,914	74,428	0.56
Average	135,969	96,152	261,790	0.52

Note: Systems use different periods for fiscal years, UHU is a response UHU

Do you operate a tiered response system? If so, ratio of ALS to BLS units on average?			
EMS System	Tiered System	ALS	BLS
EMSA	Yes	70%	30%
Guilford County EMS	Yes	70%	30%
Medic	Yes	68%	32%
RAA	Yes	69%	31%
REMSA	Yes	75%	25%
Sunstar Paramedics	Yes	90%	10%
TRAA	Yes	60%	40%
Wake County EMS	Yes	85%	15%

Does the service provide non-emergency interfacility transports (NET)? Is there a formal agreement for providing this service? Do hospitals make a financial contribution to the EMS system in any way?			
EMS System	NET	Formal Agreement(s)	Hospital Financial Contribution
EMSA	Yes	Yes, by City ordinance	Responsible payor for NET
Guilford County EMS	Yes	Yes	No
Medic	Yes	Yes	Yes. In kind, Board Leadership
RAA	Yes	No, by ordinance	Patient fees only
REMSA	Yes	Yes, County franchise	Yes. In kind, Board Leadership
Sunstar Paramedics	Yes	No	No
TRAA	Yes	No, by ordinance	No
Wake County EMS	No	N/A	No

2024 Expenses, Percentage of revenue from patient fees, Base rate						
EMS System	Expenses	Pt. Revenue	ALS-E	ALS-N/E	BLS-E	BLS-N/E
EMSA ¹	\$93,672,234	86%	\$ 1,300	\$ 900	\$ 1,300	\$ 900
Sunstar Paramedics	\$90,000,000	100%	\$ 967	\$ 967	\$ 934	\$ 907
Medic	\$81,148,864	88%	\$ 1,194	\$ 892	\$ 1,194	\$ 892
Wake County EMS	\$75,741,092	55%	\$ 1,087	\$ 751	\$ 632	\$ 632
REMSA ²	\$67,169,243	82%	\$ 2,010	\$ 1,660	\$ 2,040	\$ 1,675
Guilford County EMS	\$31,800,000	71%	\$ 1,051	\$ 664	\$ 885	\$ 553
TRAA	\$22,706,807	93%	\$ 2,093	\$ 1,583	\$ 1,763	\$ 1,102
RAA	\$20,952,551	72%	\$ 1,789	\$ 942	\$ 1,507	\$ 942

¹ Same rates since 2012 and may increase in May-26, ² includes air and other operations

Who dispatches the transport and first responder agencies?		
EMS System	Transport	First Responder
EMSA	Secondary PSAP with CAD to CAD	Police PSAP
Guilford County EMS	Guilford Metro 911	Guilford Metro 911
Medic	Secondary PSAP	Secondary PSAP
RAA	Secondary PSAP	City of Richmond
REMSA	Secondary PSAP providing EMD and ground ambulance dispatch	City and County are primary PSAP
Sunstar Paramedics	Secondary PSAP	Local Government
TRAA	Secondary PSAP	Consolidated Communications Partnership
Wake County EMS	Raleigh Wake Emergency Communication Center	Raleigh Wake Emergency Communication Center

Describe your governance structure.	
EMS System	Governance Structure
EMSA	An Oklahoma Public Trust with two Beneficiary Cities; Ten trustees appointed by the cities, and one CEO that reports to the Board of Trustees
Guilford County EMS	County government department reporting to Assistant County Manager
Medic	Joint governmental agency formed by the County and the Charlotte Mecklenburg Hospital Authority; Agency Board of Commissioners appointed by the Board of County Commissioners, with representation from two health systems and local county government
RAA	RAA is a quasi-governmental 501(c)(3) authority; governed by an 11-member Board of Directors appointed by the Richmond City Council
REMSA	Community owned non-profit 501(c)(3); governed by a volunteer Board of Directors (3 from regional hospitals, 1 legal, 1 accounting, 1 consumer rep, 1 at large)
Sunstar Paramedics	Public Utility Model
TRAA	Private for-profit company but are a not-for-profit unit of local government; the 2024 Board comprised 4 mayor appointments, 4 County Commissioner appointments, and 1 EMS Foundation appointment representing local hospitals. In 2025, Commissioners withdrew from interlocal and lost their board appointments.
Wake County EMS	A Department of County Government

Fire Responder Partnerships

Fire response: Are there written agreements for fire agencies to provide EMS? Do first responders extend the ambulance response time clock?		
EMS System	First Response Agreements	Extend Ambulance Response Clock?
EMSA	No	No
Guilford County EMS ¹	Yes	No
Medic	Yes	No
RAA	No	No
REMSA	No	No
Sunstar Paramedics	Yes	No
TRAA	No	No
Wake County EMS	No ²	No

¹ Legacy contract from 2013 requires fire response. Evaluating giving credit for their rapid response to calls.

² Wake County has a First Responder Manual under the authority of the medical director outlining roles and responsibilities for First Responders operating in the EMS System.

Does the County or transport agency provide reimbursement to first responders? If so, how much?		
EMS System	Reimbursement provided	Amount provided
EMSA	City of Tulsa only	\$1.6M, supplies, equipment
Guilford County EMS	No ¹	\$0
Medic	Yes	\$0.9M
RAA	No	\$0
REMSA	No	\$0
Sunstar Paramedics	No ²	\$0
TRAA	Yes	\$0.4M to City Fire ³
Wake County EMS	No	\$0

¹ Guilford County provides supplies and equipment exchange used on medical responses.

² Pinellas County has a property tax to support fire and EMS.

³ Should be ALS, but not always available.

Is there a response time standard expected for first responders? Does fire respond to all medical calls or only certain types? Does fire respond to any medical calls without the ambulance provider?			
EMS System	Fire Response Time Standard	Fire Response to all Medical Calls	Fire Response to Medical Calls without Ambulance
EMSA	Unknown	No	No
Guilford County EMS	No	No ¹	Yes ¹
Medic	No	No	Yes, 9.8%
RAA	No	No	No
REMSA	Yes	Yes	No ²
Sunstar Paramedics	Yes	No	Yes ³
TRAA	No	No ⁴	No
Wake County EMS	No	No ⁵	No

¹ County Fire responds to most calls; City Fire is more restrictive. Fire only for medical alarms.

² Fire agencies respond without the ambulance in approved areas where they can use their own ambulance.

³ Low-frequency, low-transport NAEMD-coded calls; example traffic collision with unknown injuries.

⁴ All Priority 1 and some Priority 2.

⁵ Respond to 54% of EMS incidents today, and will drop to 44% by June 2026.

Standards

Are ambulance response times based on population or patient acuity? What percentage of calls receive a lights and siren response?			
EMS System	Population Based	Patient Acuity Based	Lights and Siren
EMSA	No	Yes	60%
Guilford County EMS	No	Yes	60%
Medic	No	Yes	31%
RAA	Yes	Yes for P1, P2, P3	62%
REMSA	Yes	Yes for P1	50%
Sunstar Paramedics	No	Yes	78%
TRAA	Yes	Yes	50%
Wake County EMS	No	Yes	75% ²

¹ Four areas of the city require 80% compliance

² Lights and siren responses expected to drop to less than 30% by June 2026

² Lights and siren responses expected to drop to less than 30% by June 2026

Ambulance Response Time Standards				
EMS System	P1	P2	P3	P4
EMSA	10:59	24:59	60:00	N/A
Guilford County EMS	8:59/10:59 ¹	12:59	14:59	15:59
Medic	10:59	15:00	30:00	60:00
RAA	10:59-59:59 ²	14:59	59:59	N/A
REMSA	8:59-30:59	N/A	N/A	N/A
Sunstar Paramedics	12:30	20:30 (downgraded)	20:30	N/A
TRAA ³	8:30	10:30	20:00	20:00
Wake County EMS ⁴	12:00	17:00	30:00	60:00

¹ Includes Delta and Echo calls

² life-threatening (P1) are broken into response zones divided equitably by population with a sub-performance response time target @ 90% overall and, additionally, 87.5% within each zone.

³ Within the city geographical zones only, P2-P4 are unofficial requirements.

⁴ Moving to these standards in June 2026. Currently, 12:00 minutes for Echo/Delta calls and best effort for all others.

Ambulance Response Time Standards: call or population density based				
EMS System	High/Urban	Medium/Suburban	Low/Rural	Minimal/Remote
EMSA	N/A	N/A	N/A	N/A
Guilford County EMS	N/A	N/A	N/A	N/A
Medic	10:59	10:59	10:59	10:59
RAA	10:59 ¹	14:59	59:59	N/A
REMSA ²	8:59	15:59	20:59	30:59
Sunstar Paramedics	N/A	N/A	N/A	N/A
TRAA ³	8:30	10:30	20:00	20:00
Wake County EMS	N/A	N/A	N/A	N/A

¹ See prior table footnote.

² RAA uses Zone A-D to indicate call/population density

³ Within the city geographical zones only, P2-P4 are unofficial requirements

What was compliance with all response time standards in 2024? Are response time exemptions allowed, if so, what percentage were exempted in 2024?			
EMS System	Compliance in 2024	Exemptions allowed?	Exemptions in 2024
EMSA	P1, 92.0%	No	N/A
Guilford County EMS	Omega, 49.3% Alpha, 55.0% Bravo, 68.3% Charlie, 70.7% Delta, 67.3% Echo, 66.6%	No	N/A
Medic	97.3%	Yes	17.5%
RAA	83.5%	No	N/A
REMSA ¹	90.7-92.9%	Yes	1.3-1.4%
Sunstar Paramedics	P1, 89.5% P2, 96.2% NET, 99.9%	Yes	3%
TRAA	P1, 87.7% P2, P3, P4: >90.0%	Yes	<1%
Wake County EMS	Zone D/E: 75.3%	No	N/A

¹ Ranges per zone.

Are response times publicly reported? What is reported, how is it accessible to the public?			
EMS System	Publicly Reported	What Is Reported	Accessible where?
EMSA	Yes	P1-P4 for all jurisdictions	Website, Board Meetings
Guilford County EMS	Yes		Board of Supervisors
Medic	Yes	All priorities	County Manager
RAA	No ¹	P1 by zone and priority	By request
REMSA	Yes	Monthly report	Website, oversight body
Sunstar Paramedics	Yes	Monthly report card	By request
TRAA	Yes	All response times	Board Meetings
Wake County EMS	No	N/A	N/A

¹ RAA has put less emphasis on response times. Reported monthly to Board of Directors and City Leadership and are available to the public upon request.

Quality Improvement

What patient outcome and clinical quality measures are used? Can you provide the data?		
EMS System	Measures Used	Provide data?
EMSA	- AIMHI quarterly measures - Patient disposition - Transport by trauma triage - Top 10 impressions - Trauma by acuity - Whole blood administration - Airway management	Current: AIMHI and Medical Director Planned: Community reports by the end of 2026

What patient outcome and clinical quality measures are used? Can you provide the data?		
EMS System	Measures Used	Provide data?
Guilford County EMS	- Some for the IMPACT project - Refusal > 70% - Cardiac arrest < 5% - Emergency transport < 10% - Some trends on primary impressions vs EMD determinant - Some outcomes	
Medic	- Sys: Avg Time 911 to PCI - Trauma Priority 1 Average Scene Time - Trauma: P1 Avg Prehospital Time - Monthly Count Supraglottic Airway Placement - Proportion of Successful SGA Placement - Patient ETT Attempts - Proportion of Successful ETT Placement - CARES: Cardiac Arrest data	Yes
RAA	- Average scene time for AMI and STEMI - FirstPass® (software) success rate for endotracheal intubation - Out of hospital cardiac arrest - Bystander CPR - Benzodiazepine administration - ePCR evaluation	Yes, upon request
REMSA	Medical Director: - Cardiac arrests - Pediatric patients - Advanced airways - STEMI alerts - Deliveries and neonatal resuscitation - Advanced airway success rates Comm center: IAED measures	Yes
Sunstar Paramedics	- STEMI, stroke, and trauma alerts - FirstPass® used for chart review	No
TRAA	- Utstein, STEMI, trauma, cardiac - Blood administration - Antibiotic administration outcomes - Time to transport - Time to cath lab - Time to 12 lead - Provider IV, IO, ETT skills	Yes
Wake County EMS	- STEMI bundle compliance - Stroke bundle compliance - OOHCA process and outcomes - Overdose management - Falls risk management - Non-transport outcomes	Publicly reported at quarterly peer review meetings

Attachment B: North Carolina EMS System County Comparison Data

Agency	Call Volume	Billable Calls	Billable calls	Full time staff	Part time staff	FT %	Calls/FT	Shift model	Peak 911 Units	Lowest 911 Units	Ambulance Fleet Size	Fleet depth
Mecklenburg	195,426	122,019	62%	617	44	93.3%	317	10-13.5 hours mostly 12 hour	60	20	82	127%
Wake	141,306	102,445	72%	518	45	92.0%	273		53	35	95	144%
Guilford	85,006	51,800	61%	208	50	80.6%	409	12 hour	23	11	65	165%
Gaston	64,824	38,397	59%	189	52	78.4%	343	2-2-3 panama/pitman	18	13		
Iredell	41,323	17,140	41%	152	52	74.5%	272	12 and 36/48	13	11	21	138%
Cabarrus	38,247	21,912	57%	132	47	73.7%	290	12 hour	13	11	20	135%
Catawba	34,598	20,917	60%	112	67	62.6%	309	3-2-2-3	14	9		
Randolph	27,856	13,712	49%	94	44	68.1%	296	12 hour	11	9	21	148%
Rowan	26,846	18,985	71%	86	65	57.0%	312	12 hour	14	8	22	136%
Union	25,855	17,763	69%	145	30	82.9%	178	12 and 14	15	12		
Stanly	17,233	7,705	45%	71	25	74.0%	243	24/72	7	5	12	142%
Lincoln	16,627	12,208	73%	74	40	64.9%	225	12 hour	8	6	18	156%
Total/Average	715,147	445,003	62%	2,398	561	81.0%	298					

Source: Cabarrus County, Feb-26

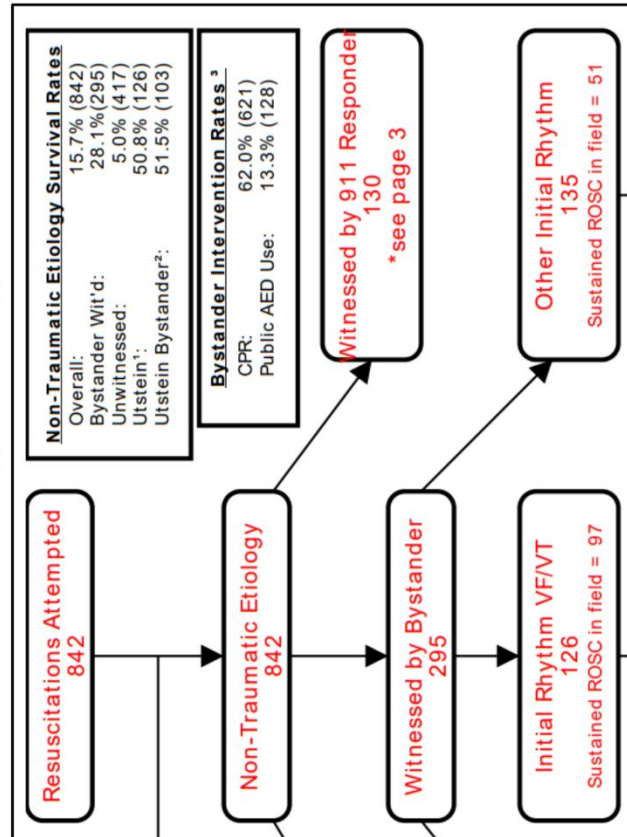
Total expenses	Exp/Call	Exp/Billable Call	Total Patient revenue	Rev/Call	Rev/Billable Call	Budget from revenue	Tx Revenue/Call	Tx Rev/ Billable Call	Collection	Billing company
\$ 81,148,864	\$415.24	\$665.05	\$ 71,162,146	\$364.14	\$583.21	87.69%	\$ 62,404,460	\$ 511.43	40%	In house
\$ 87,076,465	\$616.23	\$849.98	\$ 48,635,375	\$344.18	\$474.75	55.85%	\$ 27,164,627	\$ 265.16	75%	EMSMC
\$ 31,800,000	\$374.09	\$613.90	\$ 25,000,000	\$294.10	\$482.63	78.62%	\$ 19,654,088	\$ 379.42		EMSMC
\$ 23,208,819	\$358.03	\$604.44	\$ 15,881,748	\$245.00	\$413.62	68.43%	\$ 10,867,848	\$ 283.04	61%	EMSMC
\$ 16,676,217	\$403.56	\$972.94	\$ 7,575,388	\$183.32	\$441.97	45.43%	\$ 3,441,218	\$ 200.77	72%	EMSMC
\$ 18,467,305	\$482.84	\$842.79	\$ 11,081,294	\$289.73	\$505.72	60.00%	\$ 6,649,323	\$ 303.46	72%	EMSMC
\$ 17,872,013	\$516.56	\$854.43	\$ 10,475,990	\$302.79	\$500.84	58.62%	\$ 6,140,683	\$ 293.57	77%	EMSMC
\$ 13,154,323	\$472.23	\$959.33	\$ 6,700,000	\$240.52	\$488.62	50.93%	\$ 3,412,566	\$ 248.87	73%	EMSMC
\$ 13,881,389	\$517.07	\$731.18	\$ 7,418,546	\$276.34	\$390.76	53.44%	\$ 3,964,648	\$ 208.83	75%	EMSMC
\$ 18,000,000	\$696.19	\$1,013.34	\$ 7,500,000	\$290.08	\$422.23	41.67%	\$ 3,125,000	\$ 175.93	56%	EMSMC
\$ 8,456,534	\$490.72	\$1,097.54	\$ 5,166,413	\$299.80	\$670.53	61.09%	\$ 3,156,355	\$ 409.65	72%	In house
\$ 8,578,316	\$515.93	\$702.68	\$ 5,939,400	\$357.21	\$486.52	69.24%	\$ 4,112,284	\$ 336.85		EMSMC
\$ 338,320,245	\$473.08	\$760.27	\$222,536,299	\$311.18	\$500.08	65.78%	\$146,377,301	\$ 328.94		

Note: Variances in collection rates appear to be related to gross vs. net revenue. Mecklenburg is at 78 ambulances with 5 on order

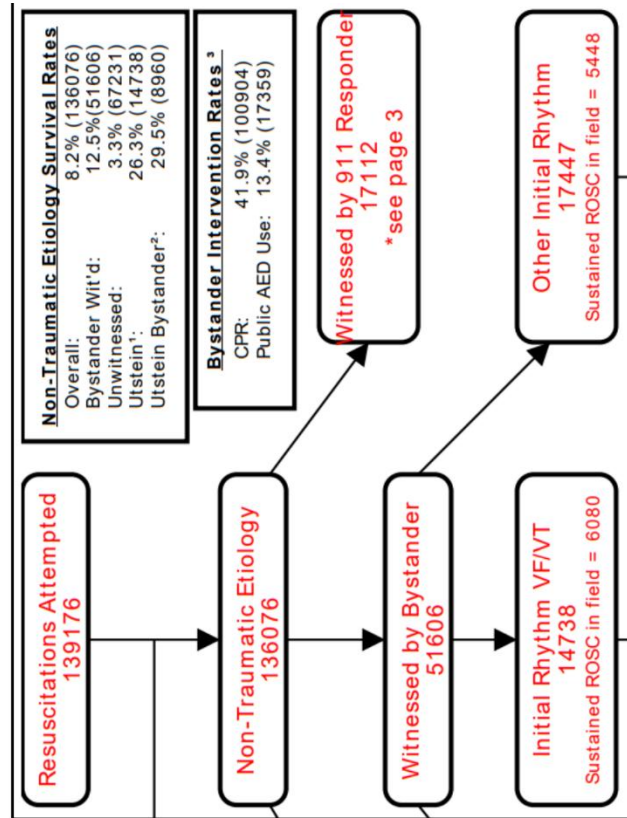
Attachment C: CARES Data

CARES Data 11/1/2024 – 10/31/2025

Mecklenburg County



National



Attachment D: EMS Standards, Core Measures, & Benchmarks

EMS Standards, Core Measures, & Benchmarks											
Key Performance Indicators	Agencies					Organizations					
	Mecklenburg	Las Cruces	Merced	SCEMS	MedStar	EMSA	NEMIS	Compass	NHS-UK	AHA	CMS
Cardiac Arrest											
Response interval < 5 minutes for CPR/AED	•				•						
Bystander CPR rate	•			•	•		•			•	
Bystander AED rate	•			•	•		•			•	
Appropriate airway management	•	•		•	•						
End-tidal CO2 monitored	•	•	•	•			•			•	
Pit crew/focused CPR	•			•							
Chest compression fraction (CCF) greater than 60%	•	•									
Transport to “Resuscitation Center”			•		•						
ROSC percentage	•			•	•	•	•		•		
Survival to discharge (e.g., overall, Utstein)	•			•	•	•	•		•		
Complete documentation (see System QI P&P)			•	•							
Hypoglycemia											
Glucose recorded before treatment	•	•						•	•		
Hypoglycemia corrected through treatment	•	•						•			
Glucose recorded after treatment		•							•		
Correct disposition (e.g., transport, referral, home)									•		
Pain Management											
Offered pain meds prior to movement					•	•					•
Pain score decreased		•			•			•			•
Respiratory Distress (e.g., asthma, intubation)											
Mental Status			•	•	•						
Resp. rate, SpO2, PEFR recorded before treatment		•			•		•		•		
Oxygen administered (if appropriate)					•				•		
Bronchodilators with wheezing (peds and/or adult)	•	•	•	•		•		•			
Beta2 agonist administration for adults	•		•		•	•			•		
Pulmonary Edema (CPAP/Nitro)	•										
Endotracheal intubation success rate					•	•	•				
End-tidal CO2 performed on any successful ET intubation		•	•	•	•		•				
Other confirm techniques (e.g., visualize chords, chest rise, auscultation)			•								
Complete documentation (see System QI P&P)			•	•							
Seizure											
Glucose recorded	•							•			
Received intervention as appropriate	•							•			

EMS Standards, Core Measures, & Benchmarks											
Key Performance Indicators	Agencies					Organizations					
	Mecklenburg	Las Cruces	Merced	SCEMS	MedStar	EMSA	NEMESIS	Compass	NHS-UK	AHA	CMS
Seizure, Febrile											
Glucose recorded	•								•		
SpO2 recorded									•		
Anticonvulsant administration	•								•		
Temperature management									•		
Sepsis											
Protocol completed (HR, BP, resp, temp, fluids started, O2, hospital alert)					•						
STEMI											
Recognition	•				•					•	
ASA administration	•	•	•	•	•	•	•		•	•	•
NTG administration		•			•				•	•	
Appropriate analgesia given					•				•	•	
Two pain scores recorded					•				•	•	
SpO2 recorded			•	•			•		•	•	
ECG acquired	•			•			•		•	•	
ECG acquired within X minutes (e.g., 5-10)	•				•					•	•
12L acquired (within X minutes)	•	•	•	•	•	•	•			•	
12L transmitted	•				•					•	
Scene time (e.g., < 10 minutes)	•	•	•	•	•	•				•	
STEMI recognition	•	•									
Transport to STEMI center rate (with notification)	•		•	•	•	•	•		•	•	•
911-to-balloon time	•			•							
Sensitivity/Specificity	•										
Complete documentation (see System QI P&P)			•	•							
Stroke											
Time last seen normal	•	•	•	•	•		•		•	•	
Use of a stroke scale (e.g., NHS, FAST, MEND, CPSS, LAPSS, MASS)	•	•	•	•	•		•	•	•	•	
Blood glucose documented		•	•	•	•	•	•		•	•	
Blood pressure documented		•			•		•		•	•	
Appropriate O2/airway management				•	•						
Scene time (e.g., < 10 minutes)		•	•	•	•	•	•				
Transport to a stroke-capable facility (and alerted)	•	•		•	•	•	•		•	•	
911-to-needle time				•							
Complete documentation (see System QI P&P)			•	•							

EMS Standards, Core Measures, & Benchmarks											
Key Performance Indicators	Agencies					Organizations					
	Mecklenburg	Las Cruces	Merced	SCEMS	MedStar	EMSA	NEMIS	Compass	NHS-UK	AHA	CMS
Trauma											
Over-triage rate										•	
Under-triage rate										•	
PAM (physio/anatomic/mechanism) scale recorded			•	•							
Scene time (e.g., < 10 minutes)	•	•	•	•	•	•					
Trauma center destination	•	•	•	•	•	•		•			
Complete documentation (see System QI P&P)			•	•							
Skills											
IV success rate		•									
ePCR Submission Compliance											
At time of patient drop off (over 90 days)			•								
High acuity (ROSC, STEMI, Stroke, Trauma) cases at time of drop off			•								
Completed within 24 hours			•								
QA/CQI Performed (e.g., 80% of charts)		•									
NON-CLINICAL STANDARDS, CORE MEASURES, BENCHMARKS											
Efficiency Domain											
Cost per patient contact											
Cost per transport					•						
Cost per unit hour	•				•						
Employee turnover rate			•								
System Response UHU	•										
Total Task Time	•										
Unscheduled Vehicle Repairs	•										
Employee Satisfaction	•										
Patient Safety											
Drops per 1,000 patient contacts											
Employee injuries per 10,000 hours worked	•		•								
AMA to new call within X hours (e.g., 24-72)	•				•				•		
AMA to hospital within 24 hours	•										
Mission failures per X responses/miles					•						
Ambulance crashes per X responses/miles	•										
Chart Review (random, manager, MD)	•										
Protocol compliance rate (note: this can be overall or individual)			•								

EMS Standards, Core Measures, & Benchmarks											
Key Performance Indicators	Agencies					Organizations					
	Mecklenburg	Las Cruces	Merced	SCEMS	MedStar	EMSA	NEMSIS	Compass	NHS-UK	AHA	CMS
Patient Satisfaction (use standardized questions to allow inter-agency comparison)											
Communication by medics (patient and family)			•								
Care shown by the ambulance crew			•								
Skill and professionalism of ambulance crew			•								
Cleanliness of ambulance			•								
Ride of the ambulance			•								
Patient Satisfaction (General)	•										
Total Standards	45	26	35	32	39	16	19	8	25	22	5

Legend:

Mecklenburg: Mecklenburg County, North Carolina

Las Cruces = Las Cruces/Dona Ana County EMS, NM Merced = Merced County EMS System, CA

SCEMS = Santa Cruz EMS System, CA

MedStar = MedStar Mobile Integrated Healthcare (Fort Worth, TX) EMSA = California EMS Authority (2015)

NEMSIS = National EMS Information Systems (version 3.0)

Compass = EMS Compass produced by National Association of EMS Officials (NASEMSO) NHS-UK = National Health Service-United Kingdom (version 1.31, 2016)

AHA = American Heart Association

CMS = Centers for Medicare and Medicaid Services (ED standards applicable to EMS)

Attachment E: Community Survey

In the past five years, about how many times have you called 911 for a medical emergency? This might have been for yourself or for someone else. Would you say:		
Once	23	23.20%
2 to 5 Times	41	41.40%
More Than 5 Times	15	15.20%
or Never	20	20.20%
n =	99	
How was your experience with the person who answered your 911 call? Would you say:		
Excellent	45	61.60%
Very Good	18	24.70%
Good	9	12.30%
Fair	1	1.40%
n =	73	
If you have any comments you would like to share about the person who answered your 911 call, I can enter them now.		
[No Comments]	43	95.60%
Don't Know/Not Sure	2	4.40%
n =	45	
If you spoke with a second person during this 911 call, how was your experience? (For example, this person may have asked you medical questions.) Would you say:		
Excellent	26	63.40%
Very Good	6	14.60%
Good	8	19.50%
Fair	1	2.40%
n =	41	
If you have any comments you would like to share about the second person you spoke with during this 911 call, I can enter them now.		
[No Comments]	31	93.90%
Don't Know/Not Sure	2	6.10%
n =	33	
Did the fire truck arrive in a reasonable amount of time? Would you say:		
Yes, It Was Faster Than You Expected	27	40.90%
Yes, It Was Pretty Fast	18	27.30%
Yes, It Was About What You Expected	17	25.80%
No, It Was Slow	3	4.50%
or No, It Was a Very Long Time	1	1.50%
n =	66	

How would you rate the firefighters on being professional and courteous? Would you say:		
Excellent	42	68.90%
Very Good	14	23.00%
Good	3	4.90%
Fair	2	3.30%
n =	61	
If you have any comments you would like to share about the firefighters, I can enter them now.		
[No Comments]	37	94.90%
Don't Know/Not Sure	2	5.10%
n =	39	
Did the ambulance arrive in a reasonable amount of time? Would you say:		
Yes, It Was Faster Than You Expected	29	38.20%
Yes, It Was Pretty Fast	20	26.30%
Yes, It Was About What You Expected	19	25.00%
No, It Was Slow	5	6.60%
or No, It Was a Very Long Time	3	3.90%
n =	76	
How would you rate the ambulance crew on being professional and courteous? Would you say:		
Excellent	55	71.40%
Very Good	15	19.50%
Good	4	5.20%
Fair	3	3.90%
n =	77	
If you have any comments you would like to share about the ambulance crew, I can enter them now.		
[No Comments]	34	97.10%
Don't Know/Not Sure	1	2.90%
n =	35	
In general, when someone calls 911 for a medical issue, how often do you believe an ambulance should be dispatched? Would you say:		
Always	38	71.70%
Most of the Time	15	28.30%
n =	53	
For a LIFE-THREATENING MEDICAL EMERGENCY, how quickly do you believe an ambulance should arrive after a 911 call is made? Would you say:		
Less Than 10 Minutes	61	62.20%
10 to 13 Minutes	29	29.60%
14 to 16 Minutes	4	4.10%
17 to 20 Minutes	2	2.00%
or More Than 20 Minutes	2	2.00%
n =	98	

For LESS URGENT MEDICAL SITUATIONS such as a person not feeling well, mild fever, nosebleed, or a small cut, what response time is acceptable? Would you say:		
Less Than 15 Minutes	26	28.00%
15 to 20 Minutes	42	45.20%
21 to 25 Minutes	9	9.70%
26 to 30 Minutes	6	6.50%
or More Than 20 Minutes	10	10.80%
n =	93	
How comfortable would you be if some NON-LIFE-THREATENING 911 medical calls were handled by alternatives to an emergency ambulance, such as a fire truck or a non-emergency ambulance? Would you say:		
Very Comfortable	40	40.00%
Somewhat Comfortable	30	30.00%
Neutral	19	19.00%
Somewhat Uncomfortable	9	9.00%
or Very Uncomfortable	2	2.00%
n =	100	
Some communities send the closest available emergency responders first, which may be a fire truck and/or an ambulance, depending on the level of emergency. How appropriate do you feel this approach is? Would you say:		
Very Appropriate	61	62.20%
Somewhat Appropriate	14	14.30%
Neutral	19	19.40%
Somewhat Inappropriate	3	3.10%
or Very Inappropriate	1	1.00%
n =	98	
In a LIFE-THREATENING MEDICAL EMERGENCY, which is more important to you:		
[Refused]	1	1.00%
[Don't Know/Not Sure]	2	2.00%
The Fastest Possible Arrival, Regardless if Responders Have Basic or Advanced Medical Training	52	52.00%
or A Slightly Longer Wait for Responders with Advanced Medical Training	28	28.00%
[Both Are Equally Important]	17	17.00%
n =	100	
If you have any additional thoughts about the local emergency medical services system, such as 911, fire, or ambulance, I can enter them now.		
No comments	69	98.60%
Don't Know/Not Sure	1	1.40%
n =	70	

The last questions are for classifying responses. Which community do you live in?		
Charlotte	53	81.50%
Cornelius	3	4.60%
Matthews	3	4.60%
Mint Hill	2	3.10%
Don't Know/Not Sure	1	1.50%
Huntersville	1	1.50%
Pineville	1	1.50%
Unincorporated County	1	1.50%
n =	65	
What is your age?		
Under 30	4	4.20%
30 to 40	15	15.80%
41 to 50	12	12.60%
51 to 60	16	16.80%
61 to 70	13	13.70%
70/Over	35	36.80%
n =	95	
ZIP Code		
28078	2	2.00%
28134	1	1.00%
28202	1	1.00%
28205	4	4.00%
28206	2	2.00%
28208	5	5.00%
28210	2	2.00%
28212	3	3.00%
28213	5	5.00%
28213-5807	1	1.00%
28217-3910	1	1.00%
28226	3	3.00%
28227	6	6.00%
28273	2	2.00%
28214-1144	1	1.00%
28227-4138	1	1.00%
28269	5	5.00%
28031	2	2.00%
28105	4	4.00%
28105-8391	1	1.00%
28208-2126	1	1.00%
28209	1	1.00%
28214-1085	1	1.00%

28215	3	3.00%
28216	3	3.00%
28217	4	4.00%
28226-7156	1	1.00%
28227-8683	1	1.00%
28262	4	4.00%
28262-8173	1	1.00%
28270	2	2.00%
28277	3	3.00%
28278	3	3.00%
28215-5727	1	1.00%
28273-4972	1	1.00%
28208-5496	1	1.00%
28277-1845	1	1.00%
28204-2859	1	1.00%
28105-5791	1	1.00%
28208-2966	1	1.00%
28209-4611	1	1.00%
28211	1	1.00%
28211-1182	1	1.00%
28214	1	1.00%
28216-4434	1	1.00%
28216-4814	1	1.00%
28269-2338	1	1.00%
28278-7358	1	1.00%
28202-1747	1	1.00%
28206-4077	1	1.00%
28211-4686	1	1.00%
28211-4937	1	1.00%
28270-2115	1	1.00%
n =	100	

Comments

Person Who Answered 911 Call Comments
I appreciate how the operator stayed on the phone with me during the emergency. Her support was a blessing, and I consider her a kind and compassionate individual. I want to express my gratitude and wish her well.
I called on Christmas Day, which was the last time I used 911. I can't recall specific details about the person who answered, but I think the experience was good, though not excellent. As someone who used to teach customer service, I usually remember strong interactions, but this one doesn't stand out as exceptional. I'm not sure if this answers your question, but I hope it helps.
I cannot remember the name of the person who answered my 911 call. It's hard to remember new names, especially when they're not from my nationality. However, every person I met in the emergency

room and ambulance was amazing. Unfortunately, I don't remember any details about the 911 call itself.
I did not provide any comments about the person who answered my 911 call. I did not do this. I would like to acknowledge the great job done by the Chinese.
I don't remember the name of the person who answered my 911 call, but they were very nice. The EMS technicians who arrived were also very nice. I don't recall speaking with anyone else during the call, and my overall experience was positive.
I had a good experience with the person who answered my 911 call. Station 16 is in my area, and they are great. I have personal experience with them, and a neighbor who has been sick has also received excellent service from them multiple times. I would rate the experience as excellent.
I had a great experience.
I have about the firefighters. The ambulance arrived faster than expected, was pretty fast, and met my expectations.
The first person was very professional. I don't remember their name. The second person's experience was excellent.
The individuals who answered my 911 call were highly professional. The paramedics who transported me were also very skilled and performed their duties exceptionally well. My experience was excellent, and I would rate it as such.
The operator was nice. The question about a second person during the call was not answered.
The operator was polite, understanding, and helped calm me until the ambulance and fire department arrived. I spoke with a second person during the call, and my experience with them was excellent.
The person who answered my 911 call had a great personality and was a great person. I asked if I could say my name, and I thanked them. I also asked if we should put that down.
The person who answered my 911 call was excellent. They stayed on the line with me until the emergency services arrived.
The person who answered my 911 call was pleasant and helpful.
The person who answered my 911 call was proficient, quick, and stayed with me on the line as long as they could while waiting for help to arrive.
The person who answered my 911 call was very considerate of me. My experience during the call was excellent.
The person who answered my 911 call was very good. I was the one who made the call, and my experience was excellent. I did not speak with a second person during this call.
The person who answered my 911 call was very patient and understanding of what I was trying to explain. However, I sometimes get nervous and tend to ramble.
The person who answered my 911 call was very professional and first class.
The person who answered my 911 call was very professional and took good care of me.
They asked questions in a timely manner and were courteous and helpful. I only spoke with one person during the call.
They were very efficient in assessing my situation and getting me to the hospital quickly. The experience with the second person was good.
They were very professional, very courteous, and very concerned. I'm just putting that in here for you.
Second Person on 911 Call Comments
All the people who answered my 911 call cared. My experience with the second person was excellent, and the fire truck arrived faster than I expected.
Everyone was cooperative. The fire truck arrived faster than I expected, but it also took a very long time.

I am so grateful that the second person was there during the 911 call because, at a time when my blood pressure was extremely high due to a frightening situation, they helped calm me down. The fire truck arrived faster than I expected.
I don't have any complaints. The interaction was good. I wasn't the one speaking to the second person because I was the subject of the emergency. As far as I could tell, everything went well. The search arrived in a reasonable amount of time-faster than I expected and about what I anticipated.
I want to thank you for your service. The interaction went very well.
The fire truck arrived in a reasonable amount of time and was faster than I expected.
The second person had a curious and positive attitude. I was told to 'show me' and 'put that down,' which I found unclear. Regarding the fire truck's arrival time, I said it was 'pretty fast' and 'about what I expected,' but then contradicted myself by stating it was 'not slow.'
The second person I spoke with was very professional. The fire truck arrived quickly, and the response time was about what I expected.
The second person was very courteous and knowledgeable. The fire truck arrived in a reasonable amount of time, faster than expected and about what was anticipated.
Firefighters Comments
All of my interactions with the firefighters over the past couple of years have been outstanding.
Everyone was good, and I have no complaints. The ambulance arrived in a reasonable amount of time, and it was faster than expected-about one minute. However, I initially said it was slow, which may have been a mistake.
I don't have any comments to share about the ambulance crew, but they were very friendly and helpful. I was asked how often an ambulance should be dispatched for a medical 911 call, but I did not provide an answer.
I don't have any comments. The firefighters were very professional and did their jobs. I was typing in the chat.
I found the firefighters to be extremely helpful, thoughtful about personal matters, and fast and efficient.
I rated the service as excellent because the staff was very courteous and caring. The ambulance arrived in a reasonable amount of time; it was faster than expected and about what I anticipated. However, there was some confusion in my response regarding whether the arrival time was slow or very long.
I would like to share that the firefighters could be a bit more courteous. When I asked for my house coat, they placed it in my lap instead of putting it around me, likely because it was cold outside. Once I got into the ambulance, I stayed warm enough. Regarding the ambulance crew, I would rate them as excellent for being professional and courteous.
The ambulance was faster than expected and met my expectations. The crew was professional and courteous, and I would rate them excellent. I believe ambulances should always be dispatched when someone calls 911 for a medical issue.
The firefighters are a great team; they are cohesive and provide strong support to our team. They engage with the community beyond emergencies, which is positive. The ambulance arrived in a reasonable amount of time, meeting expectations.
The firefighters did a great job, and I have no questions about them. The ambulance arrived in a reasonable amount of time, faster than I expected, and about what I had anticipated. I did not perceive the response as slow or excessively delayed.
The firefighters stayed with me and kept me calm even though there was no time to do anything else. The ambulance arrived faster than I expected.

The firefighters were fast and knowledgeable. They handled the situation until Medic arrived, and we were very impressed. Regarding the ambulance, it arrived in a reasonable amount of time. It was faster than expected, about what I expected, and I felt it was slow with a very long wait.
The firefighters were outstanding. They were very friendly, professional, and compassionate toward my situation. They tried to help me, and an ambulance arrived afterward.
The firefighters were professional, very helpful, and explained things clearly. The ambulance arrived in a reasonable amount of time, about what I expected.
The firefighters were very courteous. However, the ambulance arrived slower than expected.
The firefighters were very kind and made me feel safe during the rescue. I appreciated their care. The ambulance arrived quickly, meeting my expectations.
The firefighters were very knowledgeable. I need to type that in, so give me a moment. The ambulance arrived in a reasonable amount of time. It was faster than I expected and about what I anticipated. I was considering whether it was slow or took a very long time, but that seems incomplete.
The firefighters were very professional and informative. The ambulance arrived in a reasonable amount of time, faster than expected, and met my expectations.
The firefighters were very professional and took time to discuss the situation before proceeding. Regarding the ambulance, it arrived in a reasonable amount of time-faster than expected, though not excessively so. I was initially unsure whether to describe it as slow or not, but ultimately, it was about what I expected.
The firefighters were very professional and treated me with immense kindness. They saved my life. The ambulance arrived in a reasonable amount of time, faster than I expected, and met my expectations.
The firefighters were very professional, kind, and patient. The ambulance arrived in a reasonable amount of time, faster than expected.
Ambulance Crew Comments
I am afraid of needles, but the ambulance crew was very good at giving me IV treatment. They were excellent at their job, and I have no other comments to share.
I believe ambulance crews should consistently perform well, even when it's challenging or frustrating. I appreciate being able to understand the patient's concerns and support their work.
I believe the ambulance crew should have allowed my friend to ride with me. While I understand safety concerns, I noticed that others were permitted to ride with their companions, which made the situation seem inconsistent.
I can remember one of the ambulance crew members who responded quickly and was able to get the IV in me efficiently. Normally, it's a challenge for me, but she was knowledgeable and patient. Her skill and calm demeanor made the experience much easier.
I struggle to find the right words to describe the ambulance crew, but their care felt like how someone would help their own family. They were encouraging and never placed me in any questionable situation. Their actions had a heartfelt, genuine quality that made a significant difference.
I think the ambulance crew was very caring.
I was the patient at the time, but the ambulance crew seemed pretty nice. In general, when someone calls 911 for a medical issue, how often do you believe an ambulance should be dispatched? Should it be always, most of the time, only when the situation appears to be serious, or only in life-threatening emergencies?
I would like to share comments about the service provided by the ambulance crew. In general, when someone calls 911 for a medical issue, I believe an ambulance should be dispatched in emergencies.
I would rate the ambulance crew as very good in terms of being professional and courteous.
No thank you. Okay.

No, just the fact they were very professional and did well. I have nothing to complain about. Professional? Uh-huh. Did well.
The ambulance arrived in a time that matched my expectations, although the duration felt very long. I would rate the ambulance crew as 'good'.
The ambulance crew focused solely on my needs and ensured I received timely care. Regarding ambulance dispatch frequency, I did not provide a specific answer in this transcription.
The ambulance crew had difficulty getting up and down the steps at my house. I need to put that in.
The ambulance crew is great, very patient, very compassionate, and very punctual.
The ambulance crew is very professional and efficient. In general, when someone calls 911 for a medical issue, I believe an ambulance should be dispatched most of the time, but primarily when the situation appears serious or if the patient is in critical condition.
The ambulance crew was amazing. They were in their early 20s and performed exceptionally well. They were the best I've encountered.
The ambulance crew was excellent. I have no complaints.
The ambulance crew was kind and answered my questions, but I don't remember much else because I was scared during the situation. I believe ambulances should only be dispatched for life-threatening emergencies.
The ambulance crew was kind, courteous, and very helpful.
The ambulance crew was outstanding. They were friendly, professional, compassionate, and gentle. They demonstrated knowledge in their work during the ambulance ride. Their interactions with hospital staff were also commendable.
The ambulance crew was really great and appreciated. They helped calm my nerves, took care of me, and I felt like I was in good hands with them.
The ambulance crew was very calm with me and helped me stay calm. They were nice, courteous, and overall just kind people.
The ambulance crew was very caring and attentive to my medical needs, and they were also very friendly. Regarding ambulance dispatch, I believe it should be done always when someone calls 911 for a medical issue.
The ambulance crew was very courteous, respectful, and concerned. I can't remember their names.
The ambulance crew was very courteous, understanding, and patient. In general, when someone calls 911 for a medical issue, I believe an ambulance should always be dispatched.
The ambulance crew was very kind, friendly, and helpful. In general, when someone calls for a medical issue, they are the right choice.
The ambulance crew was very nice and kind. I believe ambulances should be dispatched most of the time.
The ambulance crew was very professional and always made sure I was okay. I believe the ambulance should be dispatched most of the time when someone calls 911 for a medical issue.
The ambulance crew was very professional and did exactly what they needed to do to save my life.
The female nurse who was in charge came to say goodbye to me at the hospital after I was in her room. She was exceptional-she calmed me down and helped me breathe, which made the pain more manageable. I wish I could remember her name.
The service was very good. I have about the ambulance crew; they were all courteous and friendly. Please note that in your records.
They kept me calm, helped me with my breathing, and reassured me that everything would be okay. During my ride to the hospital, they spoke to me in a pleasant manner and kept me updated on their actions and what was happening.

They were just very professional, very caring. I appreciated their help with everything.
They were professional, also very helpful, and explained things to me very clearly.
They were very serious. The respondent was asked how often an ambulance should be dispatched for a medical 911 call but did not answer the question directly.
Very knowledgeable, courteous, compassionate.
When the paramedic checked my blood sugar with the needle, she jabbed it so hard that I started crying. I asked why she did it so forcefully, and she responded, 'That's the way it always is.' Her sarcastic tone and lack of concern made me upset. She claimed to have been working there for many years, which only added to my frustration. In general, when someone calls 911 for a medical issue, I believe an ambulance should be dispatched always. Yes.
Additional Comments
I don't have any additional thoughts to share about the local emergency medical services system.
I don't have any issues with local emergency services, like 911 or ambulance. They usually call for me when I'm the patient, and they never need to follow up with a second call.
I have high respect for local emergency medical services professionals, including those who work for 911, fire, and ambulance services. They're all highly trained individuals who do their best to help others, which I believe is a very challenging job.
I have some additional thoughts about the local emergency medical services system. When they came out here to pick me up at the end of January, three people showed up in the ambulance, but they backed into my front yard and got stuck. They had to get towed out, which was frustrating because I still need someone to come and fix my yard.
I think it makes sense for police officers to have proper training, especially when it comes to stabilizing people and getting them into a situation where they can be treated by medical professionals. It's like they have a fireman or EMS person training that's more intense than what police officers receive. Ideally, they should get that training in addition to regular police training because they're often the first ones on the scene.
I think it's been discussed that they might not send out fire trucks, but personally I'm comfortable with them still responding. I don't know if it's specific to Charlotte or just a general debate.
I think it's very good here.
I think the local emergency medical services system, including 911, fire, and ambulance services, is a great service. I have some additional thoughts about it that I'd like to share.
I think the local emergency medical services system, including 911, fire, and ambulance, are all very good.
I think they do a great job.
I think they're excellent. They're there to help you when you really need them, doing a good job of getting you to the hospital quickly while prioritizing safety.
I want to share my experiences with the local emergency medical services systems. In 2023, I worked as security at the QT on Trailer Drive in Charlotte, North Carolina, and had a disturbing incident involving a woman who caused destruction and threatened others. It took the police approximately 45 minutes to arrive, during which time the situation escalated. However, in my recent experience, just a few months ago, I was impressed with the extremely quick response time of the police, which was a significant improvement.
I'd like to provide feedback on the local emergency medical services system. I want to acknowledge that our EMS is great, and I have no additional thoughts or concerns.
If the emergency medical services system, such as 911, fire, or ambulance, can arrive quickly, then it's really better.

I'm extremely satisfied with our local emergency medical services system. Both 911 and the fire department have been outstanding in my experience, and I think they should continue to be funded and supported.
I'm extremely satisfied with our local emergency medical services. We have an excellent system here, and I've had no problems whatsoever. The personnel are knowledgeable, courteous, and compassionate, and they handle situations well.
I'm grateful for the local emergency medical services system. It's made a significant difference in my life, especially in difficult situations. I appreciate all the efforts of those who work in this field.
I'm grateful for the times when emergency responders were able to reach me quickly, especially when I wasn't feeling well. The speed at which they got me to the hospital helped me through some really scary moments.
I'm really happy with the local EMS system, including 911, fire, and ambulance. Everyone I've met has been great, and I appreciate the excellent service I've received whenever I've needed it.
I'm satisfied with the local emergency medical services system, including 911 and ambulance services. I think it's doing a good job. If I could express myself more freely in my native language, I would have many more comments and suggestions to add.
I'm very happy with our EMTs - every time they responded to me, they were excellent. I also think the firefighters are great. As for police officers, I have some reservations about a few incidents, but I don't want to make any public complaints since I know some of them personally.
In my experience, I've consistently had issues with local EMS response times throughout 2024. I recall one particularly concerning incident where I had a heart attack in 2014, which could have been fatal if not for the promptness of the medical team at the time. However, when I experienced another heart issue in 2024, it took almost two hours for paramedics to arrive. This delay is unacceptable and highlights the need for prioritizing emergency responses, especially in cases where every minute counts.
I've always been treated nicely by the people who answer when I call. They make me feel like my issue is important to them, no matter how many times I have to call. It's clear they take the time to help with each problem. I even feel comfortable enough to be on a first-name basis with some of them. They reassure me that it's okay to keep calling, and that makes me feel good about reaching out for help.
I've had an issue with 911 calls where I'm put on hold sometimes.
I've had to call emergency services several times for my elderly care clients and my husband, who has had five strokes this year. In one instance, I didn't need an ambulance but rather some muscle to lift him into his wheelchair. I called the fire department, which responded quickly with two individuals who helped us without bringing their truck.
I've never had to call 911, but they seem to be readily available and conveniently located near most neighborhoods. I appreciate their services and the work they do.
The respondent has few issues with local emergency medical services, specifically ambulances. Their main concerns are billing and response time, particularly when it's unclear if a situation is life-threatening.
We were treated kindly and promptly, and the whole system worked fantastically from our perspective.

Attachment F: Acronyms

ABOC	Agency Board of Commissioners	FY	Fiscal Year (July-June)
ACE	Accredited Center of Excellence	GIS	Geographic Information System
AEMT	Advanced-EMT	HCS	Healthcare Strategists
AHA	American Heart Association	IAED	International Academy of Emergency Dispatch
ALS	Advanced Life Support	IHI	Institute for Healthcare Improvement
BLS	Basic Life Support	KPI	Key Performance Indicator
BOCC	Board of County Commissioners	MARVLIS	Mobile Area Routing and Vehicle Location Information System
CAAS	Commission on Accreditation of Ambulance Services	MCI	Multi-Casualty Incident
CAD	Computer-Aided Dispatch	MPDS	Medical Priority Dispatch System®
CARES	Cardiac Arrest Registry to Enhance Survival	NCAC	North Carolina Administrative Code
CE	Continuing Education	NCCEP	North Carolina College of Emergency Physicians
CMED	Central Medical Emergency Dispatch	NCCP	National Continued Competency Program
CMHA	Charlotte Mecklenburg Hospital Authority	NCOEMS	North Carolina Office of EMS
CMPD	Charlotte-Mecklenburg Police Department	NEMSA	National EMS Advisory Council
CPR	Cardiopulmonary Resuscitation	NET	Non-Emergency Transport
CQI	Continuous Quality Improvement	NFPA	National Fire Protection Association
ECG	Electrocardiogram	NREMT	National Registry
EMD	Emergency Medical Dispatch	EMTPCI	Percutaneous Coronary Intervention
EMR	Emergency Medical Responder	OCU	Online Compliance Utility
EMS	Emergency Medical Services	PCR	Patient Care Report
EMSA	EMS Authority	PSAP	Public Safety Answering Point
EMT	Emergency Medical Technician	QA	Quality Assurance
ePCR	Electronic Patient Care Report	ROSC	Return of Spontaneous Circulation
ETJ	Extraterritorial Jurisdictions	RSI	Rapid Sequence Induction
FOIA	Freedom of Information Act	SSM	System Status Management
FROR	First Responder Only Responses	STEMI	ST-Elevated Myocardial Infarction
		UHU	Unit Hour Utilization