Multnomah County
Emergency Medical Services
System Assessment

SEPTEMBER 2025

In cooperation with the Multnomah County
EMS Agency & System Stakeholders

Developed by

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HEALTHCARE STRATEGISTS

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EXECUTIVE SUMMARY

The consulting team from Healthcare Strategists, Inc. (HCS) is comprised of emergency medical services (EMS) experts with no less than 35 years of industry experience. They met with numerous EMS stakeholders from throughout Multnomah County (County), in addition to spending considerable time in the field observing the system at work. The Multnomah County EMS Agency and stakeholders were open and engaging in sharing their agencies' demographics, strengths, and opportunities for improvement.

HCS consultants found that the County EMS system comprises highly trained individuals working in all aspects of EMS. They share a mission and vital role in providing the prehospital continuum of care for people in need. The County delivers excellent care through the 911 system. Some of the most robust social program wrap-around services of any 911 system nationwide exist in portions of the County; however, funding for these programs is a constant concern, as is the sustainability. The EMS system and residents benefit by the programs, but Multnomah County administers Tri County 911, funded by HealthShare Oregon, and does not administer or fund Project Respond, Community Health Assessment Team (CHAT) or Portland Street Response (PSR). The challenges of EMS system funding, increasing call volume, decreasing reimbursements, and EMS personnel shortages, among others, call into question the ongoing sustainability of the system.

System Highlights

- The EMS system maintains a long-standing, high-level clinical scope of practice at the advanced life support (ALS) level.
- The Bureau of Emergency Communications (BOEC) is performing at the high standards of the Accredited Center of Excellence (ACE) and is considering pursuing ACE accreditation.
- An American Medical Response (AMR) dispatcher based within the BOEC center optimizes ambulance resources within the system.
- AMR has implemented a scholarship program to increase opportunities for its staff and community members to advance in their careers, which has led to improved staffing levels.
- All providers fall under the authority of a single county EMS medical director, supported by associate medical directors.

Best Practices

- Multiple and robust resources for behavioral health patients and persons experiencing homelessness exist within the county borders, mostly in the City of Portland. This depth of services is an admirable commitment.
- The low acuity queue (LAQ) improves system efficiency and response times by holding non-emergency calls until basic life support (BLS) units are available. An AMR paramedic triages each call referred by BOEC to ensure it meets criteria.
- LAQ calls do not have a response time standard. This is appropriate for calls that have completed the emergency medical dispatch (EMD) process, which is a proven and trusted triage methodology. It allows resources to be focused on emergency calls.
- Allowing first responders to assess, triage, and clear the scene for non-emergency patients prior to ambulance arrival is an excellent optimization of resources.

- Combining first responder and transport provider training and education improves on-scene patient care coordination.
- The County is in the process of implementing a health information exchange, allowing paramedics to access their patients' hospital diagnoses. This information will help improve patient care, EMS system efficiencies, and continuous quality improvement (CQI).
- The 911 ambulance contract prioritizes patient care through an incentive waiving outlier (i.e., late response) penalties when meeting clinical benchmarks that are proven to positively impact patient outcomes.

Key Challenges

- The ambulance provider has been slow to emerge from the response time delays that started in 2022. While close, it is not within contractual compliance yet.
- While EMD has been implemented, the local modifications minimize the advantages provided to reduce the use of lights and siren and basic life support (BLS) units.
- There are several behavioral health resources that operate independently of each other, leading to some crossover and redundancy in mission and patients served.
- The current 911 contract provider has been unable to take advantage of outlier penalty waivers due to not meeting the clinical benchmarks set within the contract.

Key Recommendations

Recommendations include some that can be implemented immediately and others that would require a contract extension or the next competitive bid.

- Combining the ambulance provider with existing social services into one, cohesive service would transform the County into a mobile integrated healthcare (MIH) system. One communications center could coordinate the delivery of healthcare from routine needs to life-threatening emergencies. However, there is some indication that the State of Oregon may not be supportive of an MIH program, especially in the Ambulance Service Plan, which could pose a challenge to implementation. If allowed, the unified system could deliver the right resources to the right person in the right timeframe with the right disposition.
- Create an acute care/advanced practice paramedic position to address concerns related to the hybrid model of one paramedic and one emergency medical technician. These staff would work autonomously in quick response vehicles across the County responding to the highest-level emergencies (e.g., cardiac arrest, respiratory arrest, gunshot wounds, drownings). To qualify for the position, paramedics would need substantial experience and complete additional clinical training (e.g., rapid-sequence intubation, blood products). This program would mitigate the concern of less experienced paramedics due to the significant turnover and eliminate ongoing senior paramedic testing.
- LAQ calls do not have a response time standard as they are not life-threatening events. Consider expanding this standard to all 911 calls that are triaged as non-life-threatening. This increases unit availability for emergencies and allows system costs to be reprioritized into other areas that benefit patient care.

- Evaluate how EMD was implemented to identify opportunities to not use lights and siren and when BLS units would be appropriate. This opportunity reduces the risk to first responders and ambulance crews as well as the driving public while also reducing operating expenses.
- Adopt and implement one electronic Prehospital Care Report (ePCR) platform for the overlapping prehospital services (e.g., ambulance, fire, social service agencies) to establish one data repository to improve patient care turnover and CQI processes.
- Implement a robust patient-centric performance monitoring system with the ambulance provider as desired within the contract. Determine the barriers to collecting and monitoring key performance indicators (KPI).
- Collaborate with fire agencies on a consistent policy when first responders are needed for 911 calls and eliminate officer discretion to cancel prior to responding. The EMD system and dispatcher are most knowledgeable to determine the appropriate resources per call type following the EMS Medical Director's policies.
- Based on a review of 14 months of data, enhanced targeted training should be implemented for field staff as soon as possible to address prolonged on-scene times for patients with confirmed stroke and heart attack signs

INTRODUCTION

Multnomah County is in the northwestern portion of the state of Oregon. It is one of 36 counties in the state and covers an area of approximately 466 square miles. It is located along the south side of the Columbia River, includes several extinct volcanoes in the Boring Lava Field, and is bordered on the eastern portion of the County's northern border by the Columbia River Gorge. The County has a population of more than 789,698 residents, having reduced from a high of 815,418 in 2020.[1] The County seat is Portland, which is also the largest city. Multnomah County is the state's smallest and most populous county.

The County EMS system is a coordinated network of EMS providers responsible for ensuring timely and effective care for individuals experiencing medical or traumatic emergencies. It relies on well-trained EMTs, paramedics, ambulance services, medical facilities, first responders, behavioral health providers, and communication centers. Combined, they offer a solid framework for comprehensive prehospital medical care to the residents of the County with operational and clinical oversight, quality improvement, performance reporting, collaboration between agencies, financial responsibility, and innovative strategies.

EMS Agenda 2050

Throughout 2017 and 2018, EMS professionals, stakeholders, and the public shared ideas through collaborative encounters to update the National EMS Advisory Council's (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.[2] 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 patients' and the community's health. Achieving this vision will require deliberate actions from 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 our decisions, from day-to-day EMS care and operations to system-wide strategic efforts like this system assessment and the upcoming RFP.

EMS Assessment

Multnomah County requested the services of HCS to provide consulting services for a comprehensive EMS system assessment of the County EMS system, conduct a final analysis of the Ambulance Service Plan (ASP), the development and management of a competitive process for advanced life support (ALS) ambulance services within the County's ambulance service area (ASA), and assistance with the negotiation and establishment of an agreement with the selected ambulance provider(s) and transition to the new system.

[1] United States Census Bureau, 2023
[2] https://www.ems.gov/assets/EMS-Agenda-2050.pdf

HCS developed a six-phase approach to achieve the County's goals. The information and recommendations identified in this first phase will be the foundation for the subsequent two phases.

1. Complete a high-level system assessment and stakeholder input process
2. Development of the selected delivery service model process and documents
3. Facilitate the service provider selection process
4. Facilitate the process for evaluating the proposals
5. Assist county staff with the development of the ambulance contract
6. Assist in ambulance service provider transition planning

The County requested the EMS system assessment to address each of the following subject areas, first identifying the current state and any recommendations for each:

- Conduct stakeholder engagement meetings, town halls, surveys
- EMS system Strengths, Weaknesses, Opportunities and Threats (SWOT)
- Communications assessment and recommendations
- Quality assurance/quality improvement assessment and recommendations
- Medical supervision: protocols, policies & procedures assessment and recommendations
- Ambulance demand and deployment analysis and recommendations
- Ambulance staffing model assessment and recommendations
- First Responder assessment and recommendations
- EMS operations assessment and recommendations
- EMS financial assessment and recommendations, including sustainability, billing rate, payor mix, etc.
- Emergency ambulance and first responder response times and outlier performance standards
- Clinical oversight and performance measures, including key performance metrics
- Assess feasibility for future community paramedic and innovation demands
- All other areas of interest as identified during stakeholder meetings
- Utilization of prehospital medical personnel at all levels
- Report on the efficacy of response time standards and recommendations
- Report on the efficacy of time-based compliance performance measures and clinical performance indicators
- Report on the efficacy of equity response zones and recommendations

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 considerable 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

- Ambulance Provider Contract
- Ambulance Provider Contract AMD 2
- Ambulance Provider Settlement Agreement, 7/31/24
- Ambulance Provider Response Time Compliance Data
- Ambulance Provider Financial Reports
- Ambulance Provider (AMR) 2024 Rate Increase
- Multnomah County EMS Policies and Procedures

- Multnomah County Ambulance Services Plan
- Dispatch Group Minutes, 9/5/2024
- Ops Group Meeting Minutes
- CQI Minutes FINAL, 2/23/24
- Dispatch Committee Agenda, 9/5/2024
- First Watch, Multnomah County
- 2024 CCRRC 6 Month Report
- Tri-County APOT, Jan 2025
- 2024_10 ED Divert Report
- Capacity Report, Oct 2024

Field Observations

- AMR
- AMR LAQ
- Portland Fire Department
- Gresham Fire Department
- CHAT-Community Health Assessment Team
- PSR-Portland Street Response
- BOEC

Interviews Completed

- EMS Medical Director
- Associate EMS Medical Director
- Multnomah County EMS Agency Leadership
- AMR Leadership
- AMR Union representatives
- Portland Fire Leadership
- Gresham Fire Leadership
- Emergency Department (ED) Managers
- Non-Emergency Ambulance Providers
- Multnomah County Behavioral Health
- Interfacility Transport Ambulance Providers
- Air Ambulance Providers
- County Counsel
- Tri-County EMS Agency Leadership
- Tri-County 911 (TC-911)
- Central City Concern (CCC)
- Portland Street Response (PSR)
- Cascade Locks Fire Department
- Public Health Emergency Preparedness
- CHAT
- Medical Insurance Providers
- Kaiser Call Center
- Unity Behavioral Health
- Law Enforcement
- Fire Department Labor Union
- Dispatch providers
- Project Respond
- Wood Village City Leadership
- Fairview City Leadership
- Troutdale City Leadership

DISCUSSIONS, FINDINGS, AND RECOMMENDATIONS

Communications Center

Dispatchers are the first link in the chain of survival between the public and the healthcare system. Dispatchers are critical in identifying emergencies and non-emergencies early, assigning appropriate resources, and providing life-sustaining interventions like dispatcher-assisted cardio-pulmonary resuscitation (CPR). However, it is essential to point out that emergency medical dispatch (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.

Medical Priority Dispatch System® (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.[3] 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 validated, 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 enable 911 calls to be categorized into one of five levels, designated as 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 healthcare provider (e.g., nurse, paramedic, EMT) for an alternate destination (e.g., urgent care center, clinic).

The five main categories are 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, statistically validated, medically managed, and supported EMD protocol ensures each 911 caller receives instructions consistent with current standards of care. The categories enable the EMS Medical Director to recommend lights and sirens for life-threatening classifications and an appropriate response for low-acuity calls. A retrospective review of critical clinical interventions performed according to the Medical Priority Dispatch System (MPDS) classification will enable recommendations to be adjusted as needed.

[3] www.emergencydispatch.org

EMS System Satisfaction with MPDS

The EMS community appears generally satisfied with MPDS for high-acuity incidents, expressing that the system accurately prioritizes critical patients. Concerns were expressed by stakeholders about moderate acuity Bravo calls, which account for approximately 14% of the total system volume.

Dispatch Acuity Level (MPDS)							
	Echo	Delta	Charlie	Bravo	Alpha	Omega	Total
Total Calls	1,199	31,245	25,358	13,121	18,912	1,352	91,187
Percentage	1.3%	34.3%	27.8%	14.4%	20.7%	1.5%	100.0%

Source: CAD Data, 2024
Note: Includes CHAT and PSR units

Bravo in MPDS denotes a moderate-priority EMS response. These are situations that are not life-threatening but could become serious, often involving:

- Possibly dangerous body areas of injury (e.g., head, chest, abdomen, neck, genitalia).
- Serious hemorrhage or bleeding complications.
- Uncertainty about patient status—callers are unsure of consciousness, breathing, or injuries.
- Mechanisms of injury that suggest possible risk (animal attacks, burns, falls, assaults, etc.).

From a dispatch-response standpoint, Bravo calls may need a rapid response, but advanced life support (ALS) resources may not be necessary. The IAED recommends a BLS response, while advanced units or additional crews stay on standby.[4,5]

There are 57 Bravo scenarios in MPDS version 14. They reflect themes like:

- **Unknown or possibly serious injury status**, e.g., “unknown status/other codes not applicable.”
- **Possible injury to critical areas**, e.g., “possibly dangerous body area injured.”
- **Serious hemorrhage**, bleeding disorders, or use of blood thinners.
- **Delayed but concerning presentations**, like allergic reactions (unknown status), overdoses without immediate priority symptoms, or childbirth labor not imminent.
- **Fearful mechanisms**, such as animal bites, falls, burns, carbon monoxide exposure, psychiatric crises, collapsing individuals, penetrating trauma, and vehicle collisions.

Finding: Concerns were expressed by stakeholders regarding Bravo calls. When callers provide "unknown" responses, the system typically creates a Bravo response, which can lead to either over- or under-response. EMS providers did not express a preference for more conservative or liberal triage but noted a pattern of mismatch.

Recommendation: Initiate a focused review of Bravo call outcomes to identify trends of types that could benefit from a change in response. Ideally, review critical interventions performed by MPDS category to determine appropriateness of response mode and ambulance type. 911 calls that result in lights and sirens transport are another approach that is easier, but not as clinically accurate.

[4] Interpretation from https://www.maine.gov/ems/sites/maine.gov.ems/files/inline-files/princdocpull03.pdf
[5] https://www.iaedjournal.org/determinant-codes.

Continuous Quality Improvement & Medical Oversight

Findings: The CQI team reports that BOEC is performing at an ACE-level and is considering pursuing accreditation. While the main center conducts internal CQI on EMD calls, the airport utilizes quality performance review (QPR). Stakeholders state the EMS medical director is positively received but reportedly does not act on input from communications personnel. A Dispatch committee existed in the past but was disbanded by BOEC. The role of dispatch CQI is filled with other committees but dispatchers feel their expertise in response configuration is overlooked. The perception is that suggestions are collected but rarely acted upon.

Recommendation: Review the current structure to support CQI and stakeholder alignment. This could include reconfiguration:

- **Dispatch Review Committee** – Comprised of frontline emergency dispatchers, emergency dispatch quality (ED-Q) staff, field responders (EMS & fire), training personnel, and shift supervisors. This group should meet regularly to review protocol application, case studies, and cross-agency workflows, with an emphasis on closing gaps between field realities and dispatch procedures.
- **Dispatch Steering Committee** – A higher-level, decision-making body including the Communications Center Manager, EMS Medical Director, Fire Chiefs, and other senior leadership stakeholders. This committee is responsible for aligning clinical protocols, operational standards, and policy decisions based on data and recommendations flowing from the Dispatch Review Committee.

Critically, these committees must be more than symbolic. They must be empowered to take actionable steps and required to provide structured feedback loops, so that input from frontline staff is visibly acknowledged, addressed, and implemented, when appropriate. This creates organizational buy-in, enhances morale, and improves the quality of medical decision-making.

If BOEC is actively pursuing ACE Accreditation, many of these structures are likely already in place or in development. The opportunity now is to ensure they are functioning with clarity, purpose, and cross-disciplinary credibility, which will support accreditation.

Call Taking & Dispatch Operations

Finding: The separation between call taking and radio dispatch is consistent with best practices, but operational strain is visible at the AMR dispatch position. That dispatcher manages two CAD systems simultaneously (i.e., BOEC and AMR), resulting in duplicate data entry and reduced situational awareness. Data flows from the BOEC CAD into the AMR CAD, but not vice versa. This is necessary due to BOEC CAD not capturing all of the data elements for exemption requests and required reports. AMR reports that there has been work to develop a two-way interface between the two centers for the past five years, but moving the data from the AMR TriTech CAD into the BOEC Versaterm CAD has continued to be a challenge. This siloed setup is inefficient and a liability during high-load events**.** Stakeholders indicate that while the system status plan coordinator (SSPC) can add more nuance to the decision-making, things can be missed when they are busy.

Recommendation: CAD interoperability is a foundational component of a high-functioning dispatch environment. AMR and BOEC dispatch leadership should consider adding the necessary elements to the BOEC CAD platform or, at a minimum, real-time two-way data exchange between the two systems. This investment will significantly reduce dispatcher fatigue, improve incident tracking, enhance coordination across agency lines, and capture compliance data within the BOEC CAD instead of the AMR CAD.

Finding: Stakeholders appreciate being part of the 911 CAD as it allows access to fire and police notes and operates on the same radio channels.

Recommendation: Continue to co-locate EMS and fire dispatch within the same center. This is a strength that promotes simultaneous dispatch, cross-communication, and optimal operations.

Finding: Stakeholders note that there is a fire command representative at BOEC to assist with leadership and serve as a resource to the fire agencies. However, there is no similar position for the ambulances. Having a command representative in the dispatch center during MCI's or periods of high volume can help with EMS system coordination and support of field crews.

Recommendation: Consider the value of having a command person present for EMS Operations at BOEC full-time, or during periods of significant demand. As the SSPC and LAQ roles and workload are reviewed to deliver adequate system support, consider if this should be a supervisor-level position to provide a command presence.

Finding: Fire first responders voiced concerns that they can upgrade a call prior to arrival on scene but believe they cannot downgrade one. The Cancellation/Slow-Down Policy #50.010 clearly allows downgrades to occur, but only after the fire unit has arrived on the scene.

Recommendation: Provide training to fire first responders about Policy #50.010 emphasizing that they are allowed to downgrade the ambulance crew when appropriate, reducing the use of lights and siren and increasing safety.

Finding: The BOEC dispatcher selects ambulances based on availability and being the closest vehicle location (using global positioning system [GPS] satellites). Ambulances are tracked by the TriTech CAD AVL (Automated Vehicle Locator), which stakeholders indicate is more accurate by about 100 feet. AMR reportedly has experienced some recent AVL system outages and spent $120,000 on the solution to improve the reliability of the AVL system. Once a unit is assigned, the BOEC dispatcher does not evaluate the system for unit exchanges. The AMR SSPC reviews and monitors the system after initial dispatch to determine if there is a closer unit that may have become or will become available subsequent to the dispatch and is closer, resulting in increased radio traffic.

Recommendation: Most communication centers have sufficient technology, training, and protocols for the dispatcher to properly assign and exchange units without the need for a second-level review. The provider should work with BOEC staff to support training and procedures that minimize the need for the AMR SSPC to intervene in selecting the most appropriate ambulance.

Low Acuity Queue

Multnomah County EMS Agency (MCEMS) implemented an innovative strategy with AMR in May 2023, following the COVID-19 pandemic, to mitigate long response times by AMR and augment ALS resources within the EMS system. It ensures the right resources respond to lower acuity calls in an appropriate timeframe while simultaneously smoothing periods of peak call volume. Called the Low Acuity Queue (LAQ), 911 calls assigned specific MPDS codes are automatically routed to an AMR paramedic staffed around the clock at the main office. This paramedic reviews the call notes, contacts the patient to gather additional information, and can place that call into one of several statuses: 1) hold until the ambulance availability levels rise, 2) dispatch immediately with no lights and siren, 3) dispatch immediately with lights and sirens, or 4) assign to a BLS unit if the patient meets criteria. The LAQ paramedic will call the patient every 15 minutes while they wait to ensure there have been no changes in the patient's condition. This program enhances the overall EMS system's efficiency while maintaining high-quality patient care. Stakeholders indicate the LAQ received approximately 12% of the 350 9-1-1 calls received per day, and about five (11.9%) of those calls are upgraded back into the 911 system. BLS unit are allowed to respond directly to calls referred by the LAQ.

The position is typically staffed by paramedics who are on light duty, want to work the position as an extra shift, or do not have a partner for an ambulance shift. Some staffing the position have never worked it previously, and stakeholders stated some have struggled to work on a computer, a critical skill for the role. They work from an office that has both BOEC and AMR CAD computers, a phone, and a radio. Training consists of ensuring the paramedic can operate the CAD computers (part of their regular training for field work) and they use their paramedic training to make patient care decisions. During the observation period, no written or electronic protocols were referenced to make decisions, unlike the MPDS process used by dispatchers.

Finding: Holding non-emergency 911 calls is an excellent practice for ensuring the patients receive the right level of care while preserving the integrity of the ALS response system during peak call volume periods. It is a best practice that few EMS systems have adopted. By rotating this task through multiple people who may not receive adequate training or formal protocols for decision-making, the assessments are subjective and potentially unreliable.

Recommendation: Continue to drive this industry-leading innovation and expand its capabilities moving forward. Develop and implement a training program that covers the process, communication strategies with the reporting party, and assures appropriate medical decisions are being made by the paramedic. LAQ is like provider-at-triage programs in other EMS systems. There may be opportunities to expand its capabilities through advanced protocols and/or nurse staffing. AMR identified staffing challenges for the second position at BOEC. There may be an opportunity to consolidate the LAQ and SSPC positions at BOEC and match to demand (i.e., days are busier than nights). Dedicated staff, instead of light duty or overtime opportunities, will optimize resource deployment even further.

Recommendation: For LAQ, assign dedicated liaisons or Subject Matter Experts (SMEs) and standardize criteria for assigning calls. Improve collaboration and transparency between AMR and BOEC on these programs. Move the LAQ Coordinator to BOEC for better coordination and communication.

Response Configurations & Protocol Discrepancies

Finding: There are inconsistencies in how similar MPDS calls are prioritized for response. For example, a 30A (Trauma) receives a Code 3, while a 17A (Fall) does not, despite both being Alpha calls. Dispatchers report that suffix-based nuances in certain determinant codes were likely overlooked during initial configuration, and attempts to raise these concerns have not gained traction.

Recommendation: Dispatchers are in a unique position to spot pattern inconsistencies. Their observations should be valued and investigated. This can be addressed by the Dispatch Review and Steering Committees suggested above.

Medical Supervision – Protocols, Policies, and Procedures

Protocols, policies, procedures, and medical supervision provide the framework and guidance for paramedics and EMTs to care for patients. The County has thorough and high-level patient treatment protocols, enabling paramedics and EMTs to provide rapid advanced care for their patients.

Multnomah stakeholders indicated that a single set of protocols works well in the system to provide consistent patient care and keep everyone on track. Patients benefit from the plethora of standing orders that enable patients to receive care quickly, and field providers noted they appreciate the freedom and sophistication they have in providing patient care. They stated that providers are attracted to the County because of the protocols. Field providers stated that they appreciate that the medical directors are easily accessible and provide their phone numbers so that providers can speak with them

when needed. Stakeholders consider it a strength that the county is heavily academic and ahead of many others because they do research papers.

There is a single resource hospital for when medical control is needed. The Medical Resource Hospital provides online medical direction, regional hospital disaster and diversion support, and trauma communications. AMR pays the EMS agency for this service, and the EMS Agency contracts with the hospital. Other County providers also use this resource.

A patient care report via radio is required for all patients transported to the ED. Many of the calls are cleared to proceed directly to the triage team in the waiting room during this process. Clearing ambulances to proceed directly to the waiting room via radio is a best practice and can help to reduce "wall times."

Finding: Stakeholders desire increased involvement in education and CQI. Ideally, areas should be prioritized based on clinical KPIs, including cardiac arrest outcomes, using a greater focus on KPIs to drive care forward. They want to benefit from examining KPI trends more than individual calls. This is the hallmark of an effective CQI program.

Recommendation: Identify a KPI reporting process with transparency to the system stakeholders. Focus on a set number of prehospital care paths based on what the data shows, followed by related training and other strategies to move the patient-centric care trend forward.

Finding: Stakeholders appreciate the CQI meetings, with great hospital representation, and would like to see more dispatch participation.

Recommendation: Ensure CQI meetings have representation from all stakeholder groups to discuss and make decisions about priorities.

Finding: Hospital outcomes are a vital part of any CQI process. Currently, paramedics must manually follow up about patient outcomes, which limits systematic analysis.

Recommendation: Share hospital outcomes automatically through the ePCR system by participating in a Health Information Exchange (HIE) when available in the County.

Ambulance Demand and Deployment

Demand

Multnomah County is a large, busy system condensed into a long, narrow area of land, presenting numerous response challenges. The annual call volume is substantial, reaching 126,616 calls for service by the end of 2024. As with many EMS systems, there was a decline in call volume during 2020 due to the COVID-19 pandemic. The system has grown slowly (~3% annually) since then. The advantages of a large system include the opportunity for increased experience and skill proficiency among EMS personnel, a more efficient use of resources, and higher demand that can justify better equipment, technologies, and staffing. The disadvantages include the potential for personnel fatigue and burnout in a high-performance system with high demands, a strained span of control over a geographically diverse workforce, limited downtime for training and professional staff development, and a substantial call volume to ensure the quality of care remains high.

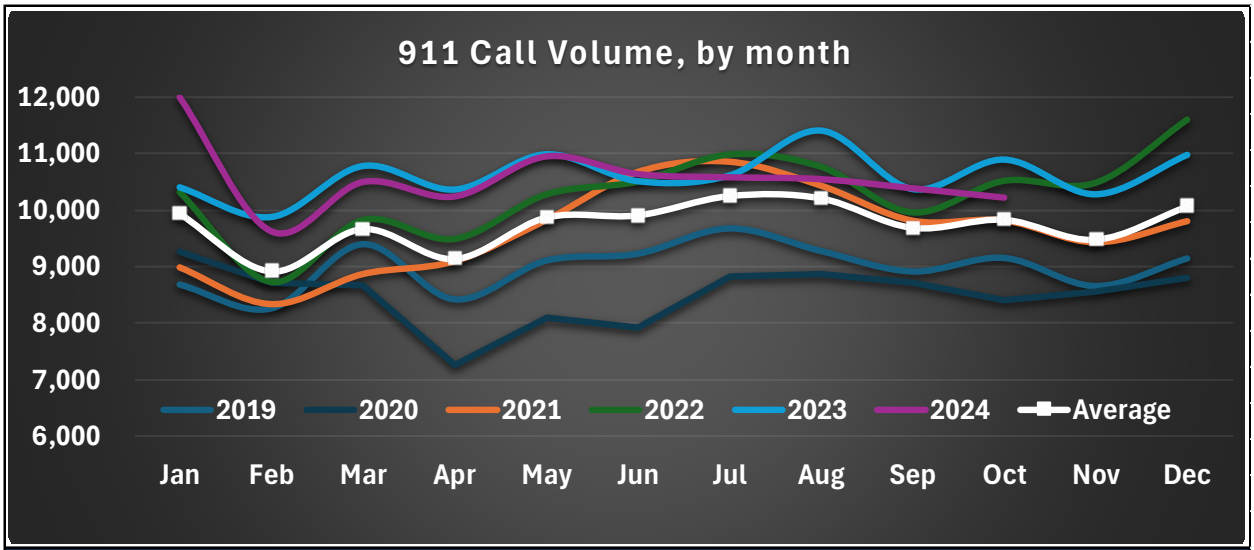
Annual Call Volume

Call Type	2019	2020	2021	2022	2023	2024	Total
911 Call	105,691	99,450	112,926	120,478	123,515	124,247	**686,307**

Source: BOEC CAD Data, 2019-2024

Seasonal Call Volume

The monthly EMS call volume does not appear to fluctuate significantly by month, with a daily range of 305 to 331 requests for service. Generally, June through August are the busiest months, with March and April being the slowest.



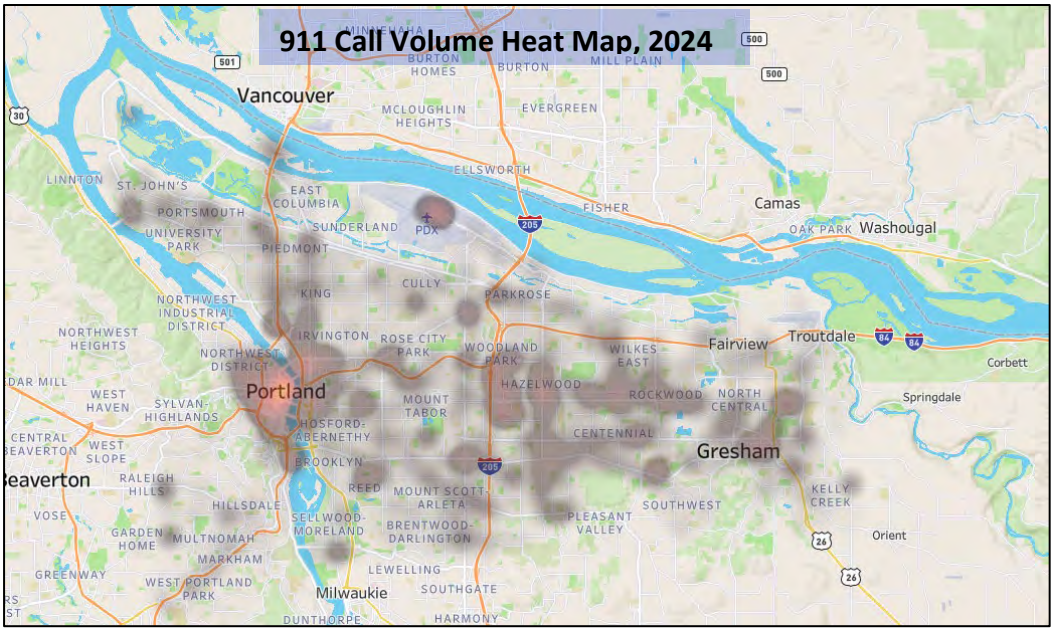
911 Call Volume, by month

Month	2019	2020	2021	2022	2023	2024	Average	Avg per Day
Jan	8,693	9,257	8,994	10,321	10,403	12,000	9,945	321
Feb	8,270	8,708	8,349	8,727	9,882	9,618	8,926	319
Mar	9,407	8,662	8,877	9,827	10,776	10,493	9,674	312
Apr	8,431	7,251	9,102	9,491	10,363	10,236	9,146	305
May	9,115	8,107	9,824	10,280	10,982	10,947	9,876	319
Jun	9,237	7,929	10,669	10,508	10,510	10,635	9,915	330
Jul	9,685	8,823	10,849	10,990	10,609	10,577	10,256	331
Aug	9,287	8,860	10,430	10,773	11,398	10,544	10,215	330
Sep	8,924	8,719	9,814	9,962	10,372	10,382	9,696	323
Oct	9,164	8,415	9,819	10,523	10,889	10,216	9,838	317
Nov	8,667	8,562	9,434	10,488	10,280		9,486	316
Dec	9,155	8,814	9,805	11,610	10,972		10,071	325
Average	**9,003**	**8,509**	**9,664**	**10,292**	**10,620**	**10,565**	**9,753**	**321**

Deployment and System Status Management Plans

Deployment and system status management (SSM) plans are strategies employed in EMS systems to optimize service delivery to patients and staff workload; each serves a distinct purpose. Deployment plans refer to how many ambulances to staff per hour of the day and day of the week. This is typically based on historical call volume per hour and geographic coverage needs. SSM plans are a dynamic approach to moving the deployed ambulance resources within the service area. Significant software optimization of historical call demand, combined with human intelligence, drives the SSM plans to predict and place units to meet the response time standards of the EMS system.

EMS systems can optimize response times by implementing deployment plans based on data analysis and demand patterns. This ensures there are sufficient ambulances available to meet the needs of the SSM plan. A well-designed SSM plan is required to allocate and manage ambulances in the deployment plan effectively. This ensures that the right resources are available at the right time and in the right place, thus improving response times and influencing patient outcomes.



For optimal outcomes, it is essential for system stakeholders and regulators to collaborate in the development and review of the SSM plan. By regularly reviewing and updating the SSM and deployment plans, EMS providers and their regulators can identify areas for improvement and implement evidence-based practices. This fosters a culture of continuous learning and improvement within the EMS system.

Finding: While BOEC uses the MPDS system to triage calls, AMR has placed an AMR dispatcher within the BOEC center whose responsibility is to move ambulance resources within the system to ensure even coverage. System participants appreciate this strategy, as it reduces the workload on BOEC staff, helps AMR ensure optimal coverage, and stakeholders feel it is easier to request additional resources and ensure their safety. However, the workload on the single AMR dispatcher is inordinate, which can cause tasks to be missed, including ambulances not being optimally positioned. Stakeholders indicated that there are supposed to be two people working in this position but staffing challenges have prevented it. During the time observing, there was only one person working in this position. She was described as one of the most capable and was fully leveraged; based on the observation time, it is unlikely that the SSPC can consistently meet the demand.

Recommendation: Continue the AMR dispatch position at BOEC, evaluate the workload, and add resources as appropriate. As described above, consider moving the LAQ to BOEC for better coordination and backup of the SSPC.

Finding: Stakeholders stated the SSM plan was recently changed but did not include input from the dispatchers. Concerns were voiced about the safety of a posting location, which they believe would have been addressed had adequate representation been present at the time of the change.

Recommendation: To create the optimal SSM plan, it should be modified collaboratively with ongoing input from ambulance, dispatch, EMS agency, and fire representatives. One option to consider is a system status committee comprised of these stakeholders.

Finding: The BOEC and AMR CADs are not connected, requiring duplicate entries by both BOEC and AMR dispatchers to maintain current unit status.

Recommendation: Consolidate into one CAD or identify another technical solution to eliminate duplication of effort.

Resource Optimization

Finding: Like the policy that first responders are not required for every medical call, there are some medical calls that are less likely to result in transport. It is common practice in most EMS systems for fire to handle lift assists, assuming the EMD process can be completed to ensure no medical merit. Some law enforcement agencies no longer request EMS for traffic collisions unless there are confirmed injuries or a substantial mechanism likely to cause injuries. An analysis of 2024 CAD data looking at MPDS code 32B2 (i.e., Medical Alarm with no Patient Contact) of 1,657 events, found that fire responded to 1,493 (90%).

Fire Response to 32B2 Calls		
Fire Response?	**Number**	**%**
No	164	10%
Yes	1,493	90%
Total	1,657	100%
Source: CAD Data, 2024		

With respect to other MPDS types using 2024 data, fire is dispatched to 64% of all EMS calls and responds to approximately 96% of all calls it is dispatched to. The highest percentage of call types where fire was dispatched was for Echo and Delta calls (91%), and the highest percentage of call types where fire went enroute was for Delta (98%) and Charlie (97%) calls. The percentage of Charlie calls where fire went enroute is substantially lower than for Bravo calls (56% vs 79%), despite the higher acuity of Charlie calls. There are an unusual number of Echo calls, where first responders are likely to be needed, with no fire response (9%).

Fire Response by MPDS Type							
	Echo	**Delta**	**Charlie**	**Bravo**	**Alpha**	**Omega**	**Total**
Total Calls	1,204	31,339	25,441	13,176	18,987	1,354	91,501
Fire Dispatched	1,093	28,550	14,280	10,470	3,691	114	58,198
Percentage	**91%**	**91%**	**56%**	**79%**	**19%**	**8%**	**64%**
Fire went Enroute	999	27,966	13,821	9,582	3,204	87	55,659
Percentage	**91%**	**98%**	**97%**	**92%**	**87%**	**76%**	**96%**
Source: CAD Data, 2024							
Note: Includes CHAT and PSR units							

Fire Unit Enroute by MPDS Type							
	Echo	**Delta**	**Charlie**	**Bravo**	**Alpha**	**Omega**	**Total**
Yes	999	27,966	13,821	9,582	3,204	87	55,659
No	205	3,373	11,620	3,594	15,783	1,267	35,842
Total	1,204	31,339	25,441	13,176	18,987	1,354	91,501
Percentage	**83%**	**89%**	**54%**	**73%**	**17%**	**6%**	**61%**

Recommendation: Analyze the MPDS results for call categories that frequently result in no transport and consider removing the ambulance response. In some EMS systems, the 32B2 dispatch determinant has a less than 5% transport rate; however, in Multnomah County, the rate is much higher at 66%. This may warrant further investigation, and other dispatch determinants to verify appropriate application. Consider evaluating dispatch and response protocols that most closely match patient acuity and the likelihood of needing first response and additional resources on the scene.

Recommendation: Analyze the MPDS results for Echo calls to identify if and why fire isn't being sent to all Echo calls and make protocol changes if needed.

Law Enforcement Requests

Finding: Under Oregon State scope of practice, paramedics and EMTs are not allowed to medically clear people to be taken to jail. While there was never a policy allowing jail clearances, fire agencies and AMR were getting called to provide this service. When discovered, MCEMS issued a memo clarifying and confirming that when requesting a fire or medical response, the intent is for patient care and transport, not medical clearance. Stakeholders voiced concerns that the update had not been received by the law enforcement officers, who may still request this service.

Recommendation: Analyze the demand for jail clearance and other low acuity calls from law enforcement, and identify the most acceptable and cost-effective solution (e.g., nurse navigation, Corrections Medical, supervisor, quick response vehicle). Educate officers that medical clearance is not available by prehospital staff and provide alternatives, when possible. Ensure law enforcement is represented when system changes or updates are discussed.

Ambulance Staffing Model and Schedules

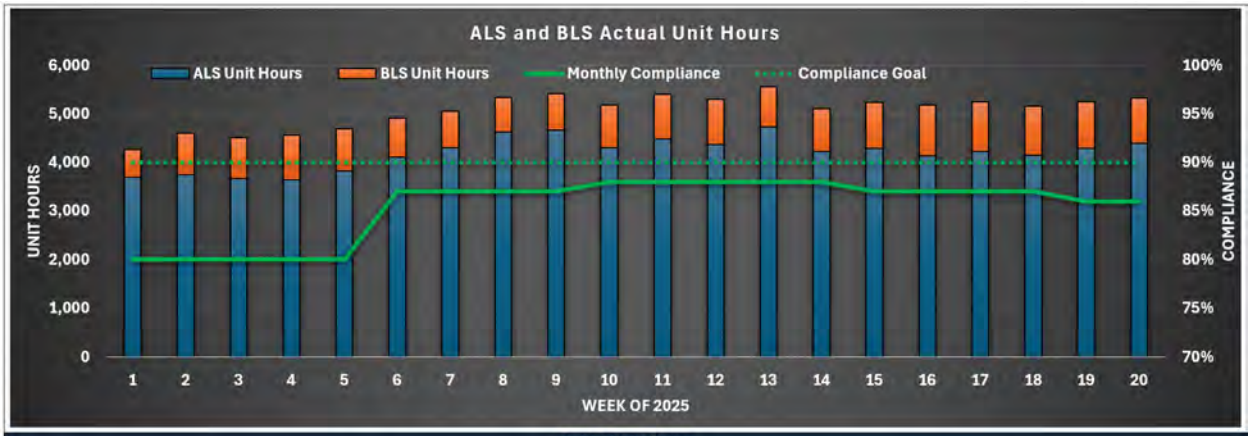
Staffing models are a critical factor in the efficient operation of the provider. EMS providers have adopted several models nationwide, each reflecting the unique needs and priorities of their respective systems. The County has historically utilized dual-paramedic staff ambulances. During COVID, paramedic schools temporarily closed, eliminating the hiring pipeline for AMR. Fire departments in nearby counties that provide ambulance transportation established a “single role” paramedic role, which attracted many private ambulance paramedics, causing further losses for AMR. The remaining paramedics experienced an increased workload, stress, and fatigue, which contributed to faster turnover and some early retirements.

To mitigate the impact of staffing shortages, the County requested that AMR deploy BLS ambulances and subcontract for additional resources. It proposed deploying a subset of hybrid (i.e., paramedic/EMT) staffed ambulances instead as part of the settlement agreement. In addition to more ambulances in the system, there are other advantages to deploying hybrid units. Studies have shown that fewer paramedics lead to greater skill proficiency as the number of ALS interventions per paramedic increases. In many hybrid systems, EMTs are permitted to assume patient care and documentation responsibilities for appropriate patients (i.e., those requiring BLS), thereby enhancing job satisfaction and retention. EMTs gain the opportunity to develop skills and experience under paramedic supervision. This arrangement also provides workload relief for the paramedic as the EMT rides with the patient and completes the paperwork. Financially, this model has proven successful in reducing operating costs. The hybrid model also acknowledges that most fire departments now provide paramedic-level care, which continues the historic “two-paramedic” standard. This is the case in the County for high-acuity calls; however, it was noted that first responders do not respond to all calls identified as life-threatening by MPDS. Many EMS systems have made this transition with similar positive results. Based on anecdotal statements from County first responders, the increase in available ambulances was notable. MCEMS has hired a physician to assess system quality. This includes reviewing a broad range of KPIs, clinical metrics, stakeholder complaints, paramedic knowledge and skills verification, ambulance driving incidents, as well as the effectiveness of the hybrid unit model. Other EMS industry studies confirm that fewer paramedics create a higher frequency per ALS skill and a higher success rate.

Finding: It is unusual for EMS systems not to send first responders to life-threatening calls where the ambulance is responding with lights and sirens.

Recommendation: Any call that is triaged via MPDS as potentially life-threatening should receive a first responder unit to initiate assessment, treatment, and stabilization until transport arrives.

By late 2022, AMR was experiencing a significant staffing crisis, and ambulance response time compliance was poor. With a large weather event expected, the County asked AMR to begin a pilot with ambulances staffed by EMTs to handle the lower acuity calls. AMR was slow to implement this pilot fully until another weather event occurred in January 2024, after which there was significant traction. In addition to the BLS unit pilot, AMR was also asked to begin implementation of the Low Acuity Queue (LAQ). This program now handles 12% of the 911 call volume and is uniformly agreed to be effective. However, making this pilot program permanent would require an update to the current ASP, and obtain approval from the Board of Commissioners and the State of Oregon. A review of staffing data for the first 20 weeks of 2025 shows a direct correlation between actual unit hours and compliance. As unit hours increased, so did compliance.



Actual Unit Hours

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Avg
ALS Unit Hours	3,693	3,747	3,661	3,642	3,818	4,110	4,304	4,629	4,660	4,299	4,482	4,371	4,730	4,228	4,292	4,140	4,230	4,141	4,289	4,397	**4,193**
BLS Unit Hours	569	853	844	920	877	808	756	716	759	883	923	926	833	877	949	1,048	1,022	1,019	958	932	**874**
Monthly Compliance	80%	80%	80%	80%	80%	87%	87%	87%	87%	88%	88%	88%	88%	88%	87%	87%	87%	87%	86%	86%	

Source: Provider data, first 20 weeks of 2025; Note: Monthly Compliance represents urban life-threatening

Finding: EMS Stakeholders voiced concerns that turnover continues to occur without an adequate volume of candidates to fill the positions.

Recommendation: Request provider agencies participate in community programs that recruit local students from high schools and junior colleges to become an EMT. Doing so can result in better representation and equity, promote EMS as a career path, and increase the workforce. AMR sponsors a similar program in the County, and a similar program exists in Alameda County (CA), attracting under-resourced community members to attain a skill and become EMTs within the EMS system.

Finding: AMR has implemented a scholarship program in the community to encourage EMS as a career. The AMR Diversity Recruitment Scholarship program, aimed at high school students, began in 2018. This program awards two financial scholarships covering full tuition, course fees and textbooks. Graduates of this program will become licensed Oregon paramedics and complete an Associate of Applied Science Degree (AAS) in Paramedicine with a 36-month commitment for AMR. According to AMR, Diversity scholarships cost approximately $30,000 for each recipient.

AMR offers employees the opportunity to attend EMT school or paramedic school. EMT school attendees are offered a full-ride sponsorship stipend with a one-year commitment to AMR, along with flexible shifts that accommodate class schedules, at a cost of $3,500 per student to AMR. They have had eight students come through the EMT training sponsorship program. Paramedic school attendees are

offered scholarship stipends and work agreements at varying rates, along with flexible schedules to accommodate class schedules. According to AMR, EMT-to-paramedic scholarships cost AMR approximately $18,000 per recipient. AMR indicated 20 students have completed EMT-to-paramedic training in Multnomah County and are currently working as paramedics, six of whom are diversity students. Four more diversity students have completed EMT school and are testing to be EMTs currently. There are 41 students enrolling in paramedic school within the next two cohorts for Multnomah County, and they expect to award up to eight diversity sponsorships this year.

Recommendation: Encourage all provider agencies to offer scholarship programs to increase the hiring pool. Consider adding a requirement in future contracts to continue this benefit.

Finding: AMR staff noted that new employees are being hired with little to no experience, and orientation training hours have been reduced due to a new AMR policy, resulting in increased ambulance accidents and errors. This was not able to be independently verified but is worth further review.

Recommendation: Review concerns of increased accidents and errors to validate the statements. If accurate, consider increasing the orientation hours to mitigate the issue. The EMS Agency may want to review the prior and current orientation policy for compliance with the current contract and the best interests of the community.

Lead Paramedic Program

As a result of the settlement agreement with AMR, AMR was asked to implement a hybrid pilot program to use a paramedic/EMT staffing model instead of two paramedics per ambulance. This has been a steady trend in the EMS industry in the last 20 years, especially for systems with firefighter/paramedics serving as first responders. In this County, the hybrid model began in 2024 and resulted in more ALS ambulances per day and improved response time compliance systemwide. Concerns were noted about a newer ambulance paramedic not having an experienced paramedic partner. Further, AMR was unable to meet the minimum lead paramedic experience requirements. Therefore, the County assumed the role of qualification testing of the existing lead paramedic program to ensure sufficient experience on every ambulance, and to offer a way for AMR to promote candidates through testing and quality reviews. Implementation has been challenging due to paramedic turnover and the training and education requirements. This has led to fewer ALS ambulances being staffed than ideal.

Finding: Concerns exist related to paramedic experience due to turnover, new paramedics, and the ongoing viability of the Lead Paramedic program.

Recommendation: Consider an acute care paramedic or APP position open to seasoned paramedics with substantial experience and additional training. Their skills could include RSI, blood products, etc. Consolidating advanced skills into a small cadre of paramedics has proven to increase proficiency in other EMS systems. In the case of blood product delivery in the field, a QRV model requires fewer units to carry blood. These advanced paramedics would respond separately along with the ALS ambulance to the highest-acuity emergency calls based on MPDS category or as requested by resources on scene. The EMS Medical Director would determine the most appropriate emergencies that would benefit from their advanced skills. In 2024, about 1.3% of ambulance responses were echo calls or 1,199 per year. This could be a starting point. The ideal approach would be to determine call types that have required ALS critical interventions historically. Like the BLS unit/LAQ program, approval of an updated ASP by the Board of Commissioners and the State of Oregon is required to make this permanent.

This Quick Response Vehicle (QRV) or APP program could be operated by the contracted ambulance provider, the fire department, the County, or other configuration as part of an RFP process. If the

contracted ambulance provider fulfilled this role, it could add supervisor duties to improve oversight and support to the ambulance crews while improving patient care. It could be partially paid for by the savings from converting dual-medic ALS units to hybrid staffing, reductions in unit hours due to reduced call volume based on the acute care paramedic reducing unnecessary transports to the ED, this program could reduce the strain on the EMS system while improving patient care, improving efficiencies, and providing a career path for paramedics. The fire service could develop EMS Battalion or District Chiefs to fulfill this role as other EMS systems have done.

Examples of several QRV or APP programs that exist elsewhere in the nation are below:

Los Angeles County (CA) uses ALS and BLS first responders to respond to calls, and has ALS and BLS ambulances for transportation. In addition, it staffs paramedic assessment units (AU). Alpha and Bravo calls are dispatched to a BLS ambulance and/or first response unit, with Charlie, Delta, and Echo calls receiving an ALS ambulance and/or first response unit. The paramedic AU responds in tandem with the ALS or BLS first response resource or ambulance, depending on the jurisdiction and MPDS category.

Alameda County (CA) has a private ambulance contract that includes ALS QRVs to support the ALS ambulance on high-acuity calls and backup BLS ambulances when needed.

New York City Fire (NY) uses "ALS fly cars", which respond to high-acuity medical calls to deliver advanced care and are deployed especially in areas with limited ALS ambulances or to support BLS crews.

Austin-Travis County EMS (TX) uses advanced practice paramedic (APP) units, which are staffed by senior paramedics or APPs for advanced interventions, triage, and refusals. They can also respond to low-acuity calls to reduce transports and ED impact. The APPs undergo additional education and clinical internships beyond standard paramedic training and have a broader scope of practice. They are used to reduce unnecessary transports to the ED, improve care for low-acuity and high-frequency callers, support field operations as clinical supervisors, provide MIH, and enable protocol flexibility with broader clinical guidelines and more autonomy. They fill the gap between street paramedicine and primary/urgent care**,** reducing strain on the 911 system while improving care outcomes for underserved or complex patients. Their broader clinical scope, judgment, and system knowledge allow them to safely divert patients away from emergency departments when appropriate.

Wake County EMS (NC) deploys APP units and EMS District Chiefs, which provide ALS-level care, field supervision, and treat-in-place capabilities. They are part of an MIH model.

MedStar Mobile Healthcare (Fort Worth, TX), deploys MIH/QRV units to low-acuity and high-utilizer 911 calls to provide treat-in-place or redirect patients to the most appropriate disposition. They are specially trained and do not transport.

Denver Health (CO) uses Paramedic Supervisor QRVs in the system to support BLS units and as backup to high-acuity scenes. They are also used for field supervision and incident command.

King County (Seattle, WA) sends BLS fire units to 100% of its calls, while the ALS response units only go to about 25% of the calls, which are identified as higher acuity. The program began in the late 1960s when the EMS system wanted to provide more advanced response in the field to heart attacks and other critical patients. Over the years, the addition of improved dispatching protocols, nearly double the required initial paramedic training hours, robust QA and QI, and a two-tiered response has resulted in state-of-the-art outcomes for cardiac arrests.[6]

[6] 2024 King County EMS Annual Report

Sunnyvale (CA) contracted with AMR in the mid-1990s to provide ALS first response instead of adding ALS service levels to its Public Safety Department. Each QRV is staffed with one paramedic, posted within the city, and responds to medical calls alongside BLS fire first responders and an ALS ambulance. The QRV paramedic provides initial care, and the ambulance transports to the hospital. The QRV unit is managed by County Communications, which dispatches all 911 ambulances in the system, but it also has access to Sunnyvale's Communications Center and can respond based on the needs. If the ambulance ETA is expected to be less than the QRV, the QRV is not sent. If the response is downgraded by the BLS fire engine on the scene, the QRV is cancelled, and the ambulance continues without lights and sirens. If the initial response is non-emergent, without lights and sirens, the QRV is not sent. If the patient requires a second paramedic to assist the transporting paramedic to the hospital, the QRV secures its vehicle and accompanies the ambulance.[7]

Other examples include:

- **San Diego Fire-Rescue (CA),** who use the ALS rescue units to provide advanced care prior to ambulance arrival.
- **Boston EMS (MA)** uses EMT and Paramedic Field Supervisors as rapid ALS response in non-transport vehicles for serious medical calls.
- **Phoenix Fire (AZ),** who use two-person rescue units to provide ALS care, technical rescue, and rapid response.
- **Dekalb County (GA)**
- Multiple systems in Kentucky

Mutual Aid

A mutual aid system is a coordinated network through which EMS agencies assist one another during emergencies that exceed the response capacity of a single agency. These systems are crucial during large-scale incidents, mass casualty events, natural disasters, or when local resources are otherwise overwhelmed.

While it is possible to review trends in call volume, it is impossible to predict with 100% certainty where and when a 911 call will come in 100% of the time. Emergency responders typically employ a mutual aid system, where a neighboring jurisdiction will episodically or automatically respond to another jurisdiction to help mitigate a spike in call volume or a hard-to-serve area. The County has intergovernmental agreements affecting Dunthorpe, portions of Multnomah County in Lake Oswego, the area adjacent to Columbia County along Highway 30, the eastern areas of Multnomah County contiguous to Clackamas and Hood River Counties, the north end of Sauvie Island, and portions of the City of Portland located in Washington County.

Interfacility transport (IFT) ambulance companies stated they are part of the mutual aid plan during disasters and can operate on the 911 radio frequencies for operational coordination. All radios in the tri-county area include each other's frequencies, an important step for interoperability during the provision of mutual aid or in disaster response. Stakeholders report that the neighboring frequencies are not used often, and a quick reference sheet would be helpful for their use.

Finding: Stakeholders report a perception that AMR allows mutual aid to arrive only when they are at level 0 (i.e., no ambulances are available) and will retain a call even if a mutual aid resource is closer. When there are fewer than three ambulances available within the system, first responders may

[7] Policy652.pdf

recommend private transport to patients. AMR is allowed to request mutual aid from MetroWest (from Washington County), but it is not required to do so. AMR's contract states the County may approve the use of mutual aid ambulances contingent upon the execution of a mutual aid agreement and requires them to respond to areas outside of the County in a mutual or auto aid capacity. There is one executed mutual aid agreement with MetroWest.

Recommendation: The County should add language to the next contract outlining expectations for providing and receiving mutual aid with bordering counties, which contains language related to the closest unit response and identifying triggers.

Integration of First Responders

Area fire departments respond to emergency medical calls with BLS and ALS-trained staff. They are typically located strategically throughout the communities, enabling firefighters to respond quickly to emergencies and begin medical care before the ambulance arrives. They possess specialized skills and equipment, including defibrillators, rescue tools, oxygen, and certain medications. Their training also includes handling hazardous materials, which can be present in a medical emergency. Fire departments provide essential support, especially in rural or under-resourced communities. The following fire departments provide first response in the County.

First Responders				
Fire Department	**Square Miles**	**Calls**	**Residents**	**Medical Level**
Portland	150	91,000	580,000	ALS
PDX	-	4,141	-	ALS
Gresham	22	20,000	110,000	ALS
Cascade Locks		450		ALS
Sauvie Island	32		1,000	BLS
Corbett	40	534	4,000	BLS

Portland Fire Department

Portland Fire Department (PFD) is the largest fire and emergency services provider in Oregon, serving over 580,000 residents over approximately 150 square miles. It operates 31 fire stations and provides ALS services, the CHAT program, fire suppression and rescue, Hazardous Materials and CBRNE (Chemical, Biological, Radiological, Nuclear, Explosives) response, Fire Prevention and Investigation, and Marine Operations.

The department uses geographic-based data extracted from the CAD and ImageTrend data to establish the policy that determines which medical calls require a fire response. There were mixed reports from stakeholders about PFD's response strategy. Stakeholders indicated that PFD has not added resources despite growing call volume over many years, and to reduce workload, station captains can decide if the engine will respond based on the dispatch call notes. Some stakeholders indicated that the station captain can call the dispatch center or the caller to get more information regarding the call before responding. Station crews find the MPDS system frustrating due to the limitations of the scripted messaging. PFD leadership stated that they will not self-cancel a dispatch.

PFD has ALS equipment on all engines; however, there are times when no firefighter/paramedic is available. PFD paramedics and EMTs come under the supervision of the company commander (i.e., fire captain). The EMS Division has a Battalion Chief, EMS supervisors (captains), and an EMS specialist, along with two nurses. The engines are not designed to transport, but if emergency conditions arise, they have transported patients in the past. Quality improvement is conducted by the EMS Division and

will coordinate with the AMR quality team as needed. In-service training is provided in a joint setting with AMR, which PFD indicates is beneficial to the system. PFD regularly dedicates a portion of its training to EMS topics.

PFD can communicate with AMR through the radio infrastructure and view AMR resources through the CAD software. PFD will respond to local correctional facilities upon request; however, those locations maintain their own medical staff (e.g., doctors, physician assistants, nurse practitioners).

PFD field staff support the hybrid program using one paramedic and one EMT per ambulance. Crews commented on how this program has increased the number of ambulances available to run calls, reducing on-scene wait times. The engine staffing of a firefighter/paramedic (and more EMTs) works well.

Community Health Assessment Team

Community Health Assessment Team (CHAT) – PFD runs four daytime response teams Monday through Thursday and follow-up services seven days a week. While additional teams would be helpful, the lack of alternate destinations on weekends and nights reduces their effectiveness. The teams comprise either a paramedic/EMT or two EMTs. This program responds to 911 calls within the City of Portland that are determined by BOEC to be low acuity with substance use, housing, and behavioral health issues. CHAT is dispatched to multiple call types by BOEC. Crews can respond with lights and siren and do not require a law response to enter homes (unlike PSR). They can offer buprenorphine treatments, which are used to treat opioid use disorders.

CHAT teams do not transport but arrange transport via taxi or other means to the two hospital-based urgent care sites that are more lenient on requiring insurance and to Unity, the psychiatric emergency services center that is cooperatively funded by all hospitals except Providence in the County. CHAT is funded through Portland opioid settlement funds and Care Oregon, with an annual budget of $3 million. Patient contact documentation is completed through a system not compatible with AMR's ESO software; one person at AMR has access to EPIC, but field providers do not, according to stakeholders. While these patients have significant overlap within the healthcare system and all hospitals are using the EPIC system, field stakeholders stated that some providers use unconnected behavioral health records, limiting effective and definitive care due to a lack of patient history.

Gresham Fire Department

Gresham Fire Department (GFD) operates six stations covering its community, including one joint station with PFD. Each engine crew of three includes at least one paramedic. The department staffs one ALS rescue unit to meet the growing number of medical calls. It is capable of transporting, but is not licensed to do so.

Firefighters reported that the clinical protocols are advanced, with almost all standing orders (i.e., not requiring hospital permission). Call volume continues to climb without a corresponding increase in fire resources. Reducing unnecessary workload will ensure resources are available and are able to help severe 911 calls. The one exception noted was medical facilities where fire does not respond to lower-level acuity calls at urgent care centers and skilled nursing facilities.

The engine captain decides whether to downgrade a call originally dispatched with lights and siren, which can result in inconsistent response modalities. First responders stated that they rarely reduce the ambulance in fear of losing it to a higher-priority call. AMR BLS units have dramatically improved ambulance availability across the system; fire crews rarely wait anymore. Protocols allow GFD paramedics to assess and release a patient pending arrival of the ambulance.

While the equipment committee standardizes equipment and supplies, the engine crews noted that there is no standardization of the brand and model number of equipment and supplies for first responders and transport crews. Agencies use different vendors and may have different medications and medication concentrations, which can lead to errors. AMR restocked the first responders as part of the prior contract; currently, AMR provides reimbursement to the fire department, and it handles restocking internally. Like other fire agencies, GFD paramedics utilize ImageTrend for patient care reports, while AMR uses ESO. As such, GFD paramedics are unable to electronically transmit patient information to the transport crew.

Port of Portland Fire Department

Portland Airport maintains a separate fire and EMS service to meet the airport's needs. This includes career staff and paramedics for medical calls. AMR provides patient transportation from the airport.

Cascade Locks Fire & EMS Department

Cascade Locks Fire & EMS Department (CLFED) is a combination fire department with career and volunteer staff, including three full-time firefighter/paramedics. It is in Hood River County. Of the 450 annual calls, only about 20% occur within the very eastern part of Multnomah County, which provides a subsidy to support the service.

Sauvie Island Fire District

The Sauvie Island Fire District (SIFD) is a volunteer fire department that serves the needs of residents and visitors to the island.

Corbett Fire District

Previously known as “Multnomah County Rural Fire Protection District #14”, Corbett Fire District serves the communities of Aims, Bridal Veil, Corbett, and Springdale, providing fire protection, EMS, and technical rescue services. With three stations, it is staffed at a BLS level with thirty-six volunteer firefighters and a part-time Chief.

Findings and Recommendations for First Responders

Finding: While BOEC dispatches a triaged call type with an assigned priority, fire officers have downgrade or cancellation authority. There are discrepancies within departments, and even between shift captains, about which calls need first responders and whether lights and siren are necessary.

Recommendation: Use data to drive decision-making about first responder (and ambulance) resource assignments for medical calls. There is a committee that works with the EMS Medical Director on this topic, but field variations still occur. Further engage the field crews in decision-making, promoting engagement, and increasing acceptance. When ready, eliminate the first responder's discretion not to respond.

Finding: AMR uses ESO for its ePCR while first responders use ImageTrend. Crews shared concerns that the disparate ePCR software do not communicate with each other, making it challenging to ensure all information is collected and recorded by AMR. The lack of communication between ePCR software can impact patient care by preventing thorough information from being passed down. This also limited the ability to perform quality assurance since clinical activities and records are in different systems.

Recommendation: Select a single ePCR platform that all medical providers can utilize cohesively for the highest level of patient care coordination. If there is not one solution, develop an HIE to collect all patient care records in one location. Ideally, the solution would include first responders, ambulance providers, PSR, CHAT, other social service agencies, and possibly the hospitals and urgent care clinics, and enable field personnel to view the patient's medical history while on the scene of the call for providing better continuity of care.

Finding: CHAT is a best practice program and offers excellent wrap-around social services. In 2023, CHAT units responded to 3,803 911 calls. This service allows fire units to remain available for other responses, including fires and high acuity medical calls. In addition, CHAT units complete thousands of follow-up visits for high-risk clients who are likely to use the 911 system. Proactive patient follow-up has reduced future 911 system needs in other communities.

Recommendation: Continue funding of the CHAT program by the City of Portland to use the right resources for the right needs while preserving the limited fire resources for critical events. When additional funding and alternative destinations are available, consider expanding the hours.

Finding: Combined first responder and transport training and education is a best practice to enhance on-scene crew interaction and patient care.

Recommendation: Continue combined in-service training with fire service providers and ambulance providers to promote relationships, teamwork, and consistency in patient care.

Finding: Multnomah County EMS Policy #50.010 permits ALS and BLS first responders to assess, triage, and cancel the incoming ambulance for non-emergency patients before ambulance arrival. Allowing an ALS fire or ambulance unit to clear the call prior to a BLS ambulance arrival on scene is a best practice. It ensures the EMD process is appropriate and smooths ambulance demand for less urgent calls.

Recommendation: Continue to support this best practice.

Finding: Fire departments have transport-capable rescue units but are not licensed to transport patients under any circumstances. Fire stakeholders voiced concern that they believe the process of transporting a patient in exceptional circumstances is too difficult. EMS Policy 50.130 is a well-written policy describing the circumstances and process for fire apparatus to transport. Fire agencies do not have ambulances for transporting these high-need patients and use the fire engine cab, a squad, or other location not normally used for patient care. Some jurisdictions voiced a desire to allow fire apparatus to transport in certain circumstances, such as for extended responses or multiple casualties.

Recommendation: Consider adding a review of EMS Policy 50.130 to annual training to improve awareness among fire personnel. Consider encouraging fire agencies to have transport-capable rescue squads at fire stations for deployment when circumstances described in the policy allow fire to transport. Examples of similar systems include the San Jose Fire Department's Supplemental Transport Ambulance Resource (STAR) cars or the Santa Cruz County Fire Protection District's Medic 3566 program. In these examples, firefighters from the engine company cross-staff the ambulance as needed to respond where the ambulance is delayed or to augment ambulance availability during EMS system overload conditions in the system.

Finding: Stakeholders report that some fire agencies are reluctant to ride into the hospital with a BLS crew when needed for a higher acuity patient unless AMR's ambulance levels are at zero, removing a system safety net opportunity. Others voiced a concern that the request for a firefighter to ride into the hospital to assist with patient care could be being overutilized.

Recommendation: Encourage fire agencies to focus on the patient's condition when making the decision to ride with an ambulance to the hospital, with a follow-up process later. Consider monitoring the utilization of firefighters riding into the hospital on a monthly basis to identify trends and ways to mitigate future situations.

Finding: Stakeholders indicated there are some inconsistencies in training and stipend availability to various fire agencies, causing frustration. Three options to increase the amount of money available to each fire agency include:

1. Increase the amount of money AMR is required to pay for training, currently set at $175,000 per year. Doing so would likely result in AMR needing to increase billing rates for patients. Because of the percentage of government payors, this increase would likely be high.
2. Fire agencies could reset the amounts provided to each agency from the current amount, balancing the stipend more equitably in the system.
3. Use the money that could become available from provider response time penalties if and when they are paid to balance distribution.

Recommendation: Encourage fire agencies to review their current practice to ensure appropriate distribution. Identify alternate sources of funding, if available, to adjust stipend amounts.

Finding: Not all law enforcement vehicles carry automated external defibrillators (AEDs). They often arrive at a call before any other responders and can use an AED early, potentially increasing the opportunity to save lives.

Recommendation: Identify a source of funding, such as grant funding, and purchase AEDs for every vehicle. Ensure law enforcement officers receive AED training with their annual CPR training.

Finding: Stakeholders report officers are withdrawing from providing assistance with secure transports for hold patients, and there are concerns about the safety of ambulance crews. They stated that some secure transportation is available through MetroWest, which uses a single EMT in a vehicle with a barrier. EMS system 911 ambulances, who can provide sedation if needed, are also used. Stakeholders stated more timely, secure transportation for IFT is needed to meet the demand.

Recommendation: Consider identifying additional secure mental health transportation using the most cost-effective approach for each patient, including response to 911 calls as appropriate.

EMS Operations Assessment

Field supervision and management are crucial for ensuring high-quality patient care, maintaining team safety, and promoting operational efficiencies. Supervisors and managers help ensure that EMS personnel follow protocols and deliver appropriate care. They provide guidance in complex and high-risk situations and identify areas that require training and follow-up. Supervisors can help resolve conflicts and troubleshoot situations that arise in the operation. They can redeploy or reposition units based on real-time needs and ensure safety in the field. Supervisors are a key point of contact for the public and other agencies and can help ambulance crews return to service more quickly after a call. They create a structured, responsive, efficient, and safe environment that supports EMS providers, the patients they serve, and the EMS system.

Training and credentialing requirements in the County for supervisors and managers are robust, with the Incident Command System (ICS) and high-level EMS management classes being required. Training and credentialing requirements for field personnel are equally robust, with ICS classes being required for enhancing response to large incidents.

Stakeholders stated that the relationships between AMR and the EDs are fantastic. Hospital staff find that the supervisors are responsive to their needs. Stakeholders stated that AMR's ePCR system doesn't allow them to look up a patient, and a digital registry would be helpful.

Supervision and Field Management

The AMR contract always requires a minimum of one paramedic field supervisor who can respond to incidents and requests from partnering agencies with a maximum response time of 30 minutes to anywhere in the service area. They are required to spend a minimum of 50% of their time in the field assisting crews and are not allowed to be routinely scheduled on an ambulance.

The AMR contract does require an Administrative Supervisor and an Operations Chief position. While these positions can take the more administrative workload off the field supervisor, a large area and a high ratio of employees to supervisors can reduce system capabilities.

Finding: Supervisor workload in a system as large and complex as this County can produce considerable demand for a field supervisor's attention. Comparable-sized systems require two or three on-duty supervisors to manage all their needs. Based on the contract requirements, one field supervisor could be supervising more than 60 field providers when fully staffed. Lack of adequate supervisory resources can limit opportunities for greater efficiencies, problem-solving, and quality in the system.

Recommendation: Consider changing the requirement for field supervision to include at least two field supervisors, possibly three, during the busier daytime hours and a minimum of one or two supervisors on duty at night.

Operations

There is an automatic referral pathway to TriCounty911 (TC911) where frequent utilizers who meet a minimum of ten or more ambulance responses, fire responses, or ED visits in the previous six months are placed or screened by TC911 for case coordination and management. Fire agencies and AMR field personnel can fax or email a referral form to TC911. The CHAT team meets monthly with TC911 to coordinate care and clients; it is also one of the referral pathways.

Finding: Field stakeholders voiced a desire to more easily provide referrals for managing the various behavioral health patient situations and receiving feedback on their referrals. While they are able to make referrals to TC-911, and the CHAT team meets monthly with TC-911 to coordinate care, they would like to be able to point patients more readily in the direction of the help they need, including referrals to PSR or other resources.

Recommendation: Consider reviewing referral processes and availability for field providers to the various behavioral health field resources and identify if there are ways to simplify or consolidate them.

Finding: Rural areas voiced a desire to contact AMR to provide public education, but felt they were unable to do so.

Recommendation: Consider asking AMR to reach out to rural areas to offer public education.

EMS System Financial Analysis

Financial Analysis

The consulting team reviewed the financial statements for the current ambulance provider, AMR. The review included payor mix, ambulance rates, and financial statements.

Findings:

Payor Mix: AMR provided billing data to calculate payor mix. The resulting table shows that 77% of trips are paid according to government payment schedules.

Ambulance Rates: AMR provided the calculation of the 2024 rate increase. The rate increase was calculated in accordance with the contract language.

Financial Statements: AMR provided CPA-reviewed financial statements for 2020 through 2024. Some one-time items were included, notably a decrease in operating costs in 2021 reflecting receipt of CARE funds for COVID, and a decrease in revenue in 2023 and 2024 reflecting higher-response time penalties. Also, in 2024, a large accrual of penalties (approximately $2.5 million) was made in accordance with the settlement agreement dated July 2024. An additional $4.4 million is still outstanding for 2023. Overall reporting appears reasonable. Income from operations (before interest and tax) is reflected in the included table.

Payor Mix, 2023	
Payor	**Percentage**
Medicare and Medicare HMO	42%
Medicaid and Medicaid HMO	35%
Insurance	10%
Private Pay	11%
Facility/Other/Cash	2%
Total	**100%**

Strength of financial position and sustainability of the system. Year over year from 2023 to 2024, net revenue increased 18%, about 10% higher than historical increases. Expenses in 2024 increased by 27% over 2023. In previous years, expenses grew between 4.5% and 7.3%. Changes in labor accounted for the highest expense increase in 2024 as the system started adding staffing to meet compliance requirements.

Profit (Loss) from Operations		
Year	**Amount**	**% of Revenue**
2020	(1,872,549)	-5.1%
2021	628,717	1.5%
2022	456,243	1.0%
2023	1,402,929	3.0%
2024	(2,691,647)	-4.9%

However, results for 2024 do not represent a fully compliant staffing model. During the first 20 weeks of 2024, there were 3,017 unfilled hours on the ambulance schedule. Annualized over the rest of the year, unit hours would have been 7,904 short of the contract requirements. Using an estimated marginal unit cost of $223.46 per unit hour, that equals $1,766,000 of expense savings in 2024.[8]

Findings and Recommendations:

Although revenue saw significant growth in 2024, expenses continue to outpace revenue as the system adds unit hours. The original contract requirements are not financially sustainable in their current design.

[8] Based on AMR 2024 financial statement's marginal expenses

Revenue increases of 2024 magnitude (18%) only occur with higher volume, higher reimbursement (either due to rate increase or higher Medicare and Medicaid rates), significant change in payor mix, higher other revenue, or a combination.

- Payor mix shows high dependence on Medicare rates, which are not increasing enough to cover expense increases.
- Annual rate increases will not increase revenue enough to cover expenses.
- Resolving Issues with response times will increase labor costs more than in previous years.

There are expense areas that could be examined for savings:

- Wages: Focus on wage rates and deployment is critical as salaries, wages, and benefits comprise 62% of total expense. Additional reviews and controls may be necessary to avoid excessive overtime.
- Management Fees: Management expenses are allocated from GMR to all locations. This is an acceptable accounting practice and normal in larger companies. It may be a good idea to gain visibility into this line-item to make sure all expenses are benefiting Multnomah County. Request a breakdown by expense line each year, and expanded explanations for larger expenses such as insurance, IT, and legal. This should be reviewed with management on an annual basis.

Ambulance and First Responder Response Times

Ambulance Response Times

Response times are the most visual and significant influence on EMS system design. The time it takes for the ambulance to arrive is part of the patient experience and impacts the first responders' on-scene commitment and overall task time. It is also the most substantial factor in the cost of designing a system. Ambulance expenses range from 60 to 80% for field crew staffing. Shorter response times require more unit hours (i.e., ambulances) and more employees. However, the revenue does not improve with response times. There is a lack of clinical evidence to support faster response times. Many systems use MPDS to allow longer (or no) response times when not clinically justified based on historical data, such as critical interventions performed per MPDS category or lights and siren transports to the hospital. Studies have shown a four-fold increase in traffic collisions when using lights and siren, causing a risk to the driving public and first responders, which is counter to the mission of EMS.

A common theme expressed during stakeholder meetings was frustration with the extended ambulance response times that were being experienced daily. The response time data review validated these concerns. The stakeholders' trust in the EMS system was eroded due to these concerns, which have led to a decrease in confidence in the system's ability to provide timely and effective emergency care. Ambulance response time delays can have significant consequences on prehospital time for patients, including:

Prolonged Time to Receive Advanced Medical Interventions

ALS ambulances are equipped with advanced medical equipment and highly trained personnel to provide critical care to patients. Delayed response times cause patients to wait longer for these advanced interventions. This delay can be crucial in time-sensitive critical interventions such as cardiac arrest, traumatic injuries, heart attacks, and stroke, where timely interventions and transport can significantly improve patient outcomes.

Potential Impact on Overall EMS System Performance

Delayed ambulance response times can have broader implications for the overall performance of the EMS system. Prolonged prehospital times can result in delayed availability of ambulances for other

emergencies, leading to a cascading effect on the entire system. It can strain EMS resources, compromise response times for other patients, and impact the community's ability to receive timely care.

Finding: The County geography makes achieving consistently low response times challenging. The County is long and thin, encompassing large rivers, islands, and remote areas that are difficult to access, which can result in extended response times.

Finding: AMR experienced a severe staffing crisis related to the aftermath of COVID and the nationwide paramedic shortage, which impacted all EMS and fire agencies. To mitigate the impact of the staffing crisis, MCEMS made changes to the EMS system that enabled more staff to be present, including changing staffing on some ambulances from two paramedics to one paramedic and one EMT, and others with two EMTs to respond to low acuity calls. AMR began sponsoring employees to paramedic training, and MCEMS requested that AMR implement a "Low Acuity Queue" (LAQ) to work with low acuity 911 callers to gather more detailed information and send ambulances when the EMS system was in a slower response period.

Urban Response Time Compliance % by SUBZONE and PRIORITY

Contract Year 4 & 5 (Mar 2022 - Feb 2023)

STANDARD = 80% MONTHLY

		SUBZONES BY MONTH												
Subzone	Priority	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	Total
NORTH	Code 1	97.19%	97.09%	97.22%	95.94%	95.86%	94.53%	92.94%	92.52%	88.92%	85.07%	91.87%	85.11%	92.92%
	Code 3	88.92%	89.02%	83.56%	82.25%	80.09%	75.61%	74.07%	71.57%	68.18%	55.46%	68.98%	67.47%	74.98%
SOUTH	Code 1	98.20%	97.60%	94.81%	94.58%	95.36%	94.27%	90.88%	89.93%	89.19%	80.65%	90.00%	85.08%	91.81%
	Code 3	86.84%	87.99%	81.17%	80.64%	78.31%	74.48%	73.50%	69.52%	66.06%	56.92%	66.02%	69.50%	74.05%
WEST	Code 1	97.98%	97.99%	96.40%	95.50%	97.48%	95.45%	93.59%	92.35%	88.33%	86.51%	91.86%	88.04%	93.42%
	Code 3	85.12%	85.81%	82.42%	84.34%	82.17%	75.75%	73.19%	73.26%	70.04%	62.43%	72.27%	68.28%	75.85%
EAST	Code 1	96.24%	95.45%	91.55%	91.30%	92.38%	89.70%	82.79%	87.53%	80.92%	66.67%	84.13%	74.05%	86.19%
	Code 3	86.25%	86.33%	78.01%	78.01%	78.73%	72.26%	64.93%	63.49%	61.18%	47.78%	62.70%	66.50%	70.14%
ALL ZONES	ALL Priorities	89.80%	90.13%	85.13%	84.85%	83.92%	79.72%	76.97%	75.33%	71.84%	61.81%	73.41%	71.93%	78.50%

(Excerpt from the 2024 CCRRC 6 Month Report)

Finding: FirstWatch reports demonstrate that response times continue to improve, but AMR is still not compliant with its contract for lights and siren response times. Stakeholders acknowledge there has been improvement with AMR not reaching "level zero", where all ambulances are assigned to calls as often.

Recommendation: AMR management should fulfill its contractual obligations by meeting the response time requirements. The EMS Agency should utilize MPDS, clinical process, and outcome data to appropriately triage incidents where short response times are most clinically relevant and deemphasize short response times for low acuity cases. When clinical outcome data are unavailable, the use of critical interventions performed by EMS providers can support system improvement.

Recommendation: The County should evaluate call priorities and outcomes, that include which MPDS codes result in emergent transport, which do not, and which result in non-transports. Response time requirements should match code priorities and outcomes. Based on available response by first responders who are closer and can provide initial care, match ambulance response to patient need, lengthen the response time requirements for the ambulance, and reduce the number of calls being dispatched in the system with lights and sirens. The following table recommends:

Ambulance Response Time Compliance Standards				
	Urban Density		Rural Density	
Response Code	Current	Recommended	Current	Recommended
Code 3 (Life-Threatening)	8:00	12:00	20:00	20:00
Code 2 (Non-Life-Threatening)	12:00	None	30:00	None
Code 1 (Non-Immediate)	20:00	None	30:00	None
Notes: 90% compliance within each density; Best effort in Frontier remains unchanged				

Finding: Firefighters shared they do not downgrade ambulances due to concerns of "losing" their ambulance to a higher priority call and increasing on-scene time commitment.

Recommendation: All fire agencies should be encouraged to reduce the ambulance when the patient's condition warrants it. When no one downgrades calls, then no one benefits. In fact, first responder crews with emergent patients will wait longer when an ambulance assigned to a non-emergency is closer but not available to respond. Patient care suffers under this common practice. Firefighters on scene of non-emergency patients should take advantage of the system protocol to leave patients when appropriate.

Contracted Response Times

The current agreement has ambulance response time requirements for life-threatening and non-life-threatening calls. These standards are consistent with prior agreements and many EMS systems across the country.

Within the last decade, there have been multiple clinical research papers published on the efficacy of ambulance response times. They consistently find that ambulance response times make little to no difference in patient outcome, especially in lower acuity calls. Less than 10% of 911 calls require a life-saving intervention, which is often a BLS skill (e.g., CPR, Narcan, Epinephrine), and can be provided by first responders while an ambulance is enroute. Contemporary EMS systems are moving away from strict response times, which require substantial unit hours to meet, in favor of using those financial resources to improve patient outcomes in other ways. The Seattle/King County (WA) system focuses substantial energy and resources on teaching public/hands-only CPR. The result is 75% of the population learning CPR (Seattle Fire is a major supporter), which translates into almost the same percentage of cardiac arrest patients receiving bystander CPR.[9]

If there is little evidence that lights and sirens make a clinical difference, then there is no scientific basis justifying response times for non-emergency calls. The dispatchers use data-driven algorithms based on industry-proven research to categorize every 911 call appropriately. Those that do not reach a threshold for emergency response can wait a longer period without affecting patient care. Like the ED, a patient is triaged and asked to sit in the waiting room when their acuity is low until ED resources are available. In the pre-hospital environment, dispatch does the triage to determine the priority.

Finding: The County has response time standards for emergency and non-emergency calls. However, there is no standard for LAQ calls, which represent the absolute lowest-priority calls.

[9] 2024 King County EMS Annual Report

Recommendation: The County's decision to implement the LAQ without a time standard is the first step towards no response time requirement for all non-emergency calls. Consider removing the response time standard for all low-acuity calls that do not require a lights-and-sirens response. Historical data should be used to drive decision-making for which calls are suitable for this category. When response times are no longer a factor for non-emergency responses, it improves unit availability for the life-threatening calls. Some systems have received concerns about first responder task time when waiting longer for an ambulance; however, the local system only sends an ambulance on non-emergency calls. Furthermore, the Santa Cruz County (CA) EMS system dispatches both first responders and ambulances to non-emergency calls, experiencing only a four-minute average difference between its emergency and non-emergency responses. There has not been a non-emergency response time standard for over 20 years, with no known negative patient outcomes or feedback from the community.

Fire Department Response Times

As first responders, fire departments have a crucial role in EMS, and their involvement brings important benefits. Fire department stations are often strategically located throughout cities and towns, allowing them to arrive sooner at a medical emergency, which can be important in life-threatening situations like cardiac arrests, severe trauma, and compromised airways. While helpful, first responders need not be ALS-capable in many cases. Most time-critical interventions for these clinical conditions, such as early CPR, defibrillation, airway control, hemorrhage control, naloxone, and epinephrine, fall under the BLS scope of practice and are crucial in the first few minutes.

As in other EMS systems, the County benefits from fire agencies responding to some of the calls. Some EMS systems partner with fire agencies that have added responsibilities to respond to certain calls and "stop the clock" for the initial response, allowing them to initiate care until the ambulance arrives. They act as "force multipliers," expanding the EMS system's reach, expediting treatment, and improving the continuity of care. In doing so, the ambulance response requirements can be reduced, resulting in fewer ambulances being needed, and the savings can be reinvested in the EMS system, such as supporting fire first responders.

Finding: The community benefits from fire agency response to medical emergencies currently. However, there is variation in how and to what calls they respond, and no additional funding is provided for this service.

Fire Response by MPDS Type

	Echo	Delta	Charlie	Bravo	Alpha	Omega	Total
Total Calls	1,204	31,339	25,441	13,176	18,987	1,354	91,501
Fire Dispatched	1,093	28,550	14,280	10,470	3,691	114	58,198
Percentage	**91%**	**91%**	**56%**	**79%**	**19%**	**8%**	**64%**
Fire went Enroute	999	27,966	13,821	9,582	3,204	87	55,659
Percentage	**91%**	**98%**	**97%**	**92%**	**87%**	**76%**	**96%**

Source: CAD Data, 2024
Note: Includes CHAT and PSR units

BOEC dispatches a fire first responder (including CHAT and PSR crews) to roughly 64% of 911 medical calls that were processed using MPDS protocols. Calls unable to complete the MPDS process, such as traffic collisions and law enforcement requests, are not included in the analysis. Data identified that fire did not go enroute to 4% of the calls of which they were dispatched.

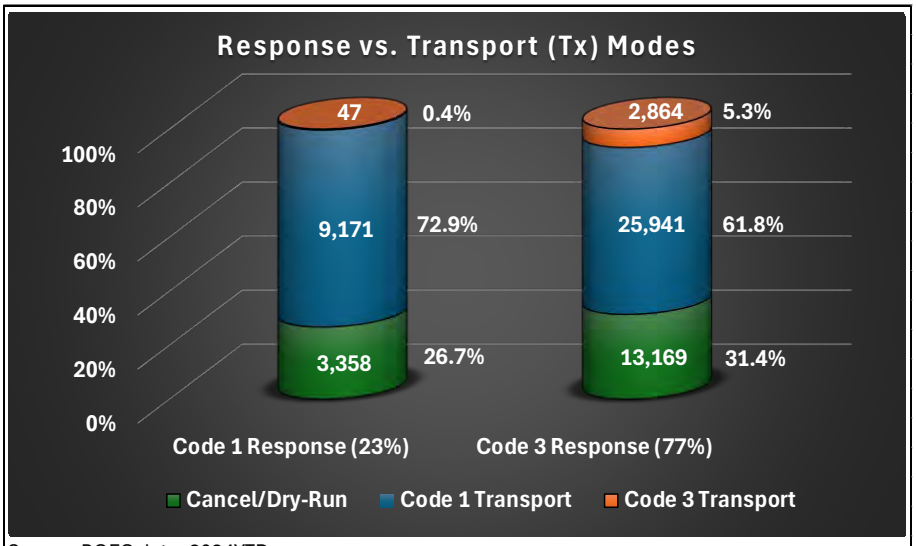
Recommendation: Explore the EMS system opportunities to relax ambulance response time standards in exchange for investing in fire agency partnerships with guaranteed response times for first responders to identified calls. Decision-making on what units are needed per 911 call should be defined by the EMS Medical Director using historical data. First responder leadership should be included in the process to increase engagement and acceptance at the engine crew level. This collaboration enables patients to be assessed more quickly and receive life-sustaining treatments until the ambulance arrives.

EMS Resource Management and Tiered Response

The current nationwide EMS staffing crisis has many causes, such as difficult work and high workload, and the County is no exception. While field personnel in Multnomah County are the highest-paid AMR employees in the state, during the aftermath of the paramedic shortage that followed COVID, they were running nearly twice as many calls as they had previously. This led to concerns about prolonged response times, fatigue, burnout, and high turnover, which ultimately diminishes provider experience and capacity. Part of this crisis is due to successful EMS education; for years, EMS presentations have encouraged the use of 911 for all complaints and have done little to educate the public about the appropriate use of 911, nor provided equally attractive alternatives. For example, Baltimore conducted a study examining the effectiveness of a 311 system in reducing non-emergency calls to 911, resulting in a 34% total reduction in 911 calls. Social, financial, and demographic changes in the population have similarly led to the unsustainable overuse of EDs as the primary source of healthcare. During COVID, paramedic training programs were halted or slowed, resulting in fewer paramedics after COVID ended. The reduction in available personnel caused the remaining staff to respond to the increasing number of calls. Overwork and fatigue contributed to personnel prematurely ending their EMS careers, and a vicious cycle ensued.

Dispatch information, especially when derived using a standardized methodology, is typically very reliable but will never be perfect. After all, one cannot guarantee that a fire response or ALS service is not needed, despite the best available information at dispatch. Many EMS subject matter experts who have worked in the field can name a handful of examples where conditions were far different than initially believed. However, even in these rare cases, it is unlikely that a few minutes would have made a difference in the patient's outcome. Stakeholders voiced concerns about inconsistencies in responses to various similar priorities and a perception of over-response. Given real resource constraints, over-response in the hope of avoiding these exceptions will lead to unintended under-response when it is truly needed.

The EMS industry needs to adapt to these changing conditions by right-sizing the response to the best available information at dispatch. Some calls clearly deserve a full response from fire, ALS, and even air assets. Many others indicate non-time-sensitive BLS-level care only. This type of resource allocation optimization and prioritization starts with a reliable dispatch system that utilizes a standardized process, such as MPDS. Dispatch determinants can reliably predict patient acuity, allowing less acute conditions to be handled with an appropriate lower-level response or potentially diverted to alternate sources of care, while the highest acuity resources are reserved for those with the most critical needs.



Source: BOEC data, 2024YTD
Note: 51% did not record response mode (or cancelled before enroute)

Additionally, the EMS industry has traditionally measured EMS performance in ways that may not have the most clinical relevance for our patients based on clinical

research. Response times, for example, are easily obtained and objectively measured, but bear little relevance to patient outcomes for the vast majority of 911 calls. This mistaken belief that lower response times are always better may have the unintended effect of exponentially increasing the cost of EMS services and depriving resources from where they are needed most acutely.

As discussed in the EMS quality section, success is best measured using clinical performance metrics. While response times are a necessary element in certain responses, their importance should be matched to the need for critical intervention and reserved for the most time-sensitive conditions.

Finding: To reduce the strain on response times for ALS units, the County allows a tiered-response model, where BLS units can be dispatched to certain calls identified as low acuity using the MPDS system in combination with the LAQ. In addition, a BLS unit can be requested by an ALS unit on the scene of a call to urgent but not life-threatening emergencies, freeing up the ALS resource to become available to the EMS system more quickly. The current ASP and County Code does not allow BLS to respond to calls determined to be an "emergency," and the current deployment process is a temporary arrangement as a bridge to remedy the staffing shortage until the ASP can be changed. AMR has stated they are interested in expanding tiered response opportunities, are willing to collaborate on social services-based mobile mental health or MIH programs, and help fund a nurse navigation program. A nurse navigation program agreement with AMR would require cost efficiencies to cover the funding, such as eliminating the LAQ staffing or collaborating with nearby counties.

Recommendation: Consider exploring the cost of adding the AMR Nurse Navigation program with AMR, or exploring the cost of using existing Nurse Advice Line programs at local health groups and hospitals. Each program would need to identify the cost of its program to undertake this important resource.

Finding: Stakeholders stated that AMR leadership is unwilling to allow the ALS unit to leave the scene once a BLS unit has been dispatched prior to their arrival due to the risk of liability. This approach negatively impacts ALS unit availability in the system. During an interview with AMR management, they stated that this is no longer accurate, and crews may leave before the BLS unit arrives.

Recommendation: Update/remind the AMR workforce about the ability to assess and defer to BLS without remaining on scene.

Finding: ALS units are routinely dispatched to Priority 1-7 calls (see Attachment), and there is a subset of calls that could be appropriately handled with a BLS unit. ALS units frequently encounter low acuity patients that can be handled by a BLS unit, as described above, thereby necessitating the dispatch of two ambulances to an event that could have been handled by a single BLS unit.

Recommendation: Evaluate the MPDS determinants and associated prehospital interventions to determine an appropriate list of 911 calls that do not need ALS on initial dispatch and could otherwise be handled by a BLS unit. This will reduce unnecessary demand on ALS units, mitigate using two ambulances for one call, and increase the number of ALS units available for higher acuity calls, which will also reduce ALS response times.

To support an effective tiered-response program that all EMS providers trust, Multnomah should include tiered-response discussions within its CQI Council meeting agendas. While a 100% audit of all BLS responses to 911 calls by the ambulance provider is ideal, at a minimum, it should be mandatory for every referral to an ALS unit or that required the firefighter/paramedic to accompany the BLS unit. The audit should compare the MPDS category to the ALS interventions performed and adjust dispatch recommendations appropriately.

Finding: Stakeholders expressed concerns that the MPDS system has been changed significantly, reducing its effectiveness.

Recommendation: The MPDS system was built using data-driven processes using millions of 911 calls nationally to validate the process. A thorough comparison of the MPDS standard versus the locally customized recommendations for resource allocation and emergent status may be warranted based on the high number of lights and siren responses and the lack of BLS units sent to low acuity calls without using the LAQ process to validate. Historical data for critical interventions and lights and siren transports can support future growth of the local EMD system.

Ensure that local MPDS dispatch protocols conform to industry standards for quality improvement and assurance. Integrate MPDS dispatch determinants into the prehospital data set to allow systematic analysis of call types, prehospital interventions, and patient outcomes. From this analysis, develop a tiered response algorithm that appropriately allocates resources based on the call type, such as fire only, BLS only, ALS only, or combinations thereof. One example of a BLS-only case would be a call from a healthcare facility for a patient who has no acute medical complaint but has abnormal labs that need ED evaluation. This will preserve ALS resources for higher acuity patients in the system. Consider developing appropriate alternate response capabilities, such as a quick response vehicle, nurse navigation at dispatch, PSR, or CHAT, that may be able to handle the incident and avoid unnecessary EMS response. A tiered system will likely require changes to the ASP.

Clinical Oversight and Performance

EMS clinical oversight and performance refer to the processes and systems that ensure that prehospital providers deliver high-quality patient care and meet established performance standards. The task involves monitoring and evaluating the clinical performance of EMS providers, including their adherence to protocols, guidelines, and best practices. This oversight ensures that EMS providers deliver safe and effective prehospital care to patients. It may involve reviewing ePCR data, conducting case reviews, and providing feedback and education to EMS providers. This data is used to identify areas for improvement and implement strategies to enhance overall performance.

Clinical oversight and performance tracking also involve CQI initiatives, which drive overall system improvement through training and education on systemic issues. CQI aims to enhance the quality and safety of EMS care through ongoing assessment, analysis, and improvement of processes and practices. Quality improvement activities may include regular audits, training and education programs, and implementing evidence-based practices.

Contemporary clinical research has demonstrated that response times do not always have a positive impact on patient outcomes as was once thought. While response times have been used as system metrics for decades, innovative EMS systems, including Multnomah County, now incentivize providers to meet clinical standards by waiving outlier penalties when certain benchmarks are met that are proven to improve patient outcomes. This practice financially encourages providers to focus on clinical excellence. The current 911 contracted provider has not been able to take advantage of the waiver of outlier penalties due to not meeting the clinical benchmarks set in the contract.

By implementing effective clinical oversight and performance management strategies, EMS agencies can ensure that providers deliver the highest standard of care to patients in emergency situations. This approach improves patient outcomes and increases public trust in the EMS system.

Medical Call Priorities					
Priority	Lights & Siren	First Responders	Ambulance	2024 Calls	Percentage
1 & 2	X	X	X	61,757	56.5%
4	X		X	19,477	17.8%
5		X		2,576	2.4%
6			X	23,205	21.2%
7		X	X	401	0.4%
8				1,829	1.7%
Total				109,245	100.0%

EMS Medical Direction and Medical Supervision

Findings: A key strength of the County EMS system's structure is that all providers fall under the authority of a single county EMS medical director. This arrangement ensures a unified vision for the EMS system through consistent prehospital protocols, equipment, procedures, and clinical expectations. Many EMS incidents simultaneously involve multiple agencies and organizations (e.g., EMS, fire, law enforcement, hospitals), and consistent EMS delivery is essential to minimize unnecessary variation in practice across disciplinary and jurisdictional boundaries. Additionally, as new therapies are introduced, such as prehospital whole blood, consistent countywide implementation is possible to support success.

Recommendation: Maintain the current structure of consistent Countywide medical direction under the sole authority of the County EMS Medical Director. The future ambulance contract should require a provider medical director or advisor dedicated to providing medical consultation services directly to the provider agency. This position is expected to work directly with the provider agency to adopt and implement standards and ensure expectations set by the County EMS Medical Director are met. A provider medical director is also responsible for internal training and education to attain the clinical standards set by the MCEMS. All provider medical directors should meet regularly with the County Medical Director or their designee to discuss challenges, successes, best practices, opportunities, and nationally recognized CQI processes, as outlined by the Institute for Healthcare Improvement (IHI) and the National Association of EMS Physicians (NAEMSP). The provider medical director position should include sufficient resources to conduct training and education on KPI findings.

EMS Quality and Data

EMS data integration and performance reporting requirements encompass the collection, standardization, and analysis of EMS data to generate performance indicators and metrics. These requirements enable real-time monitoring, compliance with regulations, stakeholder engagement, and CQI to ensure optimal delivery of emergency medical services. Timely access to performance data is crucial for effective decision-making and CQI. Real-time monitoring and reporting systems allow EMS agencies to track KPIs, identify trends, and take proactive steps to address issues promptly. This requires robust data analytics capabilities and user-friendly reporting interfaces that provide actionable insights to stakeholders.

Multnomah County KPIs											
Key Performance Indicator	**Sep-23**	**Oct-23**	**Nov-23**	**Dec-23**	**Jan-24**	**Feb-24**	**Mar-24**	**Apr-24**	**May-24**	**Jun-24**	***GOAL***
ACS STEMI											
If STEMI Alert and AMR first, transport w/in 25 min of Pt Contact	85.7%	77.8%	88.9%	87.5%	93.8%	100%	93.3%	89.5%	85.7%	100%	>=90%
ACS: 12 Lead within 10 min AMR first	33.3%	43.8%	43.8%	36.8%	44.3%	49.2%	43.8%	52.5%	46.3%	50.7%	>=70%
If STEMI, Aspirin Admin. or Allergy	90.9%	77.8%	88.2%	76.9%	93.5%	94.1%	80.8%	96.4%	80.0%	88.0%	>=99%
"STEMI ALERT" if STEMI	90.9%	77.8%	94.1%	100%	93.5%	94.1%	80.8%	89.3%	84.0%	92.0%	>=95%
"STEMI ALERT" within 5 min of STEMI EKG	36.4%	38.9%	35.3%	46.2%	41.9%	23.5%	30.8%	42.9%	20.0%	44.0%	>=70%
ACS: 12 Lead performed	51.5%	56.0%	62.5%	62.7%	57.8%	65.9%	60.4%	63.0%	63.7%	65.4%	>=95%
Stroke											
If Stroke Screen Positive, Scene Time Less Than 25 Minutes	95.0%	93.4%	96.1%	88.2%	88.9%	92.0%	92.1%	92.3%	92.1%	85.7%	>=90%
BGL Documented	100.0%	96.2%	97.7%	99.2%	97.3%	99.0%	98.4%	96.6%	100.0%	98.2%	>=99%
Stroke Screen Completed	57.0%	66.0%	69.7%	78.0%	69.0%	68.7%	68.8%	56.0%	66.7%	69.6%	>=95%
If Stroke Screen is positive, CSTAT performed	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	>=99%
If Stroke Screen is positive, Stroke Alert Performed	85.0%	85.2%	81.6%	82.9%	79.4%	82.0%	86.8%	75.0%	88.2%	79.4%	>=99%
Comprehensive Stroke Destination if CSTAT Positive	100.0%	88.9%	96.7%	96.2%	85.7%	100.0%	88.2%	100.0%	94.4%	85.7%	>=95%
Trauma											
On Scene Less Than 15 Minutes	75.6%	61.9%	74.0%	65.5%	60.1%	63.0%	55.9%	69.1%	56.8%	63.8%	>=90%
Patients meeting TSE transported to Level 1 Trauma Center	99.5%	98.9%	98.2%	98.5%	99.5%	100.0%	98.6%	100.0%	99.3%	98.5%	>=95%
Uncontrolled Bleeding	100.0%	93.8%	98.7%	92.6%	96.8%	96.3%	93.8%	96.5%	100.0%	97.6%	>=99%
Cardiac Arrest											
Adherence with Electroshock Protocols-AMR first on scene	20.0%	0.0%	no cases	25.0%	25.0%	66.7%	100.0%	0.0%	50.0%	100.0%	>95%
Sustained ROSC for PEA arrest	35.7%	57.1%	50.0%	60.0%	26.7%	50.0%	64.7%	44.4%	52.9%	41.7%	>=35%
Sustained ROSC for VF arrest	45.5%	26.7%	16.7%	28.6%	37.5%	35.7%	75.0%	75.0%	37.5%	53.8%	>=50%
Sustained ROSC for all arrests	36.2%	35.4%	42.3%	36.5%	25.0%	38.3%	40.7%	32.8%	29.2%	32.1%	>=30%
Survival to Discharge	10.3%	8.9%	19.2%	6.3%	6.6%	13.3%	15.3%	10.3%	6.2%	7.5%	>=16%
Survival to Discharge with CPC of 1-2	100.0%	100.0%	100.0%	100.0%	60.0%	62.5%	88.9%	66.7%	100.0%	75.0%	>=90%
Source: Multnomah County EMS Agency										Note: CARES data - 3-month lag	

There is a robust method to monitor the EMS system for quality and data. The EMS agency translates the emergency severity index (ESI) into a tool that can be used for EMS. The ESI is "a 5-level triage acuity scale that was developed by ED physicians Richard Wuerz and David Eitel. The framework was built on a conceptual model of ED triage to evaluate the patient's physiological stability and risk for deterioration. For patients determined to be stable, resource prediction to move the patient to a final disposition is used to further differentiate patient acuity."[10] Using this innovative approach, they can more readily review patient acuity. The County uses the First Watch, ESO, and ImageTrend platforms routinely to review EMS system data. FirstPass is available, but stakeholders believe it is underutilized. Stakeholders noted there are challenges with all EMS providers participating within one CQI process.

Finding: The current focus on quality encompasses both a systematic review of a broad array of key performance indicators (KPIs) and individual chart reviews. The County established KPIs for critical cases such as STEMI, stroke, trauma, and cardiac arrest, which focus on process and outcome measures that have been established to provide optimal patient outcomes.

Quality improvement is a proactive process that identifies areas for improvement and implements strategies to enhance processes, systems, and outcomes. This begins with establishing quality and performance expectations for all EMS providers (i.e., KPIs) and analyzing countywide data for trends, unnecessary variation, and areas for improvement. This is typically the role of the County EMS Agency and Medical Director. The current KPIs are comprehensive and representative of both process and outcome measures that are relevant to patient care.

Quality assurance, on the other hand, is a reactive process that addresses issues after they occur and often involves implementing and maintaining quality control procedures, conducting audits and

[10] Emergency Severity Index Handbook 5th Edition

inspections to verify compliance, enforcing quality standards, and ensuring that services meet county expectations. While there is admittedly some overlap between QI and QA, the latter is typically the responsibility of the EMS provider agency, as its personnel are best positioned to adjust internal agency policy and processes to ensure a quality product.

Quality data is essential to understand EMS quality. This requires consistent procedures for data entry and integration from all users (i.e., dispatch, prehospital, and hospitals) that generate data for any patient encounter. This typically starts with unifying data entry products such as EMD, ePCR, and hospital health records. While no data system integrates all three disciplines, the data from each system can be automatically integrated into a single dataset through application programming interfaces or manual processes. This is often referred to as HIE.

Of course, if information is not entered in a consistent manner across agencies or even within the same agency, the output will be difficult to interpret. Reducing variation in this area can be achieved by standardizing and sometimes limiting available input choices as provided by the National EMS Information System (NEMSIS). This could begin by limiting the extensive list of available primary and secondary impressions to one that is relevant to prehospital care and standardized. One example is critical electrocardiogram (ECG) findings using NEMSIS 3.5, allowing findings to be recorded under eProcedures, eVitals, or eDevice. Rules that allow an ePCR to be closed upon completion (i.e., a closed call) applied county-wide could help minimize variation. Monitoring of KPIs should never rely on information that is only found in the narrative field, as systematic measurement becomes impractical and unreliable.

Recommendation: Future contracts should continue to include provisions that require each provider agency to submit data in a County-approved format, allowing for the implementation of a standardized quality report. Contracts should specify procedures such as limited pick lists and closed call rules that simplify and ensure consistent data entry. The County should continue clinical KPIs with a clearly defined data dictionary that ensures reliable reporting of individual provider performance metrics. Flexibility should be permitted for the County EMS Medical Director to periodically adjust these KPIs as conditions change.

In addition to prehospital data reporting, which is useful for process measures, outcome data from hospitals is essential for implementing patient-centered outcome measures. The Cardiac Arrest Registry to Enhance Survival (CARES) is an excellent example and is currently monitored in the County. Similar registries that combine prehospital and hospital data have been developed for STEMI, stroke, and trauma. Provider contracts should specify provisions that require participation in these registries and integrate prehospital data systems with hospital HIE opportunities.

In addition to data reporting, contracts should implement minimum quality standards (e.g., National EMS Quality Alliance [NEMSQA], CARES, local) that the contractor must meet, with provisions for enforcement and/or incentives to achieve and maintain those standards. The provider medical directors, as described earlier, would be expected to play a key role in implementing these quality procedures at the provider level and to communicate with the County EMS Medical Director.

Recommendation: Integrating CQI for ALS and BLS first responders is essential for providing a comprehensive and efficient EMS System. By fully incorporating first responders into training, the EMS systems can leverage each provider's medical skills and capabilities to deliver high-quality patient care. Attention should be placed on collaborative training, which will support greater on-scene patient care.

Recommendation: Current KPIs are excellent; however, the findings need to be integrated into a comprehensive quality improvement program. One established system, adopted by the NAEMSP Quality

and Safety Course, was developed by IHI. This approach encourages a systematic analysis of quality metrics with methodology for identifying drivers of performance, cause and effect, SBAR (Situation, Background, Assessment, Recommendation – a structured communication tool used in healthcare to ensure clear, concise, effective information exchange)[11] tools and others. Ideally, quality metrics are continuously monitored in near real-time on quality control charts, allowing for the measurement of the impact of small, iterative tests of change using PDSA cycles to achieve optimal quality.

Although it is possible to process data through off-the-shelf products (e.g., Excel, SPSS), this is labor-intensive, and EMS systems that have done this have often found it burdensome to run reports on a frequent basis, limiting their utility for performing rapid tests of change. Therefore, it is recommended to evaluate products, such as FirstPass, that can automate data processing, generate control charts and integrate QA and QI activities. FirstPass, as a supplement to FirstWatch, can also integrate data from various sources (e.g., BOEC, ImageTrend, ESO, EPIC) to provide a more complete assessment of the various stages of care for EMS patients. FirstWatch is in the process of integrating artificial intelligence into FirstPass, which should simplify robust analysis of clinical topics. ImageTrend Continuum™ offers a similar solution to its customers, including Multnomah County.

EMS Scope of Practice

Finding: Multnomah County EMS paramedics have enjoyed a high-level clinical scope of practice for many years. This includes rapid sequence intubation (RSI) for approved providers and the upcoming implementation of blood products, among many others. These procedures are extremely important during ED and trauma resuscitation and have clinical benefit in the field; however, there are risks associated with these advanced procedures when not performed properly. One example is that the probability of pediatric intubation is only once every four to five years for an urban paramedic; as such, most systems no longer perform it.[12]

The changing demographics and high turnover of the ambulance workforce, especially post-COVID, can make consistent training and quality assurance a challenging prospect, especially for low-frequency procedures like RSI and endotracheal intubation. Some EMS systems rely on a small cadre of paramedics to successfully implement and maintain lesser-used skills, such as RSI (e.g., Seattle/King County, WA), while most EMS systems have a high number of first responders and ambulance paramedics, which dilutes ALS skill opportunities.

EMS skills have undergone significant changes over the years. The wide-scale adoption of high-reliability supraglottic airways and continuous positive airway pressure (CPAP) that can be employed at the ALS and BLS level has made intubation less frequent and, therefore, less reliable. There is growing recognition that prehospital intubation, especially RSI, may be contraindicated for traumatic brain injuries and cardiac arrests, as it could be harmful.

Recommendation: The use of higher-level prehospital procedures should be systematically evaluated using both prehospital and hospital data to understand the clinical utility of such procedures on a longitudinal basis, accounting for the workforce variation that is expected to persist.

[11] https://www.ahrq.gov/teamstepps-program/curriculum/communication/tools/sbar.html
[12] https://pmc.ncbi.nlm.nih.gov/articles/PMC5008974/#R2

Finding: Stakeholders report that the quality of care varies among system providers due to a lack of experience arising from increased turnover, with concerns that ST-elevated myocardial infarction (STEMI) activation times have become longer and stroke assessments are not performed when indicated. Looking at 14 months of data for 227 hospital-identified strokes, the 90th percentile scene time was over 28 minutes, and 42% (99/227) did not include a documented stroke alert.

EMS Suspected Stroke		
Stroke Alerted?	**Yes**	**Total**
No/not documented	-	97
Yes	99	130
Total	**99**	**227**
Source: Hospital Stroke Committee Data, 9/29/23-11/26/24		

On-Scene Times		
Stroke Alerted?	**Yes**	**Overall**
Average	15:00	19:00
90th Percentile	28:12	31:00
Source: Hospital Stroke Committee Data, 9/29/23-11/26/24		

Recommendation: Review and audit STEMI and stroke-related cases for accuracy of care provided. If warranted, system-wide provider retraining and education should be implemented to correct identified deficiencies, specifically extended on-scene times and a lack of prehospital stroke alerts.

Finding: To determine the clinical effectiveness of prehospital care during heart attacks with respect to key field metrics (e.g., Time to EKG and scene time), the STEMI data set from LEMC and OHSU was chosen for analysis. This is a comprehensive data registry with both EMS and hospital outcome data points for 511 medical encounters. Based on OHSU data for STEMI-alerted patients, the time to first 12-lead EKG acquisition was 11 minutes, and the 90th percentile reached 19 minutes.

Time to 12-lead EKG	
STEMI Alerted?	**Yes**
Average	11:00
90th Percentile	19:00
Source: OHSU Hospital Data, 2024	

The combined OHSU and LEMC data indicate the on-scene times averaged 14:20 for STEMI alerts and 15:56 for those without an alert. The 90th percentile was 22 and 25 minutes, respectively. This is a significant amount of time when the definitive course of treatment requires hospital interventions.

On-Scene Times		
STEMI Alerted?	**Yes**	**Overall**
Average	14:20	15:56
90th Percentile	22:00	25:00
Source: OHSU & LEMC Hospital Data, multiple years		

Recommendation: Educate field crews on the clinical importance of quick identification of heart attacks, immediate EKG acquisition, minimal on-scene times, and rapid transport.

Feasibility for Community Paramedic (CP) and Innovation

Community paramedicine, alternate destination programs, on-scene treatment and release, 911 triage and referral, post-discharge follow-up, and other types of innovation have shown promising benefits in improving patient care and reducing healthcare costs. Community paramedicine programs involve expanding the role of paramedics beyond traditional emergency response to provide non-emergency care and preventive services in the community.

This includes home visits, chronic disease management, medication management, and health education. By bringing healthcare services directly to patients' locations, these programs can improve access to care, reduce hospital readmissions, prevent unnecessary 911 calls, and enhance the community's overall health. It is worth noting that several of these programs currently lack adequate funding mechanisms.

Finding: The County has a solid commitment to innovative programs that exceeds that of most EMS systems nationwide, and is interested in exploring additional EMS alternatives that make sense. Many implemented services are mentioned throughout this assessment, including LAQ, PSR, and CHAT.

Another program is the administration of Buprenorphine, a medication to help patients experiencing addiction and overdose, to get the treatment they need early, with the goal of the patient being able to sustain sobriety. This program was modeled after one in Contra Costa County, CA, and has been working well. Stakeholders reported that only five of the 30 patients required transportation to the ED.

Stakeholders reported that the County explored an alternate destination pilot program in 2014. However, funding became a challenge, as typically reimbursement may not be available for patients not transported to an ED. Additional challenges may be posed by urgent care clinics or other destinations' hours of operation being outside of when transportation is needed. The programs can be beneficial in reducing patient load on the ED, and it would be advantageous to continue exploring them.

Recommendation: The County should continue to identify opportunities for alternative care paths and develop solutions to address them. The Buprenorphine program and others require additional funding to expand service hours and reach other parts of the County.

Behavioral Health Alternate Destination Programs

Like alternate destination programs transporting to urgent care clinics, one of the main advantages of a behavioral health alternative destination program is that it provides a more appropriate and specialized response and destination to individuals experiencing behavioral health crises when contacting 911. Instead of sending them to EDs where they may not receive the care they require, these programs connect callers with alternative destinations such as Unity, crisis stabilization units, mental health clinics, and mobile crisis teams. By diverting behavioral health calls away from EMS, these programs alleviate ED overcrowding and reduce wait times for those with urgent medical needs. This improves the efficiency of the EMS system and EDs by allocating resources appropriately.

These programs help reduce the stigma associated with seeking behavioral health services; individuals may feel more comfortable reaching out during a crisis, knowing they can connect with professionals who understand their specific needs. The County has robust programs for response and transportation of behavioral health patients with ongoing follow-up that represents a best practice. Enabling the EMS system to transport directly to a behavioral health facility 24 hours a day, seven days a week is a best practice.

Finding: Overall, community paramedicine, mobile behavioral health resources, and triage to alternate destination programs such as Unity have demonstrated positive impacts on enhancing patient care, reducing healthcare costs, and improving system efficiency – all goals of the IHI Triple Aim.[13] These innovative approaches to EMS care delivery have the potential to transform the healthcare landscape by providing more patient-centric and cost-effective care. County residents are fortunate to have some of the most robust behavioral health mobile resources compared to other EMS systems across the country. All communities across the country would benefit from the county leadership's commitment.

Finding: An obstacle to maintaining these services is the lack of sufficient facilities or receiving hours within the County. Diversion hours for Unity are some of the highest in the system. It closed the Emergency Department between 29 and 41% of the time in the last six months of 2024 for which data exists.

Recommendation: Support Unity in its efforts to help staff understand the impact of diversions and wall times. Work with Unity leadership to identify strategies that reduce diversion hours.

[13] www.ihi.org/improvement-areas/triple-aim-population-health

Post-Discharge Follow-Up

One of the critical benefits of post-discharge follow-up programs is that they help ensure patient continuity of care. Through regular check-ins and monitoring, EMS providers can identify potential issues or complications early on and intervene before they escalate. This prevents unnecessary hospital readmissions and improves overall patient health. These programs also play a crucial role in patient education and self-management. By providing patients with information and resources to understand their conditions better and manage their care, they can become more engaged in their healthcare, more resilient, and less likely to call 911.

Furthermore, post-discharge follow-up programs can help address any interruptions in the healthcare delivery system. By bridging the gap between hospital and home care, these programs facilitate a seamless transition for patients, ensuring they consistently receive the necessary support and services. The efficacy of post-discharge follow-up programs can be attributed to their ability to provide ongoing home care, support patient education and self-management, and proactively address gaps in the healthcare system. By improving patient outcomes and reducing hospital readmissions, these programs contribute to overall community health and patient satisfaction.

Finding: Visiting patients immediately after discharge can reduce EMS calls and hospital readmissions. These programs involve providing ongoing care and support to patients after they have been discharged from the hospital, as was demonstrated in the pilot projects in the cities of Alameda and San Diego (CA).

Recommendation: Discussions should be held with general acute care and psychiatric hospitals to determine if there is a need and to ascertain whether current EMS providers are interested. With that support, the County EMS Agency can develop protocols and policies to guide the post-discharge follow-up programs.

On-Scene Treatment and Release

Within the EMS industry, this refers to providing medical treatment to patients who have called 911 and not transporting them to a healthcare facility. This approach is typically used for patients with minor injuries or illnesses that do not require further treatment or hospitalization. A current example is diabetic patients who receive dextrose to correct low blood sugar and refuse transport. Future opportunities may include assisting with appointments at a doctor's office or participating in telemedicine, where patients can speak directly with a physician or high-level provider to assist in patient care planning. The on-scene paramedic or EMT facilitates this connection and supports assessment based on the physician's direction. Just prior to COVID, CMS introduced the treat and refer program known as Emergency Triage, Treat, and Transport (ET3).[14] EMS providers were eligible for payment, even when not transporting. While effective and appropriate for many patients, the timing, COVID-19 implementation challenges, and lack of provider participation caused CMS to discontinue the program.

911 Triage and Referral

When EMD trained, 911 dispatchers can accurately assess the severity of a caller's condition over the phone. If it does not require an EMS response according to dispatch protocols, it is eligible for a triage and referral process. Dispatchers refer these callers to a medical provider to receive appropriate instructions or referrals. This provider can be a paramedic, nurse, or higher-level healthcare professional,

[14] https://www.cms.gov/priorities/innovation/innovation-models/et3

following clearly defined protocols. The provider can be located at the dispatch center or connected remotely to the patient.

Finding: The LAQ and PSR programs are excellent examples of triage and referral.

Recommendation: The County should continue these programs and explore innovative solutions that provide the right resources to the right patient at the right time with the right disposition, thereby addressing ED overcrowding, enhancing patient care, and increasing EMS system efficiencies. Nurse Navigation programs are an example of this.

Health Information Exchange

Every EMS patient encounters many different providers during a medical emergency: dispatchers, first responders, transport crews, and ED providers. Bi-directional HIE across the spectrum of care between prehospital providers and EDs enhances prehospital care by providing better patient information and enables providers to confirm their suspected diagnosis after patient transfer to the ED. Benefits include:

Enhanced Patient Care and Communication: Bi-directional HIE allows for the seamless transfer of patient information between prehospital providers and EDs. This enables prehospital providers to access critical patient data, such as medical history, allergies, medications, and vital signs, improving patient care and outcomes. Real-time information sharing with the ED, such as the patient's condition, treatment provided in the field, and patient status changes during transport, enables better care coordination and reduces response times. This facilitates efficient resource allocation, ensuring that the necessary resources, such as staff, equipment, and specialized care, are available when needed.[15]

Continuity of Care: Integrating HIE ensures a smooth transition of care from prehospital providers to EDs. Receiving facilities can access the patient's prehospital records, facilitating a seamless handoff and continuity of care. This helps avoid duplicate tests, delays in treatment, and ensures the accurate capture of the patient's medical history. The patient's personal physician can also see that the patient accessed the 9-1-1 system and the care provided.

Reduced Medical Errors: By ensuring that accurate and up-to-date patient information is available, bi-directional HIE helps reduce medical errors. This minimizes the risk of medication errors, adverse drug interactions, and other mistakes due to incomplete or inaccurate information.

Provider Education: By making patient disposition information available, agencies can use this information for additional education and training of their field staff.

Finding: Stakeholders indicated that the County is in the process of implementing a Health Information Organization (HIO), like HIE. This is an excellent, innovative step for the EMS system.

Recommendation: The County should continue implementing the HIO between its EMS providers and hospitals. The successful integration of an exchange requires collaboration, standardization, financing, and ongoing evaluation to ensure effective communication and seamless transfer of patient information. It should consider the following:

Standardize Data Exchange: Establish a standardized format and set of data elements to be exchanged. This ensures that the information shared is consistent and can be easily understood by both parties.

[15] www.healthit.gov

Implement HIE/HIO Systems: Facilitate the secure exchange of health information between prehospital providers and EDs. These systems should support bi-directional data flow, allowing both parties to send and receive patient information in real-time.

Ensure Data Security and Privacy: Implement appropriate security measures, such as encryption and access controls, to protect patient data during transmission and storage. Maintain patient confidentiality by strictly adhering to the privacy regulations governing personal health information.

Develop Interoperability Standards: Collaborate with vendors and industry organizations to establish interoperability standards that enable seamless data exchange between different systems used by prehospital providers and emergency departments. This promotes compatibility and reduces the need for manual data entry or data conversion.

Train and Educate Users: Provide comprehensive training to all providers on using the bi-directional HIE system. Ensure they understand the benefits, workflow integration, best data entry and retrieval practices, privacy laws, and system security.

Establish Protocols and Workflows: Develop clear protocols and workflows for the sharing of health information. Define the specific data elements that should be exchanged, the timing and frequency of data transmission, and the responsibilities of each party involved.[12]

Explore options for financing or grants through CareOregon or other benefiting organizations to support implementation.

Other Areas of Interest

Behavioral Health

The behavioral health response resources in the County far exceed those available in most communities. One of the main advantages is that they provide a more appropriate and specialized response and destination for individuals experiencing behavioral health crises when they contact 911. Instead of sending them to EDs where they may not receive the specific care they require, these programs connect callers with alternative destinations such as crisis stabilization units, mental health clinics, or mobile crisis teams. The patients also receive case management and follow-up services. By diverting behavioral health calls away from EDs, these programs alleviate overcrowding and reduce waiting times for individuals with other urgent medical needs. This enhances the efficiency of the EMS system and EDs by matching patients with the most suitable resources.

The behavioral health programs provide case management and wraparound services, which are a highly effective approach for individuals with complex mental health and substance use challenges. The care plans often include mental and physical healthcare, housing, and family support, among other necessary services. Individuals in these programs often experience better outcomes and a higher quality of life.

Stakeholder-Identified Challenges

- Some agencies in the EMS system experience challenges in identifying and reporting EMS high-frequency users to TC-911.
- Providing feedback to field providers has been challenging for TC-911. The process previously involved an AMR supervisor looking at patient history for case management information, but that solution is no longer available.
- AMR stakeholders indicated they cannot restrain a patient without law enforcement involvement; however, officers can be hesitant to help.

- Ambulances may transport behavioral health patients directly to Unity, the psychiatric emergency services facility, which is better for the patient. Unfortunately, this facility is not available for admissions at all times.
- Stakeholders noted the need for a withdrawal management and medication-assisted treatment (MAT) program.
- Jurisdictions outside the City of Portland voiced a desire for similar services to be available in their locations. Develop comparable programs in coordination with neighboring cities and towns.

Community Health Programs

Community Health Assess and Treat (CHAT) is operated by Portland Fire & Rescue since 2021, which responds to community members who call 911 for non-emergency medical issues. This program typically involves:

- Assessment and treatment
- Community engagement
- Preventive care
- Collaboration with local health organizations

Portland Street Response (PSR) was launched in 2020 and is currently run by the City of Portland. It aims to address the needs of vulnerable populations without involving the police unless necessary. It is designed to provide a more effective and compassionate response to individuals experiencing mental health crises or substance use issues in Portland. The key elements of the PSR program are:

- Crisis intervention
- Resource connection
- Diverting non-violent crises away from police
- Improving community safety

Central City Concern (CCC) is a nonprofit organization dedicated to addressing homelessness and providing services to low-income individuals and families by focusing on various aspects of community health and housing stability. The CCC program features include:

- Housing services
- Health services
- Employment programs
- Community engagement
- Integrated services

Unity Behavioral Health is a comprehensive mental health service designed to provide support and treatment for individuals experiencing mental health crises; it offers a range of services, including crisis intervention, stabilization, and ongoing support for those with serious mental health issues. It is funded through a collaboration of Portland hospitals to reduce mental health impacts on ED bed use. The main features of Unity Behavioral Health include:

- Crisis services
- Stabilization
- Integrated care
- Support group resources

Tri-County 911 (TC-911) serves those having frequent contact with ambulance crews, first responders, and EDs in the counties of Multnomah, Clackamas, and Washington. This program consists of full-time social workers who engage with hospitals, conduct home visits, accompany clients to appointments,

help clients with community resources, provide supplies and pharmacies, and ultimately link people to the right care, at the right place and time, which reduces the demands on EMS. Key elements of this program are:

- Frequent system utilization monitoring and follow-up
- Care coordination
- Transportation assistance
- Shelter vouchers and referrals
- EMS care plans in specific situations

Finding: All community health programs shared funding challenges, which limit the scope, availability, and effectiveness of their individual programs. While each of these critical programs operates independently and under different agencies, they serve many of the same clients. This leads to inefficiencies and a general lack of coordination.

Recommendation: A unified MIH system, merged under one organization —public or private — combines all behavioral health and EMS resources to function as a single system that serves the continuum of client needs in an organized and coordinated manner. The resulting system would improve efficiencies and the overall availability and quality of care being provided. Seattle/King County (WA) operates a similar program where low-acuity callers are connected to appropriate health and social services. Through its MIH programs, multidisciplinary EMS teams work closely and extensively with frequent callers, lower-acuity callers, and patients requiring complex care to identify their root causes of need and navigate them to more appropriate, longer-term health and social services. These mobile, community-based care teams offer another option for more meaningful intervention that impacts the patient's well-being.[16]

Benefits

- Provide coordinated and specific care customized to the needs of the patient/clients
- Redirect patients from ED use to other services
- Mitigate inappropriate use of EMS resources
- Enable expansion of services
- One point of contact for any community health needs
- Optimize the prehospital EMS and behavioral health resources and reduce overlap

Requirements for Success

- Robust collaboration and planning
- Single client/patient reporting system to track contacts by any entity, or access to the client/patient's records
- Identification and consolidation of all needs and services being provided for clients currently
- Identification and consolidation of all providers of any type of services currently being provided, including case management, treatment, secure transport, etc.
- Single communications center coordinating all entities
- Single managing or coordinating organization
- Updated policies and procedures for directing resources efficiently

[16] 2024 King County EMS Annual Report

Examples:

1. An RFP could require bidders to describe how they would plan to meet the requirements outlined above.
2. The fire service could provide first response, MIH, and transport services as appropriate. This would necessitate coordination between all fire partners in the County.
3. The County could form a public "third" service that consolidates the current mobile behavioral health services along with 911 ambulance response under one department or program.

This service could be dispatched by BOEC, using current EMD protocols, and adding dispatching resources and nurse navigation for Omega calls and the dispatching of mobile behavioral health units. Financial resources currently supporting the mobile behavioral health services would be accrued under this one entity, along with EMS system financing to support the organization. The result would be an efficient, "one-stop-shopping" resource for all pre-hospital needs with the greatest level of coordination and cost-effective care. Further discussion and workplan development can be provided should there be interest in exploring this recommendation further. There may also be interest from other surrounding counties to be explored.

911 Triage and Referral

Through EMD, 911 dispatchers assess the severity of a caller's condition; if it does not require an EMS response based on EMD protocols, which is known as a "triage and referral." Dispatchers refer calls to a medical provider to offer appropriate instructions or referrals. Based on each system's preferences, this can be an EMT, paramedic, nurse, or higher medical authority who follow clearly defined protocols. The provider can be located within the dispatch center or connected virtually to the caller.

Finding: A large percentage of the County population participates in managed care organizations (MCOs). Oregon University, Providence, Adventist, and Kaiser systems have existing nurse triage benefits. MCO 911 callers who meet triage and referral criteria could be navigated to their native nurse triage service for advice, treatment, and appointments. The MCOs would avoid transport and ED costs that could be utilized to pay for the provider-at-dispatch program. This meets the IHI Triple Aim goals to treat patients at the most efficient level possible, reducing healthcare costs, and improving resource efficiencies.

Recommendation: Evaluate the local applicability and value of 911 triage and referral based on the following factors:

Timeliness of Response: The primary goal of 911 triage is to ensure timely and appropriate emergency response. Effective EMD triage protocols and well-trained dispatchers can identify critical situations and prioritize responses accordingly. Conversely, the same dispatchers can classify a non-emergency call and transfer it to an MCO for disposition. The MPDS system is designed to identify these opportunities.

Accuracy of Triage: Accuracy is crucial in determining the appropriate level of response required for a given situation. Dispatchers must gather relevant information from callers and make informed decisions about the urgency and resources needed. The efficacy of dispatch triage can be evaluated by assessing the accuracy of these decisions using the CQI process for EMD and monitoring how often a call is referred back for an EMS response and whether a caller redials 911 within 24 hours for unresolved needs.

Patient Outcomes: The ultimate measure of efficacy is the impact on patient outcomes. Effective 911 triage and referral helps patients receive timely and appropriate care at the lowest cost.

System Efficiency: Effective triage and referral processes can optimize the use of EMS resources and improve system efficiency. Accurately deferring non-emergency patients to medical provider advice and referral to alternate care options avoids unnecessary ambulance transports and ED visits. This reduces costs, alleviates the strain on healthcare resources, and improves overall EMS system performance.

It is important to note that 911 triage and referral can have a positive or negative impact depending on how the program is designed. Continuous evaluation, training, and system improvements are necessary to ensure the quality of these processes and minimize any potential shortcomings. For example, it provides little value at 3am if the only option is ambulance transportation to an ED. Additionally, public education and awareness campaigns can promote proper utilization of emergency services and reduce using 911 inappropriately.

City Stakeholder Communication

Cities indicated a desire to review response time and clinical care quality performance reports, particularly if the data could reflect performance in their general area or similar demographics, such as the rural environment. They also voiced a desire to be included in the EMS system decision-making and collaboration with the County.

Finding: The County EMS website contains links to urban and rural ambulance response time information, including the past six years.[17] Clinical care quality reports are not available online.

Recommendation: Update the EMS website to include clinical care quality reports. Meet periodically with City Managers to provide EMS system updates, ensure an understanding of how the ASP impacts the County's ability to make changes, and invite participation and collaboration where beneficial.

Interfacility Transports (IFT)

Hospitals often struggle to meet all types of healthcare needs due to resource limitations, specialization requirements, regulatory constraints, and financial considerations. Interfacility transport (IFT) services ensure patients reach the most appropriate level of care in a timely, safe, and efficient manner. This involves transferring patients between healthcare facilities based on their medical needs, available resources, and the urgency of their condition. Hospitals and counties must adhere to strict requirements to ensure this goal is met, including those outlined in the Emergency Medical Treatment and Labor Act (EMTALA).

Gaps existing in IFT services often impact 911 ambulance availability and the EMS system as a whole when 911 resources are utilized to fulfill this service to prevent negative patient outcomes. The IFT system is fragmented nationally, with significant disparities between urban and rural areas. Many communities struggle with shortages of ambulance resources, financial constraints for ambulance organizations and hospitals, and prolonged delays that result in the loss of beds and delayed care for patients. The inability to transfer patients in a timely manner contributes to delays in appropriate patient care, as well as hospital and ED overcrowding. Ambulance organizations are often unfairly blamed for delayed responses and a lack of resources, but addressing these issues requires national policy changes, state policy adjustments, funding improvements, alternative transportation solutions, and technological advancements. Collaboration is key as no single approach solves the problem; combining multiple strategies can lead to improvements to this critical infrastructure. Solutions must be

[17] *https://multco.us/info/emergency-medical-services, under "Ambulance Response Data Reports" heading*

people-centered, safe, effective, integrated and seamless, reliable and prepared, equitable, sustainable and efficient, adaptive and innovative.[18]

Findings:

- Patients in the County can wait many hours for an IFT ambulance, according to stakeholders, which can be problematic for time-dependent procedures or cause the loss of receiving facility beds. Stakeholders reported that when MetroWest, the primary IFT provider, is unavailable, hospitals request a Code 3 ambulance from the 911 system, which impacts 911 ambulance availability and response times.
- Due to government payers reimbursing below the true IFT cost, some hospitals will reimburse IFT providers at some level or become the payor of last resort to increase IFT availability for their patients.
- Stakeholders report that MetroWest is struggling to retain staff due to lower wages available for IFT services and the desire by staff to be in the 911 system.
- The nature of hospital discharges can cause multiple requests simultaneously, with no demand at other times. This creates challenges to match supply to demand.
- 911 is considered the safety net for emergent IFT patients, but stakeholders believe it is overused. When wait times are extended, stakeholders estimate that hospitals call 911 five times daily.
- Identification of a patient as "critical" or "emergent" has been challenging, according to stakeholders.
- When critical care transport (CCT) is unavailable, most hospitals no longer have the staffing to send a nurse, reducing a backup option for critical patients. Stakeholders reported that there are instances when patient care is modified to facilitate transport by a paramedic instead of a nurse. This may compromise the desired level of care for the patient.

Recommendations:

- MCEMS could spearhead a collaborative endeavor, bringing hospitals, ambulance providers, and the EMS Agency together to explore solutions for the EMS and IFT systems.
- Increase collaboration between discharge planners and IFT requests to smooth demand and prioritize the order of transports. This works well for MCOs who are financially responsible for the transports.
- Conduct a systemwide demand study of resources needed for ALS IFT, CCT-P, and CCT to confirm a deficit. If so, invite other IFT companies to provide services.
- The EMS Agency CQI team should audit emergent IFT requests through the 911 system to validate appropriateness. Those hospitals making requests that do not meet this threshold should receive education on the emergency IFT policy.
- Develop a CCT-Paramedic (CCT-P) program and related protocols to reduce the frequency of nurse involvement in CCT transports.
- Work with hospitals to determine if telemedicine consultations could reduce unnecessary transfers
- Consider hospital financial support or guarantee payment to improve IFT availability.
- Hospitals can lease unit hours during periods of higher volume and manage IFT workload.

Utilization of Artificial Intelligence (AI) and predictive analytics: Identify opportunities to leverage AI and predictive analytics to forecast resource demand based on historical data, utilizing actual request information versus negotiated times, for real-time recommendations on ambulance allocation. The use

[18] www.emsagenda2050.org

of AI and predictive analytics, or the use of MPDS, can also be used to predict transport needs and allocate ambulances efficiently. This helps determine which patients need emergency transport vs alternative transportation. Examples of analytics in EMS:

- First Due is a Fire/EMS AI tool
- The First Watch Resource Planner analyzes system demand and identifies potential resource scheduling and optimization opportunities.

Other IFT Solutions

Create a Dedicated IFT System: The County could explore creating a dedicated IFT system. This can be 1) part of a 911 RFP and contract (See Monterey County (CA) or Northwell (NY) Health's CCT program mentioned below), 2) a separate system RFP for IFT and include non-911 system needs such as secure transport, or 3) the County can encourage health systems to collaborate and contract for IFT services. Examples:

- Northwell Health's CCT program (NY): Specialized IFT separate from 911 ensures timely patient transfers, which includes nurse CCT and CCT-P.
- Boston MedFlight (MA): Provides both air and ground IFT as a non-profit.
- Mayo Clinic Medical Transport (MN): The Mayo Clinic operates its own ground and air transport services.
- Geisinger Health System (PA): This provider contracts with private medical transport companies with guaranteed availability.
- Sinai Chicago Hospitals (IL): The Mount Sinai Inter-Hospital Transfer Service provides a streamlined referral process that assists with admission processing, bed assignment, and transportation services, including specialized transport at the basic and advanced level.

Combine IFT and 911 Services: Add IFT services to the next EOA competitive bid. The County can specify response times for IFT to ensure a higher level of reliability.

Telemedicine for pre-IFT Evaluations: This can prevent unnecessary IFTs and reduce healthcare costs by keeping patients locally. It can speed up decision-making and ensure that only the most critical cases are transported. An example of where this could be helpful would be a trauma center that agrees to remain available for consultation services in exchange for a non-trauma center to keep the patient locally, such as a ground-level fall patient on Coumadin. This can be an outcome of a collaborative endeavor suggested to the hospitals by the County. Examples include:

- Cleveland Clinic Telehealth Triage (OH): Uses telemedicine to assess patients before IFT to higher-level facilities.
- Texas ER-Telehealth Pilot Program: Remote specialists guide local hospitals in stabilizing patients.

Public-Private Partnerships for Transport: Funding opportunities can help bridge the funding gap for IFT services. Examples include:

- Colorado Rural EMS Grant program.
- State-funded grants can help rural EMS organizations purchase ambulances and hire more paramedics for IFT.
- Georgia's EMS Cost-Sharing Model: Local governments partner with private EMS to split costs for IFT, ensuring availability.

These strategies can help sustain IFT ambulance companies, ensure consistent IFT resources are available, especially in rural areas, and reduce the burden on hospitals and 911 resources.

County EMS Committees

The County holds a comprehensive variety of committees addressing the EMS system's needs, including the EMS Advisory Committee (EMSAC), EMS Ops Group, Protocol Development Committee, Dispatch Committee, Dispatch User Board, Dispatch CQI Committee, Contract Compliance and Rate Regulation Committee (CCRRC), MCEMS CQI Committee, and ED/EMS Leadership Collaborative Committee. EMS system committees offer stakeholders a forum for input, collaboration, and discussion with MCEMS.

Finding: The County enjoys the opportunity to receive feedback and communicate with numerous EMS system stakeholders across all system components through the various committees and groups that meet regularly.

Finding: Some field stakeholders expressed concerns that the representation on various advisory committees lacked broad representation. In some cases, stakeholders noted that the ability to provide input was reduced when representatives stepped down and were not replaced. This led to a feeling that they are not involved in the EMS system decision-making at a higher level.

Upon review, nearly all of the committees have broad representation, including fire, ambulance, dispatch, and field staff. However, there were two exceptions noted. EMSAC, a committee that was formed to evaluate the findings and recommendations of the EMS Assessment, is advisory only and has no decision-making ability. The EMSAC Committee has broad clinical leadership represented and an IFT ambulance representative, but it does not have representation from first responders, dispatch, or a field paramedic. The CCRRC is part of the ASP; representation is detailed in the County Code. It was noted that dispatch is not represented.

Recommendation: Consider adding fire, dispatch, and field representatives to EMSAC. These representatives add value by sharing their unique perspectives to decision-making, increasing engagement, providing greater transparency, and improving communication with the rest of the field. Adding a dispatch representative to the CCRRC is suggested for similar benefits.

Hospital Wall Times

An effectively functioning EMS system and available ED beds are vital to everyone. Ambulance patient offload time (APOT) describes when transferring patient care from the ambulance crew to the ED staff. These delays negatively impact patient safety, patient and provider satisfaction, and ED throughput efficiency and effectiveness. When crews are delayed during transfers, it decreases ambulance availability and contributes to the overall cost of the EMS system. Stakeholders reported experiencing APOT delays, which impacted ambulance availability in the system.

While not as severe as other areas, opportunities may exist for Multnomah County to reduce APOT times by collaborating with system participants to explore solutions, and monitoring what other systems are doing to reduce APOT delays. According to the Tri-county APOT reports, the ambulances operating within Multnomah, Washington, and Clackamas Counties experienced 850.7 excess hours spent waiting for an ED bed due to offloads that exceeded 20 minutes from February through May 2025. If a unit hour costs $223/hour, this represents an opportunity for $190,000 to be applied elsewhere in the system during those four months. The ED/EMS Leadership Committee also serves as the APOT Review Committee.

Medical Helicopter Utilization

Using medical helicopters in the 911 field responses can have several positive impacts. Helicopters can provide rapid transportation for critically ill or injured patients. They can quickly reach remote and

inaccessible locations, bypassing traffic congestion and geographical obstacles. They also bring a higher level of care to the scene as most helicopters are staffed with a paramedic and a critical care registered nurse, with an expanded scope of practice beyond ALS. Transferring a patient to a helicopter immediately allows the ambulance to return to service, which can be vital for a rural environment, such as the Columbia River Gorge. Auto-launch protocols for known areas with extended response times and access challenges can save time by dispatching the helicopter simultaneously with the initial responding resources.

However, the utilization of medical helicopters must also consider that they are subject to weather conditions and operational limitations. Adverse weather, such as heavy rain, fog, or high winds, can ground medical helicopters. Additionally, operational constraints, such as limited availability or restricted landing zones, may affect their ability to respond promptly in certain situations.

Stakeholders noted that the medical helicopter service in the County is a not-for-profit service. These aircraft resources are available for critically ill and injured patients whose conditions meet the criteria for helicopter transport. Cancellation or non-response rates can be broken down into several categories:

- Mechanical issues
- Ambulance arrives before the helicopter
- Changes in the condition causing the patient to be unstable for transport
- Loss of bed at the receiving hospital

Stakeholders noted that landing zones can be challenging in the County due to the presence of tents and other debris that are often nearby. It is often faster to send patients by ground once the combined time for pre-flight, travel, scene, and transport is considered. This is especially true if the ambulance arrives on the scene before the helicopter. Stakeholders stated that helicopters could be better utilized in the outlying areas, such as Gresham, and that most helicopters are based in rural locations, which may result in longer response times for the County.

Finding: Helicopter Policy #50.080 does not mention auto-launch criteria or direction.

Recommendation: Review of the helicopter policy. Consider adding more details to the dispatch procedures section to add instructions for arranging transportation from PDX to the hospital. Consider adding auto-launch protocols for remote areas. Once updated, EMS providers in remote areas should receive training on the appropriate use of helicopters.

Prehospital Personnel Capabilities

Using all levels of EMS personnel allows an EMS system to function efficiently, effectively, and flexibly. Each level has a distinct scope of practice and can be used to meet the needs of the patients at their level of need. The advantages of using all EMS levels include efficient resource allocation, scalability, improved coverage, fostering a team-based approach, training, and retention. The EMS system would improve resource utilization, and clinical research demonstrates that patients receive better care.

Emergency Medical Responders

Emergency Medical Responders (EMRs) provide initial care and stabilization until a higher level of service arrives. They are most prevalent in rural or remote areas, where response times can be longer and local resources are limited. The EMR certification requires fewer training hours and fewer continuing education classes to maintain the license. The training covers critical interventions, including CPR, bleeding control, and basic airway management. This level is most appropriate for volunteer fire agencies whose providers may have limited time to train as well as law enforcement for value-added skills until help arrives.

Emergency Medical Technicians

Vital to most EMS systems, EMTs offer a wide range of basic skills and provide life-saving care for patients. The training includes basic pathophysiology, oxygen administration, vital signs, splinting, AED use, patient assessment, and transport, in addition to EMR skills. EMTs can respond and stabilize many situations. It is a common requirement for career firefighter positions. Recent scope of practice additions enable EMTs to provide advanced skills, including administration of aspirin, naloxone, epinephrine, albuterol, CPAP, supraglottic airways, and glucose monitoring. EMTs can appropriately handle many 911 calls based on call triaging using EMD determinants. Many EMS systems are doing so. These units could be sent on lower acuity calls, saving the higher acuity calls for the 911 ALS units.

EMTs are the backbone of BLS IFT services. IFT is an introduction to the prehospital environment, allowing familiarization with the response and transport of patients by ambulance. These BLS ambulances offer an excellent adjunct to the 911 system during major MCI events and disasters.

Advanced Emergency Medical Technicians

Advanced EMTs (AEMTs) begin with the same training as EMTs, supplemented with additional ALS procedures. While the skill gap between EMT and AEMT has diminished significantly, AEMTs can provide some treatments that would benefit time-critical conditions. These treatments include intravenous (IV) therapy, limited medication administration, including Glucagon.

Within an EMS system, AEMTs have greater capabilities as first responders, receive training to support a paramedic partner, and have a larger scope for IFT patients. In situations where first responder ALS (FRALS) begin treatment, they could turn over more patients than an EMT.

Paramedics

Paramedics deliver comprehensive ALS services, including ECG interpretation, drug administration, advanced airway management, cardioversion, 12-lead ECG acquisition, etc. They have additional training to manage complex medical emergencies and traumatic injuries.

With the depth of knowledge and skills, paramedics can also serve in less traditional roles. During the COVID pandemic, paramedics supported mass vaccination events, federal medical surge shelters, and EDs. Keeping them in mind during unusual situations can lead to innovative solutions for one-time challenges.

All fire agencies in the County, except Sauvie Island Fire, have at least one paramedic per station. This allows for patient assessment to be completed and ALS care to begin if the ambulance has not arrived. When necessary, firefighter/paramedics can assist the ambulance paramedics with critical patients during transport. In rare cases when a BLS unit is dispatched to a 911 call that requires ALS interventions, the firefighter/paramedic can continue providing ALS care to the hospital. This scenario would benefit from a CQI review to improve future resource matching acuity by dispatch.

Critical Care Paramedics (CCP)

A CCP has additional training beyond that of a standard paramedic, focusing on managing critically ill or injured patients. They are especially useful for critical care patients during IFT. A CCP is trained to manage complex and unstable patients through mechanical ventilator management, advanced airway techniques (e.g., RSI), advanced suction techniques, and additional medications. They can manage advanced monitoring equipment, including arterial lines, central venous pressure readings, and pulmonary artery catheter interpretation. They have an expanded scope of practice related to medication administration, including vasopressors, sedatives, paralytics, antiarrhythmics, and cardiac infusions. CCP can support IFT needs more than a paramedic, but less than a nurse.

Given the current concerns of less experienced paramedics in the EMS system, a CCP may be appropriate to fulfill the role of an acute care paramedic described in the Ambulance Staffing Model and Schedules section. Concentrating acute care procedures within a small cadre of EMS personnel will benefit the highest acuity patients through greater skill proficiency. The CCP position provides a career advancement opportunity currently unavailable.

Critical Care Nurses

EMS systems typically use nurses for critical care IFTs. In this County, MetroWest provides Specialty Care Services that include a paramedic and an RN. Additionally, ED nurses can serve this purpose; however, they are becoming less available due to internal staffing shortages and liability concerns operating outside the hospital. CCP and ALS IFT can reduce demand for nurse CCT, protecting the highest-level resource for the most critical patients. IFT providers should consider staffing on-duty or on-call nurses to support patient navigation to higher levels of care and repatriation of MCO members.

Behavioral Health Field Providers

As discussed, earlier, the County enjoys robust behavioral health prehospital resources. These providers have a variety of credentials including EMT, paramedic, community health worker, therapist, etc. Greater coordination and possible consolidation of these services could further reduce 911 calls and ED visits while delivering the right care to the right patient. In a consolidated setting, personnel can be utilized based on their credentials, potentially expanding their capabilities to benefit the community.

Secure Transport

IFT ambulance and other companies provide secure transportation for patients who are at risk to themselves or others. Unless a patient has a high-acuity medical need, ambulances are less than ideal for this task due to being an expensive resource that does not offer the same level of security as vehicles designed for this purpose. There have been cases in other areas where patients have jumped from the back of a moving ambulance. Further, using ambulances for these cases removes them from 911 and IFT systems that are already highly leveraged.

Law Enforcement

Officers will respond to medical calls, especially when they are high-acuity, such as a cardiac arrest. Everyone receives biannual CPR training, which includes AED use. Many counties encourage patrol cars to carry AEDs. This can benefit the public, but often it is used for officers following a high-stress event (e.g., foot pursuit). These officers have been credited with saving lives due to their proximity to the scene, quick response, administration of CPR, and use of an AED. Any opportunity to increase the availability of AEDs for patrol cars should be taken advantage of.

Dispatch Specialty Positions

The EMS system enjoys the benefits of the AMR SSPC position, who coordinates with BOEC staff to ensure the SSP is implemented and serves as a point of contact and support for AMR field crews. The LAQ Coordinator is an important addition in the system to prioritize BLS units to lower acuity calls. Both positions improve system efficiencies, quality, and are best practice.

CONCLUSION

Multnomah County is a high-performance EMS system that integrates evidence-based clinical protocols, nationally recognized dispatch systems, innovative staffing models, integration with first responders, and a comprehensive quality assurance and improvement process. The hospital system is top-notch with high-functioning trauma, stroke, and STEMI centers. The County and the City of Portland's approach toward behavioral health, substance abuse, and challenging social conditions, particularly among those experiencing homelessness, is remarkable, with numerous programs that address the multiple challenges with this population. Like any busy system serving a primarily urban area, this report highlights the strengths and opportunities for improvement in key areas:

Acute Care Paramedics: An acute care paramedic or APP position open to seasoned paramedics with substantial experience and additional training could mitigate concerns about inexperienced paramedics providing advanced level care. These advanced paramedics would respond along with the ALS ambulance to the highest-acuity emergency calls based on MPDS category or as requested by resources on scene. Consolidating advanced skills into a small cadre of paramedics has proven to increase proficiency in other EMS systems including Seattle/Kings County, WA. The EMS Medical Director would determine the most appropriate emergencies that would benefit from their advanced skills. This APP program could be operated by the contracted ambulance provider, the fire department, the County, or other configuration as part of an RFP process.

United Mobile Integrated Healthcare system: A unified MIH system, merged under one organization — public or private —that combines all behavioral health and EMS resources to function as a single system, serving the continuum of client needs in an organized and coordinated manner. The resulting system would improve efficiencies and the overall availability and quality of care being provided. The MIH and Behavioral Health Programs operating under one organization with EMS could provide coordinated care customized to the needs of all patients and clients, redirect patients from use of the ED and inappropriate use of EMS resources, reduce duplication of services by multiple entities, and expand the availability of resources. However, there is some indication that the State of Oregon may not be supportive of an MIH program, especially in the Ambulance Service Plan, which could pose a challenge to implementation.

Communications Center: The use of MPDS is a key strength of this communications center. That they are performing at a high level and intend to obtain status as an Accredited Center of Excellence is very positive. There are opportunities to leverage this system in several ways to increase the reliability and utility of the EMS system, including a systematic review of internal CQI findings, adjustments to prioritization of lower acuity calls, and improvement of law-initiated requests for EMS responses. Recommendations include conducting a systematic review of MPDS prioritization, improving integration with fire and EMS dispatch, and enhancing efficiency with the AMR dispatch function. Finally, there is an opportunity for better coordination with PSR, continued development and integration with the LAQ, or exploration of nurse navigation.

Medical Supervision: Key strengths of the EMS system are the consolidation of medical control with a single physician and associates, as well as a unified set of county-wide protocols and procedures. The medical direction is progressive, follows evidence-based decision-making, and is readily available to the field personnel. Specific feedback centered on the desire for direct-to-triage (i.e., EMS patient to waiting room) protocols, continued and enhanced representation, involvement, and engagement on CQI and education, and greater dispatch participation. Finally, there is a desire for systematic integration of hospital outcomes into the EMS data set to enable robust quality improvement and loop closure with field providers.

Ambulance Demand, Deployment, and System Status Management: The EMS system is busy with a steady increase in calls for service over the past four years. There are moderate seasonal variations, with the greatest demand in the summer months. The AMR dispatch desk at BOEC is an important component of ambulance resource management, but it needs better workflow and technical integration with BOEC operations. As previously recommended, a systematic review of MPDS dispatch determinants compared to clinical interventions and outcomes will help optimize allocation of EMS resources to minimize under- and over-response to incidents. There are opportunities for greater efficiency in the areas of field clearance and treat and release. The integration of EMT/paramedic staffed ambulances and BLS ambulances with LAQ use has improved issues with response times and provider fatigue. Various strategies are recommended to improve recruitment and identify the need for enhanced onboarding training for new and inexperienced personnel. Finally, the EMS system should monitor the use of mutual aid to prevent abuse of neighboring counties.

Integration of First Responders: Multiple first responders provide the backbone of EMS response in the County and include Portland Fire, PDX Fire, Gresham Fire, Cascade Locks Fire, Sauvie Island Fire, and Corbett Fire. Except for Corbett Fire and Sauvie Island Fire, all are ALS providers. While MPDS priority response recommendations are provided through the dispatching process, there is variation within departments, and within individual engine officers, about which calls warrant a response from first responders, and if lights and siren are indicated, and the priority response recommendations can be overridden. This leads to recommending a standardization of procedures and policies for the whole EMS system based on the best available data. Electronic PCR programs are not consistent between ALS agencies, and standardization is a recommendation. Other opportunities include first responder representation in the EMS Advisory Committee, limited first responder transportation capability, fire rider standards, mental health transportation, and AED-equipped police patrol vehicles.

EMS Operations: The current contract requires a minimum of one paramedic field supervisor and no on-duty/on-call Administrative Supervisor or Operations Chief. This is a large and complex system with multiple ambulance configurations, high system volume, and complex geography. Additional field supervisors would benefit the system. Better coordination is needed with allied providers, such as PSR, to identify appropriate disposition of behavioral health clients, challenging social conditions, and appropriate disposition of high system utilizers.

EMS System Financial Analysis: 75% of all EMS transports are restricted to government payment schedules. Due to this high proportion, rate increases will generate little additional revenue for sustaining operations. Sustainability will require optimal resource allocation and realistic expectations.

Ambulance Response Times and Tiered Response: Ambulance response times continue to be a key focus and source of complaint, but there is evidence of continued improvement. The use of the LAQ and hybrid ambulance staffing with improved recruitment is the primary contributor toward this improvement and should continue. There is an opportunity to further refine resource utilization through MPDS to avoid inappropriate dispatch of ALS ambulances.

Non-Emergency Response Time Requirements: LAQ calls do not have a response time standard. This is appropriate for calls that have completed the EMD process, which is a proven and trusted triage methodology. Expand this policy to include all 911 calls deemed non-life-threatening by MPDS category. EMS systems with response time standards for only emergency calls experience greater ambulance availability for life-threatening calls with lower operating expenses due to reduced unit hours.

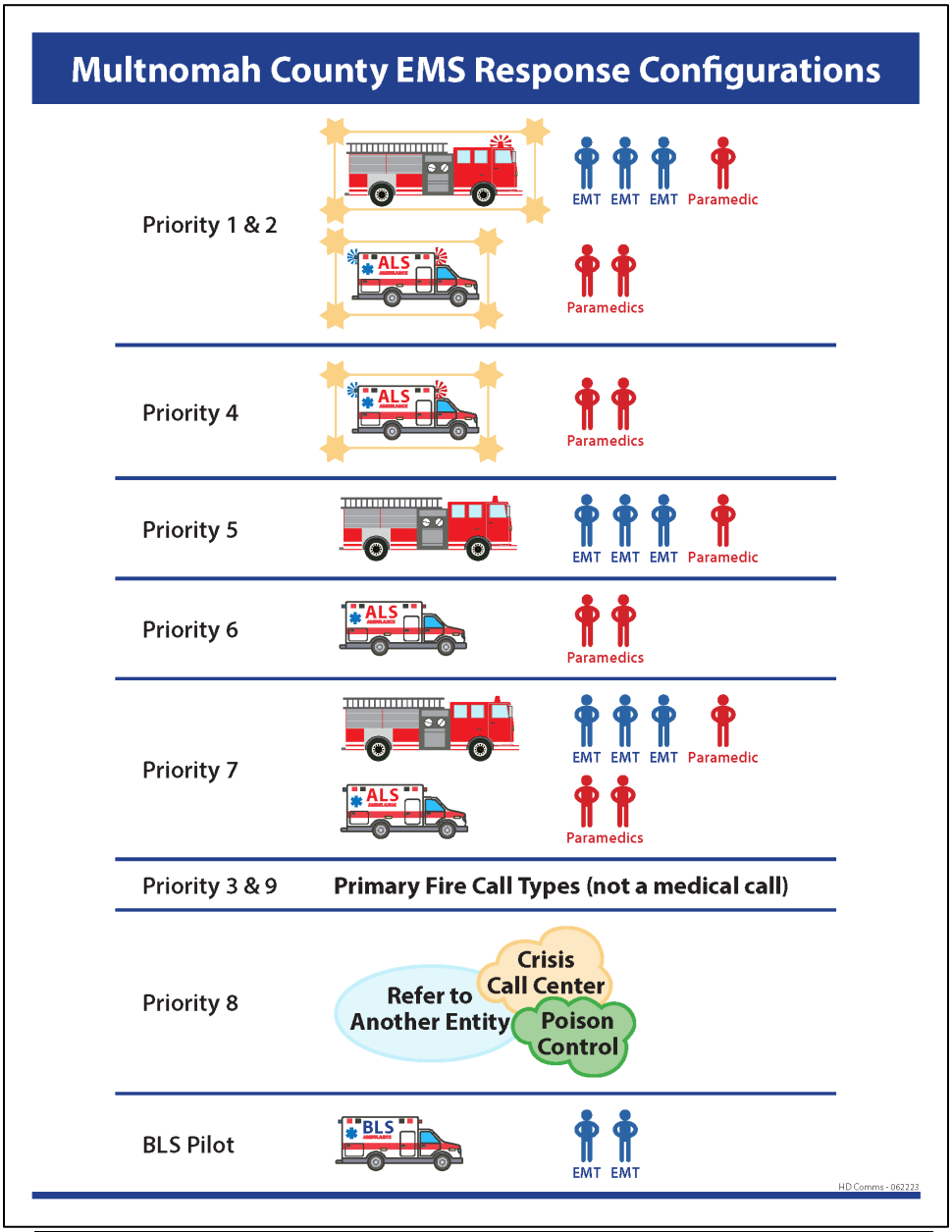
This report provides additional recommendations for community paramedicine, behavioral health alternate destination, HIE, 911 triage and referral, allied partners, and post-discharge follow-up. HCS is impressed with the EMS system in the County. Like any EMS system, there are challenges and opportunities presented by the ever-evolving landscape of EMS and healthcare in general, but the County has the systems and people in place that can assess and adapt to these changing conditions.

ATTACHMENTS

Acronyms

ACE	Accredited Center of Excellence
AED	Automated Electronic Defibrillator
AEMT	Advanced EMT
AI	Artificial Intelligence
ALS	Advanced Life Support
AMR	American Medical Response
APOT	Ambulance Patient Off-load Time
ASP	Ambulance Service Plan
BH	Behavioral Health
BLS	Basic Life Support
BOEC	Bureau of Emergency Communications
CAD	Computer-Aided Dispatch
CARES	Cardiac Arrest Registry to Enhance Survival
CCC	Central City Concern
CCP	Critical Care Paramedic
CCRRC	Contract Compliance and Rate Regulation Committee
CCT	Critical Care Transport
CCT-P	Critical Care Transport-Paramedic
CCT-RN	Critical Care Transport-Nurse
CBRNE	Chemical, Biological, Radiological, Nuclear, Explosives
CHAT	Community Health Assessment Team
CLFED	Cascade Locks Fire and EMS Dept.
CMS	Centers for Medicare and Medicaid Services
CP	Community Paramedic
CPA	Certified Public Accountant
CPAP	Continuous Position Airway Pressure
CPR	Cardiopulmonary Resuscitation
CQI	Continuous Quality Improvement
ECG/EKG	Electrocardiogram
ED	Emergency Department
ED-Q	Emergency Dispatch Quality
EMD	Emergency Medical Dispatch
EMS	Emergency Medical Services
EMSAC	EMS Advisory Committee
EMT	Emergency Medical Technician
EMTALA	Emergency Medical Treatment and Labor Act
EOA	Exclusive Operating Area
ePCR	Electronic Patient Care Report
FRALS	First Response ALS
GFD	Gresham Fire Department
GMR	Global Medical Response
HCS	Healthcare Strategists
HIE	Health Information Exchange
HIO	Health Information Organization
IAED	International Academy of Emergency Dispatch
ICS	Incident Command System
IFT	Inter-Facility Transports
KPI	Key Performance Indicator
LAQ	Low Acuity Queue
LE	Law Enforcement
MAT	Medication Assisted Treatment
MCEMS	Multnomah County EMS Agency
MCI	Multi-Casualty Incident
MCO	Managed Care Organization
MPDS	Medical Priority Dispatch System®
NAEMSP	National Association of EMS Physicians
NEMSA	National EMS Advisory Council
NEMSQA	National EMS Quality Alliance
NEMSIS	National Emergency Medical Services Information System
PCR	Patient Care Report
PDX	Portland Airport
PFD	Portland Fire Department
PSAP	Public Safety Answering Point
PSR	Portland Street Response
QA	Quality Assurance
QI	Quality Improvement
QPR	Quality Performance Review
RFP	Request for Proposal
SIFD	Sauvie Island Fire Department
SME	Subject Matter Expert
SSM	System Status Management
SSPC	System Status Plan Coordinator
STEMI	ST-Elevated Myocardial Infarction
SWOT	Strengths, Weaknesses, Opportunities, Threats
TC-911	Tri-County 911

Multnomah County EMS Response Configurations



Medical Call Priorities					
Priority	**Lights & Siren**	**First Responders**	**Ambulance**	**2024 Calls**	**Percentage**
1 & 2	X	X	X	61,757	56.5%
4	X		X	19,477	17.8%
5		X		2,576	2.4%
6			X	23,205	21.2%
7		X	X	401	0.4%
8				1,829	1.7%
Total				**109,245**	**100.0%**

SUPPLEMENTAL REPORTS

(included by reference)

Completed

1. Report on the efficacy of response time standards and recommendations
2. Report on the efficacy of time-based compliance performance measures and clinical performance indicators
3. Report on the efficacy of equity response zones and recommendations
4. Report Identifying Multnomah County Trends affecting EMS
5. Report on EMS Service Models Options

Pending

1. Ambulance service Continuity of Operations Plan (COOP)