EMERGENCY MEDICAL SERVICES SYSTEM EVALUATION

City of Missoula, Montana

September 2023

Emergency Services Consulting International
Providing Expertise and Guidance that Enhances Community Safety

Contents

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…and the rest of the members of Missoula Fire Department who selflessly serve their citizens and visitors with compassion and professionalism.

SECTION I
INTRODUCTION

Background

Missoula, Montana is growing rapidly, placing increasing pressure on all city services such as fire, rescue, and Emergency Medical Services (EMS), including ambulance transport. The current ambulance service provider, Missoula Emergency Services, Inc. (MESI) operates under a performance contract with the city managed by the fire department. As Missoula Fire Department (MFD) experiences an increasing emergency incident workload, with EMS call volume comprising approximately 65% of the total call volume and the contract with MESI up for renewal in August of 2024, the city desired an independent study to ensure that the current level of emergency medical services provided to the community is both appropriate and being provided in the most efficient and effective manner. Emergency medical response is a critical factor in every community as a core service, and the Missoula City Council desires to have its EMS service examined to comparable industry standards.

Project Scope

The study is being conducted to identify and ensure the MFD and its EMS relationships are providing a suitable level of EMS to its community, while simultaneously maintaining the highest level of customer service possible. The project's overall scope is to evaluate the current EMS delivery system for the city of Missoula and make necessary recommendations, if any, to improve community services.

The project was divided into three main elements, an evaluation of the current delivery system, projections for system growth, and options for moving forward. The evaluation of the current system included:

- Overview of current EMS system
- Planning for EMS
- Fiscal analysis
- Staffing and personnel management
- Capital facilities and equipment
- EMS delivery and performance metrics
- A review of the Missoula Emergency Services, Inc. (Current EMS transport contractor) ambulance deployment model and incident distribution

- A review of the MFD deployment model and response to EMS calls

System projections included:

- Population growth projections
- Service-demand projections
- EMS-Oriented community risk analysis

Future strategic options that were considered included:

- Establishment of performance standards
- Options for achieving performance standards
- Associated impacts

ESCI reviewed local and regional standards; and relevant standards and criteria from the *National Fire Protection Association* (NFPA), *Commission on Fire Accreditation International* (CFAI); *Commission on Accreditation of Ambulance Services* (CAAS); *Commission on Accreditation of Medical Transport Systems* (CAMTS); applicable health and safety requirements; State of Montana and federal regulations relative to the fire service, EMS, and other emergency services; and online journals and reports regarding the state of the EMS profession.

Project Study Area

The following graphics show the study area of the city of Missoula and the second graphic depicts the response area for the business unit of MESI that covers the Missoula region.

Figure 1: City of Missoula Study Area

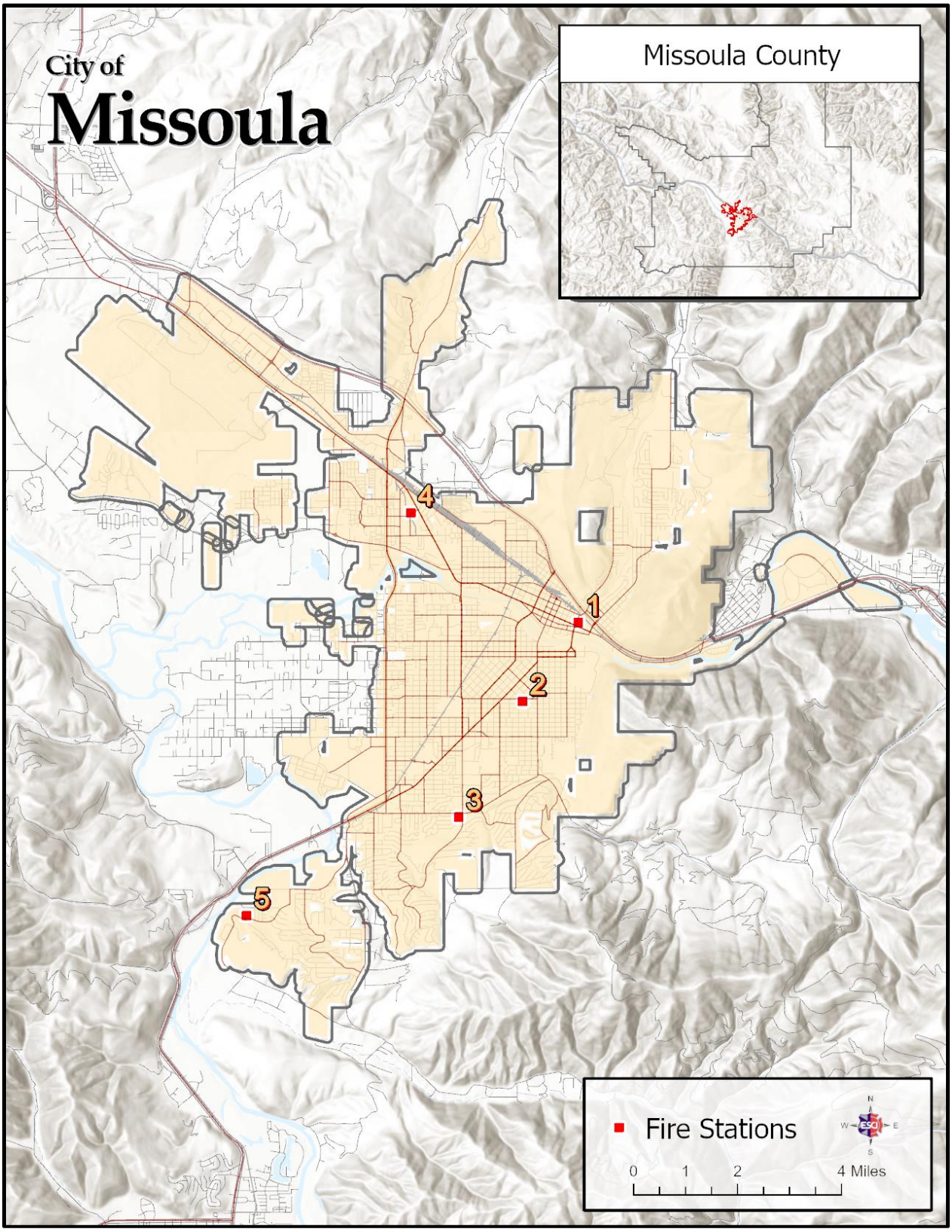
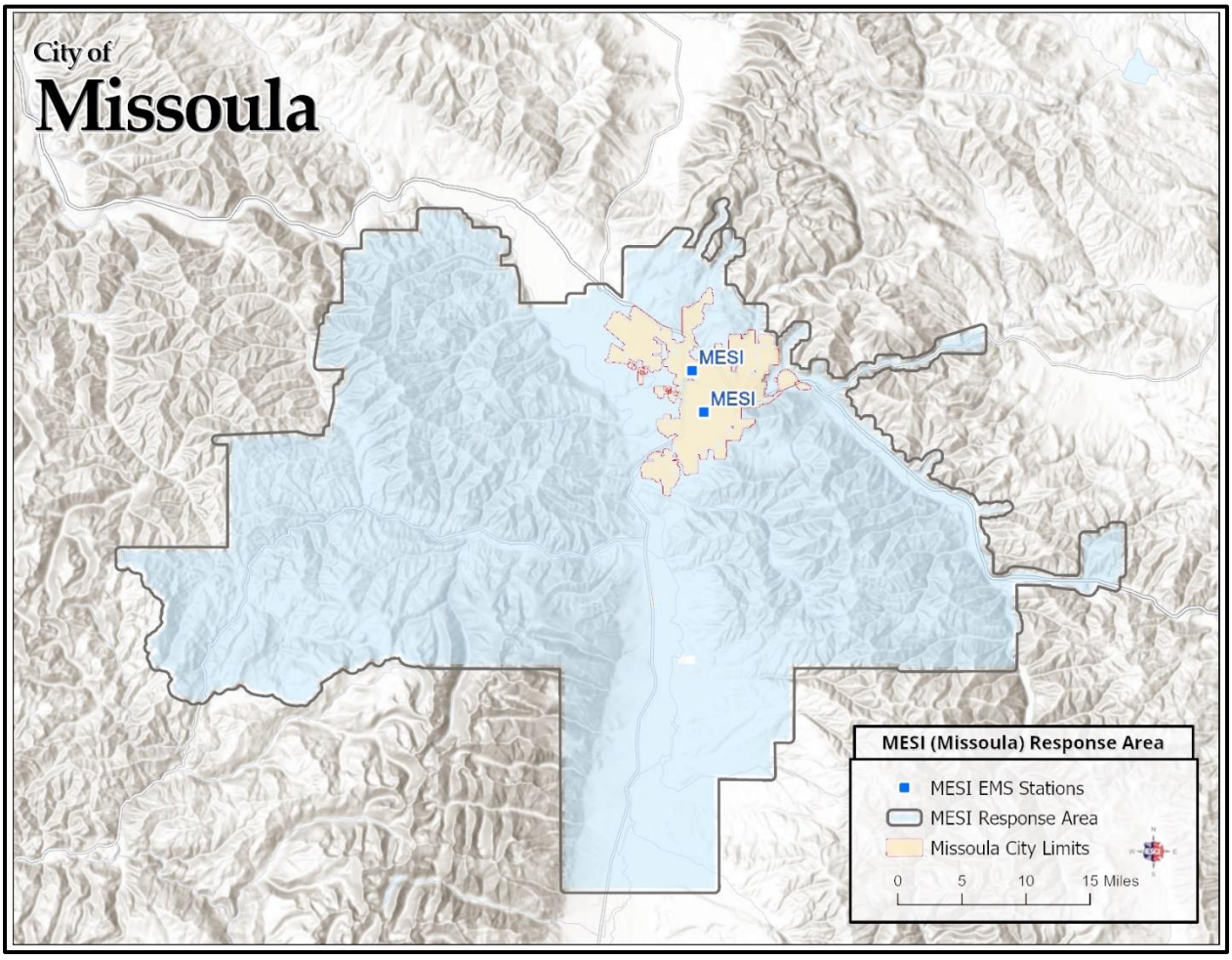


Figure 2: MESI (Missoula) Response Area



Missoula Demographics

According to the US Census Bureau, the 2022 population of Missoula is estimated at 76,955 making it the second largest city in Montana. Only 13.6% of the population is over the age of 65, lower than the state's percentage of 19.7%. Median income within the city is $54,423 with a poverty rate of 16.0%, higher than the state's poverty rate of 8.8%.

Missoula spans 35.0 square miles and has a population density of 2,199 people per square mile. The land usage is dominated by residential space (50.0%) and open space (30.0%), making the city a popular relaxing recreational-oriented community. Fifty-six acres of the city are devoted to the University of Montana's flagship campus of 10,000 students.

SECTION II
EXECUTIVE SUMMARY

Scope of Study

The city of Missoula contracted with ESCI to determine the effectiveness of its existing EMS system and whether changes needed to be made. Several conditions served as a catalyst to initiate the study. Those conditions included:

- Long-term impact of COVID on the existing EMS system and their private provider
- The upcoming renewal/expiration date of the existing EMS service contract
- Growth potential within the community and its impact on the EMS system
- Performance standards questions within the system to include all elements of the EMS delivery system from 9-1-1 call reception to potential patient transport.

ESCI obtained data and documents and performed on-site interviews with all members of the delivery system, including senior and union members of the Missoula Fire Department, Missoula County Sheriff 9-1-1, Missoula Emergency Services Incorporated (existing private EMS provider), Missoula area EMS physician advisor, and other Missoula area fire chiefs.

Conclusions

Through a collaboration with MFD staff of evaluating exhaustive options for future service and enhancements, ESCI has compiled the following four broad strategic direction options for EMS for the city, as well as fifteen recommendations on how to enhance the existing system. Pros, cons, and costs of options are provided in the report. The four possible strategic directions include the following:

- Delivery remains unchanged but includes some improvements.
- MFD takes over providing emergency transport services from MESI.
- Create an EMS division that is staffed by contractual paramedics.
- Develop Alternate Response Unit response model.

The fifteen recommendations ESCI proposes are the following:

#1: Consider dispatch practices that make all radio operators back up call-takers so that any radio operator experiencing light radio traffic can also be a backup call-taker. (Time frame: Medium) Employee turnover and busyness create volatility in 9-1-1 centers. Having more people trained at all levels provides the necessary support to alleviate this stress.

#2: Modify call-taking/dispatching procedures so that dispatching takes place as soon as the basic information of the call is determined. (Time frame: Short) EMD (Emergency Medical Dispatch) protocols require dispatching of units with only a minimum amount of information. If the CAD system cannot dispatch units while taking call information, it must be modified. If it is capable, dispatchers should receive additional training on how to quickly receive necessary information for dispatch and then dispatch the call.

#3: Enhance call code classification that allows for a more customized response recommendation that is based on call code classification. (Time frame: Short) Sending a standard response on all EMS calls is slowly giving way to data-drive response models that require only enough resources as necessary for the call received by the dispatcher. However, this requires the CAD system to be built to allow the different response models and to try to narrow down the various models into practical response types.

#4: Given the proportion of requests for EMS services, MFD should increase its EMS training hours by fifty percent. (Time frame: Short) EMS makes up a substantial portion of MFD's response history and will likely increase as the population ages. While skillsets are important to maintain, efficiencies and effectiveness can also increase through training on communication, policies, emotional support, and other elements of the EMS system.

#5: MFD and MESI should hold more frequent joint training sessions that allow for not only operational efficiency development, but relationship building. (Time frame: Short) For two agencies that jointly respond to as many EMS calls as they do, the amount of coordination between regular meetings, joint training, and dialog was low. Many of the current EMS challenges can be settled through greater communication with each other.

#6: Aid agreements should be reviewed and updated as some of them are over twenty years old. (Time frame: Medium) A few of the aid agreements are quite old. While some of them would likely have changed little, reviewing contractual obligations to each other, and keeping them appropriate to the times, prevents obsolescence and miscommunications.

#7: Ensure that Stations 1 and 5 have a paramedic staffed 100% of the time to allow for immediate and effective deployment of Medic 1 or Medic 5. (Time frame: Medium/Long) As easy as this may sound, it may require several adjustments to staffing practices, department policy and labor agreements. The intent here is to make sure that a paramedic is always available on any responding ambulance.

#8: Evaluate operational procedures to determine the need for a second engine on CPR calls based on location of responding ambulance. (Time frame: Medium) Evaluate in greater detail whether such a large response to a CPR call carries significant benefits. There may be an alternative approach to CPR management that allows for similar outcomes, while not requiring so many personnel.

#9: Develop performance compliance standards for EMS calls and use accepted standards as a foundation for any contractual EMS services. (Time frame: Long) This should involve both community interaction as well as negotiations between MFD and the EMS provider. Community expectations should be set by elected officials who regularly evaluate the EMS benefits and their associated costs. Creating benchmarks also creates a system and environment of accountability.

#10: A structured training and exercise regimen between MESI and MFD should be practiced maintaining cohesive responses and preparedness. (Time frame: Short) Several of the issues ESCI heard about could be resolved through better communications and joint training that reinforces expectations. Doing this regularly puts everyone on the same page.

#11: As important and prevalent as EMS services are, monthly operational meetings with an agenda that includes issue addressing should be regularly scheduled with procedures in place about when to escalate an issue to policy decision-makers. (Time frame: Short) Regular dialog including operational coordination and policy reviews of

practices, system expectations, and organizational requirements should be transparent and discussed with system providers.

#12: MESI should move towards an accreditation standard. While pursuing the accreditation can be arduous at times, even adopting the accreditation model as a standard for which to aim is beneficial. (Time frame: Long) Adoption of an accreditation model provides direction and a game plan to an organization. While the recognition may be long-coming, model adoption shows employees and the community that the service provided is consistent with a nationally accepted well-managed EMS organization.

#13: Develop and train on protocols that outline when voice and electronic communications are acceptable and desired. (Time frame: Short/Medium) Technology now plays a vital role in many areas of EMS service delivery. Utilizing it to the fullest allows for efficiency and minimizing interference with other non-EMS operations. (Lower radio traffic prevents interference with other calls.) This includes the ability to maintain the technology.

#14: Develop a joint communications committee of all county organizations that use the 9-1-1 system to meet monthly to coordinate and regularly evaluate the status of all communications elements. (Time frame: Medium) Joint communication amongst all agencies that use a common 9-1-1 center can benefit from having a participatory voice in how services are delivered. Meeting regularly to discuss policy and practices reduces the likelihood of inconsistent burdensome practices and improves coordination and efficiency.

SECTION III
CURRENT EMS DELIVERY ANALYSIS

EMS System Overview

General Description/History

The EMS delivery system within the City of Missoula contains several elements. They are the Missoula County 9-1-1 center, the Missoula Fire Department, and a contractual relationship with Missoula Emergency Services, Inc (MESI). Dedicated EMS service has been provided to the Missoula area since 1978 with the inauguration of advanced life support care taking place in 1981 by a predecessor to the current EMS provider, Missoula Emergency Services Inc. The city's current contract with MESI is up for renewal in August of 2024.

System Regulations

Montana EMS services are governed by the Department of Public Health and Human Services with EMS licensures such as EMT and paramedic handled by the Montana Board of Medical Examiners.

"The EMS and Trauma Systems Section is responsible for the licensing and regulation of prehospital emergency medical services including ground ambulance services, air ambulance services (fixed wing and rotor wing), and non-transporting medical units. These services are licensed at one of three levels: Basic, Intermediate or Advanced Life Support (ALS)."[1]

Both MFD and MESI are licensed at the ALS level. The system is overseen by a physician medical director.

Critical Issues

The desire to improve operational abilities is a natural part of any healthy organization. ESCI's field interviews revealed several concerns regarding the state of the EMS system. However, ESCI found many of them to be subjective or impressions rather than objective concerns and justifiable. Below are the issues that were identified as being challenges to EMS delivery:

[1] https://dphhs.mt.gov/publichealth/EMSTS/ems/servicelicensing

Dispatch

1) 9-1-1 center staffing – With minimal staffing, busy times cause delays in the answering of phones or delayed radio communications with operators. The 9-1-1 center is currently sitting at approximately 67% of its approved staffing.
2) The fire dispatcher acts as the backup call-taker. There are opportunities for the fire dispatcher to be occupied as a call-taker while ignoring fire radio traffic. This especially, creates an issue if the call-taker remains on the line for an extended period of time to provide medical assistance to the caller.

Technology

3) Limited CAD call types – This allows minimal distinctions between requests for services and forces a limited response model. Limited model responses translate frequently to an under- or over- response of resources.
4) Limited CAD depth planning – Once all fire department resources are busy, the system falls back on shift commanders and officers to manually determine call responses.
5) MDT (Mobile Data Terminal) usage – Even though MDTs are present in vehicles, voice transmissions are common, requiring dispatcher interaction and add to the increasing utilization of the radio channel.
6) MESI does not use AVL (Automatic Vehicle Locator) technology or station-based locations for unit recommendations. MFD also uses station location response zones for dispatch, but not the closest unit.
7) MESI has no IT tech support – Solutions to the tech issues with the ambulances may be extended due to no in-house tech support.
8) NO data connections to stations for pre-alerting. Turnout times could be shorter if there were a data-driven, pre-alerting system in place for the stations.

Response Model

9) MESI availability – A perception that 9-1-1 call availability or responses are compromised when MESI's contracted ambulances are used for interfacility transfers.
10) BLS ambulance with Medic10 is insufficient – When MESI's ALS ambulances are busy, MESI dispatches a BLS ambulance with their supervisor, Medic10, as the paramedic.
11) City ambulances can be used for county responses – The existing Missoula/MESI contract does not confine MESI ambulances to a city response only.

12) MESI falls to Level '0', requiring MFD ambulances to respond. (Level '0' means that the ambulance service provider has no units available to respond to an emergency.)
13) CPR gets 2-engines ('Pit Crew' response) – Is this form of care EMS necessary, efficient, and effective?
14) MFD handles all releases – Whenever a treatment crew determines there will be no transport, MFD generally handles the patient releases.
15) System status management is fluid and not known by agencies. For example, effects caused by incidents which come in the 'back line' for MESI, create an uncertainty about response availability.

Performance Standards

16) Performance standards –Performance standards for the EMS system are poorly defined consequently leaving unknown expectations.
17) Response expectations and perceptions do not align between MESI and MFD (i.e., equipment not brought into the scene, ill prepared for the response).

Training

18) EMS coordination between Fire/MESI is limited to one quarterly training and variance reports. Limited to no coordination of the overall EMS program, system status, planning, etc. occurs between the agencies.
19) Training continuity lacks due to one quarterly focus on Pit Crew CPR.

Communications

20) Limited communication/interactions between Medic 10 and MFD Battalion Chiefs.
21) No formal 'critical issue' reporting process for MFD personnel to report concerns to MFD management and protocol established for follow-up.

System Components

The existing EMS system is made up of the following elements:

- Missoula County 9-1-1
- City of Missoula Fire Department
- Missoula Emergency Services, Inc.

Missoula County 9-1-1 Communications

The 9-1-1 Center for the city of Missoula is the Missoula County 9-1-1 center, which is under the county's Emergency Management Division. It acts as the first point of contact for all emergency responders in Missoula County including ten local fire departments, two law enforcement agencies, and five ambulance services, including one air ambulance. They are:

Figure 3: Missoula County 9-1-1 Agencies

Fire	EMS	Police
Arlee Rural FPD	Arlee Ambulance	Missoula City Police
Clinton Rural FPD	Condon Ambulance	Missoula County Sheriff
East Missoula Rural FPD	Frenchtown Ambulance	
Florence Rural FPD	LifeFlight	
Frenchtown Rural FPD	MESI	
Greenough Potomac FPD	Seeley Lake Ambulance	
Missoula Rural FPD		
Missoula City FD		
Seeley Lake Rural FPD		
Swan Valley Fire Service Area		

Staffing

24/7/365 staffing for the 9-1-1 center includes four and as many as six dispatchers per shift that work twelve-hour shifts and a mix of days and nights. There is a single dispatcher for all fire and EMS county-wide, one call-taker, two to four police dispatchers and a supervisor with the fire dispatcher also acting as a backup call taker. Currently, the center is down one-third of its approved staff, which is not unusual as many 9-1-1 centers across the country are struggling with hiring and retention. The center answers over 10,000 calls per month.

Dispatch centers that have radio operators also acting as call-takers can experience periods where radio silence from a dispatcher is experienced, as the dispatcher is on a phone call taking information and not paying attention to radio communication.

Monitoring the radio while on a phone call is a skill that can be learned but it does not come easily to many.

Recommendation #1: Consider dispatch practices that make all radio operators back up call-takers so that any radio operator experiencing light radio traffic can also be a backup call-taker.

Qualifications/Training

All dispatchers are Emergency Medical Dispatch (EMD) certified, meaning any dispatcher in the system can provide basic EMS assistance to a caller through a set of medical director approved protocols. Dispatchers are not ENP certified. (Emergency Number Professional through the National Emergency Number Association, the credentialing body for 9-1-1 dispatchers).

Dispatch Methodologies

Once a call is received for an ambulance, EMD protocols are followed by the call-taker that gathers pertinent details about the request and provides initial aid instructions, if needed. Potential EMS assistance can be provided after the caller answers a series of tree-structured questions (EMD) that narrow down the nature of the call and the exact need for service. The 9-1-1 center simultaneously dispatches the call to both MFD and MESI. The overwhelming majority of EMS calls are classified into one of four categories:

- Medical Call CPR
- Medical Call ALS
- Medical Call BLS
- Med Transfer

There are no further distinctions between the call types in CAD to allow a more targeted response. (Transfers are handled by MESI units only).

The CAD system chooses which MFD unit is to respond based on pre-defined response areas with a general assignment announcement for a MESI unit. (See MESI section for how they then handle the incident.)

The following graphic shows the call received to call dispatched time for 2018-2022 for EMS calls. Receive-to-Dispatch time is the time taken between an operator answering the 9-1-1 call and the time emergency units are dispatched. Under NFPA standards[2], the goal is to have 95% (95th percentile) of all calls dispatched within 64 seconds of the call being answered and 106 seconds 99% (99th percentile) of the time.

[2] NFPA 1710 - *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*

The following are the times for the 90th percentile, significantly higher than NFPA standards.

Figure 4: EMS Received to Dispatch Times (90th Percentile)[3]

	2018	2019	2020	2021	2022
Received → Dispatch	5:16	3:27	6:48	4:56	4:59

9-1-1 centers that practice EMD tend to have longer receive-to-dispatch times as dispatchers can focus on accomplishing the protocol questions without giving thought to dispatching the units prior to the end of the questions.

Recommendation #2: Modify call-taking/dispatching procedures so that dispatching takes place as soon as the basic information of the call is determined.

Recommendation #3: Enhance call code classification that allows for a more customized response recommendation that is based on call code classification.

Missoula Fire Department (EMS Services)

The Missoula Fire Department (MFD) currently provides all-hazard emergency response from five strategically located fire stations to provide quick, emergency response to all areas of the city and beyond, when needed. The services provided by the MFD include structural and wildland fire suppression, EMS-Advanced Life Support (ALS) first-response, technical rescue services, hazardous materials response, fire investigation and code enforcement, public safety education, behavior crisis response, and other services. MFD works closely and responds with other local Missoula County fire agencies and MESI, the ambulance provider for both the City of Missoula and parts of Missoula County.

[3] 90th percentile time are higher than averages as they depict the time under which 90% of calls are handled.

Staffing

The Missoula Fire Department has 97 total personnel assigned for administration, support, operations, training, maintenance, and community risk reduction.

Figure 5: MFD Staffing (2018-2022)

Personnel	2018	2019	2020	2021	2022
Admin/support, uniformed	3	3	3	3	3
Admin/support, civilian	3	3	3	3	3
Admin/Support personnel, total	**6**	**6**	**6**	**6**	**6**
Operations personnel (Uniformed)	85	85	86	86	86
Community Risk Reduction personnel (Uniformed)	5	5	5	5	5
Total Personnel	**96**	**96**	**97**	**97**	**97**

The Missoula Fire Department has been a certified non-transport ALS provider for more than 22 years. Through these services, the MFD provides ALS personnel and equipment to all engines/trucks to augment the response of the ALS transport company, MESI. All firefighters are certified to at least the Emergency Medical Technician (EMT) level and about half are certified as paramedics. (MFD does not have a policy to have 24/7 ALS coverage on all fire units but strives to provide front-line ALS service as often as possible.)

Facilities

The Missoula Fire Department operates from five staffed fire stations strategically located throughout the city. The Fire Department has begun planning for the construction of a sixth fire station near Missoula Airport. While most stations are of older age, the facilities are in good repair and appear to be well maintained to meet the service delivery for the organization. All stations have been renovated to meet modern code requirements, except for an elevator present at Fire Station 1.

In the context of EMS provision, which would call for additional staffing and fleet, equipment and personnel space, there are concerns with all stations in their abilities to support expanded services long-term. While some space currently exists for additions to the fleet and personnel, all stations would need to be expanded (see Future Delivery System Recommendations). (See Appendix B – Fire Station Assessments more detailed station assessments.)

Fleet

MFD manages a fleet of 45 vehicles to support emergency response, prevention, maintenance, and support functions to the community. Of these 45 vehicles, the following is a breakdown of types of apparatus with EMS support vehicles highlighted:

Figure 6: MFD Fleet Summary

Vehicles	Quantity	Average Age	Average Miles
Staff	20	8.15	50,297
Engines	**8**	**8.75**	**57,043**
Aerials	**2**	**16**	**72,737**
Brush Trucks	6	10.5	41,509
Tenders	1	22	25,547
Ambulances	**2**	**17**	**34,905**
Mental Health Responses	**2**	**3.5**	**35,035**
Watercraft	2	12	259
UTV	2	7	2,425

The MFD has an in-house maintenance program for fire apparatus and fire station maintenance. This division is staffed by a master mechanic and two assistant mechanics that perform in-house repairs and preventative maintenance. All apparatus maintenance is conducted at Fire Station 4, where the fleet shop is established. The fleet shop is a single door, however it could fit two apparatus (inconveniently), if necessary. The preventative maintenance plan is well established and implemented for facilities and apparatus/vehicles.

When necessary, work beyond the scope and capabilities of internal personnel is outsourced to appropriate external agencies.

While no MESI ambulances operate from MFD facilities, MFD does have two ambulances stored/used for surge capacity and crew rehab at Stations 1 and 5. Any significant additions to the fleet would require a more comprehensive analysis of fleet maintenance resources.

Training

The MFD has an in-house training program for all members in the continual training of fire, EMS, hazardous materials, technical rescue, and other training requirements. Currently, MFD does not participate in any formal firefighter certification level through the State of Montana, but all training and internal certification reflects the

requirements of NFPA. EMS certifications are governed by the State of Montana Department of Public Health and Human Services. All operational personnel with MFD hold EMT-Basic or paramedic certifications.

On an annual basis, MFD has identified the minimum continuing education hours for each topic area:

- Fire Suppression – 160 hours (15 hours/month)
- EMS – 48 hours (4 hours/month)
- Specialized Operations (technical rescue, hazardous materials, etc.) – 42 hours
- Leadership/Officer Development – 12 hours

MFD operates the fire academy for new-hire personnel in compliance with NFPA standards for Firefighter I and Firefighter II. For EMS, MFD supports sending personnel to paramedic school at the local college. Paramedic school requires a nine-month term, and the organization supports personnel by providing time off, when assigned shifts, to attend. All recruitment for personnel to attend is voluntary and based upon seniority. Once certification is achieved, a paramedic receives a nine to eleven percent increase to base salary due to additional duties and responsibilities and training requirements. Certified personnel trained through the department must sign a contract for a 36-month period for repayment of expenses should they choose to leave the department before the end of the contract period.

Most EMS training is handled through the department's EMS coordinator. Generally, EMS training occurs each Friday. Quarterly, MESI and MFD conduct joint EMS training.

Training Division directed/supported courses are labeled as 'level 1 training.' Currently, all members receive level 1 training instruction on 1-2 topics per month in areas of fire suppression, hazardous materials, technical rescue, etc. Commonly, these courses are led by an off-duty instructor and/or training officer, along with appropriate off-duty instructors or training officer support.

Currently, the training division is at, or near, capacity regarding personnel capable of supporting the existing staff and program. If additional large quantities of personnel are added to the existing MFD system (career EMS staff), more training personnel and scheduling challenges would likely exist.

Recommendation #4: Given the proportion of requests for EMS services, MFD should increase its annual EMS training hours by fifty percent.

Recommendation #5: MFD and MESI should hold more frequent joint training sessions, recommended monthly, that allows for not only operational efficiency development but relationship building.

External Agencies

MFD has agreements for fire and EMS services with external agencies to support automatic and mutual aid in and outside the city. While Missoula County is 2,618 square miles, the city of Missoula is 35.0 square miles. In discussion with the MFD staff, there are many areas within the county that make mutual/automatic aid difficult due to vast distance and road network. These agreements are with:

- Missoula Airport Authority
- Missoula Department of Natural Resources (Wildland)
- Other Missoula County Fire Departments including:
  - Missoula Rural Fire Protection District
  - East Missoula Fire Department

The MFD and the Missoula Rural Fire District (MRFD) have an agreement for the closest available fire station to respond to incidents in areas with overlap of jurisdictional areas.

Figure 7: MFD Automatic/Mutual Aid Given/Received

	2018	2019	2020	2021	2022
Mutual Aid Given	61	58	50	43	45
Mutual Aid Received[4]	7	13	4	2	8
Automatic Aid[5] Given	309	205	272	248	193
Automatic Aid Received	265	333	232	268	255

Recommendation #6: Aid agreements should be reviewed and updated as some of them are over twenty years old.

Planning

As the community continues to grow, MFD will need to maintain/update their master planning documents and develop/evaluate response time standards for all-hazard

[4] Aid received from Missoula Rural in the 'closest available fire station' agreement not fully represented as no incident reports occur in the MFD system if no MFD units respond.
[5] Automatic aid is a form of mutual aid where additional non-jurisdictional units respond on an initial dispatch rather than a manual request for aid.

incident response. In addition, MFD will need to continue to monitor infrastructure needs, capital asset needs, and staffing requirements to meet the ever-changing requirements of all-hazard responses, including the implementation of specialized resources to meet the developing needs of the community.

EMS Delivery and Performance

Deployment Model

As previously noted, the City of Missoula Fire Department operates from five strategically placed and functioning fire stations providing all-hazard emergency response to fire, EMS, technical rescue, wildland, and hazardous materials response.

Daily, a minimum of sixteen personnel are on duty and ready to respond 24/7/365. There are twenty personnel assigned per shift, allowing the ability of up to four personnel to be on leave, training, special assignment, etc. each day.

Figure 8: Daily Distribution (Minimum/Maximum Staffing)

Station 1[6]	Station 2	Station 3	Station 4	Station 5
Engine 111[7] Command 110	**Engine 121**	**Engine 131 Truck 138**	**Engine 141 Truck 148**	**Engine 151**
Company Officer	Company Officer	Company Officer	Company Officer	Company Officer
Driver/Operator (Engineer)	Driver/Operator (Engineer)	Driver/Operator (Engineer)	Driver/Operator (Engineer)	Driver/Operator (Engineer)
Firefighter	Firefighter	Firefighter	Firefighter	Firefighter
Firefighter[8],[9]	Firefighter	Firefighter	Firefighter	Firefighter
Battalion Chief				

In addition to the fire station/fire apparatus staffing, a behavioral health unit provides a response of 10-hours per day (maximum) with one EMT and one clinician. This

[6] If Station 1 or Station 5 is requested to utilize the MFD ALS equipped ambulance/medic unit, the entire crew from that station responds, regardless of if they have a paramedic. A paramedic is then requested from the initial on-scene crew or another crew if the Ambulance/Medic is not responding with an ALS provider.

[7] Each Station has at least 1 Paramedic assigned, rank may be the Officer, Driver/Operator, or Firefighter(s).

[8] One member from each station may be assigned leave on any given day before call-back/overtime is initiated.

[9] If shifts are "heavy" (extra personnel), a fourth person is assigned to an engine/truck

model is currently funded on a grant and does not have approved funding after June of 2024.

All personnel are assigned to a four-platoon system. The shifts operate on a 24-on, 24-off, 24-on, 5-days off rotation. Under this system, personnel work an average of 91.25 days annually, with an average workweek of 42.11 hours.

While there are paramedics assigned to each station/shift, there are no instructions in staffing policy requirements that require paramedics on any fire apparatus.

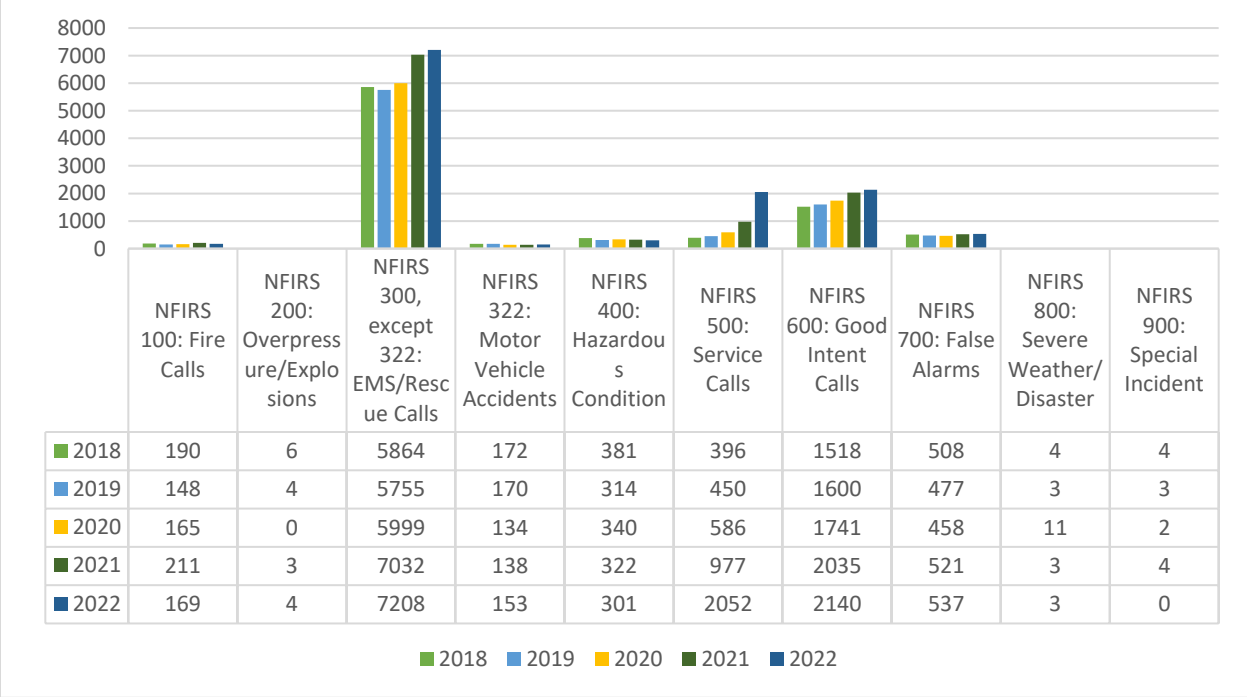
Current paramedic staffing is as follows:

- Line-staff paramedics (34)
- Current paramedic school participants (3)
- Staff/Admin paramedics (9)

In addition to responding to incidents within the City of Missoula, the Missoula Fire Department responds into the backcountry in cooperation with the Missoula County Search and Rescue Team.

Over the past five years, MFD has responded to an average of 10,245 incidents per year, however since 2021, the call volume has had a significant increase in relation to EMS and service calls. This is primarily due to the implementation in late 2020 of the Mobile Support Unit which handles non-emergency medical/service calls.

Figure 9: 5 Year Response Statistics



	NFIRS 100: Fire Calls	NFIRS 200: Overpressure/Explosions	NFIRS 300, except 322: EMS/Rescue Calls	NFIRS 322: Motor Vehicle Accidents	NFIRS 400: Hazardous Condition	NFIRS 500: Service Calls	NFIRS 600: Good Intent Calls	NFIRS 700: False Alarms	NFIRS 800: Severe Weather/ Disaster	NFIRS 900: Special Incident
2018	190	6	5864	172	381	396	1518	508	4	4
2019	148	4	5755	170	314	450	1600	477	3	3
2020	165	0	5999	134	340	586	1741	458	11	2
2021	211	3	7032	138	322	977	2035	521	3	4
2022	169	4	7208	153	301	2052	2140	537	3	0

Recommendation #7: Ensure that Stations 1 and 5 have a paramedic staffed 100% of the time to allow for immediate and effective deployment of Medic 1 or Medic 5.

'Pit Crew' Practices

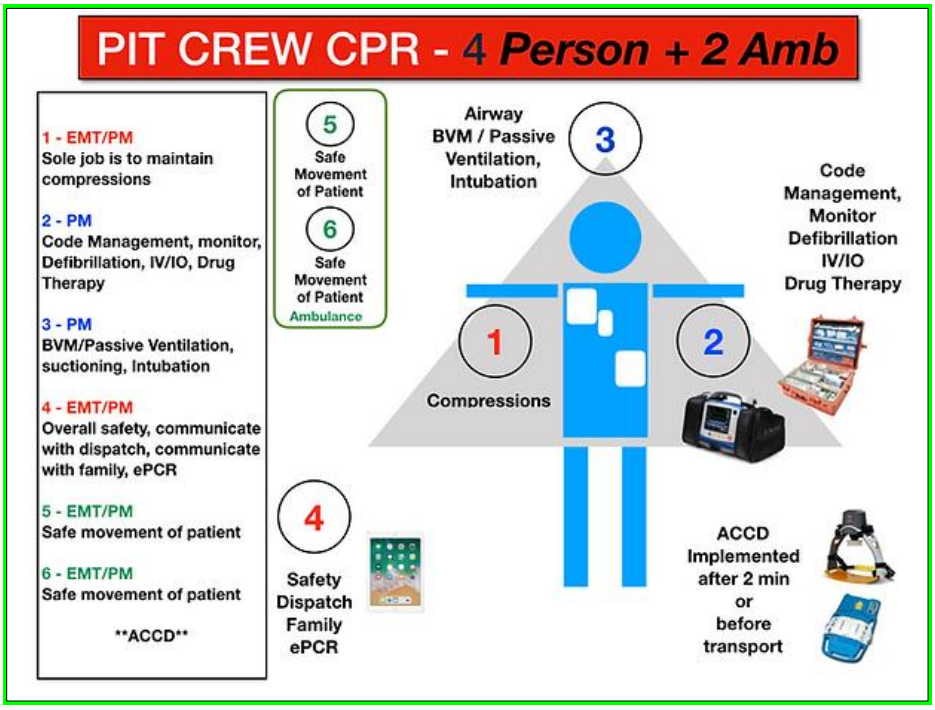
The pit crew CPR model is a team approach with pre-determined provider positions and tasks which promote greater efficiency and improved patient outcomes. (Lost time of just a few seconds can make a difference in CPR outcomes.) There are many variations of the pit crew approach, depending on the number of providers at the scene, generally based upon the 5 or 6 rescuer model. (MFD and MESI respond with 8-9 providers.)

Both MESI and MFD identified that while these trainings were occurring, there was question as to whether the large response was necessary to achieve outcome goals. At some point, it is possible that too many responders can hinder outcomes as well as diminish protections in other areas of the community.

However, what may lead to heavy MFD CPR responses is absence of knowledge concerning where the ambulance may be coming from and its estimated response time. MESI's contractual agreement only provides for a response time of less than nine minutes where MFD responding units (often two closest units) can arrive in just a few minutes, minutes that lead to an increased likelihood of a successful CPR patient outcome.

Below is a graphic of how Pit Crew CPR can work:

Figure 10: Pit Crew CPR Assignments[10]



Recommendation #8: Evaluate operational procedures and available technologies (Lukas device, etc.) to determine need for second engine on CPR calls.

[10] https://www.paramedickardex.com/pit-crew-cpr

Fiscal Analysis

Below is a table describing the broad categories of the MFD budget with a 2022 budget of just over $17 million.

Figure 11: MFD Actuals (2019-2022)

DESCRIPTION	FY2019 ACTUAL	FY2020 ACTUAL	FY2021 ACTUAL	FY2022 ACTUAL
OFFICE SUPPLIES	12,686	5,526	9,122	9,813
OPERATING SUPPLIES	118,779	173,477	212,874	88,704
MAINTENANCE SUPPLIES	57,089	86,633	95,162	82,734
FUEL	56,630	50,850	51,189	79,920
SUPPLIES	245,184	316,616	368,347	262,134
COMMUNICATIONS\POSTAGE	571	534	396	561
PRINTING & DUPLICATING	1,188	1,451	1,902	720
SUBSCRIPTION & DUES	13,330	12,378	8,343	9,506
STORM WATER	115	216	366	374
UTILITIES	77,604	79,217	81,619	83,446
WATER CHARGES	10,680	10,043	10,650	9,577
TELEPHONE SERVICES	17,737	17,047	15,371	15,408
GARBAGE	8,060	8,385	7,799	9,253
PROFESSIONAL SERVICES	39,521	39,602	31,649	30,811
REPAIR & MAINTENANCE	76,486	130,231	115,862	84,980
TRAVEL	27,366	8,825	7,874	14,667
TRAINING	11,075	64,933	62,931	9,352
PURCHASED SERVICES	283,618	372,646	344,396	268,281
GRANTS & CONTRIBUTIONS (NWS SERVER)	2,931	2,700	2,700	2,700
Fire Department Operations Budget	13,340,519	14,502,854	15,015,396	15,826,404
COMMUNICATIONS	33,874	35,037	34,574	6,181
STAFF VEHICLE REPLACEMENT	34,900			34,940
COLD STORAGE BUILDING		8,334		
THERMAL IMAGING CAMERA		14,256		
ENGINE REPLACEMENT (TYPE 1)		579,418	619,934	
ENGINE REPLACEMENT (TYPE 2)		404,945		
ENGINE REPLACEMENT (TYPE 3)				379,959
ENGINE REPLACEMENT (TYPE 6)			84,419	
DEFIBRILLATOR REPLACEMENT			173,968	

DESCRIPTION	FY2019 ACTUAL	FY2020 ACTUAL	FY2021 ACTUAL	FY2022 ACTUAL
CATARAFT TUBE REPLACEMENT			3,521	
SCBA REPLACEMENT				949,434
Fire Department Capital Budget	68,774	1,041,990	916,416	1,370,514
Total Fire Department Budget	13,409,293	15,544,844	15,931,812	17,196,918

Currently, within the fire department budget, from an EMS perspective, the following are actual expenses applied towards the fire department's EMS services from 2019 through 2022. There may be a few additional items such as training or travel that are wrapped up in a more general line item with firefighting expenses that are not included in these numbers.

Figure 12: MFD EMS Actuals (2019-2022)

	2019	2020	2021	2022
MEDICAL SUPPLIES	19,128	16,181	55,846	13,815
MEDICAL GLOVES	3,342	2,922	8,275	8,626
EMS EQUIPMENT SUPPLIES	292	6,997	4,861	146
TRAINING MANNEQUIN REPLACEMENT	0	1,942	5,951	687
EMS CERTIFICATIONS	6,780	5,365	2,448	3,858
MEDICAL DIRECTOR	7,500	10,000	10,000	10,000
DEFIBRILLATOR MAINTENANCE	6,315	8,238	2,545	1,563
PARAMEDIC PROGRAM	0	56,000	56,000	0
EMS COORD				110,844
AMB REPL LEASE PAYMENT	61,624	61,624	61,624	61,624
Total EMS Actuals	104,981	169,269	207,550	211,163

Planning

Performance Standards

As mentioned earlier, performance standards are critical to knowing whether service delivery models and performance are acceptable. At least bi-annually, organizational leadership should review whether their performance meets identified standards. If it is meeting standards, discussions can take place about whether a standard could be raised that increases service delivery effectiveness and efficiency to the community. If

performance standards are not being met, an evaluation should take place to determine what needs to change to meet the standard or if the expected standard is unrealistic.

Current EMS response standards and recommendations have benchmarks related to four-minute and eight-minute response times. Standards for time-to-patient-contact, scene time, treatment times and others exist.[11]

Rarely are standards set that have 100% compliance. If they are, it is likely they are too low and become a poor measurement of practices. Many public safety organizations have chosen to use percentile performance measurements. These are measurements where a certain percentile indicates a percentage of meeting a particular standard. For example, if response times have a measurement of eight minutes for ninety percent of the calls, this means that ninety percent of all calls have response times less than eight minutes. However, in areas that have long response times, such as exurbs and rural areas where call volumes do not justify fire stations, lower percentiles or higher response times can be chosen. What is important is that a performance standard is set, preferably by elected officials since meeting performance standards has a cost associated with it.

To validate whether any organization is providing sufficient service, performance standards are the way for the monitoring to take place. The key to knowing about adequate service is to measure outcomes. If the outcomes are being met, how they are being met is much less relevant.

Recommendation #9: Develop performance compliance standards for EMS calls and use accepted standards as a foundation for any contractual EMS services.

Missoula Emergency Services, Inc. (MESI)

The Missoula Emergency Services, Inc. (MESI) Is a private, unsubsidized company that has provided EMS service to the city of Missoula for over 30 years.[12]

[11] A standard in this case, is a nationally accepted benchmark that can be set to be met. A recommendation carries less weight and is more of a suggested practice to meet a specific outcome. It may or may not have a standard associated with it.

[12] As a private company, MESI is not required, as local governments are, to provide details about its operations and its well-being. However, for system improvement, MESI recognizes the value in offering its perspective, including some of its organizational character, on items related to the quality of EMS care to the citizens of Missoula. Some of the information provided to ESCI is considered proprietary and will not be disclosed in a manner that compromises its business model.

In addition to the basic EMS services that MESI provides, the organization also provides:

- Structure fire standbys
- Hazmat/gas line ruptures standbys
- Police standbys for law enforcement
- Transport anyone regardless of their ability to pay, and hardship write-off.
- Free standby coverage for not-for-profit events, such as marathons and other public events
- Below cost services for all high school standby and athletic events
- No bill sent to parents who lost a child to sudden cardiac arrest

Contract

MESI's relationship with the city is guided by an agreement which the current one began on September 1, 2019, and expires August 31, 2024. At the city's discretion, the agreement can be extended up to five years beyond the contractual expiration date.

Staffing

MESI uses a mix of full- and part-time staff to fill both twelve- and twenty four-hour shifts. They currently have a staff of 92 of which 26% are full-time and 74% are part-time. Based on full-time equivalents, MESI employs 42% Paramedics and 48% EMTs, which includes EMT employees who staff an ambulance in Three Mile. Therefore, the city breakdown is closer to 50% Paramedics and 50% EMTs.

The current EMS contract with MESI calls for 24/7 staffing of three ALS ambulances with a fourth unit staffed from 0600-2200 Sunday-Thursday and 24 hours Friday and Saturday within the city. This represents most of MESI's five current units in service, but the contract allows MESI to use those resources county-wide and occasionally beyond. Without having a breakdown of emergency and non-emergency calls including transfers, ESCI is unable to determine unit hour utilization rates however percentile response times indicate that MESI is complying with all contractual requirements, is adequately staffed, and able to provide the performance contract response requirements.

Employee Turnover

A recent employee workforce turnover study by the American Ambulance Association (AAA) found that overall turnover among paramedics and EMTs ranges from 20 to 30 percent annually, with organizations on-average experiencing 30% of their paramedic positions open and 29% of their EMT positions the same. MESI's forecasted turnover rate for 2023 is tracking at 19% and is considered better than national averages.

MESI conducts exit interviews with their employees upon resignation and termination with most moving on to other career opportunities, which is the nature of EMS.

It is noteworthy that with the nationwide staffing shortages, they can sustain services and have found creative ways to develop staff. They have implemented the following programs:

- Paramedic scholarship programs with local university.
- An internal program that allows EMTs to become paramedics while they work.
- A program has been created that is called "Earn While You Learn" for EMT's.

Qualifications

While MESI offers opportunities for EMTs to become paramedics, potential employees must be an EMT, at a minimum, to be hired.

Facilities

MESI operates out of two stations, the north station has a single ambulance responding from this location, while the central station staffs three ambulances. Both facilities are owned and operated by MESI.

Fleet

MESI has a fleet of ten ambulances with all their newest ambulances being frontline. MESI has an annual replacement goal of at least one ambulance, assuring that most of the time, frontline ambulances are the latest in technology and lowest in maintenance time.

Training

EMS Training occurs every Friday with all staff training once a quarter and daily training occurring as needed. Optional training is offered through a paramedic school. While there is a quarterly joint training between MFD and MESI, there is question as to its effectiveness. MESI reports that their training sessions are open to MFD participation as well.

Recommendation #10: A structured training and exercise regimen between MESI and MFD should be practiced to maintain cohesive responses and preparedness.

EMS Service Delivery

Deployment Model

MESI provides four Advanced Life Support (ALS) units each twenty-four-hour period with one deployed in the north section of the city and three in the south section of the city, divided by the Clark Fork River. The one ambulance in the north section of the city is at 2680 Palmer St and the three in the southern section of the city at 1200 Burlington St. MESI responds to approximately 11,000 emergent and non-emergent calls a year.

The agreement with the city outlines MESI's deployment model requiring a minimum of three ALS units 24/7/365. A fourth ALS ambulance shall also be deployed Sunday through Thursday from 6:00a to 10:00p and twenty-four hours a day on Fridays and Saturdays. Lastly, an on-call ambulance must be provided daily for twelve hours, however the agreement does not identify which twelve hours and leaves this designation to the contractor.

MESI's practice is to have four staffed 24-hour ALS ambulances (Medic 1-4), one staffed BLS ambulance from 10:00am to 8:00pm (Medic 5 - on call from 6:00a to 10:00pm and from 8:00pm to 6:00am) and a fifth staffed BLS ambulance (Medic 6) from 6:00am to 6:00pm. The agreement provides for MESI to keep MFD updated on its daily staffing. One shift supervisor, Medic 10, is on-call 24/7/365 operating from an office during the day and from home in the evenings and weekends.

The city's agreement allows for MESI to use this staffing model as a county-wide minimum allowing the contractual ambulances to respond outside the city to non-jurisdiction incidents.

Air Medical

Missoula County also has one rotor air transport for far rural transportation and one available fixed-wing aircraft for life flight services. Air Medical transport must be authorized by the fire department for response. Private EMS will not request air transport unless allowed in policy.

Finances

Billing

MESI bills in line with most other EMS delivery systems using the federal government's defined billing system. This system divides all reimbursable EMS costs into five categories with MESI's associated charges as of April 1, 2023, being the following.

- BLS Emergency | $1,500

- BLS Non-emergency | $1,193
- ALS Emergency | $1,715
- ALS Non-Emergency | $1,415
- ALS2 | $2,004

MESI's billing charges are in-line with other EMS providers across the country.

EMS Revenue is a composition of revenues from several payors that include government programs such as Medicare and Medicaid, for-profit insurance companies, and self-pay where the patient pays the bill. MESI reports the following payor distribution for their 2021-2022 billing year.

- Medicare | 52%
- Medicaid | 27%
- Self-Pay | 9.5%
- Insurance | 8%
- Veteran's Admin | 2.5%
- Tricare | 0.5%
- Indian Health | 0.5%

It is well-known that most government EMS reimbursements are below the cost of providing the service. MESI's actual revenues are significantly lower than what is billed, which is not unusual in the EMS industry. The recently passed "No Surprise Act," which generally prohibits any balance-billing (billing patient for an unpaid balance) limits the amount of actual expense recovery. MESI's billing is handled by a separate subsidiary of the owner's business practices.

Service Demand

For elected officials, citizens and visitors, the forward-facing component of the fire department is its ability to respond timely to calls for assistance and provide quality service. For Missoula leadership to be successful in planning for current and future service delivery, they need a thorough understanding of the various components of service delivery.

To best illustrate the service delivery and performance, the following graphics will provide a view of service demand within the city of Missoula for the past five years according to MFD data.

The following graphics depict where EMS calls have occurred from 2018 through 2022 both in quantity and density displays.

Figure 13: All EMS Incidents (2018-2022)

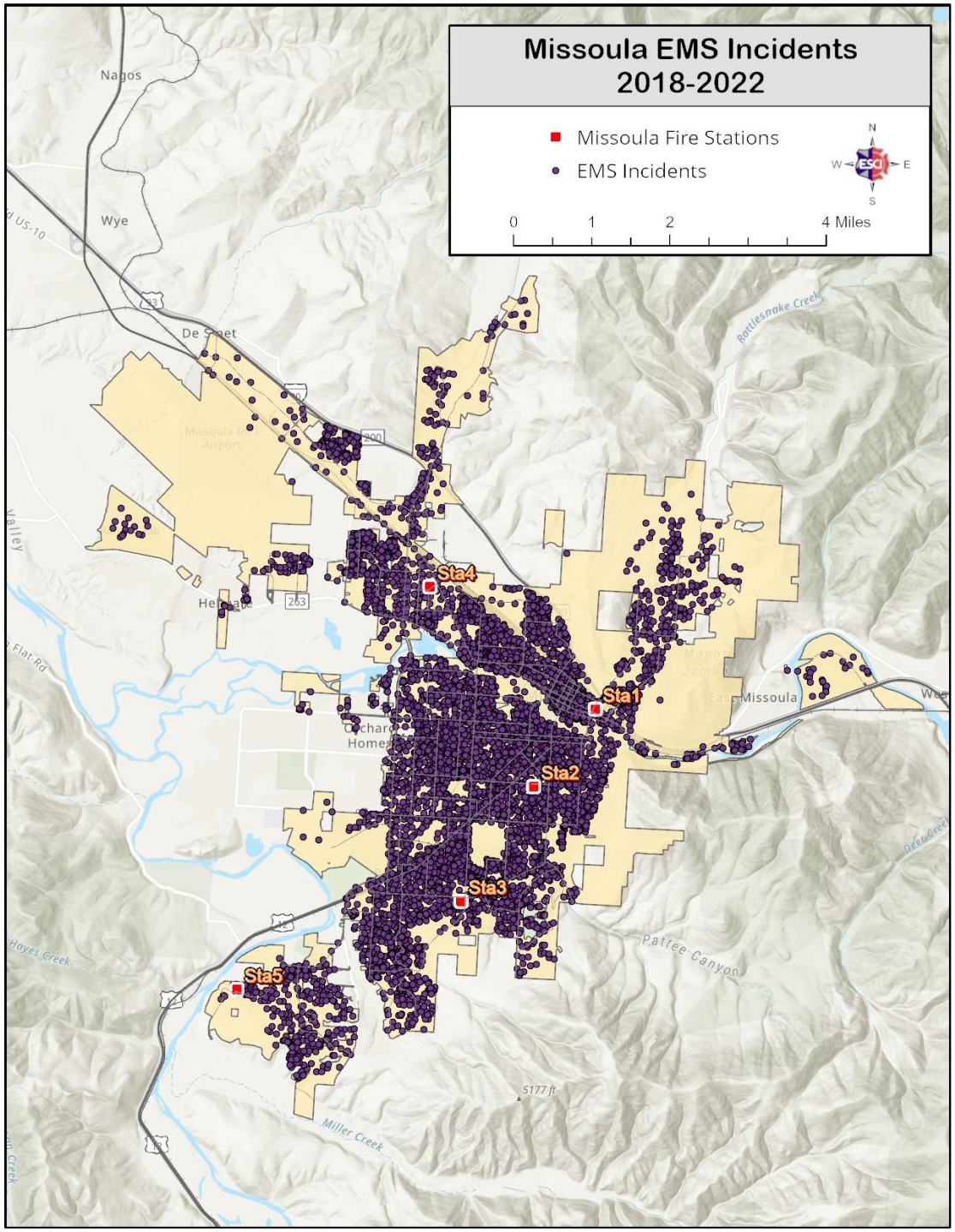
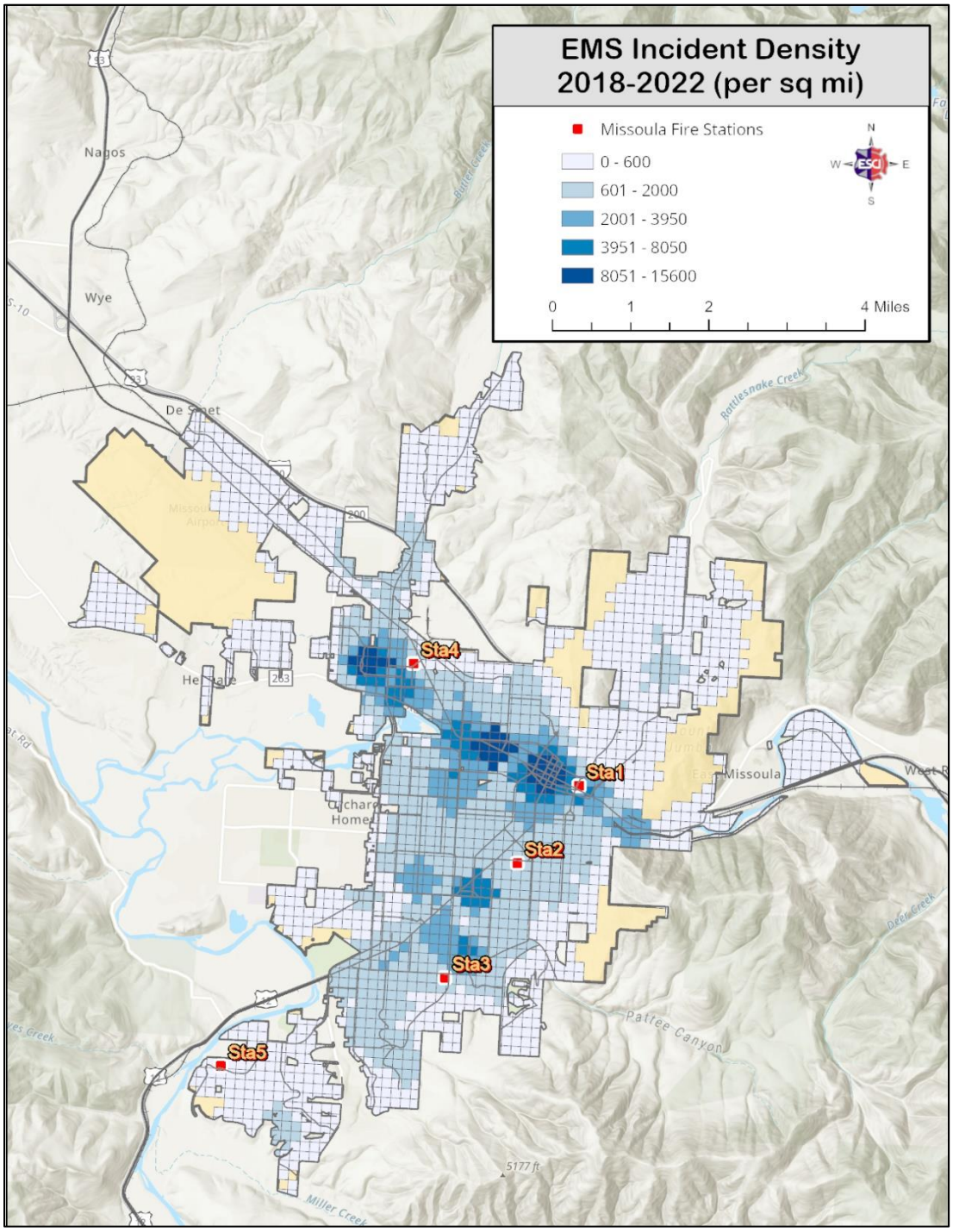
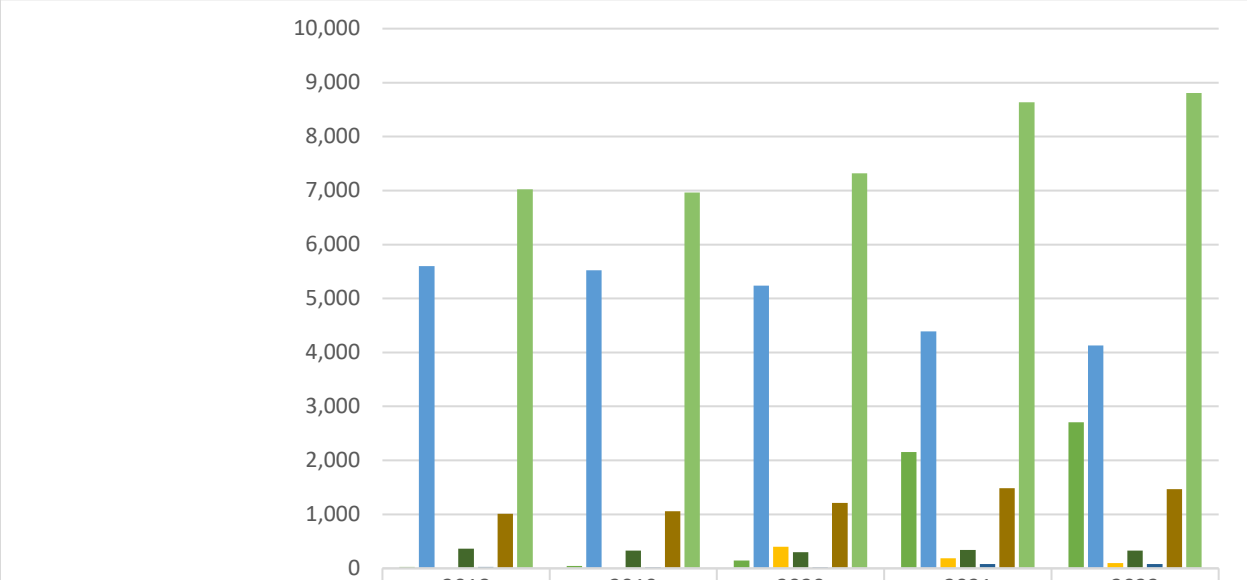


Figure 14: EMS Incident Density (2018-2022)



As illustrated in the following figure, MFD experienced an increase of 22% in service demand from 2018 to 2022 or 5.5% annually. Two trends of note are the changes in how calls are classified and the implementation of the Mobile Support Team, both in 2020.

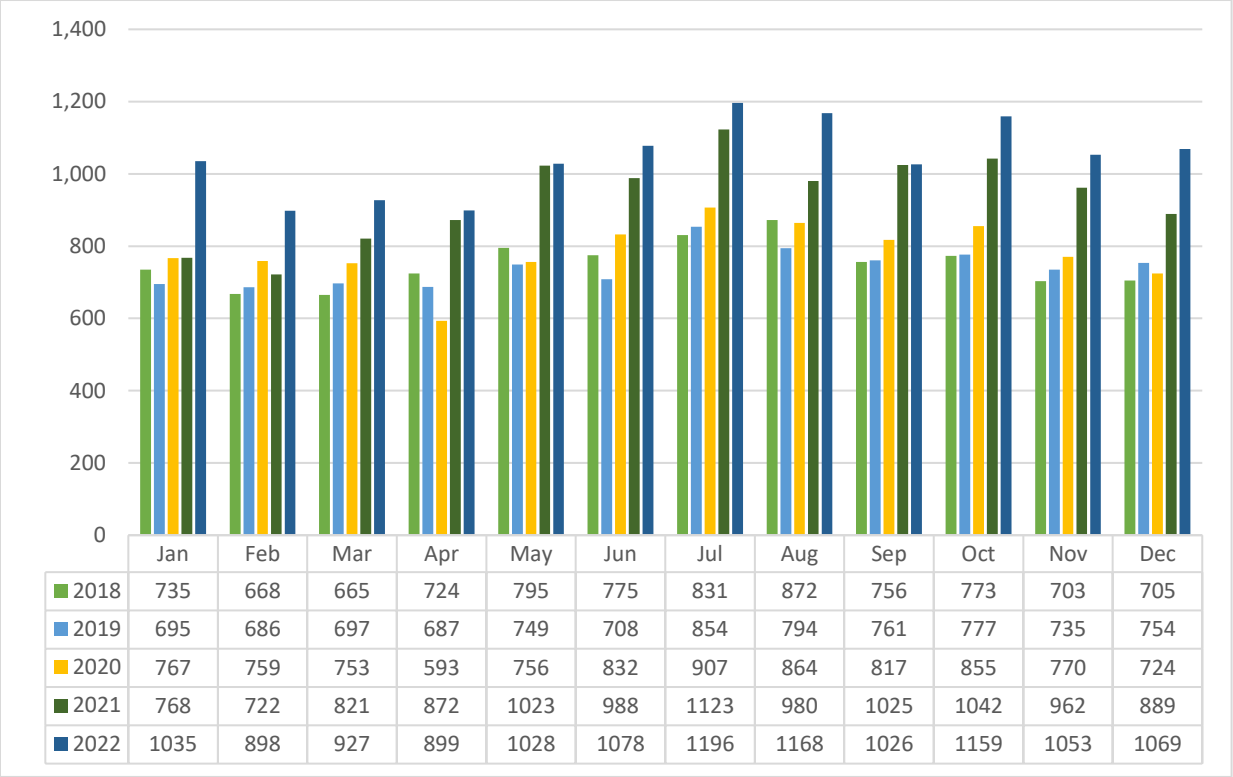
Figure 15: EMS Service Demand (2018-2022)



	2018	2019	2020	2021	2022
Medical assist, assist EMS crew	26	43	147	2,156	2,704
EMS, General	5,597	5,521	5,239	4,392	4,127
EMS, Pandemic	0	0	400	184	98
Motor Vehicle Accident	363	326	298	339	331
Other EMS	29	18	21	80	78
Dispatched and Cancelled	1,010	1,056	1,212	1,483	1,469
TOTAL	7,025	6,964	7,317	8,634	8,807

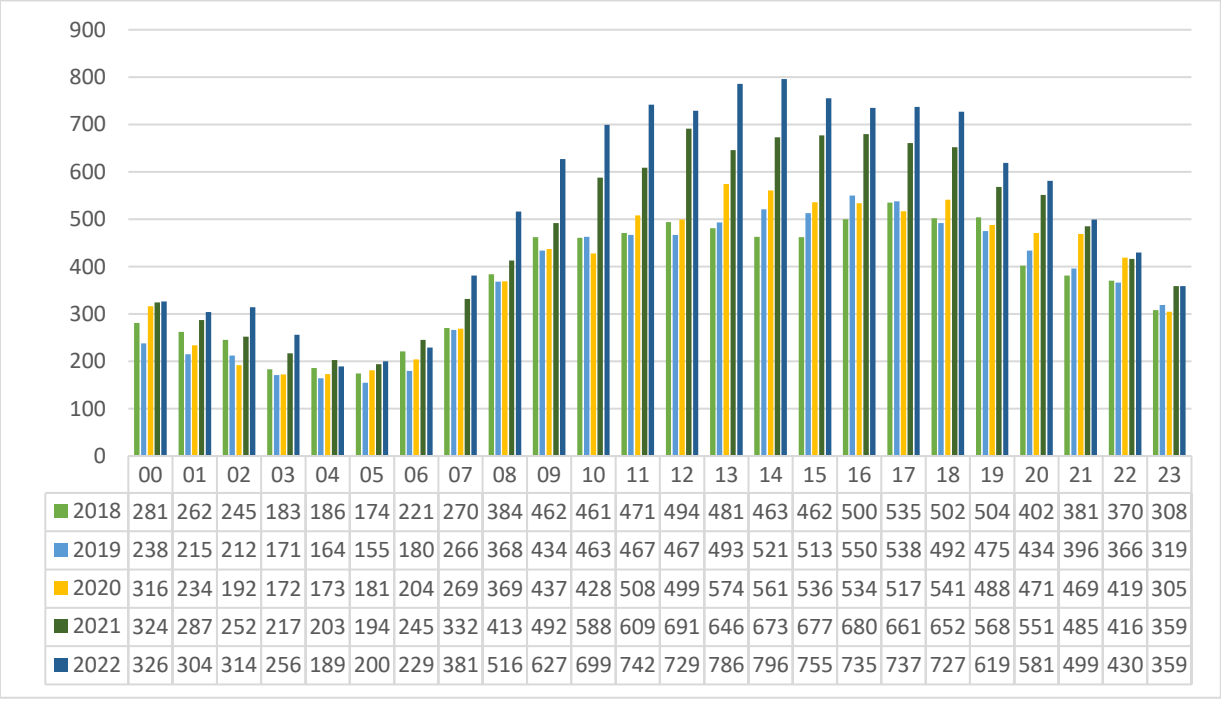
Temporal Variation

Figure 16: EMS Calls by Month



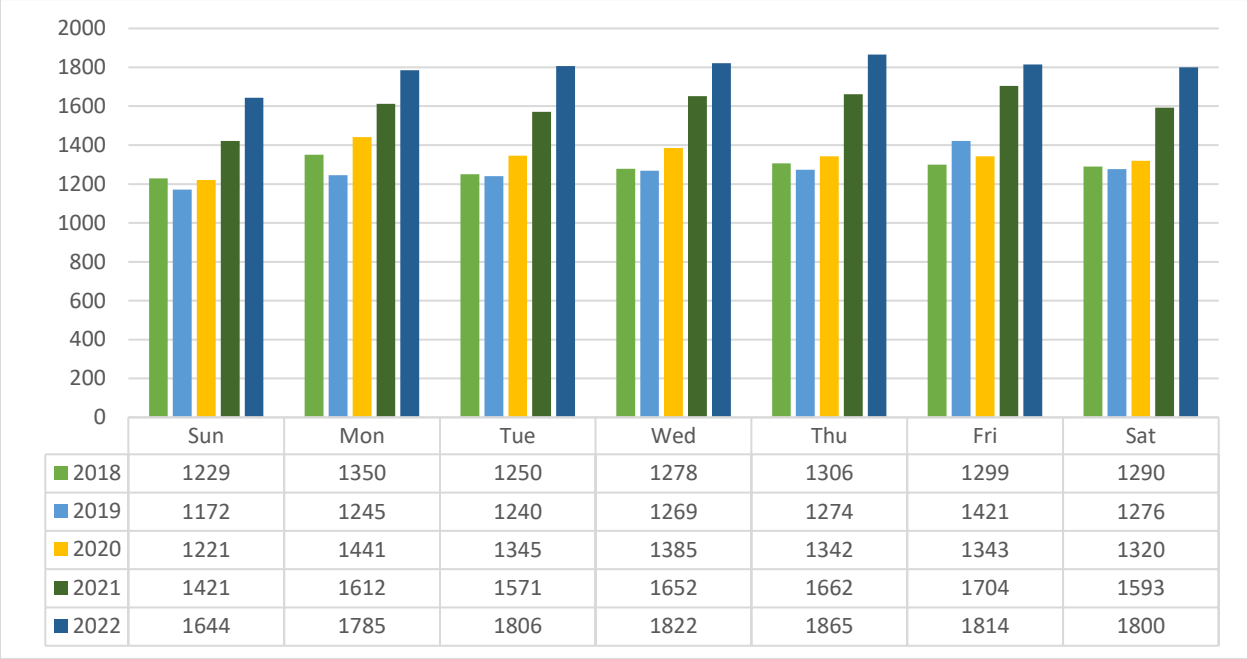
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	735	668	665	724	795	775	831	872	756	773	703	705
2019	695	686	697	687	749	708	854	794	761	777	735	754
2020	767	759	753	593	756	832	907	864	817	855	770	724
2021	768	722	821	872	1023	988	1123	980	1025	1042	962	889
2022	1035	898	927	899	1028	1078	1196	1168	1026	1159	1053	1069

Figure 17: EMS Incidents by Hour of Day (12 = 12:00p)



	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2018	281	262	245	183	186	174	221	270	384	462	461	471	494	481	463	462	500	535	502	504	402	381	370	308
2019	238	215	212	171	164	155	180	266	368	434	463	467	467	493	521	513	550	538	492	475	434	396	366	319
2020	316	234	192	172	173	181	204	269	369	437	428	508	499	574	561	536	534	517	541	488	471	469	419	305
2021	324	287	252	217	203	194	245	332	413	492	588	609	691	646	673	677	680	661	652	568	551	485	416	359
2022	326	304	314	256	189	200	229	381	516	627	699	742	729	786	796	755	735	737	727	619	581	499	430	359

Figure 18: EMS Incidents by Day of Week



	Sun	Mon	Tue	Wed	Thu	Fri	Sat
2018	1229	1350	1250	1278	1306	1299	1290
2019	1172	1245	1240	1269	1274	1421	1276
2020	1221	1441	1345	1385	1342	1343	1320
2021	1421	1612	1571	1652	1662	1704	1593
2022	1644	1785	1806	1822	1865	1814	1800

Planning for EMS

Current Planning Processes

Outside of any contractual obligations, there is limited interaction between the EMS system agencies. MFD and MESI field representatives meet quarterly to have an open dialog about EMS delivery, but both sides feel that conversations often lack any substance or agendas. Issues or concerns that each organization has with the others' operations are known in each organization, but no regular problem-solving dialog was ever demonstrated.

Recommendation #11: As important and prevalent that EMS services are, monthly operational meetings, with an agenda that includes issue addressing, should be regularly scheduled with procedures in place about when to escalate an issue to policy decision-makers.

Industry Standards

Commission on Accreditation of Ambulance Services (CAAS) is the acknowledged agency for ambulance service accreditation. Accreditation is a recognition that an organization meets standards and acceptable practices, not only with field performance, but whole organization practices. Most accreditation benchmarks are beyond baseline performance standards. From CAAS's website:

CAAS accreditation is designed to help EMS agencies increase organizational performance and efficiency, increase clinical quality, and decrease risk and liability. Accreditation provides a template for making comprehensive organizational changes that improve the organization's overall performance. An independent review validates that accredited agencies are adhering to the highest standards in the industry.

ACCREDITATION IS IMPORTANT TO YOUR:

Patients (and your community)
Accreditation assures your patients that the service has met the Commission's high standard for quality patient care and that the service stands ready to care for their families if needed.

Local Officials
Accreditation assures local officials that your service has undergone scrutiny by an independent review process. In future years, many local officials are expected to require ambulance accreditation.

Medical Community
Your medical community can be confident that your service is providing quality patient care in accordance with nationally accepted standards. Ambulance accreditation is also important because of the significant role you play in the health care team.

Ambulance Service
Your ambulance service will receive the recognition it deserves for its outstanding achievements. Your staff will be proud to be affiliated with a service which has met the Commission's high standards. Accreditation may also provide you with a competitive advantage particularly when marketing your service.[13]

The intent of the CAAS Standards is to define a "gold standard" for the medical transportation industry of a higher caliber than is typically required for state or local licensing. The revised CAAS Standards–updated to reflect today's emergency medical services environment–are built upon this original intent.

Clearly stated in the introduction to the original standards, "The applicant service desiring to become accredited should do so with the knowledge that it will fall into a class that has more to prove every day, rather than less. That is, the conferment of a Certificate of Accreditation is not justification to rest on that laurel, but to always prove that such recognition is warranted. Along with the certification that the agency has met

[13] https://www.caas.org/about/why-accreditation/

these standards in the past, must be the commitment to continue striving to meet new standards and excel in ways not yet adopted into standards."

Currently, there are no EMS agencies accredited within the state of Montana. The complete accreditation standards outline is in Appendix C.

Recommendation #12: MESI should move towards an accreditation standard. While pursuing the accreditation can be arduous at times, even adopting the accreditation model as standards for which to aim for is beneficial.

SECTION IV
FUTURE SYSTEM DEMAND PROJECTIONS

Population Growth Projections

The future growth of the city of Missoula is guided by two documents: "Our Missoula City Growth Policy 2035" and the Missoula County Growth Policy most recently updated in 2019.

Currently, the city encompasses 35 square miles and a 2021 population of 74,822[14]. The city document uses a study area that encircles the current city limits to include a total area of 62.96 square miles or 80% more area than the existing city limits. The city report[15] identifies an annual growth rate of approximately 1.5% annually. Based on this growth rate, projected populations through 2035 are:

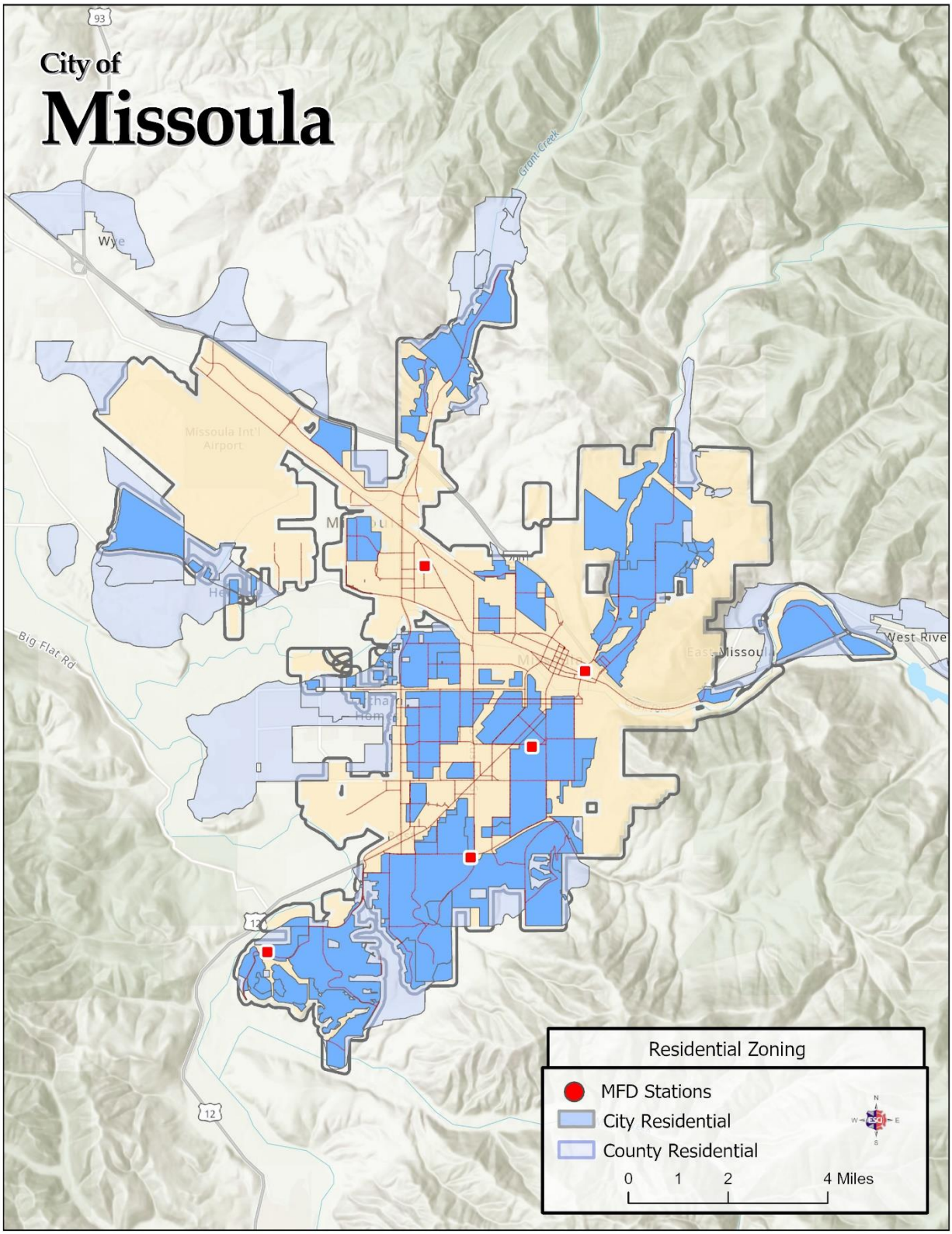
2025 – 79,413 persons
2030 – 85,570 persons
2035 – 92,162 persons

The county document identifies a 2015 county population of 116,076 while the US Census Bureau reports a 2021 population of 121,041. This suggests a 62/38 percent breakdown between the city and unincorporated area populations with the 2035 population projection aligning with the city's projection. In addition, the over 65 population, a substantial user base for EMS services is projected to grow from the existing 13.6% of the population to 20%.

The map below shows the residential zoning areas and existing city boundaries along with the Urban Fringe Development Area (UFDA). It encompasses 40,254 acres within the city and 21,462 currently outside the city where the potential for most growth is expected to occur.

[14] US Census Bureau
[15] https://www.ci.missoula.mt.us/DocumentCenter/View/34746/OurMissoulaGP_full?bidId=

Figure 19: Residential Zoning



Service Demand Projections

The 2019 MFD annual report identified two models for its projections of calls into the future. One was based on population growth, the second was based on historical trends. Figure 57 of the report identified that by 2020, both models projected call volumes of approximately 10,000 calls annually. In review of the actuals for 2020, actual call volume was 9,433 of which 6,132 (65.0%) were EMS calls. (This is consistent with nationwide percentage statistics when the fire department responds to EMS calls.) The report then projects a per capita annual call growth at 3.5% reflecting the previous 5 years annual population growth rate and a 5.4% annual growth rate when looking at historic call volume back to 2006 excluding the year 2021, which was the first full year of MFD's Mobile Support Unit.

What was not known at the time of the plan included the onset of COVID and its impact not only on call volumes but nation-wide population distributions. Its long-term impacts are still unknown. While the city's Growth Policy 2035 projected an annual population growth of approximately 1.5%, 2021, growth was 1.8%, and in 2022 growth increased to 2.9%. In addition, Montana's 2022 growth rate ranked sixth amongst the 50 states.[16] With these cited facts, ESCI chooses to use an estimated annual growth rate of 2%.

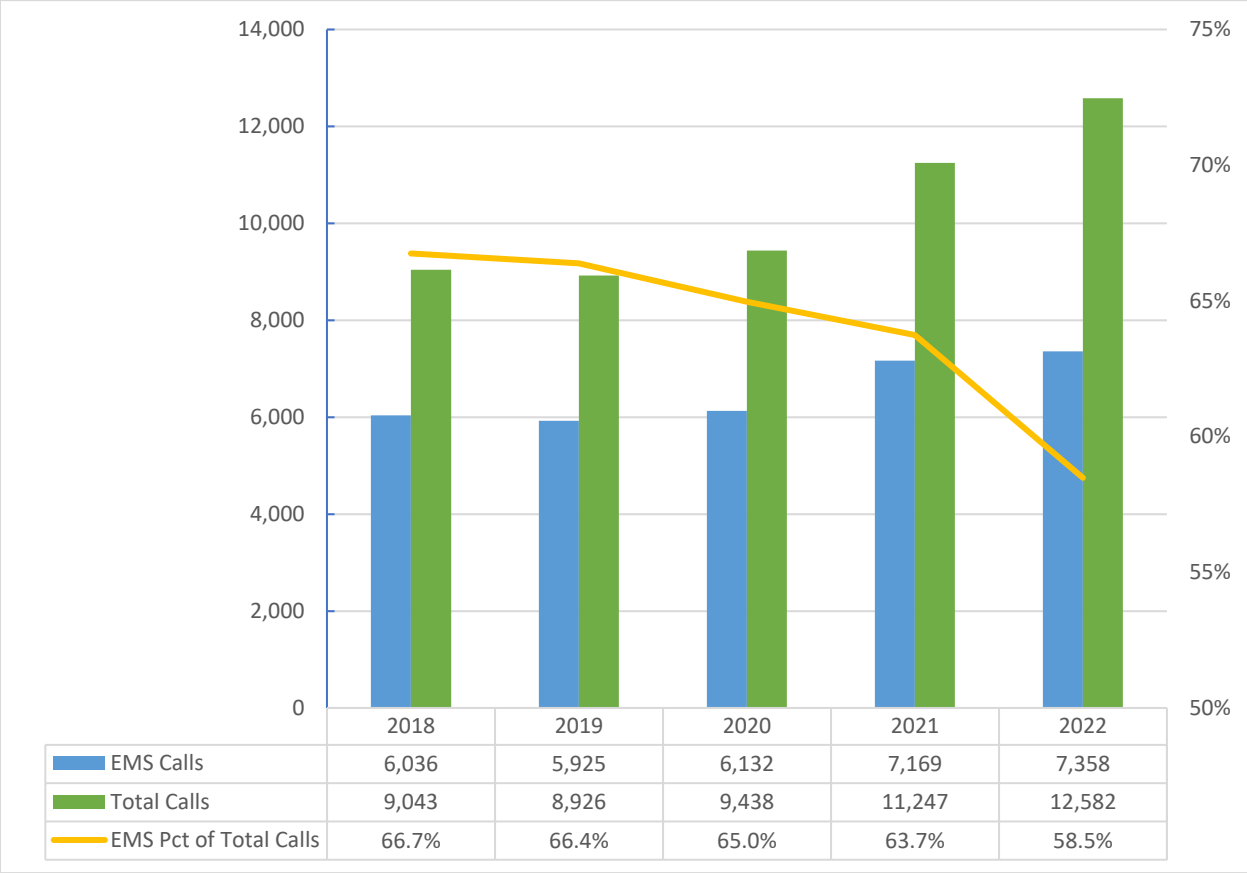
From a call volume trends perspective MFD's call volume in 2019 took a dip of 1.29% from 2018, but then significantly increased by 5.74%, 19.17%, and 11.87% in 2019 through 2021, respectively. Since the 3-yr COVID experience now makes up a majority of the 5-yr look back, an annual trend based on the previous five years is difficult to determine as call volumes for many departments both increased and decreased at an out-of-the-ordinary rate during this time frame. In addition, MFD implemented a Mobile Support Team response in late 2020 to assist with non-emergency calls that increased call volume. ESCI chooses to see a slower growth than the 5.4% historic rate when COVID-influenced rate numbers are discarded. (The first two months of 2023 are slightly less than the corresponding 2022 numbers.) We use the 4.0% growth rate through 2030 and then slow to a 3% growth rate beyond that while maintaining a persistent 65% EMS/Non-EMS call ratio.

One caveat to this is that from 2018 to 2022, the highest volume of EMS calls (55.2%) occurred in commercial and mercantile areas of the city[17] with only 29.9% of EMS calls occurring in residential areas.

[16] https://worldpopulationreview.com/state-rankings/fastest-growing-states
[17] Based on Missoula City zoning areas

The chart below reflects the EMS aspects of the trends with a rapidly increasing total emergency response and a slower, but still increasing EMS response.

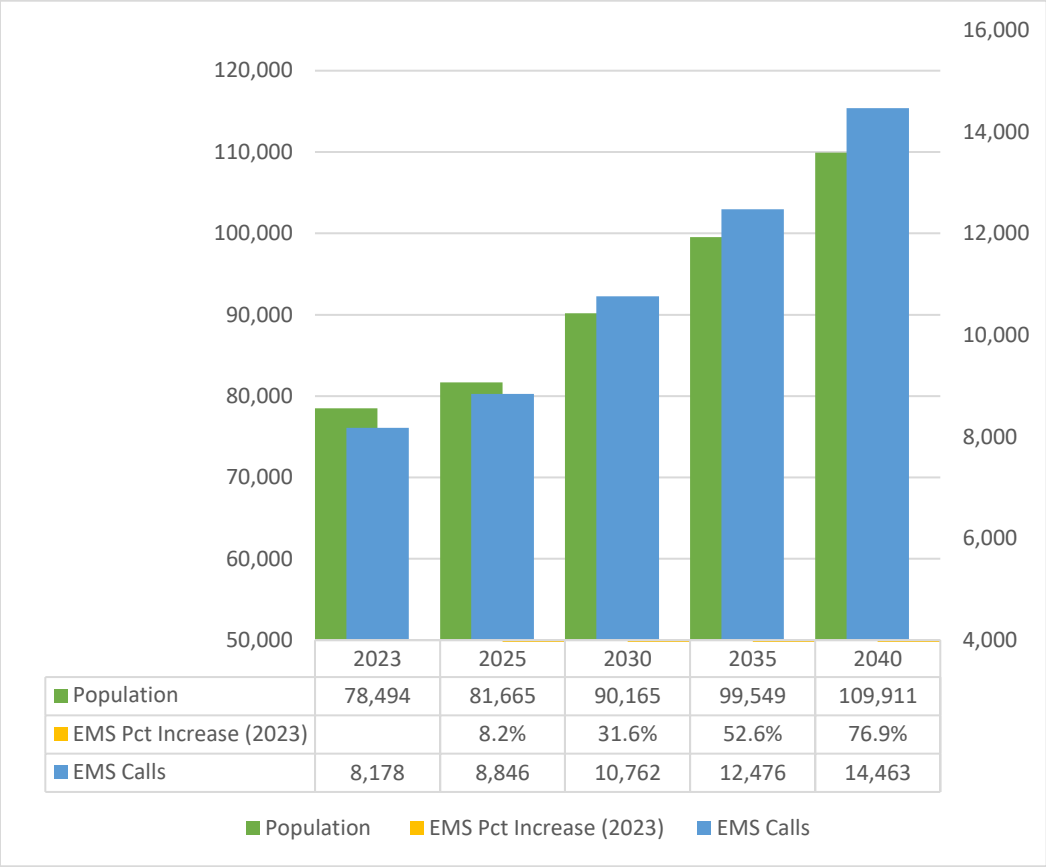
Figure 20: Incidents (2018-2022)



	2018	2019	2020	2021	2022
EMS Calls	6,036	5,925	6,132	7,169	7,358
Total Calls	9,043	8,926	9,438	11,247	12,582
EMS Pct of Total Calls	66.7%	66.4%	65.0%	63.7%	58.5%

The preferred way for smoothing out the abnormalities is to see the 22.9% increase from 2018 to 2022 (5.48% annually) and align that with the 2019 Master Plan's historical trend of 5.4%. Utilizing this long-term trend rather than the population trend yields the following MFD EMS call volume in 2040 of 18,962. However, also looking at the call volume model based on population yields a 2040 EMS call volume of 10,859. ESCI chooses to average the two and call the two numbers a high and low possibility.

Figure 21: 2023-2040 Projections



	2023	2025	2030	2035	2040
Population	78,494	81,665	90,165	99,549	109,911
EMS Pct Increase (2023)		8.2%	31.6%	52.6%	76.9%
EMS Calls	8,178	8,846	10,762	12,476	14,463

Industry Trends

The future of EMS is documented in a 2019 report created by the National Highway Traffic Safety Administration called *EMS Agenda 2050: A People-Centered Vision for the Future of Emergency Medical Services.*[18] It is a document outlining "a vision for what could be," not full of specifics of how it is changing. It relies on the continued vision of seeing EMS service as much more than an ambulance service but, rather, one doorway into an ever-changing community-oriented healthcare system.

[18] https://www.ems.gov/assets/EMS-Agenda-2050.pdf

The six principles it adopts as its vision are "an EMS system that is….":

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

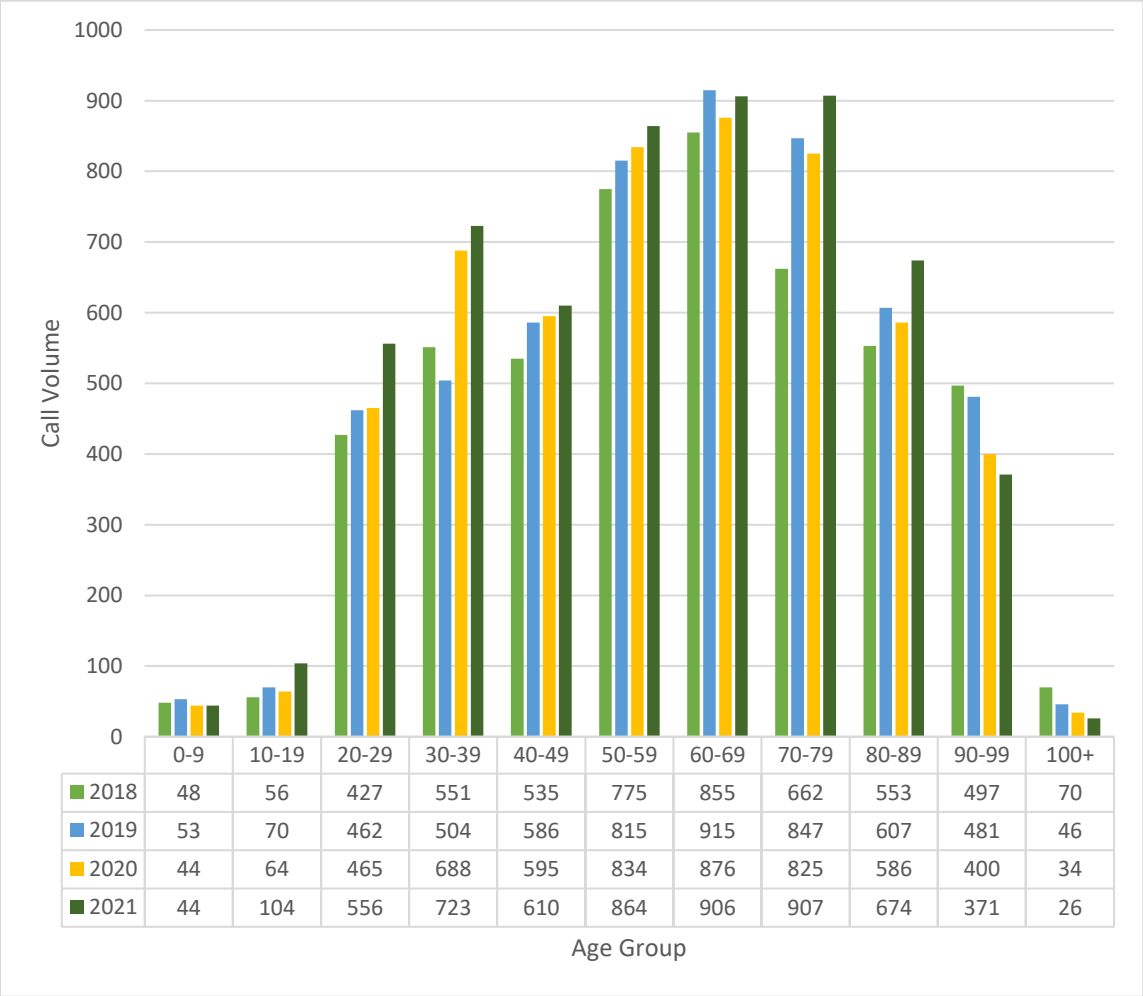
Montana has identified that EMS systems in rural areas of the state are slowly diminishing as those systems that rely on volunteers continue to have decreasing participation. It is likely a new model of EMS service will be required to replenish this capacity. The Montana Ambulance Association acknowledges similar issues that are the national level that are affecting local EMS: increasing costs of care, workforce shortages, and underfunded services are significant issues with limited options under discussion.[19]

Community Risk Analysis (EMS Perspective)

From an EMS perspective, the main long-term community risk for the city is an aging population. It is well-known that an older population tends to cause a greater service demand on EMS due to deteriorating health conditions. Below is a graphic of EMS calls of patients transported from 2018 through 2021[20] by age group.

[19] https://mtambulance.org
[20] 2022 data was unavailable.

Figure 22: EMS Transports by Age (2018-2021)



	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+
2018	48	56	427	551	535	775	855	662	553	497	70
2019	53	70	462	504	586	815	915	847	607	481	46
2020	44	64	465	688	595	834	876	825	586	400	34
2021	44	104	556	723	610	864	906	907	674	371	26

With the end of the baby-boomer generation now approaching retirement, likely the peak of the senior citizen population over the next ten years, senior housing has become more in demand. As Missoula may consider these options in the future, they should keep in mind that the anecdotal calculation the development of senior facilities has on EMS call volume is about one call per unit per year. In other words, for every single unit of senior housing added to the community, one call per year should be added to projected EMS call volumes.

SECTION V
FUTURE DELIVERY SYSTEM MODELING/RECOMMENDED ENHANCEMENTS

In reviewing options for improved EMS, ESCI looked at various aspects of the current service delivery model. To assist in understanding the current concerns, ESCI looked for both documented and undocumented shortcomings in multiple areas to determine the level of concern. In general, ESCI found little data-supported or incident-supported concern with the EMS model as it is and little indication of contractual or response deficiencies. However, to take a broader look outside of immediate problems to address, ESCI did work with MFD staff to determine if an entirely different response model would yield increased benefits. As in most situations, a greater benefit comes with a greater cost.

EMS models across the country are generally provided by either a level of government or private businesses, usually contracted. Both models can be provided at either the county and community levels or a combination of the two. Which one of the two is a better model is quite subjective and depends on where the values of the community lie. Where one community may value service provision with limited concern for costs, other communities will accept a lesser service delivery at a lower cost.

Service Delivery and Targets

EMS Capabilities

The national EMS system, in general, is struggling. EMS staff shortages (including paramedics), low insurance reimbursement rates, system abuse due to limited healthcare options, and EMS staff mental health impacts create an environment of required and on-going adaptation to conditions.

Two new practices that are gaining steam nationally are the incorporation of a response unit that handles non-emergency calls and a response unit dedicated to mental health issues.

Non-Emergency calls

A frequent community question to fire chiefs is whether a large response to EMS calls is necessary, i.e. an ambulance and a fire truck with up to five people. Historically, the

large response was for two reasons. The first was to make sure that upon scene arrival EMS staff did not find themselves understaffed with a more serious incident, as caller information about the request nature was often limited or had misinformation leading to the potential of not having sufficient staff to provide aggressive medical care.

The second reason was for manpower. Serious calls requiring aggressive intervention came with a great deal of equipment to be brought to the patient as well as that equipment plus the patient having to be transferred to the ambulance. Insufficient personnel created opportunities for treatment delays and staff injury when trying to accomplish everything that needed to be done with limited staff.

However, improved 9-1-1 call screening and an emphasis on staff safety with a reduction in hospital transport expectations has provided an opportunity for EMS agencies to now respond dedicated units, often quietly and without an emergency urgency. These units handle a great many more incidents while leaving emergency crews available for true emergencies.

While it may not be a 24-hr practice due to funding availability, (insurance reimbursement is questionable for non-emergency incidents), any practices that are more in-tune with the true nature of the incident that increase safety and reduce costs for all is a benefit. This option is being suggested as an option in the Deployment Strategy Options section as it was an idea tried a few years back and thought to be successful but had limited funding.

Mental Health units

Another rapidly growing area of EMS includes mental health patients, not an area that EMTs and paramedics typically are given a great deal of training for, as this requires a different approach to treatment. Included in care is a psychological element that even many emergency rooms are not capable of treating effectively.

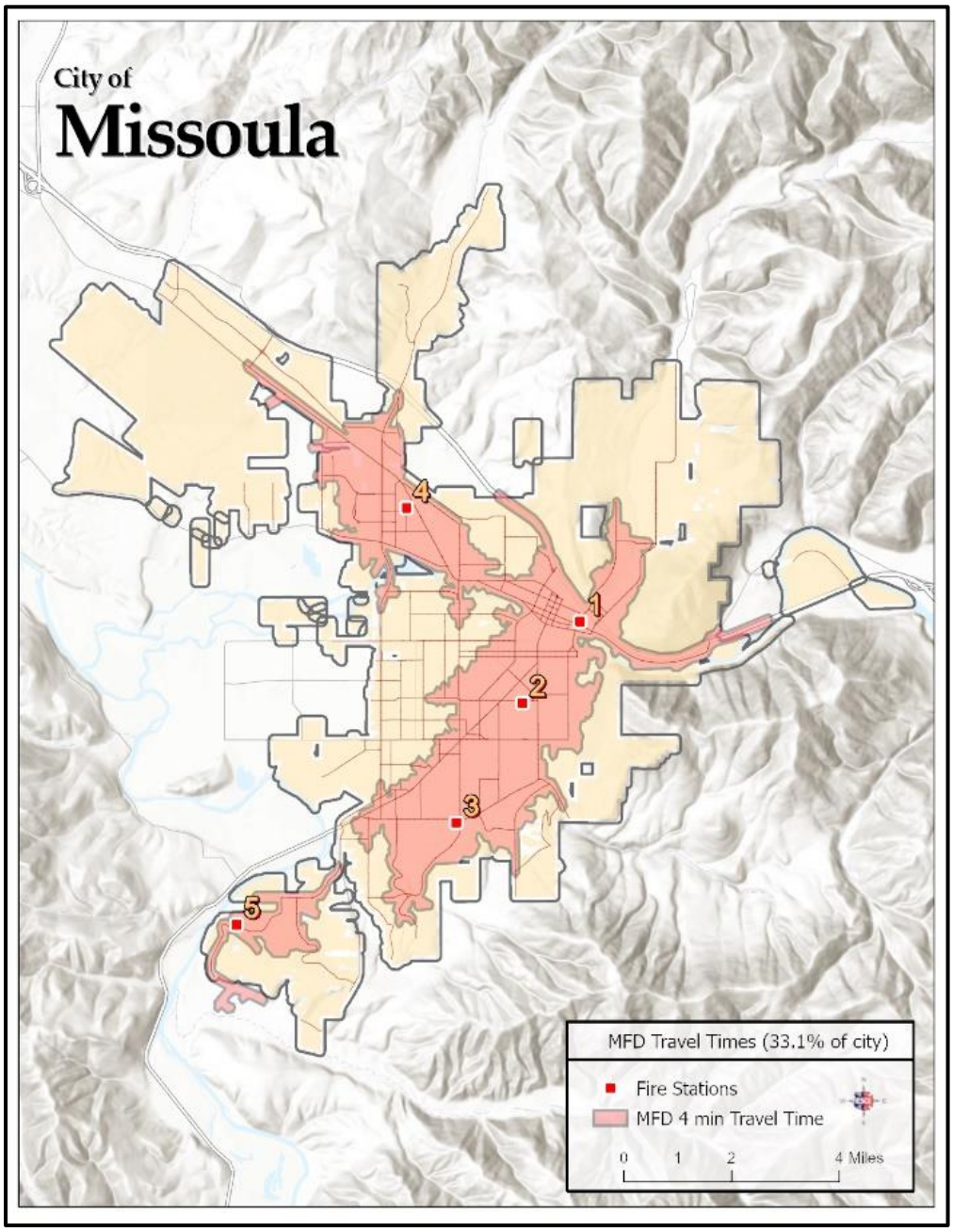
Fire departments and EMS agencies are now beginning to staff at certain periods of the day or week, units that are made up of a paramedic, certified mental health clinician, and possibly a non-uniformed police officer. These units are solely dedicated to incidents where mental health is a possible contributing factor to a call for service where in the past, fire departments EMS units would have been required, with limited flexibility, to provide treatment and/or transport. MFD has implemented this with the 2020 initiation of a mobile response unit.

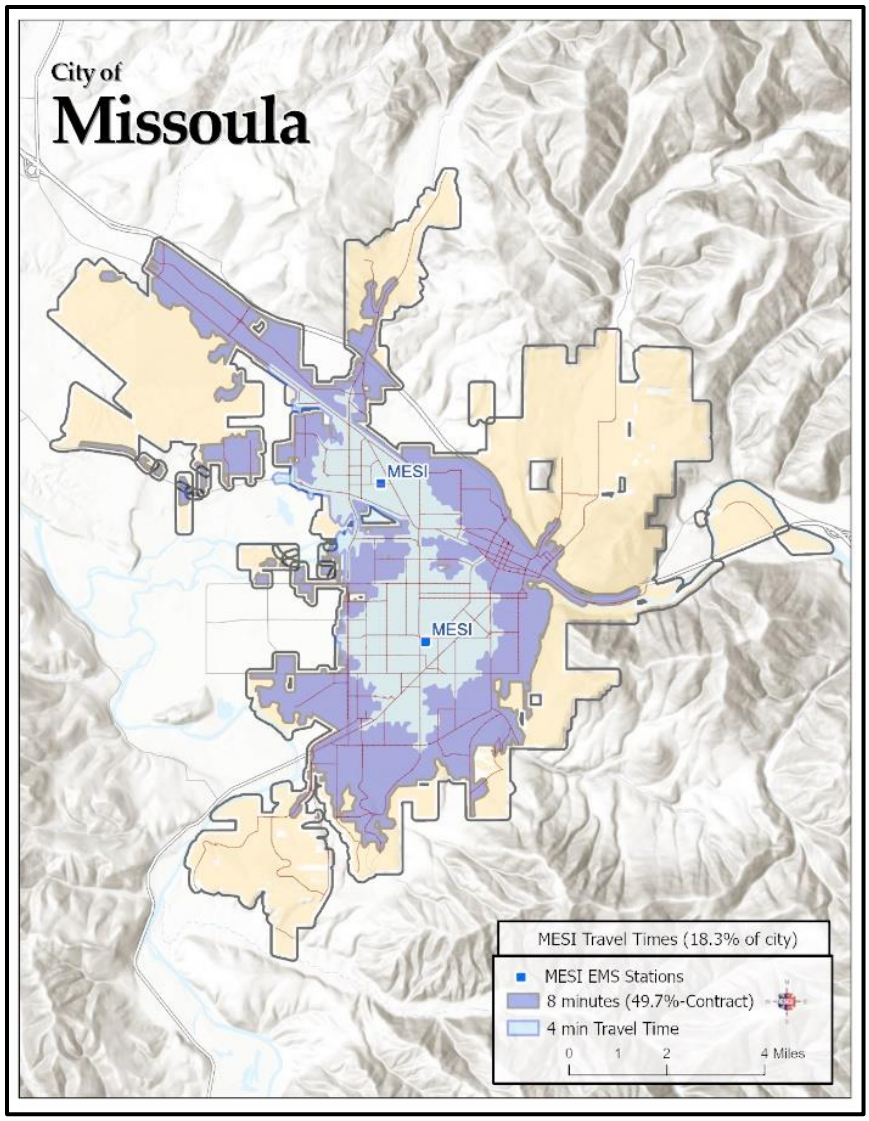
Response Standards

Response standards currently used by the EMS profession still prefer four minute on-scene time for cardiac arrest since by that time, a non-intervention cardiac arrest

survival rate is already reduced by 40%. (For every one minute that a victim is in cardiac arrest, their survival chances decrease by 10%.) The following maps show the four-minute travel time for Missoula based first on fire department response and second by MESI ambulances, all responding from their stations.

Figure 23: MFD/MESI 4 min Travel Times





Across the country, the accepted rate of EMS arrival time is 8 minutes based on a cardiac arrest study in the 1970s. This has aligned with an NFPA standard for fire responses, so the response time recommendation has become more anecdotal than based on studies. In fact, some of the latest studies have indicated there is no discernible benefit increase in patient outcomes that can be tied to response times. This has then led more to a standard rooted in public expectation where when people call 9-1-1 they expect a quick response rather than most beneficial patient outcomes.[21]

[21] Response Times: Myths, Measurement and Management - JEMS: EMS, Emergency Medical Services - Training, Paramedic, EMT News (Aug 2005)

However, to know whether an EMS system is meeting expectations, performance standards or expectations need to be established. Elements that most often make up measurable performance standards include time, quality, and resources. Times are set for various scopes of the response model such as call handling, dispatch, turnout, and arrival. Quality is often measured through feedback from patient contacts, QA/QI programs (Quality Assurance/Quality Improvement), and patient outcomes. Resources are part of the planning process where various incident types are modeled, operational strategies are researched, and then appropriate resources are determined to accomplish established goals. Goals can be made up of one, a combination of, or all the elements but unless specific goals are established and then monitored, there is little way to know if performance standards are being met.

EMS response standards begin with elected officials guided by EMS staff on standards options and costs for achieving them. For example, a performance standard of arriving at the scene of an 9-1-1 emergency request within 8 minutes 90% of the time is a performance standard. Having two paramedics that increase the likelihood of a successful patient outcome for all cardiac arrests is a performance standard.

Response Zones

Response zones are strategies to indicate the selection of an ambulance to respond to a call primarily based on geographical proximity. Two methodologies are primarily used when there is a selection opportunity for an available ambulance, static and dynamic.

The static option is to pick an ambulance according to a pre-defined area that is used mostly defined by geographic proximity. For example, if you have a north and south station, there is a response zone for the north and a response zone for the south. Assuming all things equal across the board (which they often are not), the border between the two response zones would be the middle line between the two stations.

The dynamic option is based on geographic proximity to the call. In other words, response zones change based on the current location of an ambulance. As it moves around the community, it is always available for the call that it is closest to even if under normal circumstances when all units are in quarters, another unit is normally closer.

There are few pros and cons to both options as listed below:

Figure 24: Response Zone Strategies Pros/Cons

	PROS	CONS
Static Response Zones	*Responders are familiar with area *Responders possibly know the potential patient from previous encounters. *Patients may know the responders and have trust *Ambulances within response zones closets to medical facilities do not get repeated call burdens	*May not always be the closest unit to a call * Could be out of their primary response zone creating a longer response time.
Dynamic Response Zones	*Will almost always get closest unit *Responders get a larger community perspective *May be better at balancing call distribution loads	* May unnecessarily get called into another unit's area, if closer by only a few seconds. * May have loss of relationship familiarity * Unpredictability as to who responds where creates complex planning.

Technology

Modern and reliable technology is now a given for almost all aspects of EMS care. From the taking of a 9-1-1 call to delivery of patient care, technology now plays a crucial role in patient outcomes. Consequently, the pace of technological change and the associated improvements needs to continually be embraced. This means an ongoing system of design, testing, implementation, and review and since the Missoula EMS system has three primary players. Effective communication is a necessity.

9-1-1 CAD systems should allow rapid call entry and rapid dispatch. Connectivity to responders should be reliable. Communication procedures should be straight-forward, well-understood, with associated training and accountability. Adequate resources are needed to support very low system downtimes and rapid response times to system issues.

The Missoula EMS system has taken some initial steps towards implementing good technology practices. A CAD system is used, MDTs (Mobile Data Terminals) or laptops are installed in vehicles, and there is regular, but not necessarily dependable, practices amongst field units. Interviews with all organizations indicated various levels of

dissatisfaction with the scope of technology practices. Limited call type usage in the CAD system prevented more targeted resource assignments. Mixed use of voice and electronic unit status changes created inconsistencies. Lack of tech support promoted regular use of backup methodologies that often negated the significance of quick problem resolution.

Some of the recommended improvements have already been spelled out in earlier sections.

Recommendation #13: Develop and train protocols that outline when voice and electronic communications are acceptable and desired.

Recommendation #14: Develop a joint communications committee of all county organizations that use the 9-1-1 system to meet monthly to coordinate and regularly evaluate the status of all communications elements.

Recommendation #15: Develop protocols on how to manage communication system issues, for both critical and non-critical systems. Make sure that all participating organizations are aware of protocols.

Deployment Strategy Options

For the future of EMS for the city of Missoula, ESCI brainstormed with the Missoula Fire Department staff to develop eleven different options for consideration for Missoula EMS's future. No option was considered too radical to be considered. The eleven options were:

1) Delivery remains unchanged but includes some improvements.
    a. The service delivery model remains as it is currently with targeted improvements.
2) MFD takes over providing emergency transport services from MESI.
    a. MFD begins providing all 9-1-1 emergency services to the community and MESI (at its discretion) only provides backup and interfacility transport.
3) Provide city funding to MESI (contract) to enhance response.
    a. Provide funding to MESI to meet performance standards currently unattainable due to funding issues.
4) MFD provides a partial level of service by implementing a closest unit response model that includes considering both MESI and MFD unit locations.

   a. The MFD and MESI provide 9-1-1 EMS services jointly with the closest unit, either MFD or MESI, responding. (Should a MESI unit be dispatched, a MFD support unit would also be dispatched as currently.)

5) MFD takes Advanced Life Support (ALS) calls and MESI retains responses for Basic Life Support (BLS) calls and interfacility transports.
   a. 9-1-1 services are split between the two agencies with MFD handling only the most critical calls and MESI handling the non-critical calls and interfacility transports.
6) Move MESI ambulances into MFD fire stations.
   a. Have MESI change their response model so that they respond from MFD stations and are dispatched like a MFD unit, rather than using their existing multi-unit/single station model.
7) Allow MFD to provide 9-1-1 services but have private contractor staffing for ambulances.
   a. Move 9-1-1 EMS service to MFD but have MFD contract with a private EMS provider for ambulance staffing. Ambulances and equipment would be owned (contracted?) by the city except for staffing.
8) Look to Missoula County to take up EMS responsibility.
   a. Request Missoula County to assume responsibility for all EMS services within the county, including the city, expecting a single response model for the entire county.
   b. Create a countywide EMS district.

      Create a separate county-wide organization with taxing authority that solely provides EMS services. This would be another government body with its own elected officials.
9) Create a countywide EMS authority.
   a. Create a separate county-wide EMS agency with no taxing authority but funded by contributions from all local government agencies.
10) Create a City EMS Authority
   a. Create a separate EMS agency with no taxing authority but funded and overseen by participating government agencies. (Not necessarily county-wide)
11) Develop Alternate Response Unit response model.

a. Have MFD stand up an additional vehicle that is dedicated to non-emergency response leaving front-line MESI ambulances to only handle emergency responses.

12) Provide funding to MESI to meet performance standards currently unattainable due to necessary funding.

In all twelve options were identified which included discussions on service level improvement realities, funding, operational benefits, political support, organizational dynamics, and logistical adjustments. Pros and cons were developed for each.

From those twelve options, four were chosen as the most likely to be pursued in the future. Those are:

1) Delivery remains unchanged but includes some improvements.
2) MFD takes over providing emergency transport services from MESI.
3) Create an EMS division that is staffed by contractual paramedics.
4) Develop Alternate Response Unit response model.

OPTION 1: Delivery remains unchanged but includes improvements.

This option requires the least amount of change and is effectively keeping the existing system but with improvements. The pros/cons of this option include the following:

Figure 25: Option 1 Pros/Cons

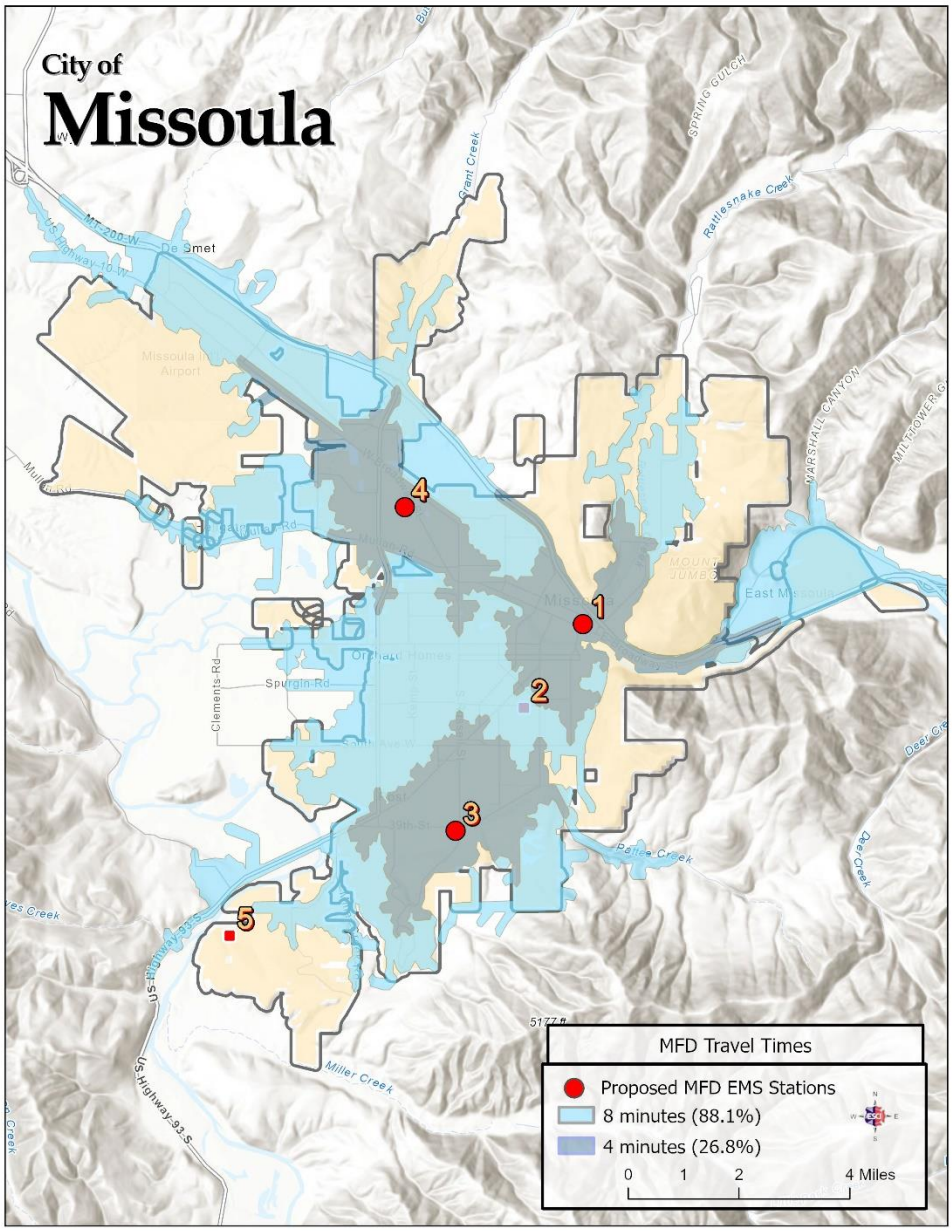
PROS	CONS
System remains as is with little change	Exposure to any future MESI uncertainty
Minimal or no costs to improvements	Fewer cross-trained paramedics to increase FF staffing
Maintenance of system stability	System weaknesses still prevail such as MESI's commitments outside of contractual obligations
No significant EMS expense	
No citizen exposure to increased tax burden	

To pursue this option, MFD and MESI need to outline specifically what shortcomings need to be addressed.

OPTION 2: MFD takes over providing emergency transport services from MESI.

This option requires a radical restructuring of the community's EMS service delivery system. To provide these services and based on previously documented call densities and response times, ESCI recommends a minimum of three ambulances to service the city residents. In reviewing this density and response time distribution across the city, ESCI would recommend that ambulances be placed at Stations 1, 3, and 4. The following is a map and graphic of how coverage would take place across the city and anticipated response ranges.

Figure 26: Proposed MFD EMS Stations



MFD would need to acknowledge that unintended consequences to EMS service to Missoula County residents outside the city boundaries would likely have to be addressed, as MESI's ability to provide services to the rest of the county would be unknown, but possibly have a detrimental effect. (If MESI decides that it can no longer operate due to the lack of call volume and revenue, it is likely the burden for county EMS would fall to the city which may require an additional ambulance.)

This option would cause a significant increase in city expenses to accommodate the additional staff and fleet that would be required. (See Figure 28) Increased resources would not be confined to the fire department as additional staff may create increased need within the Human Resources Department and an increase in size of fleet would likely create increased need or resources such as mechanics and bay space.

The following are the pros and cons of this option.

Figure 27: Option 2 Pros/Cons

PROS	CONS
All EMS services under city control	Significant increased expense through increased staffing and fleet
Cross-trained paramedics could add to number of on-duty firefighters	EMS often operates at a loss
Greater service efficiency since all staff belong to same organization	Facilities may need to be expanded
No exposure to private EMS provider future	Could put MESI out of business and cause the city to address county impact
Improved response times	

Below is a very rough estimated cost for MFD to provide EMS to the city. This does not consider any impact on county EMS services.

Figure 28: Estimated MFD EMS costs

Resources required	Quantity	Cost
Additional staff required	24–28 staff (3 ambulances x 2 FFs/shift x 4 shifts) plus staff to cover vacation/sick time	$3.8 million annually[22]
Additional ambulances required	3 for a total of 5 (Since there likely would be no backup ambulances from other agencies, ESCI would recommend two spare ambulances.)	Initial Purchase: $1.2 million plus $240,000/yr. for replacement
Additional equipment purchases	3 for a total of 5 ambulances (Most spare ambulances carry all front-line equipment except for controlled drugs.)	Initial Purchase: $300,000
Station expansions	Assuming property is available for expansion, $500/ft2 for three stations	$3.6 million (25% increase in station space)
Total Initial Investment	Staff plus ambulances plus equipment	$5.3 million
Total Eventual investment	Above plus station expansion	$8.9 million
Total Annual Investment	Staffing plus annual fleet replacement allocation	$4.04 million

To offset these expenses would be the revenue that is collected from the delivery of EMS services.

Without going into MESI's financial details, which has provided the background for our cost estimating, we can estimate that MFD would likely receive EMS collections of

[22] Estimated at $7,500/mo/FF plus 50% benefits plus one additional HR rep plus one additional fleet mechanic.

approximately $2.4 million annually[23]. This means the net increased cost of providing EMS service to the city would likely be approximately $1.6 million annually.

One brighter perspective on this cost is that MFD would also get, if cross-trained, 28 additional firefighters which normally would cost $3.8 million so the city would be saving $2.2 million if looked at from a firefighting perspective as well.

OPTION 3: Creation of an Alternate Response Unit (ARU)

To create a more targeted response to the 9-1-1 request, MFD may take on the creation of an Alternate Response Unit (ARU) dedicated to handling incidents that do not require an emergency response. These incidents could be of both a fire and EMS nature. Depending on anticipated call volumes, ARUs can greatly reduce the number of incidents a frontline unit responds to while also improving coverage to the community by increasing frontline unit availability.

[23] Based on national collection rate of 25%. https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/Ground%20Ambulance%20Services%20in%20the%20United%20States%20-%20A%20FAIR%20Health%20White%20Paper.pdf

Figure 29: Option 3 Pros/Cons

PROS	CONS
Responding resources are more appropriate for nature of call	No cost reimbursements
Frontline emergency staff has greater availability	Possible station expansion
Slower responses increase safety	Personnel burnout and skill degradation
Lower vehicle wear and maintenance	
Stronger community relationships	

The following are the roughly estimated costs for an alternate response unit which can be tested with one vehicle.

Figure 30: ARU Cost Estimates

Resources required	Quantity	Cost
Additional staff required	8 staff (1 unit x 2 FFs per shift x 4 shifts) plus staff to cover vacation/sick time	$1.08 million annually[24]
Additional units required	2 units likely of SUV style (1 frontline and 1 reserve	Initial Purchase: $100,000 plus $20,000/yr. for replacement
Additional equipment purchases	Basic equipment for safety and EMS issues	Initial Purchase: $25,000
Total Initial Investment	Staff plus vehicles plus equipment	$1.2 million
Total Annual Investment	Annual fleet replacement allocation	$1.3 million which includes staffing plus annual replacement allocations.

As outlined earlier, an alternate response unit would be responsible for 9-1-1 calls for service that a dispatcher has screened clearly to be non-emergency. A system like this

[24] Estimated at $7,500/mo/FF plus 50% benefits.

can be set up to exclude MESI from the initial response only requiring them once scene evaluation has taken place or include them if a medical facility transport is required.

OPTION 4: Create an EMS division within the MFD that contracts its EMS services to a private provider.

There are EMS organizations that offer contractual EMS services to local fire departments in such a way that the community experiences the EMS services provided as coming from the fire department. Through a contractual relationship, the private EMS provider is responsible for providing the vehicle, equipment, staff, and training to the fire department with the vehicle and equipment livery and uniforms showing them as members of the fire department. The more advanced EMS contractors that provide this may also include their paramedics being trained as firefighters, assigning them schedules that match with firefighter schedules, and occasionally receiving equipment from the fire department as recognition that they are part of the firefighting team.

Figure 31: Option 4 Pros/Cons

PROS	CONS
EMS under the FD control	Lower wages/benefits than firefighters possibly creating turnover issues
Greater efficiency since fire and EMS generally operate as a team	Dual management and accountability issues
No private ambulance business	Potential identity issues
No responsibility of day-to-day EMS operations	Could create issues for MESI and have county impact

Short-, Mid-, and Long-Term Strategies

Recommendation #1: Consider dispatch practices that make all radio operators back up call-takers so that any radio operator experiencing light radio traffic can also be a backup call-taker. (Time frame: Medium) Employee turnover and busyness are volatile in 9-1-1 centers. Having more people trained at all levels provides the necessary workforce.

Recommendation #2: Modify call-taking/dispatching procedures so that dispatching takes place as soon as the basic information of the call is determined. (Time frame: Short) EMD protocols require dispatching of units with only a minimum amount of information. If the CAD system is not capable of allowing the ability to dispatch both units while taking call information, it needs to be modified. If it is capable, dispatchers

should receive additional training on how to quickly receive necessary information for dispatch and then dispatch the call.

Recommendation #3: Enhance call code classification that allows for a more customized response recommendation that is based on call code classification. (Time frame: Short) Sending a standard response on all EMS calls is slowly giving way to data-drive response models that require only enough resources as necessary for the call as received by the dispatcher. However, this requires the CAD system to be built to allow the different response models and to try to narrow down the various models into practical response types.

Recommendation #4: Given the proportion of requests for EMS services, MFD should increase its EMS training hours by fifty percent. (Time frame: Short) EMS makes up a substantial portion of MFD's response history and will likely increase as the population ages. While skillsets are important to maintain, efficiencies and effectiveness can also increase through training on communication, policies, emotional support, and other elements of the EMS system.

Recommendation #5: MFD and MESI should hold more frequent joint training sessions that allows for not only operational efficiency development but relationship building. (Time frame: Short) For two agencies that jointly respond to as many EMS calls as they do, the amount of coordination between regular meetings, joint training, and dialog was low. Many of the current EMS challenges can be settled through greater communication with each other.

Recommendation #6: Aid agreements should be reviewed and updated as some of them are over twenty years old. (Time frame: Medium) A few of the aid agreements are quite old. While some of them would likely have changed little, reviewing contractual obligations to each other, and keeping them appropriate to the times prevents obsolescence and miscommunications.

Recommendation #7: Ensure that Stations 1 and 5 have a paramedic staffed 100% of the time to allow for immediate and effective deployment of Medic 1 or Medic 5. (Time frame: Medium/Long) As easy as this may sound, it may require several adjustments to staffing practices, department policy and labor agreements. The intent is to ensure a paramedic is always available on any responding ambulance.

Recommendation #8: Evaluate operational procedures to determine the need for a second engine on CPR calls based on location of responding ambulance. (Time frame: Medium) In greater detail, evaluate whether such a large response to a CPR call carries

significant benefits. There may be an alternative approach to CPR management that allows for similar outcomes, while not requiring so many personnel.

Recommendation #9: Develop performance compliance standards for EMS calls and use as well as accepted standards to serve as a foundation for any contractual EMS services. (Time frame: Long) This should involve both community interaction as well as negotiations between MFD and the EMS provider. Community expectations should be set by elected officials who regularly evaluate the EMS benefits and their associated costs. Creating benchmarks also creates a system and environment of accountability.

Recommendation #10: A structured training and exercise regimen between MESI and MFD should be practiced to maintain cohesive responses and preparedness. (Time frame: Short) Several of the issues ESCI heard about could be resolved through better communications and joint training that reinforces expectations. Doing this regularly puts everyone on the same page.

Recommendation #11: As important and prevalent that EMS services are, monthly operational meetings, with an agenda that includes issue addressing, should be regularly scheduled with procedures in place about when to escalate an issue to policy decision-makers. (Time frame: Short) Regular dialog including not only operational coordination, but policy reviews of practices, system expectations, and organizational requirements should be transparent and discussed with system providers.

Recommendation #12: MESI should move towards an accreditation standard. While pursuing the accreditation can be arduous at times, even adopting the accreditation model as a standard for which to aim is beneficial. (Time frame: Long) Adoption of an accreditation model provides direction and a game plan to an organization. While the recognition may be long-coming, model adoption shows employees and community that the service provided is consistent with a nationally accepted well-managed EMS organization.

Recommendation #13: Develop and train protocols that outline when voice and electronic communications are acceptable and desired. (Time frame: Short/Medium) Technology now plays a vital role in many areas of EMS service delivery. Utilizing it to the fullest allows for efficiency and minimizes interference with other non-EMS operations. (Lower radio traffic prevents interference with other calls). This includes the ability to maintain the technology.

Recommendation #14: Develop a joint communications committee of all county organizations that use the 9-1-1 system to meet monthly to coordinate and regularly evaluate the status of all communications elements. (Time frame: Medium) Joint

communication amongst all agencies that use a common 9-1-1 center can benefit from having a participatory voice in how services are delivered. Meeting regularly to discuss policy and practices reduces the likelihood of inconsistent burdensome practices and improves coordination and efficiency.

Recommendation #15: Develop protocols on how to manage communication system issues, for both critical and non-critical systems. Make sure that all participating organizations are aware of protocols. (Time frame: Medium) While technology is not perfect, backup and communications systems need to be in place and managed properly to deal with issues that are both primary and non-critical. In practices that involve multiple agencies, this can get complex and requires effective communication to work efficiently.

CONCLUSIONS

With the 2024 contract expiration for EMS services slowly approaching, it is prudent for the city of Missoula to evaluate whether the existing system is adequate and if not, what improvements could be made.

Overall, ESCI finds the delivery of EMS services within the city of Missoula satisfactory. This does not mean that there is no room for improvement. However, what ESCI has observed and researched is that systemically, the existing EMS system is providing services that meet contractual expectations and that the quality of service is within nationally accepted standards.

Conversely, since the EMS system is composed of primarily three separate organizations, each with their own set of priorities, there is room for improved coordination, communication, and technological advancement that would contribute to a more robust system.

Largely, we (ESCI consultants) have concluded that most concerns expressed by participating members are issues that can be dealt with through improved communications and coordination. A wholesale transition to a new EMS model is not necessary. Intentional and frequent communication between the three organizations would address most of the problems identified.

Appendices

Appendix A – Table of Figures

Appendix B – Fire Station Assessments

*Items displayed in red could be of concern if adding additional capacity to the fire stations

**Storage of reserve ambulances would be tight without the reduction of any other fleet.

***Any additional apparatus, equipment, etc. would potentially not fit in stations, overall, the Fire Department storage is beginning to be maxed out without the addition of ambulance.

Area of Focus	Station 1	Station 2	Station 3	Station 4	Station 5
Year Built/Remodel	1995	2008	1975 / 2008	1994	2007
Condition (Organizational Assessment)	Marginal / Poor	Good	Fair	Marginal	Good
Sleeping Rooms	7 (Individual Rooms)	6 (Individual Rooms)	4 (Individual Rooms)	6 (Individual Rooms)	6 (Individual Rooms)

Area of Focus	Station 1	Station 2	Station 3	Station 4	Station 5
Bathrooms/Showers	Locker rooms Female: 2 showers/1 toilet stall; Male: 4 showers/2 toilet stalls	2 unisex bathrooms with showers	2 unisex with showers 1 additional unisex with shower in separate area	Locker room Women: 1 shower/1 stall Male: 2 shower/2 toilet stalls	3 Unisex bathrooms with showers
Bays	4 Double Deep Drive Through	3 Single Deep Drive Through	2 Double Deep Drive Through 1 Back-in	3 Double Deep Drive Through	3 Double Deep Drive Through

Area of Focus	Station 1	Station 2	Station 3	Station 4	Station 5
Apparatus Assigned/Stored[25]	1 – Battalion Chief 1 – Engine (T1) 1 – Wildland Engine (T3) 1 – Ambulance (Reserve/Surge) 2 – Engines (T1) (Reserve) 1 – UTV 1 – Cataraft *Ambulance could take over existing ambulance space*	1 – Engine (T1) 1 – Wildland Engine (T6) 1 – Wildland Engine (T7) 1 – UTV *Could have limited space for at least one ambulance.*	1 – Engine (T1) 1 – Wildland Engine (T3) 1 – Ladder Truck *Could have limited space for at least one ambulance.*	1 – Engine (T1) 1 – Ladder Truck 1 – Wildland Engine (T3) 1 – Reserve Engine (T1) *Could have limited space for at least one ambulance.*	1– Engine (T1) 1 – Reserve/Surge Ambulance 1 – Wildland Engine (T6) 1 – County Haz-Mat Resource (*1/2 Year) *Ambulance could take over existing ambulance space*
Storage	Limited storage areas	Limited storage areas	Ample storage areas	Ample storage areas	Ample storage areas
Day Rooms	*Small, but could support 6/7 members*	*Smaller, could support 5/6 members*	*Small, would be tight for 5/6 members*	*Small, but could support 5/6 members*	*Could support 5/6 members*

[25] Engine classifications – T1(structure), T3 (wildland/structure), T6 (wildland), T7 (wildland)

Area of Focus	Station 1	Station 2	Station 3	Station 4	Station 5
Kitchen	*Small kitchen, could support 6/7 members*	*Small kitchen, could support 5/6 members*	*Small kitchen, would be tight for 5/6 members*	*Small kitchen, could support 5/6 members*	*Small kitchen, could support 5/6 members*
Gear Lockers	Rolling racks *Would need additional racks*	18 current racks *Would need additional racks*	Many racks, not formally divided, homemade system. *Would need additional racks*	24 racks	18 racks, could add additional rolling racks *Would need additional racks*
EMS Supply Area	*Limited storage area, could be slightly expanded*	*Limited storage area, could be slightly expanded*	*Limited storage area, could be slightly expanded*	*Ample available storage*	*Ample available storage*
Staff Parking	*Limited area, except in the admin area*	*7 parking spaces*	*Plenty of Parking*	*Plenty of Parking*	*Plenty of Parking*
Fitness Area	*Small area, would be tight with 6/7 members*	*Small area, would be tight with 5/6 members*	*Small area, would be tight with 5/6 members*	*Small area, would be tight with 5/6 members*	*Small area, would be tight with 5/6 members*

Area of Focus	Station 1	Station 2	Station 3	Station 4	Station 5
Others	Main EMS Restock		*TRT Equipment *Truck cross Truck staffed to District 4 fires *Community Training Room	*Cross staffed Tower *Community Training Room *Burn Tower/Training Room *Maintenance Shop *Maintenance Shop would likely need to be expanded to support Ambulance maintenance	*Community Room *Has back-up Ambulance

Appendix C – Commission on Accreditation of Ambulance Services (CAAS) Standards Outline

101 Organization

Purpose

A clear delineation of service ownership and organizational structure is necessary to assure accountability to customers, partners, medical oversight, and local/state/federal authorities. These standards are important for the organization to maximize its own effectiveness and to be responsive to the public.

101.01 Ownership

101.02 Organizational Structure

102 Inter-Agency Relations

Purpose

Positive inter-agency relations are necessary to provide high quality patient care services. A high-quality EMS system depends on cooperation between several types of public safety agencies and all local EMS providers. The following standards are to emphasize these relationships.

102.01 Mutual Aid

102.02 Disaster Coordination

102.03 Conflict Resolution

102.04 Inter-Agency Dialogue

103 Management

Purpose

These standards establish general management policies and practices not specifically addressed in other sections.

103.01 Policies and Procedures

103.02 Strategic Planning

103.03 Management Development

103.04 Information Management

104 Financial Management

Purpose

Standards in this section relate to the general need for an emergency medical services provider to accurately track and plan for its fiscal resources while meeting its day-to-day management responsibilities.

104.01 Financial Policy
104.02 Budgeting and Financial Statements
104.03 Accounts Receivable
104.04 Insurance

105 Community Relations and Public Affairs

Purpose

Due to the high visibility and unique expertise of EMS agencies, there exists a responsibility to keep the public well informed about out-of-hospital care and related health issues These agencies must maintain a respected, high profile to enhance out-of-hospital care in their communities.

105.01 Community Education, Health Promotion & Injury Prevention
105.02 Community Relations
105.03 Media Relations

106 Human Resources

Purpose

The process by which an EMS agency selects, trains, and maintains a working relationship with employees is critical to the agency's success.

106.01 Credentials
106.02 Compensation Package
106.03 Discipline/Corrective Action
106.04 Problem Resolution
106.05 Recruitment & Hiring
106.06 Employee Training & Development
106.07 Conduct
106.08 Performance Evaluations
106.09 Subcontractor Personnel

201 Clinical Standards

Purpose

Well-defined clinical standards are an essential foundation to the provision of quality out-of-hospital health care.

201.01 Medical Oversight
201.02 Clinical Protocols

201.03 Medical Records
201.04 Staffing
201.05 Response Plan
201.06 Clinical Standards Performance Improvement

202 Safe Operations & Managing Risk

Purpose

Comprehensive safety standards are required to assure that patients, employees, and the agency are protected from unnecessary risk.

202.01 Vehicle Safety
202.02 Employee Safety
202.03 Patient Safety
202.04 Patient Personal Property
202.05 Incident Reporting
202.06 Loss Control

203 Equipment & Facilities

Purpose

All equipment and facilities must be maintained to a high standard to assure the delivery of quality patient care.

203.01 Vehicles
203.02 Vehicle Maintenance
203.03 Medical Equipment
203.04 Durable Medical Equipment Maintenance
203.05 Disposable Items
203.06 Facilities

204 Communications Center

Purpose

Efficient call taking, effective resource deployment, and continuous communications capabilities are required to maintain an effective EMS agency.

204.01 Policies and Procedures
204.02 Contingency Plans
204.03 Preventive Maintenance
204.04 Training
204.05 Licensure
204.06 Communications Inter-Agency Dialogue
204.07 Communications Performance Improvement

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