

Consolidation of Fire and EMS Services

**Baraboo Fire Department
Baraboo District Ambulance Service**

Final Report-January 2022



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CENTER FOR PUBLIC SAFETY MANAGEMENT, LLC
475 K STREET NW, STE. 702 • WASHINGTON, DC 20001
WWW.CPSM.US • 716-969-1360

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The Center for Public Safety Management, LLC, maintains the same team of individuals performing the same level of service as when it was a component of ICMA. CPSM's local government technical assistance experience includes workload and deployment analysis using our unique methodology and subject matter experts to examine department organizational structure and culture, identify workload and staffing needs, and align department operations with industry best practices. We have conducted 341 such studies in forty-two states and provinces and 246 communities ranging in population from 8,000 (Boone, Iowa) to 800,000 (Indianapolis, Ind.).

Thomas Wieczorek is the Director of the Center for Public Safety Management.

Leonard Matarese serves as the Director of Research & Program Development. Dr. Dov Chelst is the Director of Quantitative Analysis.

CENTER FOR PUBLIC SAFETY MANAGEMENT PROJECT CONTRIBUTORS

Thomas J. Wieczorek, Director

Leonard A. Matarese, Director, Research & Project Development

Dov Chelst, Ph.D. Director of Quantitative Analysis

Joseph E. Pozzo, Senior Manager

Jim Mauney, Senior Associate

Xianfeng Li, Data Analyst

Sarah Weadon, GIS Analyst

Dennis Kouba, Senior Editor

CONTENTS

Tables	vi
Figures	viii
Section 1. Executive Summary	1
Next Steps and Recommendations.....	2
Section 2. Baseline Fire & EMS Analysis	3
Baraboo Fire Department (BFD).....	3
Governance and Oversight	3
Fire Service District.....	4
Training and Certifications	5
Staffing and Deployment of Operational Resources	6
NFPA 1720	6
NFPA 1500, and Two-In/Two-Out.....	8
Infrastructure	12
Revenues and Budget.....	14
Baraboo District Ambulance Service (BDAS)	15
Governance and Oversight	15
EMS Service District	16
Training and Certifications	17
Staffing and Deployment of Operational Resources	18
Infrastructure	19
Revenues and Budget.....	21
Section 3. Fire and EMS Consolidation Considerations	23
Fire and EMS Consolidation	23
Current Fire and EMS Working Relationship	23
Fire and EMS District Characteristics	24
Emergency Communications.....	25
BFD Workload and Response Times	25
BDAS Workload and Response Times	33
Section 4. Fire and EMS Integration Opportunities.....	43
Stakeholder Input.....	46
Stakeholder Discussion/Inputs	48
Section 5. Conclusion	51
Next Steps and Recommendations.....	67

Section 6. BFD Data Analysis.....	69
Methodology	71
Aggregate Call Totals and Runs	72
Calls by Type.....	72
Calls by Type and Duration	74
Average Calls by Month and Hour of Day	75
Units Arriving at Calls.....	77
Workload: Runs and Total Time Spent	79
Runs and Deployed Time – All Units	79
Workload by Location	83
Workload by Unit	85
Analysis of Busiest Hours	87
Response Time.....	89
Response Time by Type of Call.....	90
Response Time Distribution.....	93
Attachment I: Actions Taken	95
Attachment II: Fire Suppression Units Arriving at Calls	96
Attachment III: Fire Mutual Aid.....	97
Section 7. BDAS Data Analysis.....	98
Methodology	98
Aggregate Call Totals and Runs	99
Calls by Type.....	99
Calls by Type and Duration	101
Average Calls by Month and Hour of Day	102
Units Arriving at Calls.....	104
Workload: Runs and Total Time Spent	106
Runs and Deployed Time – All Units	106
Workload by Unit	109
Workload by Location	111
Analysis of Busiest Hours	112
Response Time.....	114
Response Time by Type of Call.....	115
Response Time by Hour	117
Response Time Distribution.....	119
Transport Call Analysis	121
Transport Calls by Type	121
Average Transport Calls per Hour	122

Calls by Type and Duration 124

Transport Time Components..... 125

Transport Destination 127

TABLES

TABLE 2-1: BFD Fire Response District Population.....	5
TABLE 2-2: NFPA 1720 Staffing for ERF, Typical Residential Structure.....	8
TABLE 2-3: BFD Effective Response Force for Fire Incidents.....	11
TABLE 2-4: BFD Effective Response Force for Non-Fire Incidents.....	11
TABLE 2-5: Calls by Call Type and Number of Units Arriving.....	12
TABLE 2-6: BFD Operating Budget.....	15
TABLE 2-7: BDAS Response District Population.....	17
TABLE 2-8: BDAS Ambulance Fleet.....	21
TABLE 2-9: BDAS Revenues.....	22
TABLE 2-10: BDAS Revenues and Budget.....	22
TABLE 3-1: BFD Fire Response Call Types.....	25
TABLE 3-2: NFPA 1720 Staffing and Response Times, Low-Hazard Structural Fire.....	30
TABLE 3-3: 80th and 90th Percentile Response Time of First Arriving Unit, by Call Type.....	32
TABLE 3-4: BDAS Response Call Types.....	33
TABLE 3-5: Average Response Time of First Arriving Unit, by Call Type.....	38
TABLE 3-6: 90th Percentile Response Time of First Arriving Unit, by Call Type.....	39
TABLE 3-7: Time Component Analysis for Ambulance Transport Runs, by Call Type.....	39
TABLE 5-1: Consolidation Roadmap.....	52
TABLE 6-1: BFD's Service Area Jurisdictions and Mutual Aid Agencies.....	69
TABLE 6-2: Call Types.....	72
TABLE 6-3: Calls by Type and Duration.....	74
TABLE 6-4: Calls by Call Type and Number of Units Arriving.....	77
TABLE 6-5: Annual Runs and Deployed Time by Run Type.....	79
TABLE 6-6: Average Deployed Minutes by Hour of Day.....	81
TABLE 6-7: Annual Workload by Location.....	83
TABLE 6-8: Structure and Outside Fire Runs by Location.....	83
TABLE 6-9: Call Workload by Unit.....	85
TABLE 6-10: Annual Runs by Run Type and Unit.....	85
TABLE 6-11: Average Deployed Minutes by Run Type and Unit.....	86
TABLE 6-12: Frequency Distribution of the Number of Calls.....	87
TABLE 6-13: Top 10 Hours with the Most Calls Received.....	87
TABLE 6-14: Frequency of Overlapping Calls.....	87
TABLE 6-15: Average Response Time of First Arriving Unit, by Call Type.....	90
TABLE 6-16: 80th and 90th Percentile Response Times of First Arriving Unit, by Call Type.....	90
TABLE 6-17: Average, 80th, and 90th Percentile Response Time of First Arriving Unit, by Time of Day.....	92
TABLE 6-18: Cumulative Distribution of Response Time – First Arriving Unit – Outside and Structure Fires.....	94
TABLE 6-19: Actions Taken Analysis for Structure and Outside Fire Calls.....	95
TABLE 6-20: Calls by Call Type and Number of Arriving Fire Suppression Units.....	96

TABLE 6-21: Mutual Aid Given.....	97
TABLE 6-22: Mutual Aid Received	97
TABLE 7-1: Call Types.....	99
TABLE 7-2: Calls by Type and Duration	101
TABLE 7-3: Calls by Call Type and Number of Units Arriving.....	104
TABLE 7-4: Annual Runs and Deployed Time by Run Type	106
TABLE 7-5: Average Deployed Minutes by Hour of Day	107
TABLE 7-6: Call Workload by Unit.....	109
TABLE 7-7: Annual Runs by Run Type and Unit.....	109
TABLE 7-8: Average Deployed Minutes by Run Type and Unit	110
TABLE 7-9: Annual 911 Workload by Location	111
TABLE 7-10: Frequency Distribution of the Number of Calls	112
TABLE 7-11: Top 10 Hours with the Most Calls Received	112
TABLE 7-12: Frequency of Overlapping Calls.....	113
TABLE 7-13: Average Response Time of First Arriving Unit, by Call Type	115
TABLE 7-14: 90th Percentile Response Time of First Arriving Unit, by Call Type.....	116
TABLE 7-15: Average and 90th Percentile Response Time of First Arriving Unit, by Time of Day....	117
TABLE 7-16: Cumulative Distribution of Response Time – First Arriving Unit	120
TABLE 7-17: Transport Calls by Call Type.....	121
TABLE 7-18: Transport Calls per Hour, by Time of Day	122
TABLE 7-19: Transport Call Duration by Call Type	124
TABLE 7-20: Time Component Analysis for Ambulance Transport Runs by Call Type	125
TABLE 7-21: 9-1-1 EMS Transport by Destination.....	127
TABLE 7-22: Interfacility Transfer by Facility	128

FIGURES

FIGURE 2-1: BFD Organizational Chart.....	3
FIGURE 2-2: BFD Fire Response District	4
FIGURE 2-3: Two-In/Two-Out Interior Firefighting Model*	9
FIGURE 2-4: BFD Staffing Assignment by Company	10
FIGURE 2-5: BDAS Organizational Chart-June 2021	16
FIGURE 2-6: BDAS EMS Response District	17
FIGURE 3-1: 2021 BFD and BDAS District Comparison	24
FIGURE 3-2: Fire Incident Demand Density, All BFD Fire Incidents	27
FIGURE 3-3: Fire Incident Demand Density, Structural and Outside Fires	28
FIGURE 3-4: Fire Growth from Inception to Flashover	29
FIGURE 3-5: Fire Propagation Curve	30
FIGURE 3-6: NFPA 1720 Urban, Suburban, Rural Density Map.....	31
FIGURE 3-7: NFPA 1720 Response Time Performance Measures	32
FIGURE 3-8: EMS Incident Demand Density, All BDAS EMS Incidents	34
FIGURE 3-9: EMS Incident Demand Density, Motor Vehicle Accidents	35
FIGURE 3-10: EMS Incident Demand Density, Cardiac and Breathing Difficulty	36
FIGURE 3-11: Sudden Cardiac Arrest Chain of Survival.....	37
FIGURE 3-12: EMS Response Time Components	38
FIGURE 3-13: 9-Minute Travel Time from BFD/BDAS Station	41
FIGURE 3-14: 10-Minute Travel Time from BFD/BDAS Station	41
FIGURE 3-15: 14-Minute Travel Time from BFD/BDAS Station	42
FIGURE 4-1: BFD/BDAS District Overlays	46
FIGURE 4-2: Stakeholder Questions/Discussion Points.....	47
FIGURE 4-3: Stakeholder Discussion and Input Result Categories.....	47
FIGURE 5-1: Example of a Long-Term Functional Organization Structure	63
FIGURE 5-2: Taking the Next Steps.....	68
FIGURE 6-1: BFD Response Area	70
FIGURE 6-2: Calls by Type	73
FIGURE 6-3: Average Calls by Month.....	75
FIGURE 6-4: Calls by Hour of Day.....	76
FIGURE 6-5: Calls by Number of Units Arriving.....	77
FIGURE 6-6: Average Deployed Minutes by Hour of Day	82
FIGURE 6-7: Average Response Time of First Arriving Unit, by Call Type	91
FIGURE 6-8: Cumulative Distribution of Response Time – First Arriving Unit – Outside and Structure Fires	93
FIGURE 6-9: Calls by Number of Arriving Fire Suppression Units	96
FIGURE 7-1: Calls by Type	100
FIGURE 7-2: Average Calls by Month.....	102
FIGURE 7-3: Calls by Hour of Day.....	103

FIGURE 7-4: Calls by Number of Units Arriving.....	105
FIGURE 7-5: Average Deployed Minutes by Hour of Day	108
FIGURE 7-6: Average Response Time of First Arriving Unit, by Call Type	115
FIGURE 7-7: Average Response Time of First Arriving Unit, by Hour of Day	118
FIGURE 7-8: Cumulative Distribution of Response Time – First Arriving Unit	119
FIGURE 7-9: Average Transport Calls by Hour	123

SECTION 1. EXECUTIVE SUMMARY

The Center for Public Safety Management (CPSM) was contracted by the City of Baraboo, Wis., to complete an analysis of the potential to consolidate the city's fire department and EMS provider. Both organizations serve the city and a larger response district contiguous to the city. This report provides an overview analysis of Fire and EMS operations of the Baraboo Fire Department (BFD) and Baraboo District Ambulance Service (BDAS). Next steps and recommendations for consolidation are included in Section 5 and listed next on page 2. Timelines for a consolidation of Fire and EMS services that include short-, mid-, and long-term time frames are also included in Table 5-1. **CPSM has concluded and recommends full consolidation of BFD and BDAS into one Fire/EMS District.**

Cooperative working relationships among regional or district service delivery agencies is important and beneficial in the field of public safety services. Cost-sharing and deliberate operational collaboration can enhance both the range and level of service provided to individual communities. This report seeks to determine this for the City of Baraboo and the congruent Fire and EMS districts and make the appropriate recommendations.

Fire and EMS departments tend to deploy resources utilizing traditional approaches, which are rarely reviewed. This report identifies ways each agency can improve efficiency, effectiveness, and safety for the communities they serve through the practicality of consolidation. The recommendations contained herein may be adopted in whole, in part, or rejected.

This report will also provide benchmarks for the BFD and the BDAS in their delivery of Fire and EMS services. For definition purposes, a benchmark is the existing performance for an agency as reported in the operational sections of this report. Additional benchmark performance information can be found in the data analysis conducted by CPSM for both agencies.

The service demands of the Fire and EMS districts are numerous for each agency and include EMS, fire, technical rescue, hazardous materials, and other non-emergency responses. The structural risks unique to a Midwest community are present in the City of Baraboo. These include single-family homes; manufactured homes; apartment houses; taxpayer (public) buildings; and commercial/industrial structures. The age of many structures, multiple change of occupancy use, and renovations potentially increase fire risk. Each district includes rural areas that create extended response times. EMS risks are typical for agencies that CPSM studies and include a significant number of interfacility transfers, some of which are critical-care transports.

A forensic data analysis for each agency was prepared as a key component of this study. The data analysis examined all calls for service involving the BFD and the BDAS.

Other significant components of this report include an analysis of the current deployment of resources and the performance of these resources in terms of response times; current staffing levels and patterns; critical tasking elements for specific incident responses; and the capability for assembling an effective response force.

A full analysis of consolidation alternatives was also completed. This included stakeholder interviews with elected officials representing each municipality in both the Fire and EMS districts, Fire and EMS leadership, and City of Baraboo leadership. Stakeholder input is included in Section 4 of this report.

NEXT STEPS AND RECOMMENDATIONS

- CPSM recommends the BFD and the BDAS promptly and methodically implement as many of the feasible *Consolidation Components* in Table 5-1 as both organizations collaboratively find suitable and attainable.
 - CPSM further recommends the implementation of each *Consolidation Component* be implemented as incremental next steps **to a full consolidation.**
- CPSM recommends a board/commission style governance board be established to provide policy and governing oversight of the consolidated Fire and EMS district.
 - CPSM further recommends a governing board like that of the BDAS Commission; this board must operate in accordance with state statutes and law, and it must allow for fair and equitable stakeholder membership and voting input.
- CPSM recommends the consolidation effort of the BFD and BDAS maintain the two-Chief concept during the short- and mid-term *Consolidation Components* development and implementation time frames, at a minimum.
 - CPSM further recommends that if one Chief would like to assume the Deputy District Chief or similar role and allow for a single Chief leadership model, that the governing board allow this transition in the best interest of the consolidation effort.
 - CPSM does not recommend the forced placement of one Chief over another in a single Chief leadership model as this may lead to disruption of the consolidation effort and resistance among the operational and administrative staff. It could also stymie the goals and vision of the consolidation of operational services.

Each organization's governing board (Baraboo City Council and BDAS Commission) should keep in mind that the longer-term success of the full consolidation is built on short-term operational success and measured cost savings. Governing board members should stay focused on the desired outcomes and overall initiatives and goals of the transitional phases of consolidation and not get bogged down in the operational minutia.

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SECTION 2. BASELINE FIRE & EMS ANALYSIS

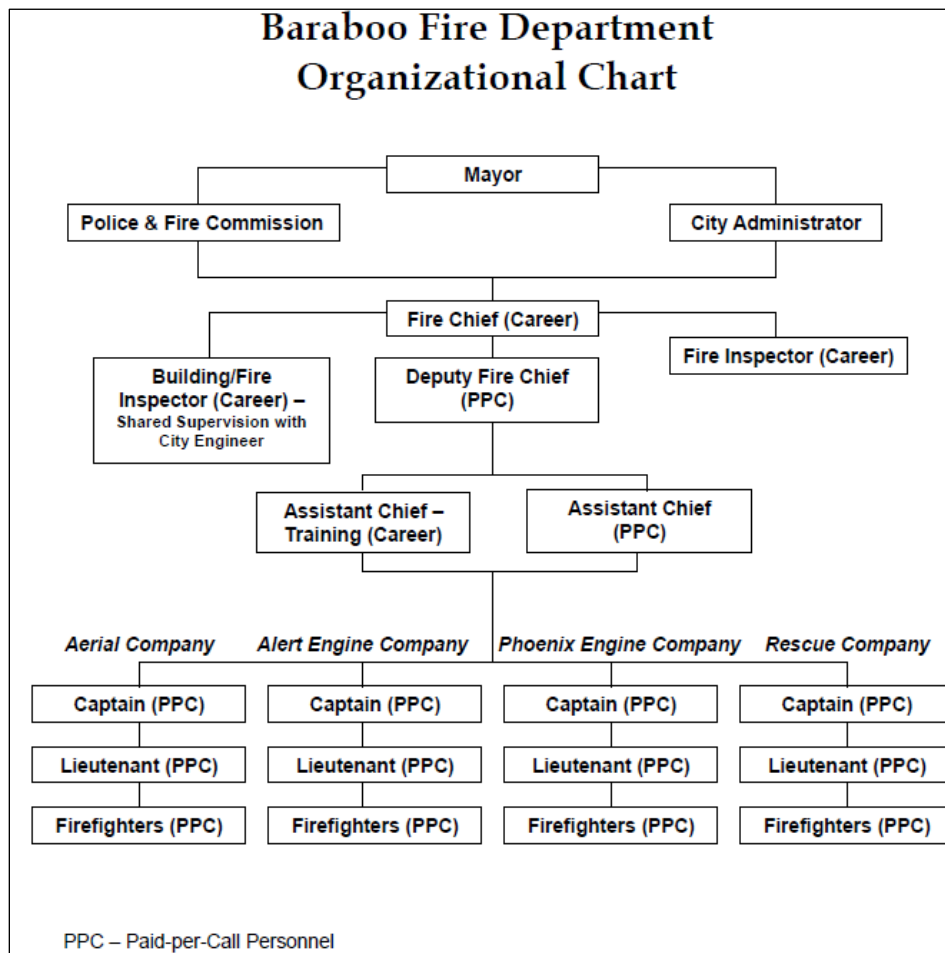
BARABOO FIRE DEPARTMENT (BFD)

Governance and Oversight

The BFD is a city department established in Chapter 5 the city's Code of Ordinances. Specific to fire department operations, staffing, and response, Chapter 5 outlines the authority of the established fire department to provide fire protection (5.01); the composition of the fire department to include full-time, part-time, and paid-per-call staffing levels [5.03(1)]; the appointment of the Fire Chief by the Police and Fire Commission [5.01(2)]; the powers and duties of the Fire Chief (5.04); and control and care of fire department equipment (5.05). Chapter 5 also includes substantial fire prevention and community risk reduction sections.

Pursuant to §62.13, Wisconsin Statutes, a Police and Fire Commission has been established by the city. The commission is composed of five citizens appointed by the Mayor of the Common Council on a schedule outlined in the statute. Among the items the Commission oversees are the appointment of the Police and Fire Chiefs, and personnel and employee relations matters. The following figure illustrates the BFD organizational chart.

FIGURE 2-1: BFD Organizational Chart

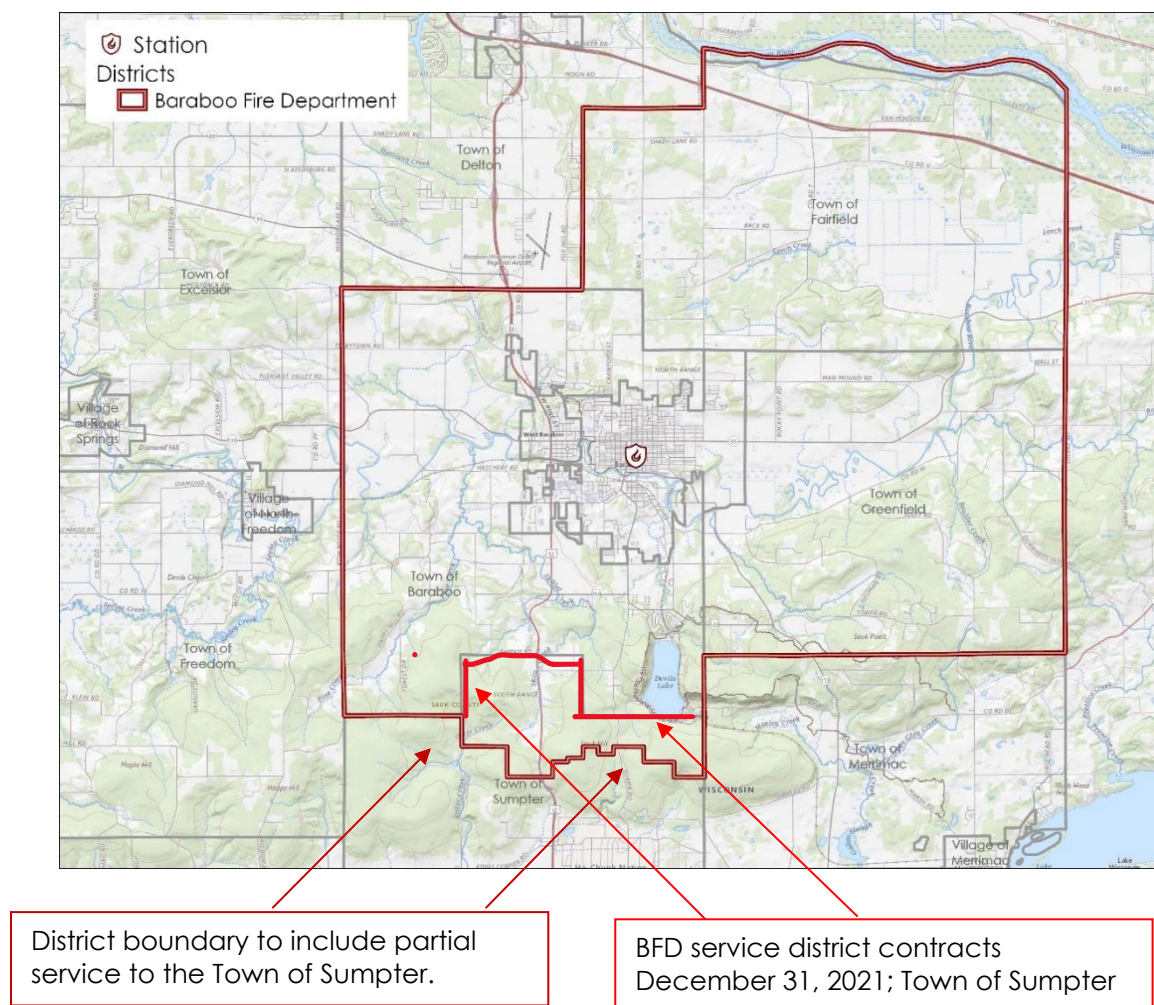


Fire Service District

The BFD fire district includes the City of Baraboo; the Townships of Baraboo, Fairfield, Greenfield, and the Town of Sumpter (areas in the Baraboo School District), and the Village of West Baraboo. The BFD will cease providing fire services to the Township of Sumpter as of December 31, 2021.

Fire services are provided to the jurisdictions outside of Baraboo through a Fire Protection Service agreement, to which all entities are signatory. The agreement includes types of service(s) provided, ownership of equipment, fair share costs for equipment and services to include community risk reduction (Fire Inspector), liability and the potential for claims while operating in a village or town, use of the BFD ladder truck, and the cost allocation for each entity signatory to the agreement. The following figure illustrates the BFD response district.

FIGURE 2-2: BFD Fire Response Area



The following table depicts the population served by the BFD by jurisdiction and total.

TABLE 2-1: BFD Fire Response Area Population¹

Municipality	Population
City of Baraboo	12,165
Village of West Baraboo	1,627
Town of Baraboo	1,816
Town of Fairfield	1,078
Town of Greenfield	909
Town of Sumpter (BFD serves approx. 15%)	20
Approximate BFD Population Served	17,753

Training and Certifications

The BFD follows the training and certification program and classes available to Wisconsin civilians who aspire to be firefighters and incumbent firefighters seeking advanced and officer certifications. The Wisconsin Technical College System, Fire Service Education Office, offers this training. For Baraboo, this is conducted through the Madison Area Technical College. As well, the training is available in-house, or at other departments that host training classes.

BFD training includes:

- A non-certification Entry-Level Firefighter course for probationary staff.
- Firefighter I and II certification standard based courses which teach fundamental and advanced firefighting theory and skills that are used during fire service responses.
- Fire Officer I and II certification courses that provide the certified incumbent firefighter with training in company operations, incident strategy and tactics, and fire administration.
- Instructor I and II certification courses that provide incumbent firefighters the knowledge and practical application to teach from prepared lesson plans, and to develop lesson plans and deliver instruction for specific courses.
- Fire Inspector I certification course, which provides seasoned firefighters and fire officers course material to ensure proficiency in the use of codes and standards applicable to their jurisdiction regarding fire prevention and community risk reduction.
- Driver Operator-Pumper certification course, which provides incumbent certified firefighters training in fire pump operations and maintenance, hydraulic calculations, emergency driving, and fireground hose operations.

A training certification matrix is maintained by the Fire Chief on all members of the department. Training is made available to those seeking to expand their skill and knowledge base, as well as those chosen or aspiring to take on additional roles in the department.

1. 2020 Census, United States Census Bureau, <https://www.census.gov/search>

STAFFING AND DEPLOYMENT OF OPERATIONAL RESOURCES

Fire, rescue, and EMS incidents, and the fire department's ability to respond to, manage, and mitigate them effectively, efficiently, and safely, are mission-critical components of the emergency services delivery system. In fact, fire, rescue, and special operations provide the primary, and certainly most important, basis for the very existence of the fire department.

Nationwide, fire departments that provide EMS first response are responding to more EMS calls and fewer fire calls, particularly fire calls that result in active firefighting operations by responders. This is well documented in both national statistical data, as well as in CPSM fire studies. Nationally, improved building construction, code enforcement, automatic sprinkler systems, and aggressive public education programs have contributed to a decrease in serious fires and, more importantly, fire deaths among civilians. The BFD has initiated first response EMS on certain EMS call types.

These trends and improvements in the overall fire protection system notwithstanding, fires still do occur, and the largest percentage of those occur in residential occupancies, where they place the civilian population at risk. Although they occur with less frequency than they did several decades ago, when they occur today, they grow much quicker and burn more intensely than they did in the past due to building construction features, more flammable interior finishes, and more flammable furniture.

To ensure civilian and firefighter safety, fireground tasks must be coordinated and performed in rapid sequence. Assembling an *Effective Response Force* (ERF) is essential to accomplish on-scene goals and objectives safely and efficiently. Without adequate resources to control the fire a structure and its contents continue to burn. This increases the likelihood of a sudden change in fire conditions, the potential for failure of structural components leading to collapse, and limits firefighters' ability to successfully perform a search and potential rescue of any occupants.

Critical tasks are those activities that must be conducted in a timely manner by responders at emergency incidents to control the situation and stop loss. Critical tasking for fire operations is the minimum number of personnel needed to perform the tasks required to effectively control and mitigate a fire or other emergency. To be effective, critical tasking must assign enough personnel so that all identified functions can be performed simultaneously. However, it is important to note that secondary support functions may be handled by initial response personnel once they have completed their primary assignment. Thus, while an incident may end up requiring a greater commitment of resources or a specialized response, a properly executed critical tasking assignment will provide adequate resources to immediately begin bringing the incident under control.

NFPA 1720

NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*, 2020 edition (National Fire Protection Association, Quincy, Mass.), outlines organization and deployment of operations by volunteer and combination (a fire department having emergency service personnel comprising less than 85 percent majority of either volunteer

or career membership) fire and rescue organizations.² It serves as a benchmark to measure staffing and deployment of resources to certain structures and emergencies.

National Fire Protection Association (NFPA) standards are consensus standards and not the law. A local jurisdiction must decide on the level of service it can deliver based on factors such as need and call demand, public expectations, community risk and hazards, and funding decisions. Again, these are national consensus standards, representing best practices and applied science and research.

The BFD is considered by this standard an NFPA 1720 department.

According to NFPA 1720, fire departments should base their specific role on a formal community risk management plan and taking into consideration:³

- Life hazard to the population protected. The number and type of units assigned to respond to a reported incident shall be determined by risk analysis and/or pre-fire planning.
- Fire suppression operations shall be organized to ensure that the fire department's fire suppression capability includes personnel, equipment, and other resources to deploy fire suppression resources in such a manner that the needs of the organization are met.
- The Authority Having Jurisdiction shall promulgate the fire department's organizational, operational, and deployment procedures by issuing written administrative regulations, standard operating procedures, and departmental orders.
- The number of members that are available to operate on an incident is sufficient to meet the needs of the department.
- Provisions for safe and effective firefighting performance conditions for the firefighters. Personnel responding to fires and other emergencies shall be organized into company units or response teams and have the required apparatus and equipment to respond.
- Initial firefighting operations shall be organized to ensure that at least four members are assembled before interior fire suppression operations are initiated in a hazardous area.
- The capability to sustain operations shall include the personnel, equipment, and resources to conduct incident specific operations.

It is understood that volunteer and paid-per-call members typically respond to incidents from home or work, so for a minimum-level Effective Response Force to begin fire suppression efforts, NFPA 1720 establishes the minimum response staffing for this type of department for low-hazard structural firefighting incidents (to include out-buildings and up to a 2,000 square-foot, one- to two-story, single-family dwelling without a basement and no exposures) for specific demand zones as shown in the following table. Each demand zone takes into consideration certain risk elements such as population density, exposed occupied buildings (more predominate in urban and suburban demand zones), water supply, and proximity to responding apparatus and members (incident and fire station).

2. NFPA 1720 is a nationally recognized standard, but it has not been adopted as a mandatory regulation by the federal government or the State of Wisconsin. It is a valuable resource for establishing and measuring performance objectives for the BFD but should not be the only determining factor when making local decisions about the agency's fire services.

3. NFPA 1710, 5.2.1.1, 5.2.2.2

TABLE 2-2: NFPA 1720 Staffing for ERF, Typical Residential Structure

Demand Zone	Demographics	Minimum Staff to Respond
Urban Area	>1,000 people/mi ²	15
Suburban Area	500-1,000 people/mi ²	10
Rural Area	<500 people/mi ²	6
Remote Area	Travel Distance ≥ 8 miles	4

NFPA 1500, and Two-In/Two-Out

Another consideration, and one that links to critical tasking and assembling an Effective Response Force, is that of two-in/two-out. Essentially, prior to initiating any fire attack in an immediately dangerous to life and health (IDLH) environment (and with no confirmed rescue in progress), the initial two-person entry team shall ensure that there are sufficient resources on-scene to establish a two-person initial rapid intervention team (IRIT) located outside of the building.

One standard that addresses this is NFPA 1500, *Standard on Fire Department Occupational Health, Safety, and Wellness*, 2018 Edition. NFPA 1500 addresses the issue of two-in/two-out by stating that during the initial stages of the incident where only one crew is operating in the hazardous area of a working structural fire, a minimum of four individuals shall be required consisting of two members working as a crew in the hazardous area and two standby members present outside this hazard area available for assistance or rescue at emergency operations where entry into the danger area is required.⁴

NFPA 1500 also speaks to the utilization of the two-out personnel in the context of the health and safety of the firefighters working at the incident. *The assignment of any personnel including the incident commander, the safety officer, or operations of fire apparatus, shall not be permitted as standby personnel if by abandoning their critical task(s) to assist, or if necessary, perform rescue, the clearly jeopardize the safety and health of any firefighter working at the incident.*⁵

According to the standard, one of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident.

To meet the intent of NFPA 1500, the BFD must utilize two personnel to commit to interior fire attack while two firefighters remain out of the hazardous area or immediately dangerous to life and health (IDLH) area to form the IRIT, while attack lines are charged, and a continuous water supply is established.

NFPA 1500 does allow for fewer than four personnel under specific circumstances. It states, *Initial attack operations shall be organized to ensure that if on arrival at the emergency scene, initial attack personnel find an imminent life-threatening situation where immediate action could*

4. NFPA 1500, 2018, 8.8.2.

5. NFPA 1500, 2018, 8.8.2.5.

prevent the loss of life or serious injury, such action shall be permitted with fewer than four personnel.⁶

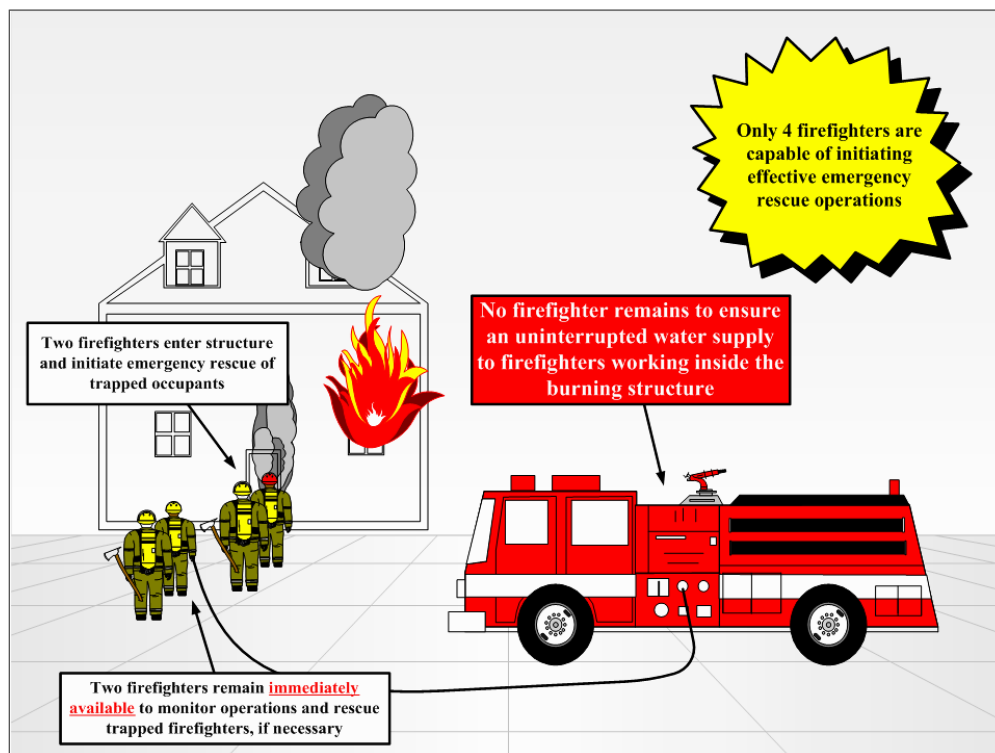
The Wisconsin Department of Safety and Professional Services (DSPS) SPS 330 also provides guidance on two in-two out as noted next:

(a) A fire fighter using SCBA and operating in an interior structural fire shall operate in a team of 2 or more fire fighters. Except in the case of a structural fire that can be controlled or extinguished by portable fire extinguishers, a back-up team of at least 2 fire fighters wearing SCBA shall be assigned to remain available to perform assistance or rescue activities. One back-up team member with a charged line shall be assigned to a safe non-affected area in or near the structure. The other back-up team member shall remain within voice contact and may be assigned to additional roles so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any fire fighter working at the scene. At least one additional member shall be assigned to remain outside the structural fire and monitor the operations.

Note: It is not the intent of this rule to prevent any number of persons from responding to a fire call, setting up equipment and initiating exterior suppression at the fire scene. Also, it is not the intent of this rule to prohibit an individual fire fighter from taking an action to preserve the life or safety of another person.

In the end, the ability to assemble adequate personnel, along with appropriate apparatus to the scene of a structure fire, is critical to operational success and firefighter safety. NFPA 1720 addresses this through the minimum staff to respond matrix this standard promulgates.

FIGURE 2-3: Two-In/Two-Out Interior Firefighting Model*



Note: *Four-person staffing, with single engine arrive at scene, or two 2-person staffed units (engine/engine; engine/ambulance) arrive at scene.

6. NFPA 1500, 2018 8.8.2.10.

The variables of how and where personnel and companies are located, and how quickly they can arrive on scene, play major roles in controlling and mitigating emergencies. Monday through Friday, the BFD typically has four staff members on duty to respond to calls for service, which include the Fire Chief, Assistant Chief for Training, Fire Inspector, and Building/Fire Inspector. ***BFD relies heavily on paid-per-call volunteer members' response from home or work to make up the teams and crews of the Effective Response Force.***

The BFD currently has twenty-nine line personnel assigned to four companies. There are also three senior staff (chief officers) who respond to incidents and provide command and control functions. There are various apparatus assigned to each company to include engines (pumpers), water tenders, a heavy rescue, and an aerial ladder platform. The staffing matrix for each company is described in the next figure.

FIGURE 2-4: BFD Staffing Assignment by Company

Alert Company 	1 Captain 1 Lieutenant 1 D/O FF, 6 Firefighters	Aerial Company 	3 Acting Lieutenants (D/O as well) 1 D/O Firefighter 3 Firefighters
Phoenix Company 	1 Captain 1 Lieutenant 3 D/O Firefighters 3 Firefighters	Rescue Company 	1 Captain 1 Lieutenant 1 D/O Firefighter 2 Firefighters
Chief Officers	1 Fire Chief 1 Deputy Chief 1 Assistant Chief-Training		

The BFD, utilizing a full paid-per-call staffing system, has established response standards that include:

- Members respond to the station to staff response units.
- Each engine/ladder/squad apparatus assigned to the incident responds with four personnel from the station (this is considered fully staffed). Units can respond with three, per the Fire Chief.
- Other units such as tender and brush apparatus respond with two personnel.
- Command units respond with one person.

To accomplish the regimen of assembling an Effective Response Force, the BFD operates with the response matrix shown in the following table for fire incidents.

TABLE 2-3: BFD Effective Response Force for Fire Incidents

Municipal Structure Fire (21 personnel) <ul style="list-style-type: none"> ■ Engine (3) ■ Truck (1) ■ Squad (1) ■ Chief (1) Assistant Chief (PPC) (1) 	Brush/Wildland Fire (11 Personnel) <ul style="list-style-type: none"> ■ Brush Truck (1) ■ Engine (1) ■ Tender (1) ■ Brush UTV (2) ■ Chief (1) Assistant Chief (PPC) (1)
Rural Structure Fire (25 personnel) <ul style="list-style-type: none"> ■ Engine (3) ■ Tender (4) ■ Squad (1) ■ Chief (1) Assistant Chief (PPC) (1) 	Brush/Wildland Fire w/ Target Hazard (13 Personnel) <ul style="list-style-type: none"> ■ Brush Truck (1) ■ Engine (1) ■ Tender (1) ■ Support (1) ■ Chief (1) Assistant Chief (PPC) (1)

The BFD responds to other types of emergency calls to include technical rescue incidents involving rope rescue, confined space rescue, water rescue, elevator rescue, and EMS first response. The following table depicts these responses.

TABLE 2-4: BFD Effective Response Force for Non-Fire Incidents

Technical Rescue/Confined Space (9 Personnel) <ul style="list-style-type: none"> ■ Squad (1) ■ Truck (1) ■ Chief (1) Assistant Chief (PPC) (1) 	Technical Rescue/Elevator (9 Personnel) <ul style="list-style-type: none"> ■ Engine (1) ■ Truck (1) ■ Chief (1) Assistant Chief (PPC) (1)
Technical Rescue/Water Rescue (15 Personnel) <ul style="list-style-type: none"> ■ Engine (1) ■ Truck (1) ■ Squad (1) ■ Brush Truck (1) ■ Chief (1) Assistant Chief (PPC) (1) 	Technical Rescue/High-Low Angle Rescue (12 Personnel) <ul style="list-style-type: none"> ■ Rope Rescue Utility (1) ■ Support (1) ■ Quick Response Vehicle (2) ■ Chief (1) Assistant Chief (PPC) (1)
EMS Assist <ul style="list-style-type: none"> ■ Engine (1) 	

The next table shows the average number of units the BFD responded to fire and fire-related incidents during the study period. The largest percentage of the time the BFD responded a single unit to an incident. False alarms and hazard calls represent the largest number of single-unit and two-unit responses. Three or more-unit responses are the result of structure fire incidents, which is typical across the country.

TABLE 2-5: Calls by Call Type and Number of Units Arriving

Call Type	Number of Units				Total Calls
	One	Two	Three	Four or More	
False alarm	30	11	2	0	43
Good intent	13	7	3	0	23
Hazard	24	16	7	2	49
Outside fire	2	6	3	3	14
Public service	12	3	6	5	26
Structure fire	3	3	6	8	20
Fire Total	84	46	27	18	175
EMS Total	17	51	24	15	107

Infrastructure

Facility

The BFD is located at 135 4th Street. This building, which once served as a joint city hall, police, and fire department, is currently occupied by the BFD and BDAS as primary occupants. The facility consists of three separate buildings. The first was constructed in the early 1900s. The apparatus bays were added in 1957, and the rest of the facility constructed in 1965. Since original construction, the buildings have undergone remodeling and mechanical upgrades. The facility has reached its life expectancy and does not meet the growing operational, administrative, and training needs of the BFD and BDAS.

Contemporary fire facilities are designed and constructed to accommodate current and forecasted future trends in fire service vehicle type and manufactured dimensions. A facility must have sufficiently sized bay doors, circulation space between garaged vehicles, departure and return aprons of adequate length and turn geometry to ensure safe response, and floor drains and oil separators to satisfy environmental concerns. Station vehicle bay areas should also consider future tactical vehicles that may need to be added to the fleet to address forecasted response challenges, even if this consideration merely incorporates civil design that ensures adequate parcel space for additional bays to be constructed in the future.

Personnel-oriented needs in fire facilities must permit performance of daily duties in support of response operations. For personnel, fire facilities must have provisions for vehicle maintenance and repair; storage areas for essential equipment and supplies; space and amenities for administrative work, training, physical fitness, laundering, clean areas where crew members can drop contaminated station wear, meal preparation, and personal hygiene/comfort, and—where a fire department is committed to minimize “turnout time”—bunking facilities.

While serviceable the current facility is crowded; lacks contemporary fire and EMS staff space and needs; requires stacking of fire and EMS apparatus, some with little room to spare; and faces the facility infrastructure inefficiencies a more contemporary facility would not. Based on these issues, a new facility is being contemplated by the City of Baraboo and which would house both fire and EMS districts. A new facility is discussed later in the analysis.

Fleet

The provision of an operationally ready and strategically located fleet of mission-essential fire-rescue vehicles is fundamental to the ability of a fire-rescue department to deliver reliable and efficient public safety within a community.

From its single location, the BFD responds with fire suppression and rescue apparatus to all areas of the district. Emergency response units include:

Engine companies, which are designed primarily for firefighting operations, the transport of crew members, hose (fire attack and larger supply), tank water, ground ladders, self-contained breathing apparatus, and storage of an assortment of hand tools used for a broad spectrum of fire operational tasks. Since engines are often utilized as first response units on EMS calls, they also carry an assortment of EMS gear to treat patients and provide life-saving measures prior to the arrival of EMS transport units.

The BFD currently responds to emergencies with an inventory of three engines. Although the engines are designed and equipped similarly, they may have differing response objectives when dispatched simultaneously. Engines include:

- | | | |
|----------------------------|---------|------------------------|
| ■ 2002 Pierce Enforcer | 1500GPM | 750 Gallon Water Tank |
| ■ 2013 Pierce Velocity PUC | 1500GPM | 750 Gallon Water Tank |
| ■ 2017 Pierce Velocity | 1500GPM | 1000 Gallon Water Tank |

A ladder company, which is also primarily designed for firefighting operations, and differs from the engines in that it also has a hydraulically operated aerial device designed to reach above grade floors to transport crew members, effect rescues, and provide an elevated water stream. The ladder truck also transports crew members, ground ladders, self-contained breathing apparatus, various forcible entry tools, ventilation equipment, and hydraulic rescue tools as well as other equipment to deal with an assortment of fires and technical rescues. Some ladder trucks, such as the one in the BFD, carry hose (fire attack and larger supply) and tank water.

The BFD currently responds to emergencies with an inventory of one ladder truck. When needed, the unit responds with a crew capable of performing ladder company functions such as ventilation, utility control, above-grade firefighting tasks, and elevated master stream application. The ladder apparatus is a 2010 Pierce Velocity (2000 GPM), equipped with a 300 gallon water tank and a 100-foot aerial platform.

A Rescue truck, which does not carry hose or water, but does transport crew members and carries special rescue and hazard mitigation equipment for vehicle extrication, rope rescue, water rescue, and confined space rescue to name a few. Vehicles such as this also carry self-contained breathing apparatus, various forcible entry tools, ventilation equipment, and other equipment geared to support emergency scene operations. The rescue truck is a 1994 Ford/Marion Body.

A brush fire unit, which is a specially designed vehicle for off-road terrain encountered during brush and wild land firefighting operations, are typically 4-wheel drive, and carry crew members, water, hose, and an array of hand tools specific to brush and wild land fires.

The BFD currently deploys one brush fire rig from the 4th Street fire station; it is a 2011 Ford with pump and water tank.

Water Tenders, which are designed and built to transport substantial amounts of water to the fire scene. These units augment engine company efforts by providing water directly or through water supply from a portable tank carried by and typically then filled by a water tender. Some water tenders carry attack lines and water supply hose.

The BFD currently deploys two water tenders:

- 1995 Ford 500 GPM Pump 3000 Gallon Water Tank
 3000 Gallon Portable Tank
- 1995 Freightliner 125 GPM porta-pump 2000 Gallon Tank
 2200 Gallon Portable Tank

Replacement of fire-rescue response vehicles is a necessary, albeit expensive, element of fire department budgeting that should reflect careful planning. A well-planned and documented emergency vehicle replacement plan ensures ongoing preservation of a safe, dependable, and operationally capable response fleet. A plan must also schedule future capital outlay in a manner that is affordable to the community.

NFPA 1901, *Standard for Automotive Fire Apparatus*, serves as a guide to the manufacturers that build fire apparatus and the fire departments that purchase them.

The Annex material in NFPA 1901 (2016) contains recommendations and work sheets to assist in decision-making in vehicle purchasing. With respect to recommended vehicle service life, the following excerpt is noteworthy:

"It is recommended that apparatus greater than 15 years old that have been properly maintained and that are still in serviceable condition be placed in reserve status and upgraded in accordance with NFPA 1912, Standard for Fire Apparatus Refurbishing (2016), to incorporate as many features as possible of the current fire apparatus standard. This will ensure that, while the apparatus might not totally comply with the current edition of the automotive fire apparatus standards, many improvements and upgrades required by the recent versions of the standards are available to the firefighters who use the apparatus."

The BFD has a replacement plan for all heavy apparatus and light command vehicles. Heavy fire apparatus replacement ranges from 21 to 26 years.

Revenues and Budget

The BFD budget is not atypical of other municipal fire department budgets where fire services include contracted services with other incorporated and/or unincorporated areas.

The BFD budget includes revenues derived from intergovernmental charges for service (the largest revenue other than funding from the general fund); fire insurance taxes; and various grants, fees, and donations.

Personnel costs (salary, benefits, overtime) represent the largest percent of expenditures. The next largest budget areas are contractual services (for the operation and repair of facilities and equipment), uniforms and supplies, and automotive operational costs. This budget makeup is no different than other fire departments across the country. Additionally, the city's Emergency Management budget is included in the BFD budget as well as maintenance and operating cost for the Alma Waite Annex.

The funding formula for municipalities in the BFD district includes three factors as follows:

- Equalized Value of Property for a municipality (land and buildings property tax levy).
- Total calls for a municipality (three-year average).
- Population for a municipality.

The following table depicts the last two fiscal year budgets for the BFD.

TABLE 2-6: BFD Operating Budget

Fiscal Year	BFD Revenues (Non-City GF Revenues)	BFD Expenditures
FY 20 Projected Total	\$269,653	\$1,325,595.00 (all lines)
FY 21 Approved Budget	\$299,471	\$1,347,817.00 (all lines)

BARABOO DISTRICT AMBULANCE SERVICE (BDAS)

Governance and Oversight

The BDAS is a quasi-public EMS agency. The agency was established and exists pursuant to §66.30 Wisconsin Statutes (1993-94) (currently numbered as §66.0301 Wisconsin Statutes (2011-12)). §66.0301 allows for local governments to cooperate on a wide range of intergovernmental issues and activities, in this case the delivery of emergency medical services collectively among several incorporated areas.

BDAS was created in 1993 and is governed by the Baraboo District Ambulance Commission. The Commission is made up of ten voting Commissioners, and one non-voting Commissioner (appointed by Saint Clare Hospital or its designee). The powers and duties of the Commission are promulgated in the BDAS By-Laws and include such duties as overarching management of the agency (fiscal, personnel and employee relations, equipment and fleet, records, legal counsel, execution and maintenance of contracts, employee salaries) and other traditional governing body duties.

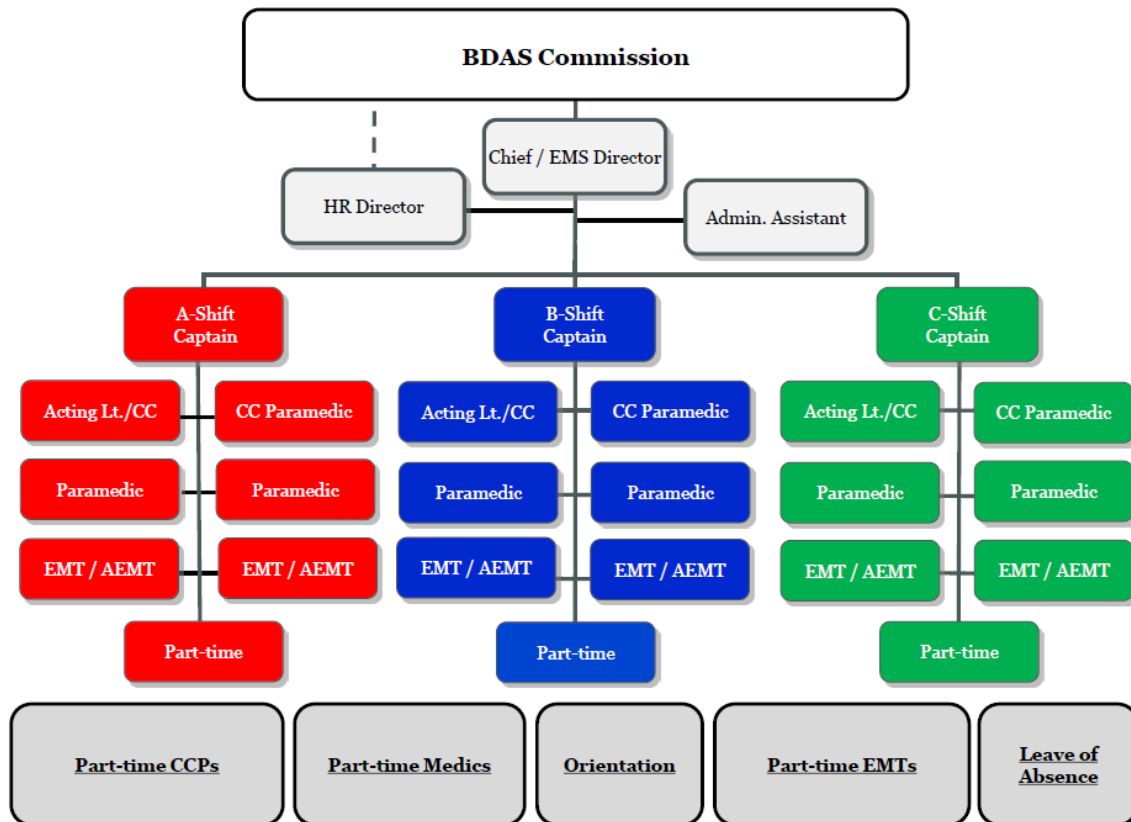
BDAS staff includes an EMS Chief, Human Resources Director, Shift Captains (shift supervisors), Critical Care Paramedics, Paramedics, Advanced EMTs, and EMTs. The agency has eliminated the finance officer and deputy chief positions and added a staff assistant position. Eliminating the finance officer and deputy chief salaries allows the BDAS to hire additional operational staff (EMTs/PMs).

Pursuant to Wisconsin §35.93, Department of Health 110.49, operational medical direction is provided through Madison Emergency Physicians (MEP).

Pre-hospital emergency medical care is governed through the MEP EMS Guidelines and Protocols. These comprehensive protocols define the standard of care for those EMS providers working under the medical direction of the MEP medical directors, and as well are in accordance with Chapter DHS 110.

The next figure illustrates the BDAS organizational chart.

FIGURE 2-5: BDAS Organizational Chart-June 2021

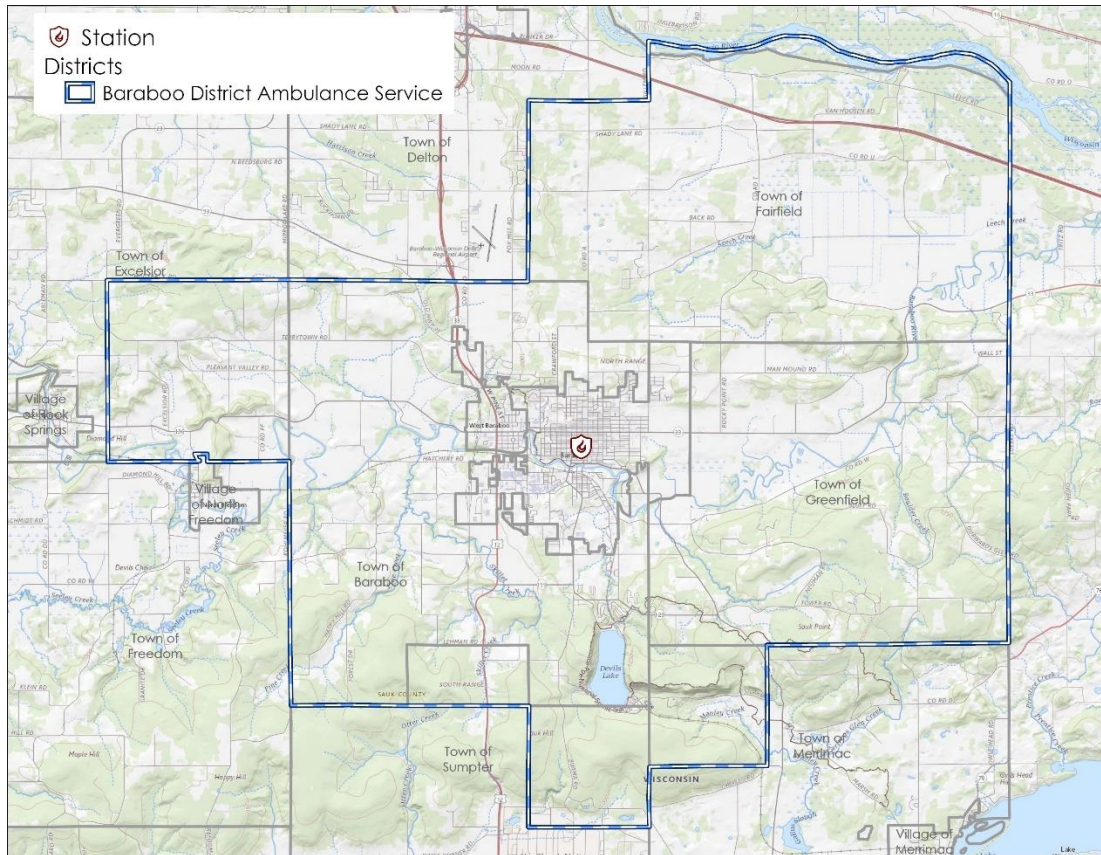


EMS Service District

The BDAS service area encompasses the City of Baraboo, Village of West Baraboo, Township of Baraboo, Township of Fairfield, Township Greenfield, a portion of the Township of Excelsior, and a portion of the Township of Sumpter. Members of the district are pursuant to Section I(2) of the BDAS By-Laws. The district has one receiving hospital (SSM Health, Saint Clare Hospital, Baraboo). The BDAS does conduct interfacility transfers out of the district.

The next figure illustrates the BDAS service district.

FIGURE 2-6: BDAS EMS Response District



The next table depicts the population served by the BDAS.

TABLE 2-7: BDAS Response District Population⁷

Municipality	Population
City of Baraboo	12,165
Village of West Baraboo	1,627
Town of Baraboo	1,816
Town of Fairfield	1,078
Town of Greenfield	909
Town of Sumpter (BDAS serves approx. 3%)	33
Town of Excelsior (BDAS serves approx. 25%)	401
Approximate BDAS Population Served	18,260

Training and Certifications

Certifications for employees of the BDAS are governed by the state through Chapter DHS 110 of the Wisconsin statutes. Chapter 110 outlines emergency medical professionals, licensing,

7. 2020 Census, United States Census Bureau, <https://www.census.gov/search>

certifications, training, training center oversight, applicable fees, testing and credentialing, as well as investigation and enforcement of certification and patient care infractions.

The BDAS, as mentioned earlier, utilizes personnel certified as Emergency Medical Technician-Basic; Emergency Medical Technician-Advanced or Intermediate as outlined in Chapter DHS 110; and Emergency Medical Technician-Paramedic. BDAS also has on staff Critical Care Paramedics, which is a Paramedic endorsed under Chapter DHS 110 as an advanced level of Paramedic care once the advanced training is completed and certified.

EMS training in Wisconsin is offered through a statewide system of education centers. Training centers must meet all requirements of the state (Chapter DHS 110), to include accreditation for those offering Paramedic training. Training is completed in-house as well through SSM Hospital's learning management system, EMS education program. Necessary certification courses such as Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), and Pre-Hospital Trauma Life Support (PHTLS) are also conducted through the SSM Hospital system.

The EMS Chief maintains all certifications and ensures all elements of required certification and re-certification are met in accordance with Chapter DHS 110.

Staffing and Deployment of Operational Resources

Emergency Medical Service (EMS) operations are a vital component of the comprehensive emergency services delivery system in any community. Together with the delivery of police and fire services, it forms the backbone of the community's overall public safety net. The EMS component of the emergency services delivery system is more heavily regulated than the fire side. NFPA 450 *Guidelines for Emergency Medical Services (EMS) and Systems* (2017 edition), the Commission on Accreditation for Ambulance Services (CAAS), and local EMS protocols are documents and processes that provide a template for local stakeholders to evaluate an EMS system and to make improvements based on that evaluation.

In terms of overall incidents responded to by the emergency agencies in most communities, it could be argued that EMS incidents constitute the greatest number of "true" emergencies, where intervention by trained personnel makes a difference, sometimes literally between life and death. Heart attack and stroke victims require rapid intervention, care, and transport to a medical facility. The longer the time duration without care, the less likely the patient is to fully recover. Numerous studies have shown that irreversible brain damage can occur if the brain is deprived of oxygen for more than four minutes.

The BDAS staffing and deployment model includes the following:

- Three platoons 24/7 (All units respond out of the BDAS main station in the City of Baraboo)
 - 1 Captain (Shift Supervisor).
 - 3 to 4 full-time crews/shift.
 - Unit Staffing: 1 CC Paramedic and 1 CC Paramedic or Paramedic, OR
 - 1 CC Paramedic or Paramedic and 1 Advanced EMT, OR
 - 1 CC Paramedic or Paramedic and 1 EMT.
- Full-time crews work a three-week rotational schedule. A shift will either work Monday, Friday, Sunday; Wednesday, Saturday; or Tuesday, Thursday during a week. Every three weeks a crew's days of the week worked will rotate.

- 911 Advanced Life Support (ALS) Ambulances
 - 3 to 4 Ambulances 24/7
 - Ability to staff up to six ambulances during periods of high demand at peak times
 - 3 to 4 24/7.
 - 1 to 2 peak times.
- ALS Interfacility transfer ambulance is also available for ground transportation services between hospitals. These units are typically staffed with a CC Paramedic or Paramedic and an EMT.
- Part-time members are required to work a minimum of 24-hours/month. Part-time staff typically fill vacancies created by scheduled and unscheduled leave, and as well staff extra units when these units are in service.

Infrastructure

Facilities

The BDAS is located at 135 4th Street (co-located with BFD). As discussed above, this building, which once served as a joint city hall, police, and fire department, was constructed in 1965 and has since undergone additional remodeling and mechanical upgrades. And as discussed above, the facility has reached its life expectancy and does not meet the growing operational, administrative, and training needs of the BFD and BDAS.

The BDAS did have a satellite station in Richland Center (west of Baraboo and outside of the BDAS district) for the purpose of out-of-district interfacility transfers. This station is no longer active.

Contemporary EMS facilities should be designed and constructed to accommodate current and forecasted future trends. Crew space needs as well as apparatus bay size and ventilation should be carefully thought out and planned for. EMS facilities should also include:

- Crew space that is individualized (sleeping quarters for 24-hour and overnight static deployed crews, and gender-specific locker rooms and bathrooms).
- Triage room, preferably accessible from the front entrance for walk-in customers.
- Training areas—practical labs, study labs with computers, and lecture areas.
- Isolated decontamination/disinfecting rooms for crew members and equipment that leads to crew showers.
- Secure storage/inventory management for EMS supplies and pharmaceuticals.

As noted in the BFD section above, the current facility, while serviceable, is crowded; lacks contemporary fire and EMS staff accoutrements; the fire and EMS apparatus must be stacked, some with little room to spare; and it does not have the facility infrastructure efficiencies a more contemporary facility would. For these reasons a new facility is being contemplated by the City of Baraboo; it would house both fire and EMS districts. A new facility is discussed later in the analysis.

Fleet

BDAS deploys two types of ambulances:

- Type I ambulances, which are typically a square box patient compartment mounted on a truck chassis. The connection between the patient compartment and the chassis cab is a small pass-through that looks like a window.
- Type III ambulances, which are typically a square box patient compartment mounted on a cutaway van chassis. With a Type III ambulance, the chassis is an integral part of the patient compartment. The connection between the patient compartment and the chassis cab is typically a small door.



Given that NFPA 1901 targets specifications for only fire suppression vehicles, NFPA 1917, *Standard for Automotive Ambulances*, was published in 2013 (updated in 2019) to provide similar recommendations governing the design and construction of ambulances. The U.S. General Services Administration also promulgates ambulance standards under KKK-A-1822. Additionally, the Commission on Accreditation of Ambulance Services (CAAS) has established a Ground Vehicle Standard (2016). While NFPA 1917, KKK, and CAAS standards do not include recommended service-life replacement standards for EMS vehicles, common industry practice suggests typical replacement intervals of four to eight years. This schedule depends on several variables, most notably vehicle mileage, escalation of annualized repair expenses, and frequency with which the subject vehicle is out of service.

After replacement, serviceable vehicles may be retained in ready-reserve status for an additional two to four years. Considering the inherently shorter service life of ambulances, owing to a higher frequency of emergency responses handled than corresponding suppression vehicles, there are fewer legitimate concerns regarding "missing" essential improvements in occupant/operator safety standards.

The following table outlines the BDAS fleet.

TABLE 2-8: BDAS Ambulance Fleet

Ambulance Type	Year Purchased
Type I: Ford F-350	2017
Type I: Ford F-350	2019
Type I: Ford F-450	2016
Type III: Ford E-350	2000
Type III: Ford E-350	2000
Type III: Ford E-350 6.0	2009

Revenues and Budget

The BDAS budget is primarily funded from ambulance ground transport fees and assessment revenues from the jurisdictions the district services. Other revenue sources are typical of non-municipal ambulance services and include ambulance event stand-by fees, fees for medical and training services, ambulance fees written off and recovered in the budget year the write-off occurred or in the next budget year, sale of equipment, and grants.

BDAS ground transport revenues are no different than any other EMS agency in the country. Actual cash revenues collected compared to overall gross billing charges vary by region of the country, and more importantly, by locality being served by the ground transport agency. This is driven by mandated adjustments in the gross billing. These include ceiling limits on reimbursement amounts legislated through U.S Code of Federal Regulations for Medicare, Medicaid, and other federally funded medical reimbursement programs, which also have a high use rate.

Medicare and Medicaid reimbursements are based on a locality's demographics and can be better understood through analysis of the EMS payer mix. For instance, in a locality that has a large population of residents who utilize Medicare and Medicaid, the payer mix shifts to a larger percentage of government-funded (federal and state) Medicare and Medicaid health care, which does not pay the full EMS transport fee. In each of these cases, the billable amount is not fully recovered, and the service can only bill the patient for the co-pay. Even private insurance may not pay the full amount of the charge. In these cases, the co-pay and the remaining balance can be billed to the patient.

Payer mix is the percentage of claims that result from EMS transport incidents when billed to the various main insurance payer groups. Typically, the major components in a payer mix are Medicare, Medicaid, commercial insurance, patient/self-pay, and in some cases, facility transport contract. BDAS is no different. It should be noted that raising EMS transport fees will not counter a collection issue in all payer-mix categories, as federal law prohibits the billing of the remaining amount of the EMS transport bill for certain protected rates, such as Medicare and Medicaid other than the co-pay.

The funding formula for municipalities in the BDAS district includes only one factor as follows:

- Each municipality is assessed based on population served.
 - Formula: Per Capita Rate (Currently \$30) x Municipality Population Served = Municipal Tax Levy Assessment.

The following table shows the revenues in the past two fiscal years.

TABLE 2-9: BDAS Revenues

Fiscal Year	BDAS Revenues	Uncollectible Accounts (Transport)	Other Income (Includes Municipal Fees)	Total Income
FY 2019	\$5,965,637	\$3,328,452	\$443,753	\$3,080,938
FY 2020 (Unaudited)	\$4,912,057	\$2,980,751	\$867,403	\$2,798,709

Expenditures for BDAS are typical of an EMS agency and include salary and benefits; training and training center costs; vehicle repair, maintenance, and fuel; EMS operating supplies and equipment; building lease and utilities; transport billing services; office and personnel supplies; and uniforms and equipment. BDAS has debt service for cardiac monitors.

The following table shows the BDAS Budget for the past two fiscal years.

TABLE 2-10: BDAS Revenues and Budget

Fiscal Year	BDAS Revenues	BDAS Expenditures	+/-
FY 2019	\$3,080,938	\$3,190,848	-109,910
FY 2020 (Unaudited)	\$2,798,709	\$2,649,928	+148,781

The approved FY 2021 budget includes projected operating revenues of \$3,278,750 (net operational fees \$2,741,450 + municipal fees totaling \$537,300), and \$3,278,750 in operating expenditures.

§ § §

SECTION 3. FIRE AND EMS CONSOLIDATION CONSIDERATIONS

FIRE AND EMS CONSOLIDATION

Cooperative service delivery or consolidating services is not new to local governments and has been undertaken in both the public sector and private industry for many years. When public sector fire and EMS services are not already consolidated into a single agency, political and community leaders may seek ways to have these services work more closely together. Agencies that have been hesitant to work together and have chosen to remain independent and discipline-specific may have had and may still be facing various economic and staffing challenges that are triggering a new perspective with respect to some form of merger/consolidation.

The public sector (and as well the private sector) continually faces funding issues brought on by a host of issues that affects the ability of communities to unilaterally finance and manage needed growth, aging infrastructure, new/expanded services, and change. These funding issues were exacerbated by the Great Recession and now by the pandemic. In some cases, in those communities that have not felt the greater pressures of the most recent economic downturn and pandemic and which are not directly experiencing funding issues are regularly lobbied by residents and the private sector to lower taxes or even increase services.

While financial considerations typically drive merger/consolidation discussions, another prime consideration is single-service/autonomous fire and EMS departments do not take advantage of assets and staffing resources, supply chains, training, and administrative oversight that are linked to an all-hazards combined fire and EMS department. The successful mitigation of an emergency depends on the rapid response of trained personnel and assets representing several emergency services disciplines. Combined fire and EMS services operate with sophisticated strategies and mitigation plans that respond a right-sized response force and assets to a variety of fire and EMS call types while capitalizing on economies of scale in management and oversight.

While the desire for cost efficiencies can initially drive the merger/consolidation of fire and EMS services, those efficiencies can be modest at times and not reach what is envisioned. What typically is gained, however, and which can be more significant, is the longer-term cost avoidance related to facilities and other infrastructure, management and supervisory staffing, training, and line personnel staffing. This is due to the increased depth of resources when fire and EMS services are merged and nurtured over the long haul. ***Merging the BFD and the BDAS will potentially maximize the longer-term benefits related to facilities and equipment infrastructure, management and supervisory staffing, training, and line personnel staffing.***

Current Fire and EMS Working Relationship

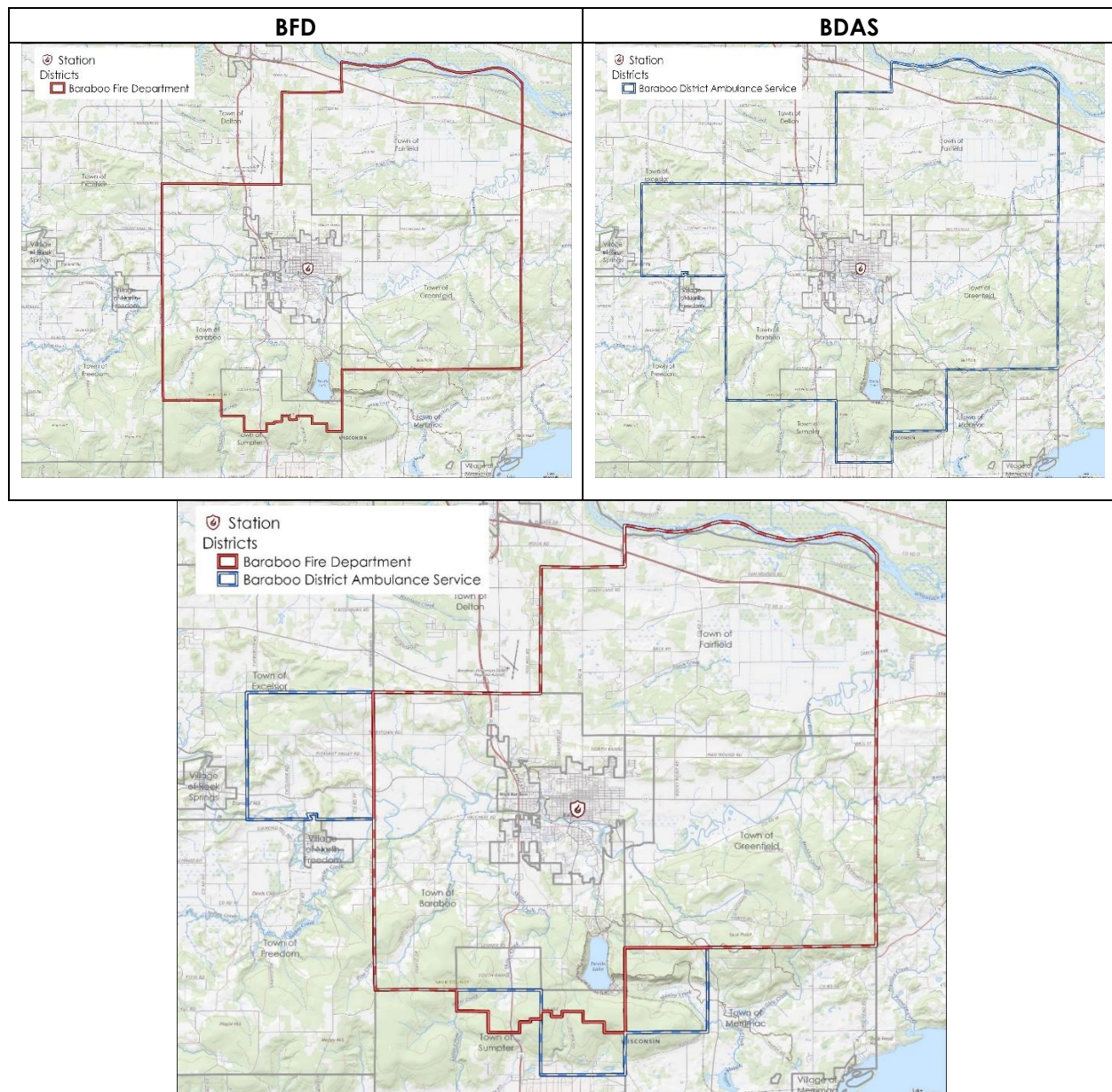
The BDAS and the BFD have an excellent working relationship in terms of both administration and operations. The two agencies share a station located in the City of Baraboo and at times respond to calls for service together. CPSM conducted several interviews with both Chiefs and we conclude they strongly favor a merger/consolidation of the two agencies. Each Chief has outlined the benefits of the merger/consolidation to include asset and facility/infrastructure sharing, the potential of merging staff into dual certified positions (fire and EMS), both of which

would create a more effective Fire and EMS response force. Both Chiefs also see the consolidation of agencies as beneficial to the citizenry who fund the agencies and potentially may need their service.

Fire and EMS District Characteristics

The BDAS and BFD response districts are quite similar. Each agency serves the City of Baraboo, the Townships of Baraboo, Fairfield, and Greenfield. Each agency also serves the Village of West Baraboo and certain portions of the Township of Sumpter (the BFD is scheduled to cease providing fire services to the Township of Sumpter on December 31, 2021). BDAS also serves certain portions of the Township of Excelsior (BFD does not). The next figure shows a side-by-side comparison of the current response districts.

FIGURE 3-1: 2021 BFD and BDAS District Comparison



Emergency Communications

Emergency communications for both the BFD and the BDAS are provided through by the Sauk County Sheriff's Office. The Sauk County Emergency Communications Center (SCECC) serves as the consolidated public safety answering point (PSAP) for the BFD and BDAS. SCECC provides dispatching services for the BFD and BDAS as well as law enforcement. The SCECC does not provide dispatching services for non-emergency county departments.

The SCECC utilizes Zuercher-Central Square Computer-Aided Dispatch (CAD) software. CAD software is utilized by telecommunicators during call taking, call processing, and dispatch of emergency responding units. A CAD system also serves as a records management system for all incidents processed. Depending on the CAD system, it may also incorporate information from agency-specific records management systems, global information systems, automatic vehicle locators, and caller ID.

In 2020, the SCECC processed 14,249 incoming 9-1-1 phone calls. Each telecommunicator in the SCECC is trained in the three major disciplines of fire, EMS, and law enforcement. Telecommunicators are not discipline specific when working the dispatch console. Therefore, a telecommunicator can take an incoming 911 call, process a 911 call, and of course dispatch a 911 call.

BFD WORKLOAD AND RESPONSE TIMES

An indication of the fire department workload and the community's fire risk and is the type and number of fire-related incidents the fire department responds to. During the CPSM data analysis study period of January 1, 2019, and January 1, 2020, the BFD responded to 211 fire-related calls for service, and nine mutual aid calls. The following table details the call types and call type totals for these types of fire-related risks.

TABLE 3-1: BFD Fire Response Call Types

Call Type	Number of Calls	Calls per Day	Call Percentage All Calls
False alarm	62	0.2	16.8
Good intent	25	0.1	6.8
Hazard	56	0.2	15.2
Outside fire	14	0.0	3.8
Public service	34	0.1	9.2
Structure fire	20	0.1	5.4
Fire total	211	0.6	57.3
EMS total	108	0.3	29.3
Canceled	40	0.1	10.9
Fire mutual aid	9	0.0	2.4
Total	368	1.0	100.0

This table tells us:

- Fire calls for the year totaled 211, with an average of 0.6 or not quite a call per day.
- False alarm calls were the largest category of fire calls at 29 percent of fire calls.
- Hazard calls made up 27 percent of all fire calls.
- Structure and outside fire calls combined made up 16 percent of fire calls, an average of 0.1 calls per day, or one call involving a fire on average about every 10 days.
- EMS assist calls made up 51 percent of all calls to which the BFD responded.

The number and types of incidents is important when analyzing a fire department's workload and a community's risk, as outlined above. Analyzing where the fire incidents occur, along with the demand density of fire incidents, helps to determine adequate fire management zone resource assignment and deployment. For the BFD, the entire district serves as the single fire management zone. The following figures illustrate fire demand in the BFD response zone. Figure 3-2 illustrates all BFD fire incidents and Figure 3-3 illustrates BFD structural and outside fire incidents.

These demand maps tell us that:

- The highest demand for fire-type incidents is in the City of Baraboo and the Village of West Baraboo.
- Call demand for all fire incident types is significantly lower in all other areas the BFD serves.
- Actual fire incidents (outside and structural fires) are highest in the City of Baraboo with moderate demand in the Village of West Baraboo and then significantly less demand in all other areas the BFD serves.

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FIGURE 3-2: Fire Incident Demand Density, All BFD Fire Incidents

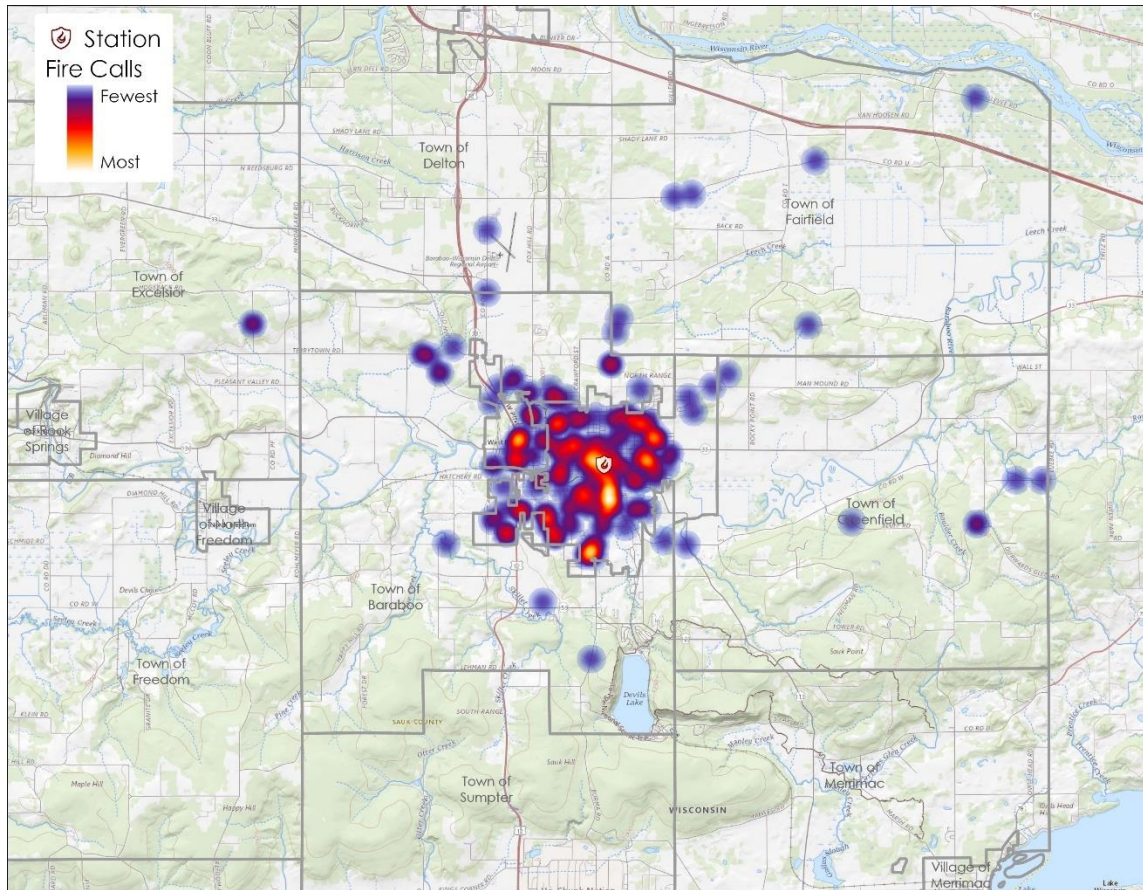
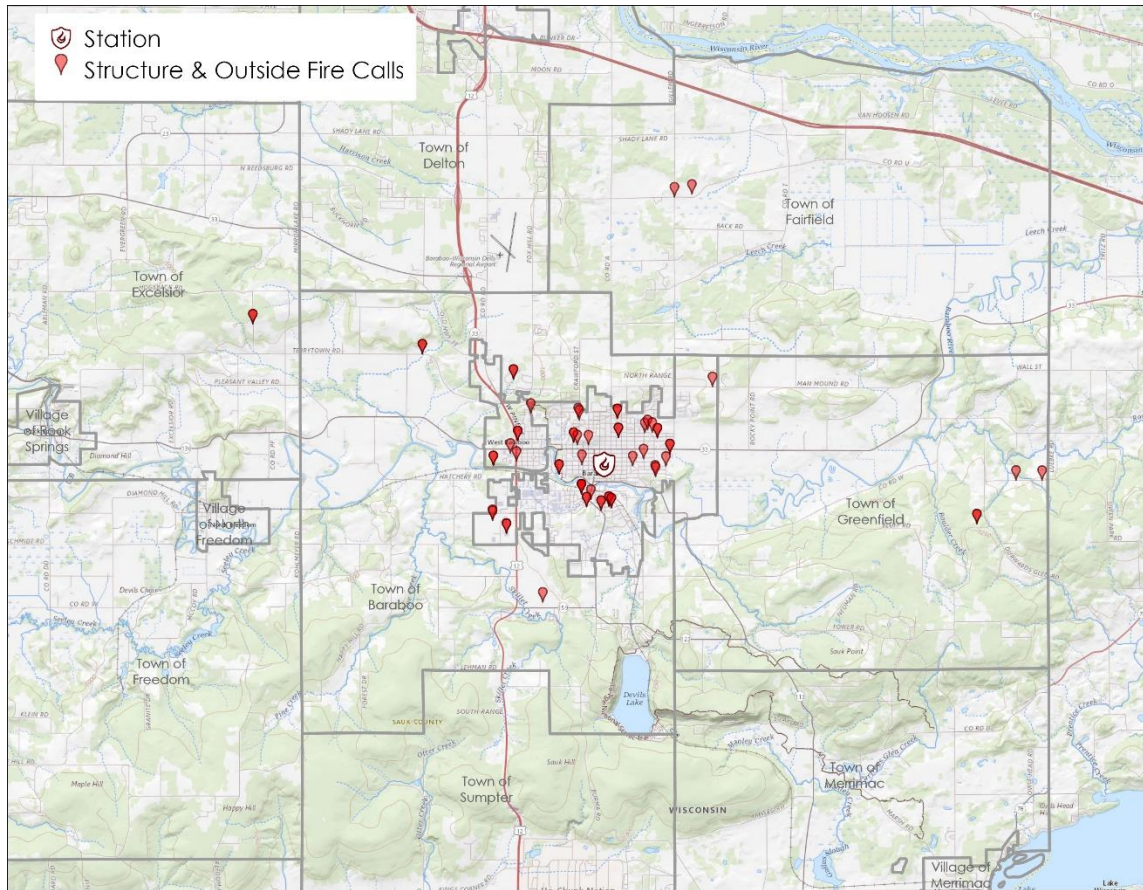


FIGURE 3-3: Fire Incident Demand Density, Structural and Outside Fires



Overall, BFD fire response is most concentrated in the in the City of Baraboo and the Village of West Baraboo.

Response times for fire incidents is based on the concept of “flashover.” A **flashover** is the near-simultaneous ignition of most of the directly exposed combustible material in an enclosed area. When certain organic materials are heated, they undergo thermal decomposition and release flammable gases. Flashover occurs when the majority of the exposed surfaces in a space are heated to their auto ignition temperature and emit flammable gases. “Flashover is the transition phase in the development of a contained fire in which surfaces exposed to thermal radiation, from fire gases in excess of 600 degrees Celsius, reach ignition temperature more or less simultaneously and fire spreads rapidly throughout the space.”⁸

Flashover is not time-dependent. Flashover can occur within three minutes from ignition; it may also take considerably longer. Flashover times are more dependent on the size of the compartment, the fuel load within the compartment, and the construction of the compartment. Again, these variables cannot be seen from outside the structure, so the interior firefighters and officers must be constantly aware of them.⁹

When the fire does reach this extremely hazardous state, initial firefighting forces are often overwhelmed, a larger and more destructive fire occurs, the fire escapes the room and possibly

8. National Institute of Standards and Technology, Definition of Flashover.

9. Fire Engineering, June 2010, “Understanding Flashover.”

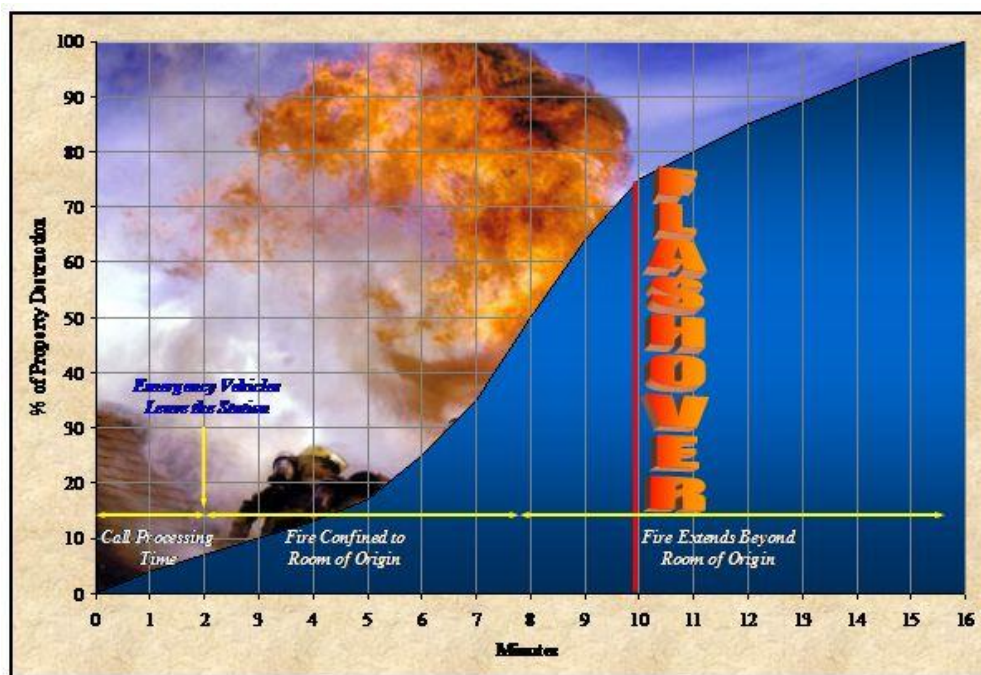
even the building of origin, and significantly more resources are required to affect fire control and extinguishment.

Flashover occurs more quickly and more frequently today and is caused at least in part by the introduction of significant quantities of plastic- and foam-based products into homes and businesses (e.g., furnishings, mattresses, bedding, plumbing and electrical components, home and business electronics, decorative materials, insulation, and structural components). These materials ignite and burn quickly and produce extreme heat and toxic smoke.

As a benchmark, for a volunteer or predominately volunteer fire department/paid-per-call department such as the BFD, NFPA 1720, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments, 2020 Edition, recommends the entire initial effective response force of between 4 and 15 personnel, depending on demand zone (urban, suburban, rural, remote areas), be on scene within between 9 and 14 minutes of dispatch, depending on demand zone (other than remote, which is dependent on travel distance). It is also important to keep in mind that once units arrive on scene there is a time lag before water reaches the fire as crews and responding units have several tasks to complete in the initiating action period immediately after arrival at the scene.

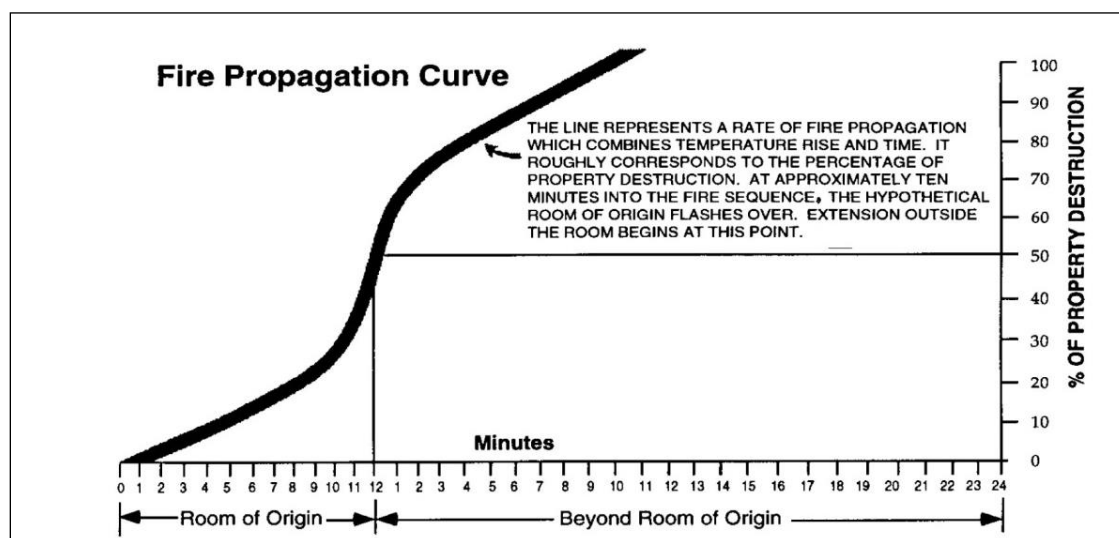
To illustrate how a fire grows over a brief period of time, Figure 3-4 shows the time progression of a fire from inception (event initiation) through flashover. The time-versus-products of combustion curve shows activation times and effectiveness of residential sprinklers (approximately one minute), commercial sprinklers (four minutes), flashover (eight to ten minutes), and firefighters applying first water to the fire after notification, dispatch, response, and set up (ten minutes). Figure 3-5 shows the fire propagation curve relative to fire being confined to the room of origin or spreading beyond it and the percentage of destruction of property by the fire.

FIGURE 3-4: Fire Growth from Inception to Flashover¹⁰



10. Source: <https://www.slideserve.com/tavon/the-international-society-of-fire-service-instructors>.

FIGURE 3-5: Fire Propagation Curve



Source: John C. Gerard and Terry Jacobson

As noted above, the BFD is a combination fire department (career and paid-per-call).

The next table shows the response time and minimum staffing level for low-hazard structural firefighting incidents (to include out-buildings and up to a 2,000 square-foot, one- to two-story, single-family dwelling without a basement and no exposures) in each demand zone as defined by NFPA 1720. This table reflects the minimum staffing and response time in minutes to assemble the minimum staffing in each demand zone type (urban, suburban, rural, and remote). The minimum staffing represents the response force necessary to combat or begin to combat a structural type of fire as described above.

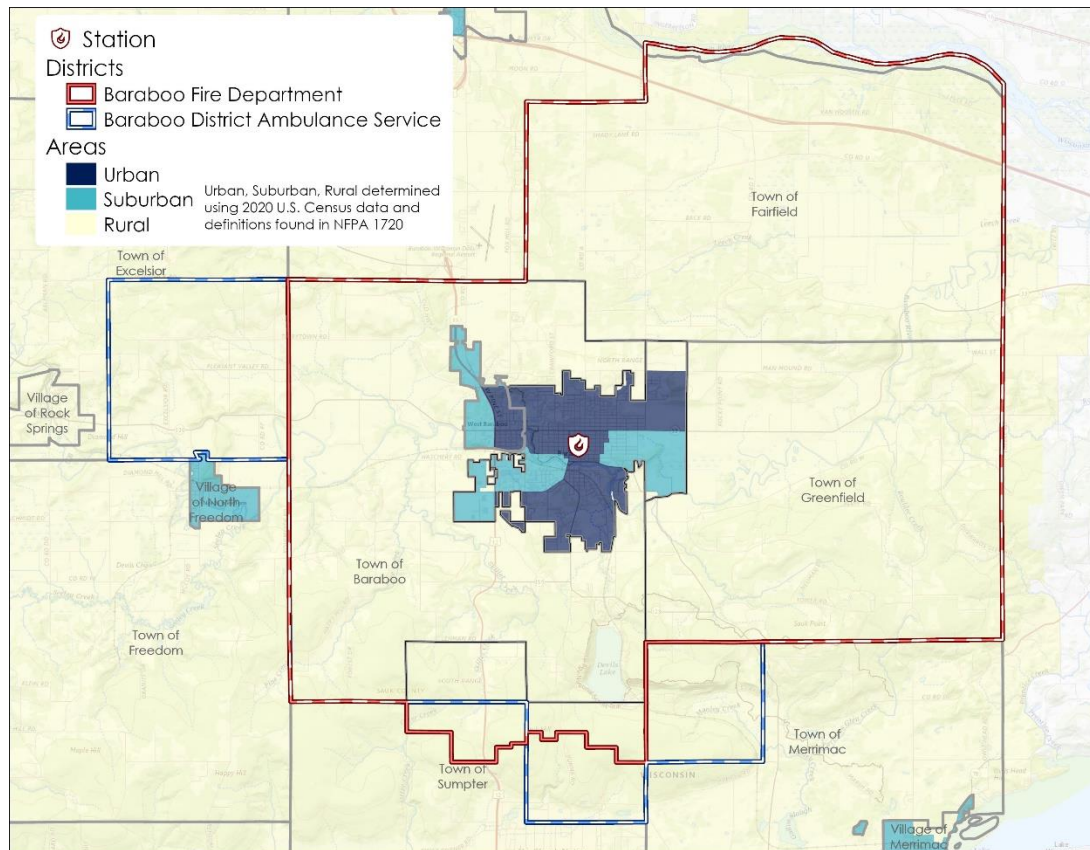
Urban and suburban demand zones differ as these demand zones have a higher population density, and have a higher percentage of multifamily, townhouse, condominium, and multistory apartment building structures, which require a greater response force to complete the critical tasking necessary to mitigate the fire and life-safety emergency.

TABLE 3-2: NFPA 1720 Staffing and Response Times, Low-Hazard Structural Fire

Demand Zone	Demographics	Minimum Staff to Respond	Response Time in Minutes	Meets Objective Percentile
Urban Area	>1000 people/mi	15	9	90%
Suburban Area	500-1000 people/mi	10	10	80%
Rural Area	<500 people/mi	6	14	80%
Remote Area	Travel Distance ≥ 8 miles	4	Directly dependent on travel distance	90%

The BFD response district includes urban, suburban, and rural response demand zones as illustrated in the next figure.

FIGURE 3-6: NFPA 1720 Urban, Suburban, Rural Density Map



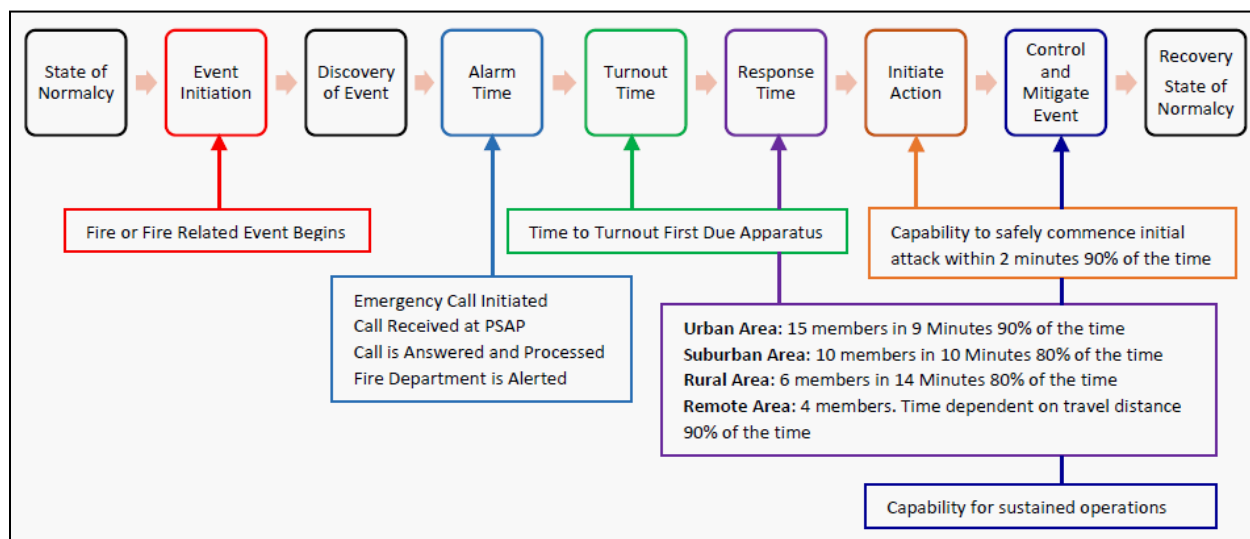
NFPA 1720 calls attention to additional requirements worth noting here:

- *The fire department shall identify minimum staffing requirements to ensure that the number of members that are available to operate are able to meet the needs of the department.*
 - For the volunteer component this can include scheduled staffing at predetermined stations. As an example, this can include 6:00 p.m. to 11:00 p.m., Monday-Friday; and 7:00 a.m. to 11:00 p.m., Saturday and Sunday.
- *Where staffed stations are provided, when determined by the authority having jurisdiction, they shall have a turnout time of 90 seconds for fire and special operations and 60 seconds for EMS incidents, 90 percent of the time.*
 - This should be measured at staffed stations.
- *Upon assembling the necessary resources at the emergency scene, the fire department shall have the capability to safely commence an initial attack within 2 minutes 90 percent of the time.*
 - This should be announced by the incident commander over the radio and measured through the computer-aided dispatch (CAD) system after the arrival of the initial arriving companies and response teams.

- Personnel responding to fires and other emergencies shall be organized into company units or response teams and have the required apparatus and equipment.
- This avoids freelancing by personnel before and after the arrival of the fire suppression units; enables the incident commander to size-up available on-scene resources, ensures fireground accountability, and ensures a coordinated assignment of critical tasks.

The following figure illustrates the overview of response time performance for fire response under NFPA 1720.

FIGURE 3-7: NFPA 1720 Response Time Performance Measures



The next table illustrates BFD's response times for fire incident types at the 80th and 90th percentile in terms of response from the central station with the first arriving apparatus to any urban, suburban, or rural areas.

TABLE 3-3: 80th and 90th Percentile Response Time of First Arriving Unit, by Call Type

Call Type	80th Percentile Response Time, Minutes			90th Percentile Response Time, Minutes			Number of Calls
	Turnout	Travel	Total	Turnout	Travel	Total	
False alarm	8.1	6.3	13.1	9.1	8.6	15.5	46
Good intent	7.1	5.6	12.5	9.5	8.4	14.0	17
Hazard	8.4	7.4	13.3	9.5	9.6	15.3	46
Outside fire	6.2	12.1	18.3	7.5	19.7	22.0	6
Public service	9.6	6.0	12.8	11.5	6.5	15.7	17
Structure fire	6.2	5.8	10.9	7.7	6.1	12.8	18
Fire Total	8.0	6.4	13.1	9.4	7.9	15.0	150
EMS Total	5.0	7.7	11.4	6.3	9.7	14.9	95
Total	6.8	6.8	12.7	8.7	9.1	15.0	245

This table tells us:

- The 90th percentile turnout and travel time to outside fire and structure fire incidents is 22.0 minutes and 12.8 minutes, respectively, for the first arriving unit.
- The 90th percentile turnout and travel time to all fire-related incidents is 15.0 minutes for the first arriving unit.
- The 80th percentile turnout and travel time to outside fire and structure fire incidents is 7.5 minutes and 7.7 minutes, respectively, for the first arriving unit.
- The 80th percentile turnout and travel time to all fire related incidents is 13.1 minutes for the first arriving unit.

BDAS EMS WORKLOAD AND RESPONSE TIMES

As with fire risks, an indication of the community's pre-hospital emergency medical workload and overall EMS risk is the type and number of EMS calls to which a department responds. During the CPSM data analysis study period of January 1, 2019, and January 1, 2020, BDAS responded to 2,013 EMS 9-1-1 calls for service. The following table outlines the call types and call type totals for these types of EMS risks.

TABLE 3-4: BDAS Response Call Types

Call Type	Number of Calls	Calls per Day	Call Percentage
Breathing difficulty	123	0.3	2.9
Cardiac and stroke	187	0.5	4.5
Fall and injury	348	1.0	8.3
Illness and other	687	1.9	16.3
MVA	87	0.2	2.1
Overdose and psychiatric	295	0.8	7.0
Seizure and unconsciousness	286	0.8	6.8
9-1-1 EMS subtotal	2,013	5.5	47.9
Interfacility Transport	2,074	5.7	49.4
EMS total	4,087	11.2	97.3
Fire assist total	79	0.2	1.9
Canceled	19	0.1	0.5
Mutual aid	17	0.0	0.4
Total	4,202	11.5	100.0

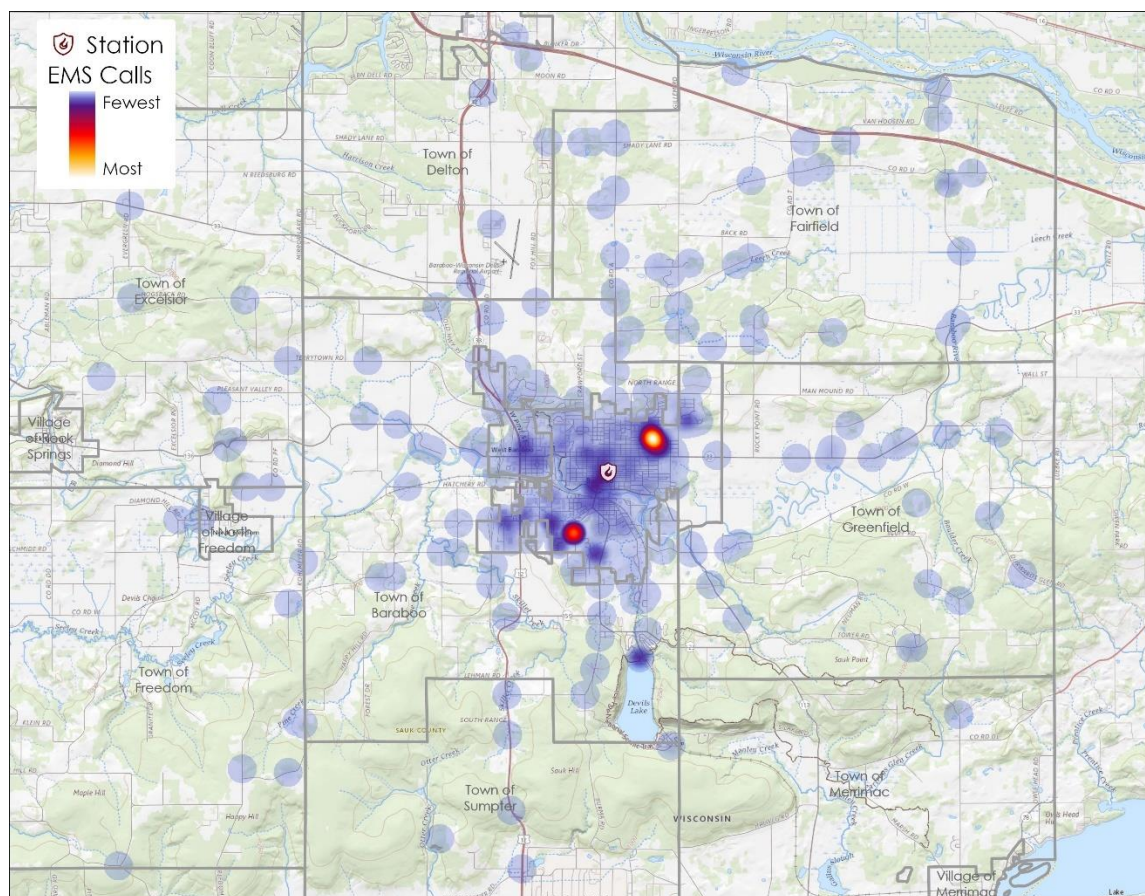
This table tells us:

- All EMS calls for the year (including interfacility transports) averaged 11.2 calls per day.
- Illness and other calls were the largest category of EMS calls at 34 percent of EMS 9-1-1 calls or on average of 1.9 calls per day.

- Cardiac and stroke calls made up 9.2 percent of EMS 9-1-1 calls and averaged 0.5 calls per day.
- Motor vehicle accidents made up 4 percent of EMS 9-1-1 calls and averaged 0.2 calls per day.
- Overall, Interfacility transports make up the largest percent of calls the BDAS handles (49 percent) and averaged almost 6 calls per day.

As with fire workload and risk analysis, the number and types of incidents an EMS agency responds to is important. Analyzing where EMS incidents occur, and the demand density of EMS incidents, helps to determine adequate response district resource assignment and deployment. In EMS, determining whether to staff basic life support and advanced life support units and how many, typically is made when analyzing types of calls and workload. The following figures illustrate fire demand in the BFD response zone. Figure 3-8 illustrates all BDAS incident demand; Figure 3-9 illustrates BDAS motor vehicle accident (MVA) incident demand; and finally Figure 3-10 illustrates BDAS cardiac and breathing difficulty incidents.

FIGURE 3-8: EMS Incident Demand Density, All BDAS EMS Incidents

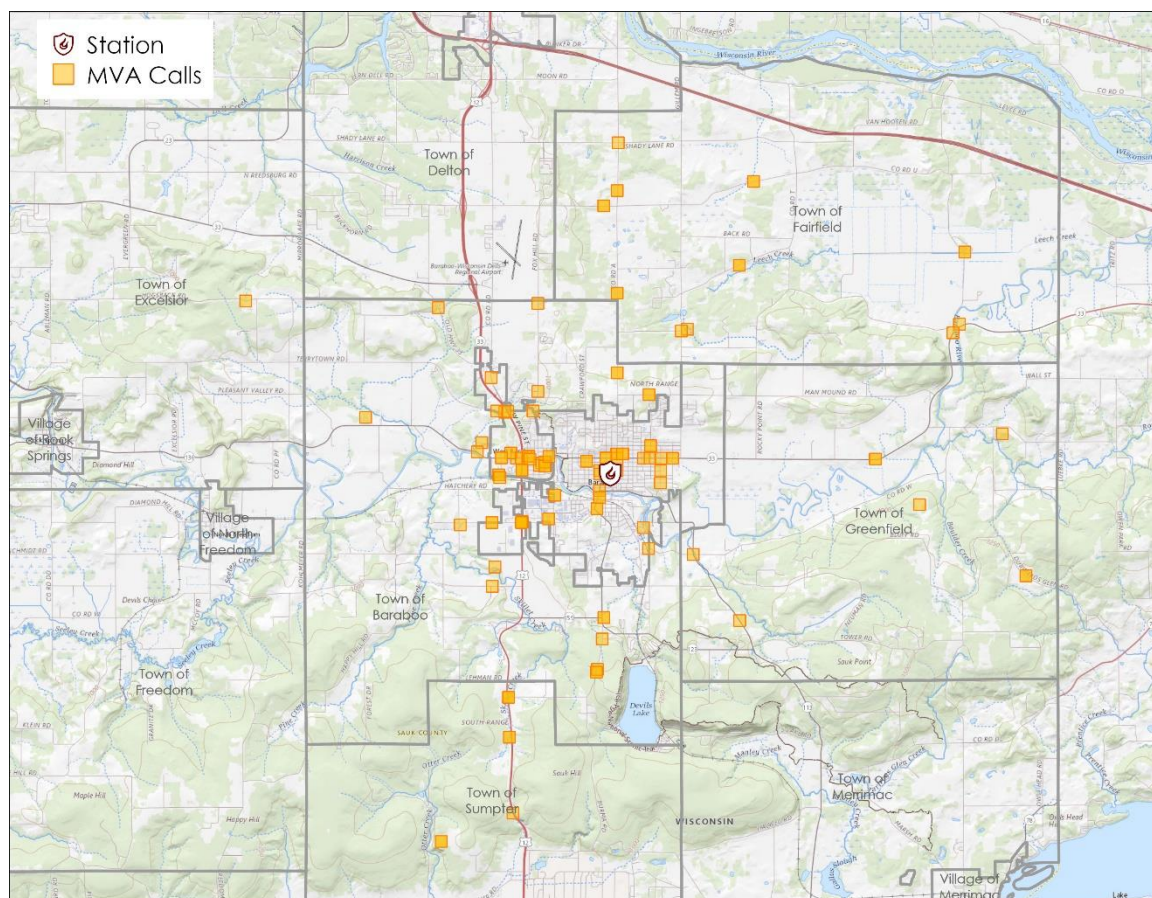


This demand maps tell us that:

- The highest demand for EMS service is in the City of Baraboo, the Village of West Baraboo, and the Town of Baraboo.

- There is moderate demand in the remaining service district, particularly in the Towns of Fairfield and Greenfield.

FIGURE 3-9: EMS Incident Demand Density, Motor Vehicle Accidents

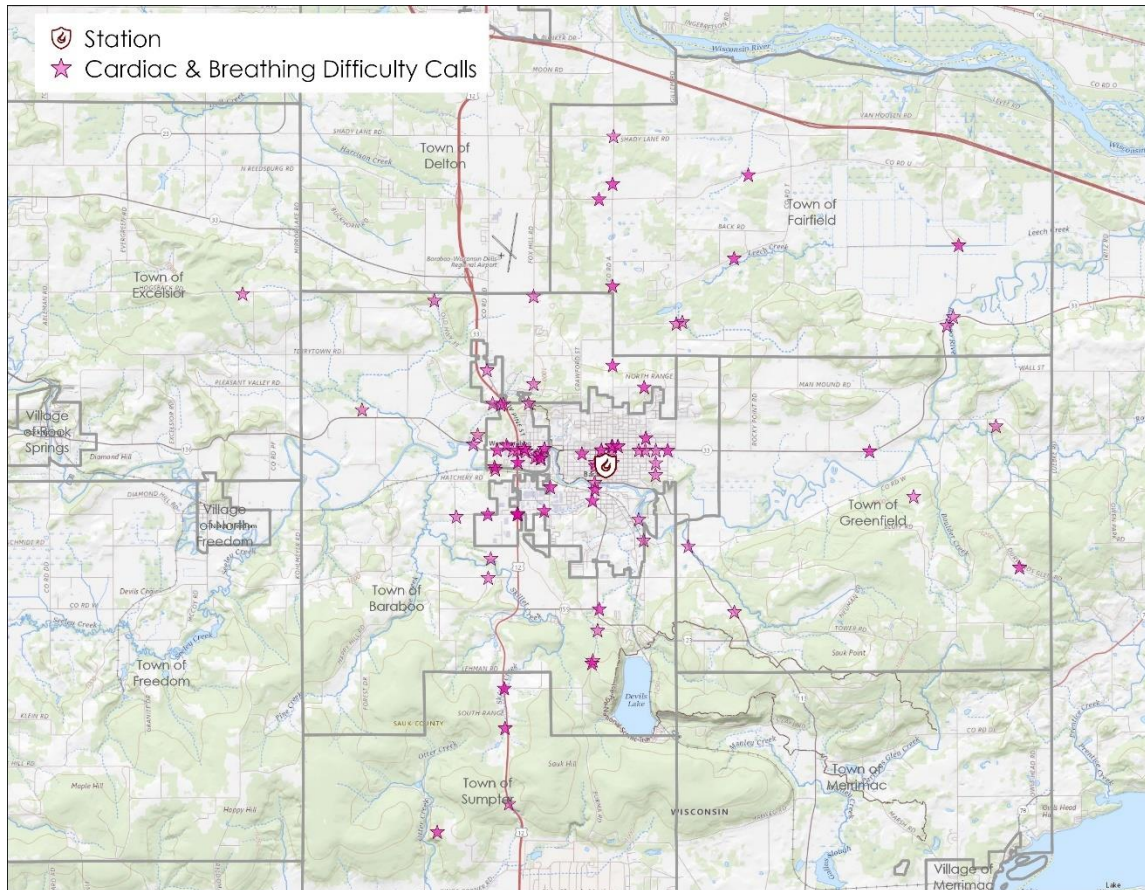


This demand maps tell us that:

- The highest demand for EMS response to motor vehicle accidents occurs in the City of Baraboo and the Village of West Baraboo.
- The Towns of Baraboo, Sumpter, Greenfield, and Fairfield have a low to moderate demand for EMS response to motor vehicle accidents.

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FIGURE 3-10: EMS Incident Demand Density, Cardiac and Breathing Difficulty



This demand maps tell us that:

- The highest demand for cardiac and breathing difficulty EMS response occurs in the City of Baraboo and the Village of West Baraboo.
- The Towns of Baraboo, Sumpter, Greenfield, and Fairfield have a low to moderate demand for EMS response to cardiac and breathing difficulty calls.

Overall, BDAS demand is most concentrated in the City of Baraboo and the Village of West Baraboo.

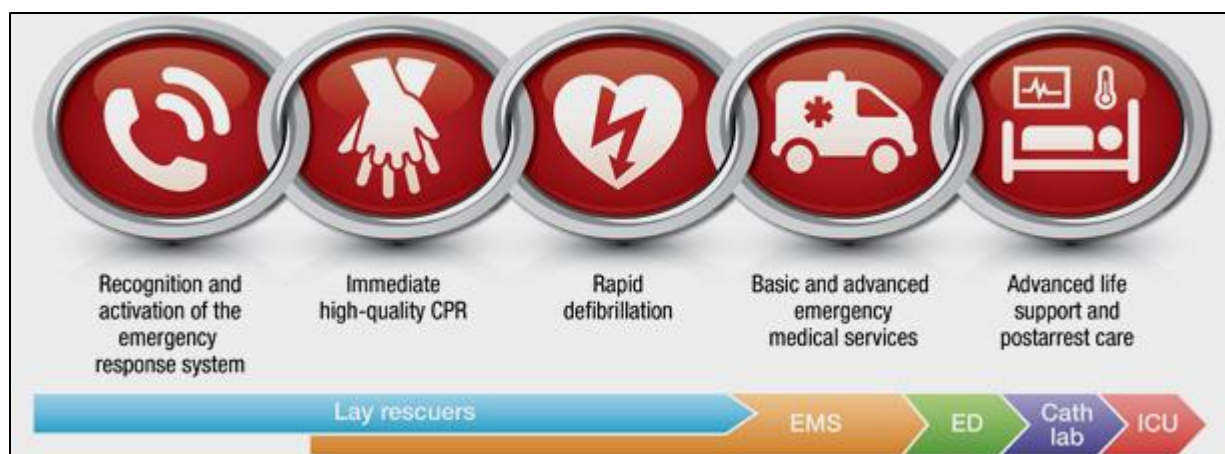
EMS response times are measured differently than fire service response times. Where the fire service uses NFPA 1710 and 1720 standards as response time benchmarking documents, the focus in EMS is and should be directed to the evidence-based relationship between clinical outcomes and response times. Much of the current research suggests response times have negligible impact on clinical outcomes outside of a small segment of call types. These include cerebrovascular accidents (stroke), injury or illness compromising the respiratory system, injury or illness compromising the cardiovascular system to include S-T segment elevation emergencies, and certain obstetrical emergencies. Each of these call types requires rapid response times, rapid on-scene treatment and packaging for transport, and rapid transport to the hospital. For stand-alone EMS agencies, the jurisdiction establishes response times (BDAS does not currently have established response times).

Typically, a low percentage of 9-1-1 patients have time-sensitive and advanced life support (ALS) needs. However, for those patients that do have such a need, time can be a critical issue of morbidity and mortality. For the remainder of those calling 9-1-1 for a medical emergency, though they may not be facing a medical necessity, they still expect rapid customer service. Response times for patients and their families are often the most important measurement of the EMS department. Regardless of the service delivery model, appropriate response times are more than a clinical issue; they are also a customer service issue and should not be ignored.

Cardiac arrest is one emergency that EMS response times were initially built around. The science tells us that the brain begins to die without oxygenated blood flow at the four- to six-minute mark. Without immediate cardiopulmonary resuscitation (CPR) and rapid defibrillation, the chances of survival diminish rapidly at the cessation of breathing and heart pumping activity. For every minute without CPR and/or defibrillation, chances of survival decrease 7 to 10 percent. Further, only 10 percent of victims who suffer cardiac arrest outside of the hospital survive.¹¹

The following figure illustrates the out-of-hospital chain of survival, which is a series of actions that, when put in motion, reduce the mortality of sudden cardiac arrest. Adequate EMS response times coupled with community and public access defibrillator programs potentially can impact the survival rate of sudden cardiac arrest victims by deploying early CPR, early defibrillation, and early advanced life support care provided in the prehospital setting.

FIGURE 3-11: Sudden Cardiac Arrest Chain of Survival



From: "Out of Hospital Chain of Survival,"

http://cpr.heart.org/AHA/ECC/CPRAndECC/AboutCPRFirstAid/CPRFactsAndStats/UCM_475731_Out-of-hospital-Chain-of-Survival.jsp

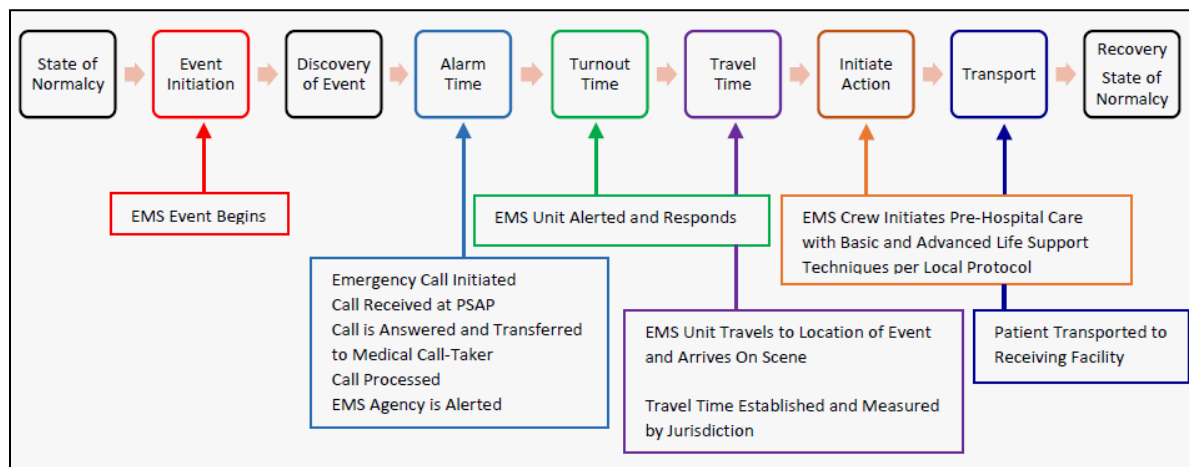
EMS response times and performance should be built around:

- Rapid response times for the subset of emergency calls where time clinically matters.
- Adequate response times for lower acuity incidents.
- Rapid scene assessment to determine if the patient has emergency clinical conditions that warrant rapid advanced life support pre-hospital care and rapid transport to the hospital.

The next figure provides an overview of response time components for EMS response.

11. American Heart Association. *A Race Against the Clock, Out of Hospital Cardiac Arrest*. 2014.

FIGURE 3-12: EMS Response Time Components



The following table depicts BDAS average response times by call type.

TABLE 3-5: Average Response Time of First Arriving Unit, by Call Type

Call Type	Minutes				Number of Calls
	Dispatch	Turnout	Travel	Total	
Breathing difficulty	1.8	1.7	3.9	7.4	122
Cardiac and stroke	1.6	1.5	4.6	7.7	186
Fall and injury	2.2	1.8	4.6	8.6	330
Illness and other	1.8	1.7	4.7	8.3	656
MVA	2.7	1.5	5.6	9.7	77
Overdose and psychiatric	2.6	1.9	4.8	9.3	254
Seizure and unconsciousness	1.8	1.4	4.6	7.7	280
Fire Assist	3.1	2.0	4.8	9.9	73
Total	2.0	1.7	4.7	8.4	1,978

Observations of BDAS average response times are as follows:

- Crew turnout and travel time to the scene of the EMS incident on average for all call types is 8.4 minutes. Considering the size of the response district this represents a good overall time.
- On average, dispatch times for EMS incidents are processed quickly (2.0 minutes) to ensure a rapid response of EMS crews.

A stricter response time analysis is at the 90th percentile; this is a benchmark used by most fire and EMS agencies as the standard of measurement. The next table depicts the BDAS response times at the 90th percentile. A 90th percentile means that 90 percent of calls had response times at or below that number.

TABLE 3-6: 90th Percentile Response Time of First Arriving Unit, by Call Type

Call Type	Minutes				Number of Calls
	Dispatch	Turnout	Travel	Total	
Breathing difficulty	2.9	3.5	6.1	10.2	122
Cardiac and stroke	2.6	2.8	6.8	11.8	186
Fall and injury	3.3	3.8	6.9	13.4	330
Illness and other	2.7	3.6	7.8	12.4	656
MVA	4.4	2.8	12.4	16.4	77
Overdose and psychiatric	4.4	4.1	8.7	16.5	254
Seizure and unconsciousness	2.6	2.4	7.2	11.5	280
Fire Assist	4.1	4.3	7.9	19.2	73
Total	3.0	3.4	7.7	13.3	1,978

This table tells us that:

- Even at the 90th percentile, crew turnout and travel time to the scene of the EMS incident on average for all call types is 13.3 minutes. Considering the size of the response district, and at the 90th percentile, this still represents a good overall response time.

As discussed, EMS response times and performance should be also built around rapid scene assessment to determine if the patient has emergency clinical conditions that warrant rapid ALS pre-hospital care, and rapid transport to the hospital. The next table looks at the on-scene time and travel to hospital time by BDAS crews by call type.

TABLE 3-7: Time Component Analysis for Ambulance Transport Runs, by Call Type

Call Type	Average Time Spent per Run (Minutes)			
	On Scene	Traveling to Hospital	At Hospital	Deployed
Breathing difficulty	19.3	5.4	16.6	45.2
Cardiac and stroke	19.8	6.5	21.0	51.7
Fall and injury	19.4	7.5	25.0	56.2
Illness and other	17.8	5.6	24.7	52.7
MVA	18.5	7.3	72.4	103.0
Overdose and psychiatric	16.9	6.1	67.2	94.1
Seizure and unconsciousness	18.8	5.4	19.3	47.6
9-1-1 EMS Total	18.5	6.1	29.1	58.0
Interfacility transport	19.9	56.6	34.3	137.1
EMS Total	19.4	37.3	32.3	106.8
Fire & Other Total	19.0	11.9	43.7	77.2
Total	19.4	37.1	32.4	106.6

This table tells us:

- BDAS crews are extremely efficient in on-scene time and time spent at the hospital for 9-1-1 calls. This translates to an average time of under 60 minutes per call.

Response Times from Current Station

Travel time is key to understanding how station location influences a community's aggregate response time performance. Travel time can be mapped when existing and proposed station locations are known. The location of responding units is one key factor in response time; reducing response times, which is typically a key performance measure in determining the efficiency of department operations, often depends on this factor. The goal of placement of a single fire station or creating a network of responding fire stations in a single community is to optimize coverage with short travel distances when possible, while giving special attention to natural and manmade barriers, and response routes that can create response-time problems.¹² This goal is generally budget-driven and based on demand intensity of fire and EMS incidents, which for this report were mapped earlier. As already discussed, the BFD and BDAS jointly respond from a single fire station located in the center of the City of Baraboo, which is somewhat central to the BDAS and BFD service districts.

This section expands on the travel time discussion outlined above, and depicts graphically travel times of 9 minutes, 10 minutes, and 14 minutes (NFPA 1720 standard response times) when mapped from the current fire station location. This mapping involved projected travel time utilizing existing streets and roads. The GIS data for streets and roads includes speed limits for each street segment and allows for "U-turns" for dead end streets and intersections. This analysis is not all inclusive as it does not contemplate traffic, weather, and such things as road obstructions caused by construction, public transportation movement, and the like.

It is noted here the BDAS does not have established response times, nor are there established national response time benchmarks for a non-fire-based EMS service. Regardless, it does show the response reach capabilities of the BDAS from the Baraboo station.

Figure 3-13 illustrates the 9-minute travel time response bleed from the BFD/BDAS station.

- Benchmark: NFPA 1720 urban response area.
- 9-minute response reach by the current road network is central to the City of Baraboo and the Village of West Baraboo. This response time also covers the highest demand of fire and EMS incidents.

Figure 3-14 illustrates the 10-minute travel time response bleed from the BFD/BDAS station.

- Benchmark: NFPA 1720 suburban response area.
- 10-minute response reach by the current road network is again central to the City of Baraboo and the Village of West Baraboo, with moderate expansion into the Town of Baraboo and Town of Greenfield and some expansion into the Town of Fairfield. This response time also serves the highest demand of fire and EMS incidents.

Figure 3-15 illustrates the 14-minute travel time response bleed from the BFD/BDAS station.

- Benchmark: NFPA 1720 rural response area.
- 14-minute response reach by the current road network is central to the City of Baraboo and the Village of West Baraboo with significant expansion into the Town of Baraboo and Town of Greenfield, moderate expansion into the Town of Fairfield and Town of Excelsior.

12. NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Departments*, 2010 Edition, 122.

FIGURE 3-13: 9-Minute Travel Time from BFD/BDAS Station

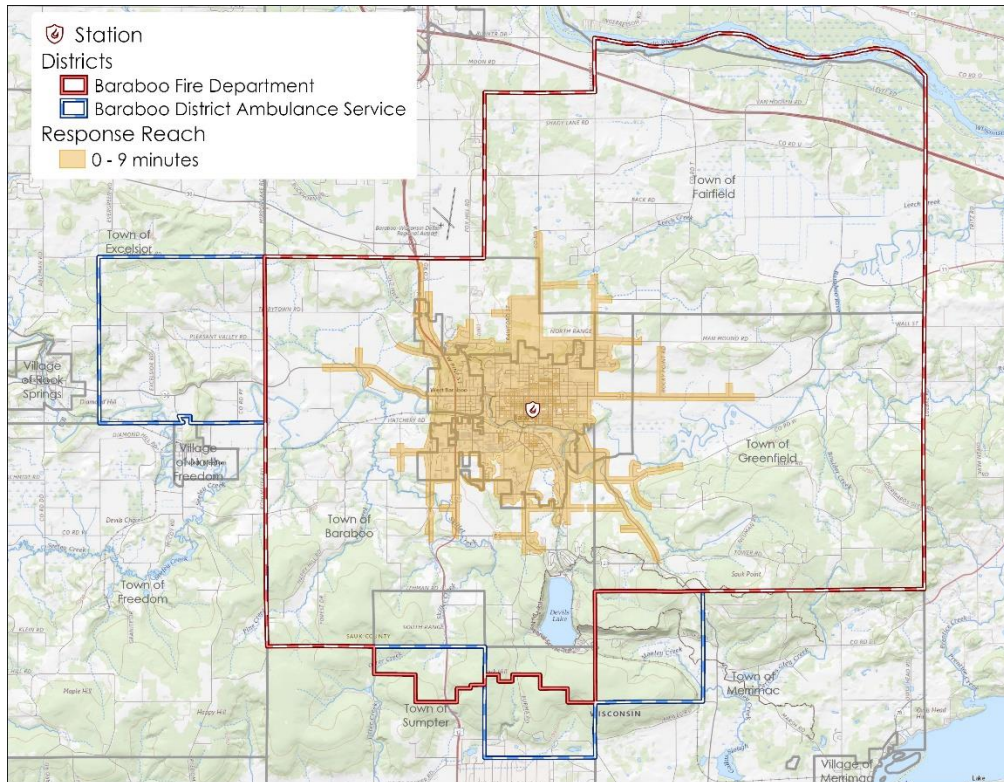
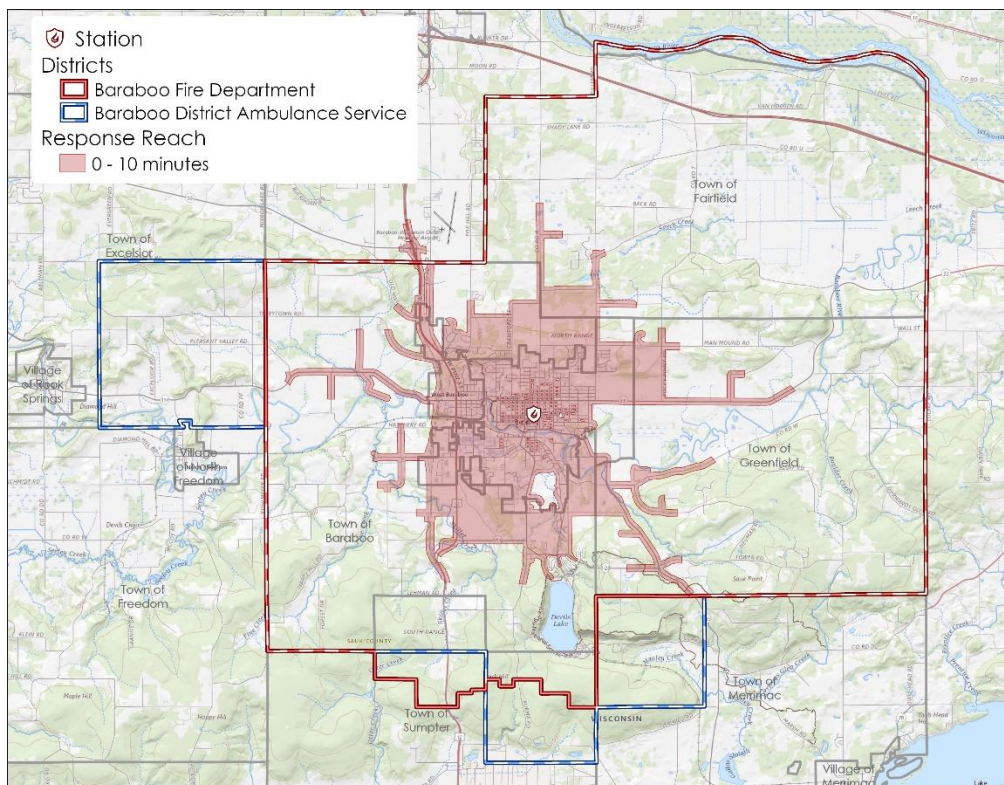
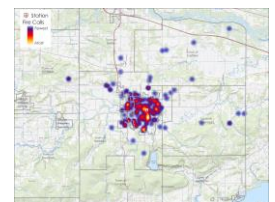


FIGURE 3-14: 10-Minute Travel Time from BFD/BDAS Station



Call Demand

Fire



EMS

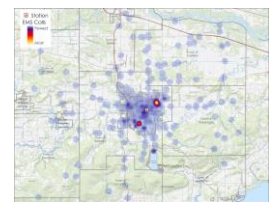
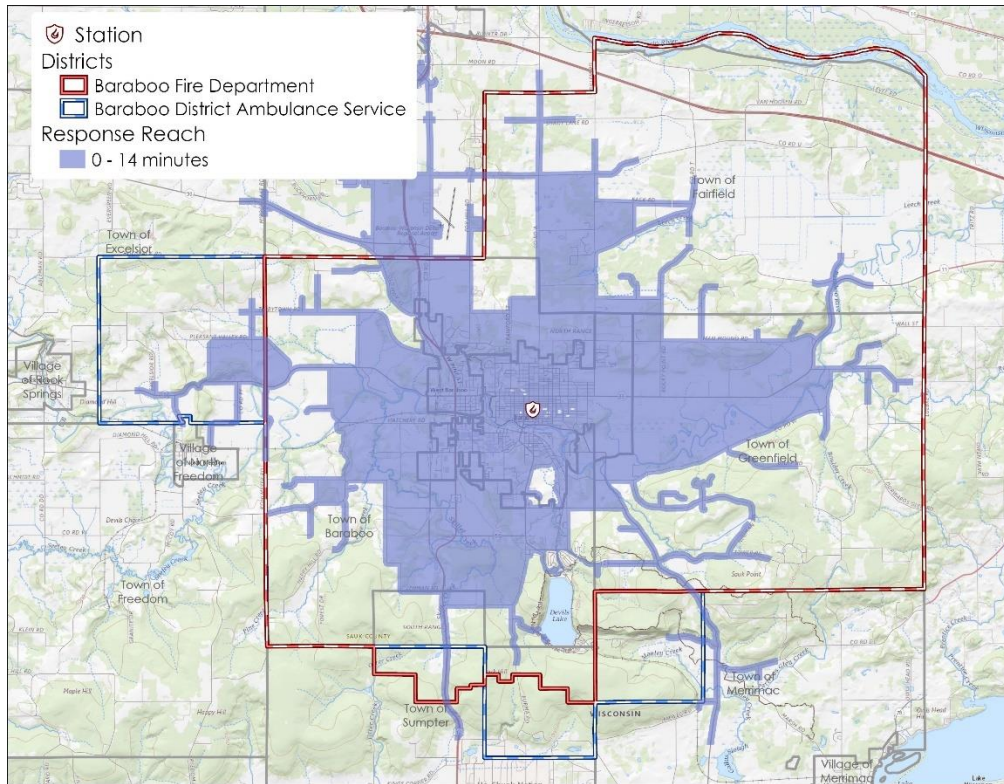


FIGURE 3-15: 14-Minute Travel Time from BFD/BDAS Station



Call Demand

Fire



EMS



SECTION 4. FIRE AND EMS INTEGRATION OPPORTUNITIES

When considering consolidation of public safety agencies, particularly when the goal is efficiencies of service and increased effectiveness in service deliverables, commonalities in governance, administration, operational, logistics and supply chains, along with infrastructure and asset commonalities, are typically considered. The BFD and BDAS share certain commonalities as discussed here, and which support the idea of consolidating these agencies. The commonalities are as follows:

- Each of the agencies has current rules and regulations in place that govern personnel, administrative, and operational components of the organization. These rules and regulations are in most cases located in more than a single manual. Each of the department's policies and guidelines provide direction, establish member expectations, and encompass essential industry elements. Included in this segment are the BDAS medical protocols.
- Each of the agencies utilizes a traditional scalar organizational structure to lead and manage their respective departments. Each agency has a Chief as the administrative and operational head of the agency, as well subordinate senior managers, middle managers, and line supervisors.
- Each agency has established prerequisite, probationary, and incumbent training requirements. In our review of each agency's training regimen we found that each meets state standards for all levels of staffing.
- BDAS has current members who are cross-trained as a combat firefighter; BFD has current members who are cross-trained as EMTs and Paramedics. **Each agency has staff members who are willing to cross-train.**
- Operationally, each agency has established response, equipment, personal protective equipment on-scene emergency mitigation guidelines (either fire or fire-related and patient care), and post incident practices, guidelines, and procedures.
- Each agency has an established records management system (RMS) to record incident information and related operational and administrative information.
- Each agency has emergency apparatus that, due to the cost, is typically procured through established and formal request for proposals, or through established contracts that allow other government or quasi-government agencies to piggyback or ride.
- Each agency has logistical and supply chain commonalities that include office and administrative supplies, cleaning and janitorial supplies, EMS supplies, uniform and personal protective clothing/equipment supplies, fuel and vehicle maintenance costs, and facility costs.
- The BFD and BDAS currently share a facility. The two agencies share the facility costs through their respective budgets.
- Each agency has an established levy formula, although not the same basis, for participating municipalities who receive service as a part of their service district.

- Each agency currently operates under the same medical protocols and medical direction when providing EMS services.
- Each agency has a governing hierarchy, although not the same, that provides overarching governance, establishes budgets, and approves certain administrative and operational costs, programs, and matters germane to the operation of their agency.

The BDAS and the BFD do not share governance commonality, as the BDAS is governed by an appointed commission and acts as a quasi-public agency under Wisconsin State Statutes. The BFD is a city department established in Chapter 5 the city's Code of Ordinances.

There are several practical policy options when considering the integration of the BFD and BDAS. Certainly, one option is to do nothing, that is, continue with the status quo. The status quo is an option and fosters a business-as-usual policy decision where cooperation and support between the BFD and BDAS continues with no change to governance, deployment of resources, and staffing. This policy option maintains the independence of each agency and maintains current governing controls. Because this option does not change any organizational structures or shift any operational personnel job responsibilities, it creates the least amount of stress on each agency. The status-quo approach may, however, pose a riskier decision as any potential efficiencies in totality over time will not be realized.

Consolidation options are as follows:

Administrative Consolidation

- Under an administrative consolidation, the two agencies consolidate the administrative services of each agency. This typically results in increased efficiencies of administrative personnel such as one agency head, merged training functions, and merged administrative support personnel. Duplicative positions are reduced through attrition or reduced when merged.
- The obvious advantages of this consolidation model are reduced overhead costs, alignment of separate public safety operations under a single command, and if successful can lay the foundation to a consolidation of operational services as well.
- Disadvantages include policy conflict between the two governing boards, the command head working for two masters, and conflict at the line/operational level.

Operational Consolidation

- Under an operational consolidation, the two agencies fully consolidate the operational and service delivery components under a single agency while remaining separate agencies. From a service delivery perspective, the two agencies operate as one and consolidate operational guidelines, daily staffing, operational supervision, and response assets. An operational consolidation can include the administrative consolidation (an advantage) or not (a potential disadvantage).
- Advantages of this option include the operational alignment of public safety agencies and assets, enhancement of service deliverables through the cross-training of personnel, economy of scales with operational logistical, supply, and equipment procurements, and reduced overhead costs if the administrative function is consolidated as well.
- Disadvantages include policy conflict between the two governing boards, the command head working for two masters if the administrative function is consolidated, and confusion among the operational staff if the administrative function is not consolidated.

Functional Consolidation

- A functional consolidation blends administrative functions with some operational functions and maintains separate agencies, with their governing boards and administrations left unchanged. Functional consolidation involves cooperation across agencies and/or jurisdictions for a common service, in this case fire and EMS. Transportation authorities or water and sewer districts are common examples of functional consolidation. The challenge of functional consolidation is the inability to address issues such as labor/operational disputes, personnel management, and resource accountability that cross functional boundaries.¹³
- Under functional consolidation, the two agencies here would remain separate entities but would deliver specific functions as though they were a single agency. Examples would be combined training programs, technical rescue response, EMS protocols, supply chain management and logistics, apparatus and equipment maintenance, public education, and records management systems.
- Advantages of this option include economies of scale in procurement, reduction in certain staffing that is duplicative, and some reduction in like overhead costs.
- Disadvantages are rare if the functional areas consolidated are managed correctly but may include conflict in administering the consolidated programs at the agency or governing body level.

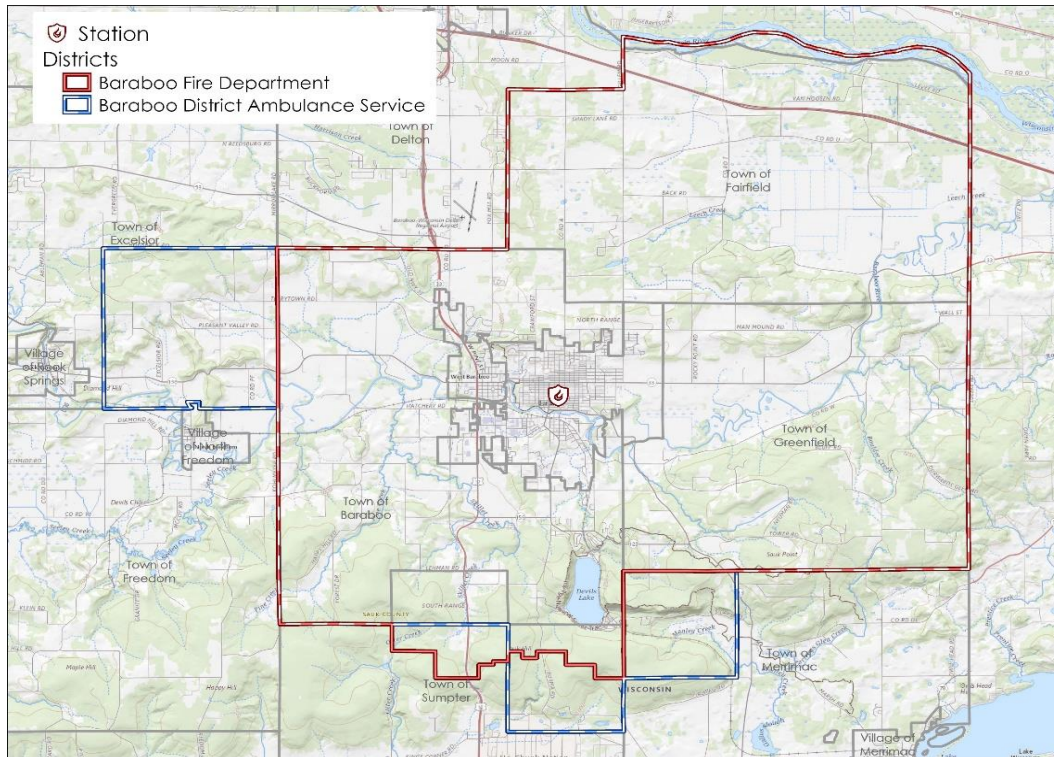
Full Consolidation

- A full consolidation takes place when two or more agencies fully merge into one. The agencies merge resources including governance, staff, facilities, fleet, and other infrastructure. A full consolidation immediately establishes a clear chain of command from the outset, including the single-chief model. Governance, administrative, operational, and functional components merge on an established consolidation date. Efficiencies of the consolidation and service delivery are measured immediately.
- Advantages of a full consolidation model from the outset are the potential for reduced overhead costs over the long term, alignment of separate public safety operations under a single command, enhancement of service deliverables through the cross-training of personnel, and economies of scale with operational logistical, supply, and equipment procurements.
- Disadvantages include concern from staff regarding cross-training (am I going to lose my job if I do not cross train?), inadequate training/preparation at the outset leading to low staff morale, unforeseen costs, role conflicts that arise out of moving too fast, faulty planning, and ineffective/inefficient goals to name a few.

Regardless of which consolidation alternative or alternatives are chosen, the commonality that elevates the potential for a successful consolidation is the almost identical service districts that BDAS and BFD serve, as illustrated in the next figure.

¹³ Restructuring Local Government, Cornell University. <http://government.cce.cornell.edu/doc/>

FIGURE 4-1: BFD/BDAS District Overlays



STAKEHOLDER INPUT

An important component of our information gathering for this analysis is that of stakeholder input. Since the BDAS and BFD districts almost overlap one another, and as it is important to include stakeholders who receive the two services, it became clear, after consultation with the Baraboo City Administrator, that we should utilize the BDAS Commission members for this input as they represent all the municipalities served by each agency.

Eleven stakeholders were contacted by the CPSM project manager and asked to participate in a stakeholder interview. Each stakeholder was provided the questions/discussion points to review prior to the stakeholder meeting. Nine stakeholder meetings were conducted.

The stakeholder meetings occurred virtually via Zoom on October 12, 25, 26, and 28, 2021. In-person stakeholder meetings occurred on November 13, and 14, 2021 while the CPSM project team was in Baraboo. The stakeholder meetings provided an excellent representative response for input to a community-wide decision such as is being considered.

Stakeholder meeting questions/discussion points are outlined in the following Figure. Inputs and discussion results are listed in text beginning on the next page. All inputs have been combined with those of similar meaning so as not to have a run-on list, and to capture the main points of stakeholder discussion and input.

FIGURE 4-2: Stakeholder Questions/Discussion Points

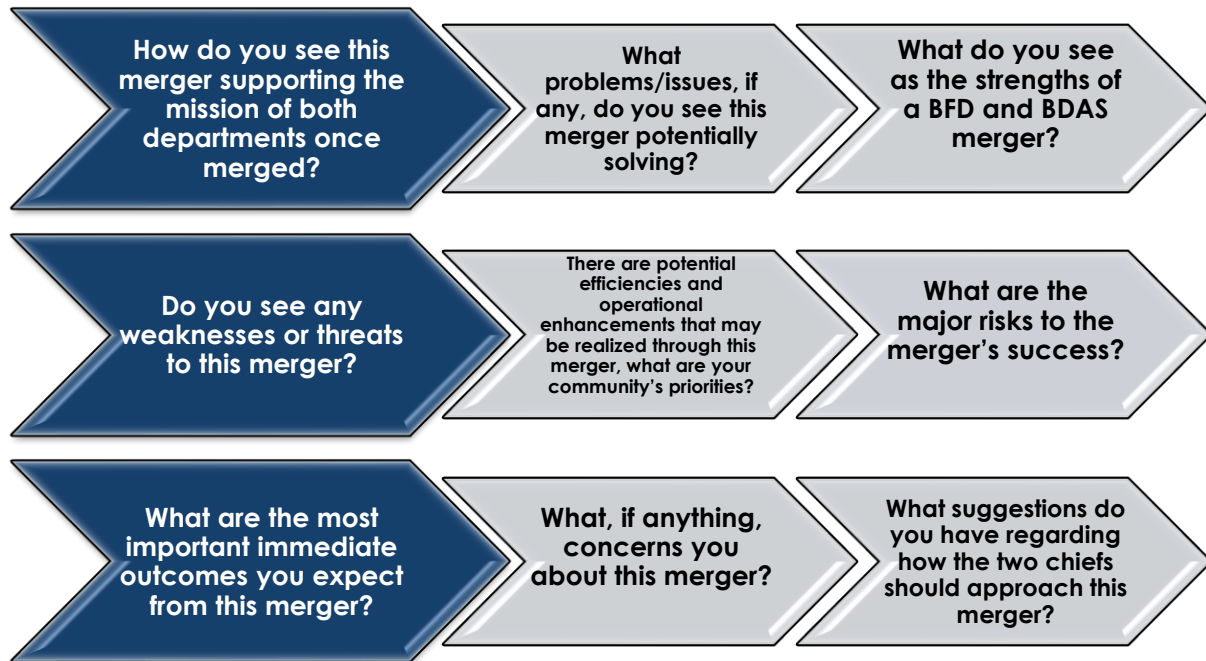


FIGURE 4-3: Stakeholder Discussion and Input Result Categories



Stakeholder Discussion/Inputs

Strengths/Positives

- Excellent service provided by both BDAS and BFD.
- Excellent administrative and operational staff at both BDAS and BFD.
- Combined facility.
- Efficiencies in the purchase of infrastructure such as radios, protective gear, common emergency equipment.
- Cross-training leading to dual-certified staff (Fire and EMS).
- Services functioning better together.
- Chiefs are supportive of consolidation and work well together now.
- BDAS and BFD currently work well together.
- Potentially leading to better response times and service levels.
- Win/win for both agencies.
- Good for community.
- Consolidation will unify community and the two districts.
- Good time to consolidate the two districts.
- Efficiencies/overlap of staffing and services.
- Improved work conditions for fire and EMS staff.

Concerns/Issues

- Loss of EMS staff who feel they must be firefighters as well.
- Loss of firefighters who feel they must staff EMS units.
- Increase in costs to smaller communities.
- Loss of control of managing BDAS through a separate governing body.
- Responsibility for future debt such as a new facility, new apparatus.
- Township representation to governing board(s) for a consolidated Fire and EMS.
- Liability (risk management) for new facility (injuries in the facility/caused by facility).
- Decline in service.
- Future staffing and recruitment.
- Cross-training may result in increased costs.
- Spend the money on training rather than equipment.

- Need to ensure specialized training (rope rescue; confined space rescue; trench collapse rescue; auto extrication) is maintained. May cause burnout of staff as they are also cross-training fire to EMS and EMS to fire.
- How will the staffing work?
- Balance with duty crews. Fire is volunteer and most if not all work. Part-time EMS crews also may work another job.
- Cost of new facility. Are municipalities going to have to contribute?
- Fire and EMS costs are increasing around the state; concern this consolidation may increase costs to municipalities.

Opportunities

- Joint training.
- One administrative functional group; offers efficiencies.
- Lower overhead cost.
- Increase in quality of service with a lower cost.
- Increase in service deliverables through a cross trained response force.
- New facility built to house both BDAS and BFD.
- Paid-on-call fire staff assigned shifts at station to enhance service.
- Cross-staffing model (BDAS staff cross-staffs fire apparatus; BFD staff cross-staffs EMS units).
- May lead to enhanced recruitment of EMS and Fire staff.
- Dependable service for the long term.
- Representation weighted by population.
- Calls for service may be dispatched more correctly in the rural areas (issues now with units being dispatched to wrong address or area).
- Open lines of communication between municipalities and combined Fire/EMS district.
- Foster transparency.
- Consolidation will promote great forward thinking.
- May add other municipalities to the combined district.
- No muted roles; fire and EMS staff can cross-train and enhance their careers.
- Many opportunities for all staff involved such as cross-training and expansion of careers.
- Efficiencies may reduce costs for municipalities.
- Increase in voice from municipalities.

Threats/Risks

- Smaller communities will lose voice.

- Burnout from maintaining dual certifications.
- Loss of quality of service deliverables.
- Employees and volunteers resistive to consolidation.
- If current staff not supportive will undermine consolidation.
- We have always done it this way attitude.
- Increase in costs for service leading to increase in user fees/tax levies.
- City of Baraboo exerting too much control.
- Cross-training will be mandatory.
- May/will add additional budget items.
- Two chiefs, two masters for employees. Avoid this if possible.
- Does not want demographic to change; volunteer fire staff is unique.
- Staff adapting to new/combined district model.

Considerations

- Move slowly with a consolidation. Ensure employees and volunteers are on board.
- Transparency in all consolidation steps.
- Two Chiefs approaching the consolidation in unison will ensure success.
- Consolidation makes sense regarding funding, cross training, potential for an increase in service.
- Maintain a dual Chief system as it provides a balance of knowledge, skills, and abilities to manage the services and the consolidation.
- Move slowly: merge the two agencies functionally, operationally, and administratively but not as a city agency and maintain current governance structures in place.
- Partial consolidation (functional, administrative, operational): maintain current governing bodies and current fee schedules.
- Management stays the same in any functional consolidation.
- If a city agency, funding model includes city tax levy, establishment of a levy rate for external users of services, and ground transport fees.
- Allow EMS staff who do not want to be trained as a firefighter the opportunity to stay in the consolidated service. Ensure there is a transition plan.
- Employees and volunteer staff involved need to be treated fairly and their input considered.
- Maintain current funding model utilized by BFD for a combined district. Consider eliminating population-only levy model utilized by BDAS.
- Need for future thinking and strategic planning. Need to evolve both services.
- Keep the consolidation simple and ensure full transparency.

SECTION 5. CONCLUSION

The potential efficiencies to be gained by pursuing higher levels of cooperation between the BFD and the BDAS can be better described as a continuum. As discussed, identified consolidation strategies fall in a range, from remaining autonomous (or the status quo), to the creation of a new organization encompassing both agencies (full consolidation). The processes for the various consolidation approaches are further broken down in this section. Continual and thoughtful nurturing by all stakeholders can bring about the desired outcome of Fire and EMS services delivered from a combined agency.

It is important to state here that the BFD and BDAS are already collaborating either physically (sharing of a facility), and through management strategies, training, and equipment. ***It is equally important to note that the City of Baraboo is actively reviewing and considering architectural, engineering and construction costs for a new station.*** It is anticipated this will happen. This creates an initial positive pathway to this project that is needed. The city is to be commended for taking this much-needed and forward-looking position. If this city review stays the course, members of the unified Fire and EMS district will pay operation and maintenance costs for the new facility, as each currently does for the existing facility.

Regardless of the existing level of collaboration, a strategic roadmap of the consolidation potential, and the elements that would need be achieved are outlined in the following table. Information in the table includes technical information that CPSM analyzed, stakeholder input as previously discussed in this report, and discussions with BFD and BDAS leadership.

Timelines for various consolidation steps include short-, mid-, and long-term timelines.

- A short-term time frame is considered to occur within one year to 18 months
- A mid-term time frame is considered as one to three years
- A long-term time frame typically involves those strategies that take more than three years.

The timelines outlined above and in the next table are flexible, since the collaborative strategies that include integration of agencies requires certain planning and implementation. ***In some cases, in the table below and following pages, short-term actions may overlap with mid-term timelines.***

TABLE 5-1: Consolidation Roadmap

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Governance and Oversight	<p>A solution to governance and oversight of the combined Fire and EMS district (formation of a consolidated Fire and EMS Board) must be decided by the primary stakeholders, which includes all municipalities who will be receiving service from the new district.</p> <p>Stakeholder input includes: A governance board similar to the BDAS Commission where member municipalities are represented; allowing opportunity for new district members; increase in district member input; transparency; governance process that consolidates services simply, slowly, and maintaining the district governance process; move slowly—merge the two agencies functionally, operationally, and administratively; representation weighted by population; good for community; consolidation will unify community and the two districts; dependable service for the long term; partial consolidation (functional, administrative, operational); maintain current governing bodies and current fee schedules.</p>	Administrative	Short Term 8 to 12 months

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Stakeholder discussions with BFD and BDAS members	<p>Member input through open discussion regarding the proposed consolidation should be conducted. BFD and BDAS leadership should provide opportunity through open meetings with members of each organization to discuss the proposed consolidation, and to seek input. BDAS and BFD stakeholder input and discussion should be captured and saved for further strategic planning.</p> <p>Stakeholder input includes: Two Chiefs approaching the consolidation in unison; employees and volunteer staff involved need to be treated fairly and their input considered; consolidation leads to improved work conditions for fire and EMS staff; concerns about loss of Fire and EMS staff if their input not considered and the processes not fully explained; staff should be advised how staffing will work (cross-staffing opportunities); employees and volunteers resistive to consolidation; current staff not supportive will undermine consolidation; ensure employees and volunteers are on board; no muted roles—fire and EMS staff can cross-train—enhance their careers; do not want demographic to change—volunteer fire staff is unique.</p>	Administrative, Operational, and Functional	Short Term 3 to 6 months

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Develop funding mechanism for the combined Fire and EMS District	A solution to funding the combined Fire and EMS district must be decided by the primary stakeholders, which includes all municipalities who will be receiving service from the district.	Administrative and Operational	Short Term 8 to 12 months
Develop a single budget for the combined Fire and EMS district	<p>BFD and BDAS leadership prepare a joint budget with separate administrative and operating lines that is presented to and approved by the joint BFD and BDAS District Governing Board.</p> <p>Stakeholder input includes: Fire and EMS costs are increasing around the state—concern this consolidation may increase costs to municipalities; a funding mechanism similar to that of the BFD, which includes equalized value of property for a municipality (land and buildings property tax levy), total calls for a municipality (3-year average), population for a municipality; do not include calls for service; identify responsibility for future debt such as a new facility, new apparatus; increase in costs for service leading to increase in user fees/tax levies; if a city agency, funding model includes city tax levy, establishment of a levy rate for external users of services, and ground transport fees; increase in costs to smaller communities.</p>	Administrative and Operational	Short Term 10 to 12 Months

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Identify efficiencies in current City of Baraboo, BFD, and BDAS positions	BFD and BDAS leadership and current respective governing bodies work together to identify efficiencies in current administrative positions. This include the known, which is: the City of Baraboo has a Finance Officer, and the district will not; the BDAS has a Human Resources Manager, and the City of Baraboo does not have a separate position for this function; identify opportunity for shared administrative, logistical, IT, electronic reporting, maintenance functions where there are commonalities.	Administrative	Short Term 10-12 months
	Consolidate the completion of administrative tasks into a single operation with shared resources and management practices.	Full Consolidation	Short Term 12-18 months
	Consolidate the administrative elements of both agencies into one administrative services staff member, which promotes efficiencies by eliminating duplication in both agencies.	Full Consolidation	Mid Term 1-3 years
	Consolidate the operational elements of both agencies into one operational district, which promotes efficiencies through a pool of cross-trained members and functions.	Full Consolidation	Mid Term 1-3 years
	Stakeholder input includes: Combined facility; efficiencies in the purchase of infrastructure such as radios, protective gear, common emergency equipment; efficiencies/overlap of staffing and services; one administrative functional group for efficiency; increase in service deliverables through a cross-trained response force; efficiencies may reduce costs for municipalities; services functioning better together.		

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Develop a joint Strategic Plan	Develop and implement a joint district Strategic Plan that guides the new combined district through the short and medium term and identifies longer-term strategies for future consideration; and identifies the mission, values, and vision of the new combined Fire and EMS district. The Strategic Plan should also include Core Strategies that are developed with district stakeholder input and accompanied by planning goal components that articulate achievable strategies and key measurements.	Administrative, Operational, and Functional	Short Term 12 to 18 Months
Develop a joint Standard of Cover	<p>Develop a joint Standard of Cover for operational service delivery designed to identify district Fire and EMS risk-defined services, service levels, and response times, and establish operational response performance goals.</p> <p>Stakeholder input includes: Consolidation will promote great forward thinking; need for future strategic planning—the need to evolve both services; consolidation potentially leading to better response times and service levels; efficiencies/overlap of staffing and services; need to ensure specialized training (rope rescue; confined space rescue; trench collapse rescue; auto extrication) is maintained; increase in service deliverables through a cross-trained response force; open lines of communication between municipalities and combined Fire/EMS district; we have always done it this way; two Chiefs/two masters for employees—avoid this if possible; does not want demographic to change-volunteer fire staff is unique; maintain a dual Chief system as it provides a balance of knowledge, skills, and abilities to manage the services and the consolidation; cross-staffing model (BDAS staff cross-staffs fire apparatus; BFD staff cross-staffs EMS units); staff adapting to new/combined district model; consolidation makes sense regarding funding, cross training, potential for an increase in service.</p>	Operational and Functional	Short Term 12 to 18 Months

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Develop a cross-training plan	<p>Design a training plan that offers Fire and EMS in-house and external certification training to existing and new members with a focus on combining incumbent BFD and BDAS staff into a resource pool of dual certified staff for both agencies to utilize as an operating combined Fire and EMS district. The plan should include an opt-out provision for incumbent staff who may want to continue to operate as a single-resourced asset, and a new-hire/member standard that delineates a preferred candidate as dual-certified or willing to be dual-certified.</p> <p>Stakeholder input includes: Cross-training leading to dual-certified staff (Fire and EMS); loss of EMS staff who feel they must be firefighters as well; loss of firefighters who feel they have to staff EMS units; cross-training may result in increased costs; specialized training (rope rescue; confined space rescue; trench collapse rescue; auto extrication) may cause burnout of staff as they are also cross-training fire to EMS and EMS to fire; may lead to enhanced recruitment of EMS and Fire staff; many opportunities for all staff involved such as cross-training and expansion of careers; burnout from maintaining dual-certifications; will cross-training be mandatory?; no muted roles—fire and EMS staff can cross-train and enhance their careers.</p>	Operational, and Functional	Short Term 12 to 18 Months

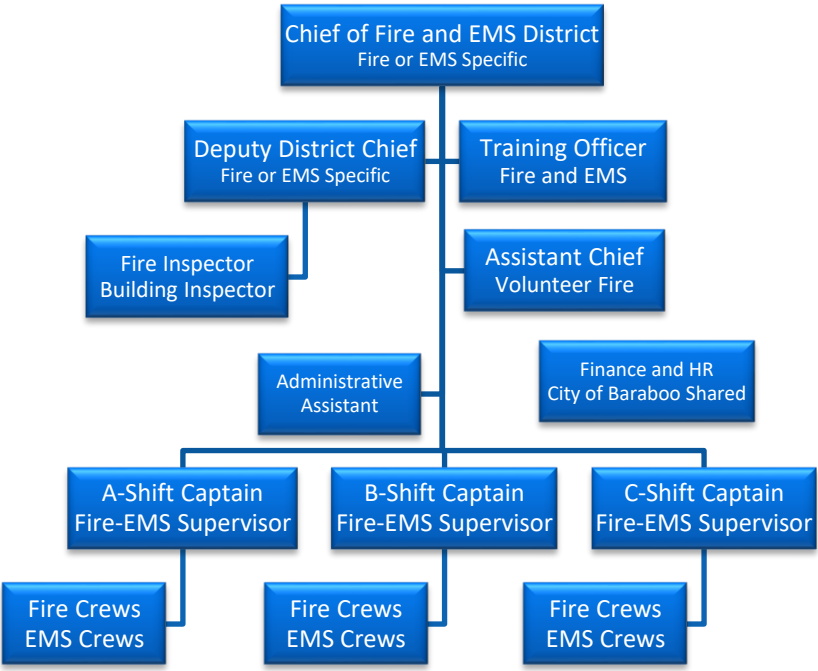
Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Consolidate training into a single training platform with a single records management system.	Design a single unified training program that eliminates duplication and increases training efficiency to include the implementation of a single and shared training records management system for the combined Fire and EMS district.	Administrative and Functional	Short Term 12 to 18 months
Develop collaborative training strategies that are disseminated under a single training plan	Provide focus and direction for training program management and delivery by combining the strengths of the BFD and BDAS resources that overcome training obstacles and provides a standardized and consistent training program for all members.	Administrative and Functional	Short Term 12 to 18 months

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Consolidate emergency response directives and protocols	Implement guidelines, directives, protocols for operational deployment during emergencies and non-emergency incidents and activities as a combined Fire and EMS district.	Operational, and Functional	Short Term 12 to 18 Months
Combine/develop district policies and procedures (SOGs)	Implement routine use administrative, fiscal, employee relations, and other similar type guidelines and directives for the combined Fire and EMS district.	Administrative	Short Term 12 to 18 Months
Develop an officer rank/incident command system that utilizes officer staff from the BFD and BDAS	Develop guidelines, directives, and protocols for a single officer rank structure/incident command system to be utilized during emergency and non-emergency incidents as a combined Fire and EMS district. Stakeholder input includes: Services functioning better together; BDAS and BFD currently work well together; one administrative functional group for efficiencies; dependable service for the long term; calls for service may be dispatched more correctly in the rural areas (issues now with units being dispatched to wrong address or area).	Operational and Functional	Short Term 12 to 18 Months

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Develop specialty team staffing and training for the combined district	<p>Implement guidelines, directives, and protocols for specialty team staffing and training to include all members wishing to participate and as a combined Fire and EMS district.</p> <p>Stakeholder input includes: Services functioning better together; potentially leading to better response times and service levels; need to ensure specialized training (rope rescue; confined space rescue; trench collapse rescue; auto extrication) is maintained—may cause burnout of staff as they are also cross-training fire to EMS and EMS to fire.</p>	Operational, and Functional	Mid Term 1 to 2 Years

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
Develop a joint support and logistics program	Develop shared support and logistical functions/assignments that achieve procurement efficiencies by eliminating duplication in the acquisition and distribution of supplies.	Administrative and Functional	Short Term 12 to 18 months
Consolidate fleet replacement plans	A single emergency apparatus specifications and replacement plan may create opportunity for economies of scale procurement of emergency response apparatus (utilizing a common emergency apparatus dealer lends greater chance of this aspect), but certainly ensures common safety factors and other appurtenances are in place for all emergency vehicles.	Administrative	Mid Term 1 to 3 Years
Consolidate capital equipment purchase-replacement plans	A single capital equipment new purchase/replacement plan will create opportunity for efficiencies, economy of scale procurement of capital items, and ensure common equipment for ease of use by the combined Fire and EMS staff.	Administrative	Mid Term 1 to 2 Years
Consolidate goods and services purchase plans and maintenance-service contracts	Consolidated purchasing and consolidated maintenance and service contracts will create opportunity for efficiencies and economy of scale procurement.	Administrative	Mid Term 1 to 2 Years
Establish shared public information/public education	Design a shared public information and public education program for the combined Fire and EMS district utilizing existing BFD and BDAS staff, or any combination of BFD, BDAS, and City of Baraboo public information staff. The focus of this program should also be keeping member municipalities informed about district incidents, programs, revenues and budgets, and other public information.	Functional	Short Term 10 to 12 months
Consolidate recruitment and retention programs	Design a joint recruitment and retention program for the combined Fire and EMS district utilizing existing BFD and BDAS staff to include the BDAS Human Resources Manager. The focus of this program should be the recruitment of single- and dual-certified prospective staff. The focus of the program should also be on continuous communication with and recognition of current Fire and EMS staff that links to	Administrative	Mid Term 1 to 2 years

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
	<p>aggressive retention programs designed to keep members informed and engaged in the combined district endeavors.</p> <p>Stakeholder input includes: Efficiencies in the purchase of infrastructure such as radios, protective gear, common emergency equipment; services functioning better together; lower overhead cost; efficiencies may reduce costs for municipalities; need for future thinking-strategic planning-the need to evolve both services; keep the consolidation simple and ensure full transparency; win/win for both agencies; services functioning better together; BDAS and BFD currently work well together; efficiencies/overlap of staffing and services; one administrative functional group.</p>		

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
<p>Consolidate leadership into a single Chief district</p>	<p>A single Chief position is the optimum leadership model for the combined district. Merging the two organizations, however, relies heavily on subject matter expertise of the two disciplines (Fire and EMS) that neither Chief has command of at the current time but is what the consolidation requires initially from the current two Chiefs. Merging the leadership to a single Chief should occur unforced and naturally, and at the right time.</p> <p>FIGURE 5-1: Example of a Long-Term Functional Organization Structure</p>  <pre> graph TD Chief["Chief of Fire and EMS District Fire or EMS Specific"] Deputy["Deputy District Chief Fire or EMS Specific"] Training["Training Officer Fire and EMS"] FireInspector["Fire Inspector Building Inspector"] AdminAsst["Administrative Assistant"] AsstChief["Assistant Chief Volunteer Fire"] FinanceHR["Finance and HR City of Baraboo Shared"] AShift["A-Shift Captain Fire-EMS Supervisor"] BShift["B-Shift Captain Fire-EMS Supervisor"] CShift["C-Shift Captain Fire-EMS Supervisor"] FireCrews1["Fire Crews EMS Crews"] FireCrews2["Fire Crews EMS Crews"] FireCrews3["Fire Crews EMS Crews"] Chief --- Deputy Chief --- Training Deputy --- FireInspector Deputy --- AdminAsst Training --- AsstChief AsstChief --- FinanceHR AShift --- FireCrews1 BShift --- FireCrews2 CShift --- FireCrews3 </pre> <p>The above figure represents a longer-term functional table of the organizational that can be implemented over time, utilizing current</p>	<p>Full Consolidation</p>	<p>Long Term As Opportunity Dictates</p>

Consolidation Component	Objective(s)	Consolidation Progression	Timeline
	<p>personnel, and as the consolidated district matures as discussed herein, with a full consolidated Fire and EMS district lead by a single Chief, who may be discipline-specific (Fire or EMS). In this scenario, a District Deputy Chief with a strong opposite discipline background is warranted to ensure continued success of consolidated services.</p> <p>Stakeholder input includes: Excellent service provided by both BDAS and BFD; excellent administrative and operational staff at both BDAS and BFD; Chiefs are supportive of consolidation and work well together now; BDAS and BFD currently work well together; one administrative functional group for efficiencies; two chiefs/two masters for employees—avoid this if possible; two Chiefs approaching the consolidation in unison will ensure success; maintain a dual Chief system as it provides a balance of knowledge, skills, and abilities to manage the services and the consolidation; move slowly; merge the two agencies functionally, operationally, and administratively but not as a city agency and maintain current governance structures in place.</p>		

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During the process of gathering information, data analysis, research, and through stakeholder interviews, CPSM found that the BFD and BDAS have several features that are found in progressive Fire and EMS agencies. These features, along with industry best practices, have been discussed in this report. The current positive operational health of the two organizations is related to the dedication and strong interagency relationship espoused by the current Chiefs, the Baraboo City Council, and the BDAS Commission. The two Chiefs—as well as the employees, volunteers, and paid per call members of the two organizations—have created an operational emergency response system delivers high-quality services to the public.

Based on our review of the BFD and BDAS, information and data analysis, and our experience with other Fire and EMS projects of similar scope. CPSM concludes and recommends **the full consolidation of BFD and BDAS**. Our conclusion is based on the organizations' current similar service districts, the proposed construction of a new fire station that will house the combined Fire and EMS organization, the current collaborative efforts between the two agencies, the willingness of the stakeholders interviewed who represent the municipalities to move in the direction of consolidation, and the opportunities for collaboration outlined in this report. CPSM is not suggesting that the BFD and BDAS are not already performing at a high level. The fact is Fire and EMS services are delivered in the respective districts in a timely manner and with dedicated, well-trained personnel. Sometimes this is done with limited resources. **A full consolidation will only make the delivery of Fire and EMS services better and will broadcast a culture of continuous improvement.**

Financially, the consolidation may not generate immediate savings or lower taxes. Aside from ambulance transport fees that support the BDAS, both agencies levy taxes on district members for services, each based on a different formula. The current levy structures for each do, according to stakeholders, stress the small municipalities' budgets. Considerations regarding immediate financial savings are as follows:

- There are disadvantages if nothing is done (maintaining the status quo). These include the solving of fiscal and operational complications that either agency might be facing are not changed, and opportunities for efficiency (either financial or operational) through greater, formal collaboration are not realized, so existing duplication, funding, and budgetary issues and future concerns and overlap continues.

The two Chiefs have moved forward on their own to work cooperatively with each other. Preserving these collaborative efforts and continuing to leverage them has tremendous merit and will continue to provide benefits over the short term. The downside of this relationship is that without a longer-term commitment of the stakeholder communities either organization can withdraw from the collaborative partnership that currently exists. Over time, as governing bodies and organizational leadership changes and fiscal issues become front and center, a collapse in cooperative efforts could occur.

- A transition to an administrative consolidation would provide some degree of streamlining of administrative services (sharing of finance and human resources services between the City of Baraboo and the District as an example), training programs, procurement, recruitment and retention, maintenance and service contracts, public education and information. Some financial advantages will be realized at this stage, but there will still be two separate response entities that would still need to be managed by two separate governing bodies.

There are complications managing a consolidated administrative unit (does not include the leadership level) and separate operational units without the long-term commitment for a fuller consolidation effort that includes functional/operational consolidation. This consolidation choice aligns better as a transitional phase and not in the longer term. What will occur is the

two Chiefs will be wedged into managing two separate organizations and reporting to two direct governing boards and the stakeholder municipalities. This will become frustrating and at times inefficient, not to mention the adverse effect it will have on the leadership. Administrative consolidation should and can be implemented as a transitional step with a goal of moving towards a fully consolidated Fire and EMS district.

- A transition to a functional consolidation will yield minimal financial benefit in the short term. However, over the longer term, positions and duty assignments can and should be modified (to include cross-training of Fire and EMS staff) to achieve the operational efficiency gains discussed in the report, which include the real possibility of fire personnel staffing ambulances and EMS personnel being available to respond to fire incidents and/or staffing fire apparatus. Opportunities will present themselves to reduce or redeploy some staff in the interest of cost reduction through attrition and organizational adjustment.

While there may not be immediate and noticeable cost reduction, the efficiencies gained are worth discussing. Training program management and delivery will be streamlined and standardized, which will prove to be beneficial over time, even bringing more programs in-house. Fire operational response will be enhanced through cross-training and in-station EMS unit availability. EMS operational response is enhanced by cross trained fire staff, who, when staffed EMS units are unavailable, can respond to the station and deploy the next EMS unit. Other efficiencies will be realized regarding support and logistics services and specialty response teams. Even though there is not an immediate reduction in agency costs, the gain of increased operational service delivery, logistical and procurement efficiency, safety, and response effectiveness are immediate benefits from functional consolidation.

- A full consolidation takes advantage of the administrative, operational, and functional consolidation strategies already discussed. Every facet of the two organizations come together to include the organizational leadership and the governing boards. A single governing board is formed, and a single leadership model (one Chief) is an eventual transition. As discussed earlier, a full consolidation establishes a clear chain of command. Governance, administrative, operational, and functional components merge either transitionally, or on an established consolidation date.

Advantages of a full consolidation model are the potential for reduced costs over the long term as administrative, operational, and functional alignment occurs and includes those already mentioned above. Opportunities will present themselves to reduce or redeploy some staff in the interest of cost reduction through attrition and organizational adjustment. Operational efficiencies and service delivery will begin to be enhanced over the short term as cross-training begins and becomes the norm over the longer term. Economies of scale and cost savings are reachable with logistical, supply, maintenance and service contract, and equipment/capital procurements. Efficiencies of the consolidation and service delivery are measured immediately.

Next Steps and Recommendations

- CPSM recommends the BFD and the BDAS promptly and methodically implement as many of the feasible *Consolidation Components* in Table 5-1 above as both organizations collaboratively find suitable and attainable.
 - CPSM further recommends the implementation of each *Consolidation Component* be implemented as incremental next steps **to a full consolidation**.
- CPSM recommends a board/commission style governance board be established to provide policy and governing oversight of the consolidated Fire and EMS district.
 - CPSM further recommends a governing board like that of the BDAS Commission; this board must operate in accordance with state statutes and law, and it must allow for fair and equitable stakeholder membership and voting input.
- CPSM recommends the consolidation effort of the BFD and BDAS maintain the two-Chief concept during the short-and mid-term *Consolidation Components* development and implementation time frames, at a minimum.
 - CPSM further recommends that if one Chief would like to assume the Deputy District Chief or similar role and allow for a single Chief leadership model, that the governing board allow this transition in the best interest of the consolidation effort.
 - CPSM does not recommend the forced placement of one Chief over another in a single Chief leadership model as this may lead to disruption of the consolidation effort and resistance among the operational and administrative staff. It could also stymie the goals and vision of the consolidation of operational services.

Each organization's governing board (Baraboo City Council and BDAS Commission) should keep in mind that the longer-term success of the full consolidation is built on short-term operational success and measured cost savings. Governing board members should stay focused on the desired outcomes and overall initiatives and goals of the transitional phases of consolidation and not get bogged down in the operational minutia.

§ § §

FIGURE 5-2: Taking the Next Steps



SECTION 6. BFD DATA ANALYSIS

This data analysis examines all calls for service between January 1, 2019, and January 1, 2020, as recorded in the Sauk County's Computer-Aided Dispatch (CAD) system, and the Baraboo Fire Department's National Fire Incident Reporting System (NFIRS). This analysis is made up of four parts. The first part focuses on call types and dispatches. The second part explores the time spent and the workload of individual units. The third part presents an analysis of the busiest hours in the year studied. The fourth and final part provides a response time analysis of the department's units.

During the year covered by this study, the BFD provided fire and rescue services to an area with an approximate population of 17,000 and an area of 108 square miles. The service area (see Figure 6-1) includes the City of Baraboo and several other contracted municipalities as listed presented in the following table. The BFD is part of the State of Wisconsin Mutual Aid Box Alarm System (MABAS) Division 131. The following table also lists the fire departments that have mutual aid agreements with the BFD.

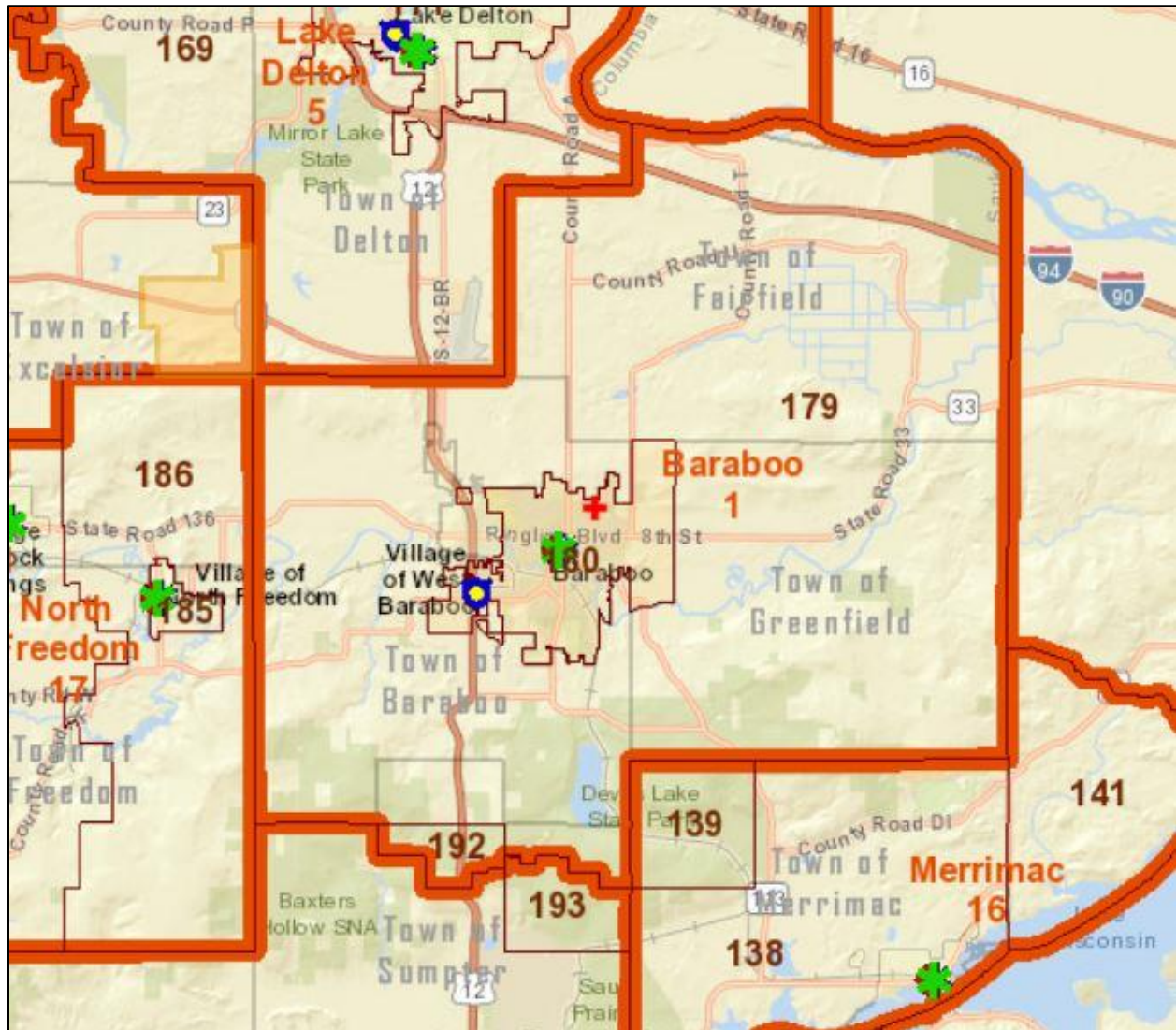
The BFD operates out of one station. Its frontline apparatus includes three engines, two tanker tenders, a brush truck, a ladder truck, a rescue truck, a pickup support vehicle, and three officer cars.

In 2019, the BFD responded to 368 calls, of which 57 percent were fire calls. The total workload in 2019 was 731.5 hours. The average response time was 8.8 minutes, the 80th percentile response time was 12.7 minutes, and the 90th percentile response time was 15.0 minutes.

TABLE 6-1: BFD's Service Area Jurisdictions and Mutual Aid Agencies

BFD's Service Area Jurisdiction's	BFD's Mutual	Aid Agencies
Village of West Baraboo	Delton FD	Prairie Du Sac FD
Town of Baraboo	Cazenovia FD	Plain FD
A portion of the Town of Sumpter (within Baraboo School District)	Hillpoint/Town of Washington FD	Reedsburg FD
Town of Fairfield	Kilbourn FD	Rock Springs FD
Town of Greenfield	LaValle FD	Sauk City FD
City of Baraboo	Loganville FD	Spring Green FD
	Lyndon Station FD	Wonewoc FD
	Merrimac FD	Portage FD
	North Freedom FD	

FIGURE 6-1: BFD Response Area



METHODOLOGY

In this report, CPSM analyzes calls and runs. A call is an emergency service request or incident. A run is a dispatch of a unit (i.e., a unit responding to a call). Thus, a call may include multiple runs.

We received CAD data from the Sauk County 9-1-1 Dispatch Center, and NFIRS data from the BFD. We first matched the two sets of data based on the available information of call time, location, and type of each incident. Then, we classified the calls in a series of steps. We first used the NFIRS incident type to identify canceled calls and to assign EMS, motor vehicle accident (MVA), and fire category call types. EMS calls were then assigned detailed categories based on their Clawson descriptions. Mutual aid calls were identified based on the information recorded in the fire zone field in NFIRS.

AGGREGATE CALL TOTALS AND RUNS

In 2019, the BFD responded to 368 calls. Of these, 20 were structure fire calls and 14 were outside fire calls.

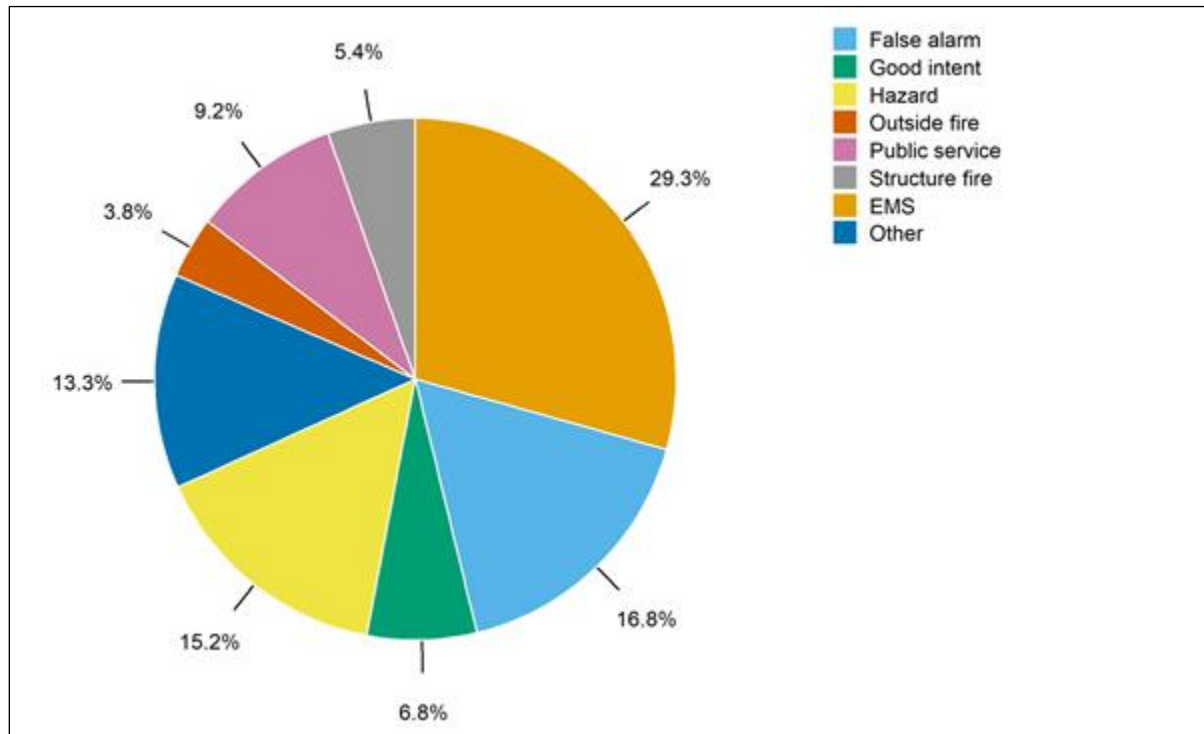
Calls by Type

The following table and two figures show the number of calls by call type, average calls per day, and the percentage of calls that fall into each call type category for the 12 months studied.

TABLE 6-2: Call Types

Call Type	Number of Calls	Calls per Day	Call Percentage
False alarm	62	0.2	16.8
Good intent	25	0.1	6.8
Hazard	56	0.2	15.2
Outside fire	14	0.0	3.8
Public service	34	0.1	9.2
Structure fire	20	0.1	5.4
Fire Total	211	0.6	57.3
EMS Total	108	0.3	29.3
Canceled	40	0.1	10.9
Fire mutual aid	9	0.0	2.4
Total	368	1.0	100.0

FIGURE 6-2: Calls by Type



Observations:

- In 2019, BFD responded to an average of one call per day.
- EMS calls for the year totaled 108 (29 percent of all calls), an average of 0.3 calls per day.
- Fire calls for the year totaled 211 (57 percent of all calls), or an average of 0.6 calls per day.
- Other (including mutual aid and canceled) calls for the year totaled 49 (13 percent of all calls), or an average of 0.1 calls per day.
- False alarm calls were the largest category of fire calls at 16 percent of total calls (29 percent of fire calls), an average of 0.2 calls per day.
- Structure and outside fire calls combined made up 9 percent of total calls (16 percent of fire calls), or an average of 0.1 calls per day, or one call every 11 days.

Calls by Type and Duration

The following table shows the duration of calls by type using four duration categories: less than 30 minutes, 30 minutes to one hour, one to two hours, and more than two hours.

TABLE 6-3: Calls by Type and Duration

Call Type	Less than 30 Minutes	30 Minutes to One Hour	One to Two Hours	More Than Two Hours	Total
False alarm	37	20	5	0	62
Good intent	10	15	0	0	25
Hazard	18	26	10	2	56
Outside fire	2	5	4	3	14
Public service	12	12	4	6	34
Structure fire	5	7	3	5	20
Fire Total	84	85	26	16	211
EMS Total	10	39	39	20	108
Canceled	27	9	3	1	40
Mutual aid	0	1	2	6	9
Total	121	134	70	43	368

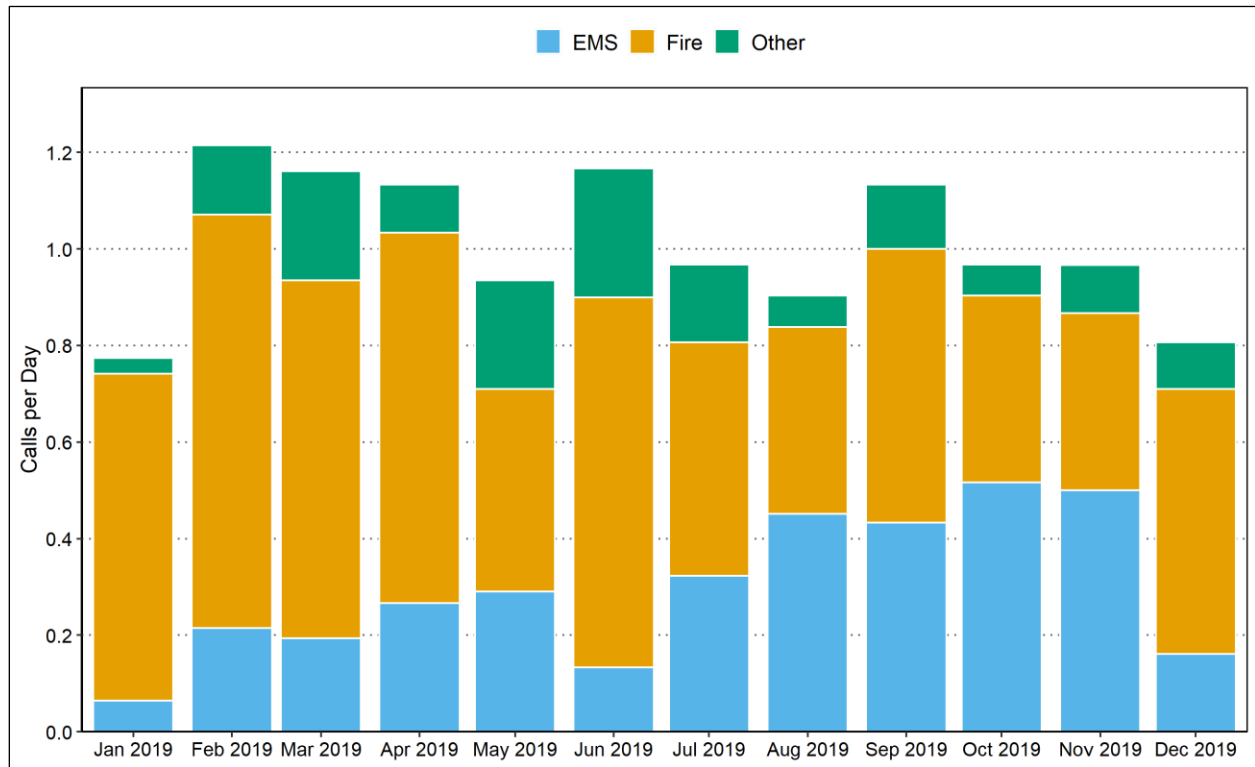
Observations:

- A total of 169 fire calls (80 percent) lasted less than one hour, 26 fire calls (12 percent) lasted one to two hours, and 16 fire calls (8 percent) lasted two or more hours.
- A total of 57 false alarm calls (92 percent) lasted less than one hour, and 5 false alarm calls (8 percent) lasted one to two hours.
- A total of 7 outside fire calls (50 percent) lasted less than one hour, 4 outside fire calls (29 percent) lasted one to two hours, and 3 outside fire calls (21 percent) lasted two or more hours.
- A total of 12 structure fire calls (60 percent) lasted less than one hour, 3 structure fire calls (15 percent) lasted one to two hours, and 5 structure fire calls (25 percent) lasted two or more hours.
- On average, BFD responded to 0.1 fire calls per day that lasted more than one hour.
- On average, BFD responded to 0.2 EMS calls per day that lasted more than one hour.

Average Calls by Month and Hour of Day

Figure 6-3 shows the monthly variation in the average daily number of calls handled by BFD in 2019. Similarly, Figure 6-4 illustrates the average number of calls received each hour of the day over the year.

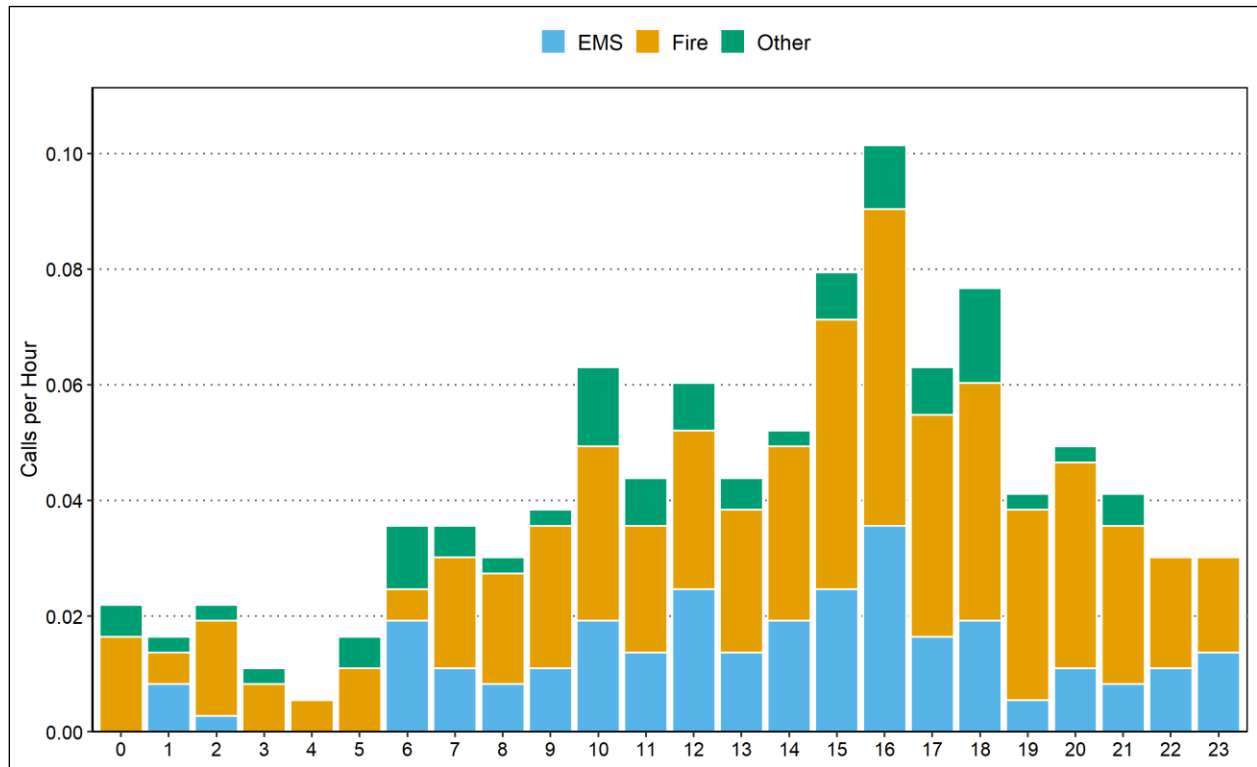
FIGURE 6-3: Average Calls by Month



Observations:

- Average EMS calls per day ranged from 0.1 in January 2019 to 0.5 in October 2019.
- Average fire calls per day ranged from 0.4 in November 2019 to 0.9 in February 2019.
- Average other calls per day ranged from less than 0.1 in January 2019 to 0.3 in June 2019.
- Average calls per day overall ranged from 0.8 in January 2019 to 1.2 in February 2019.

FIGURE 6-4: Calls by Hour of Day



Observations:

- Average calls per hour ranged from 0.01 between 4:00 a.m. and 5:00 a.m. to 0.10 between 4:00 p.m. and 5:00 p.m.

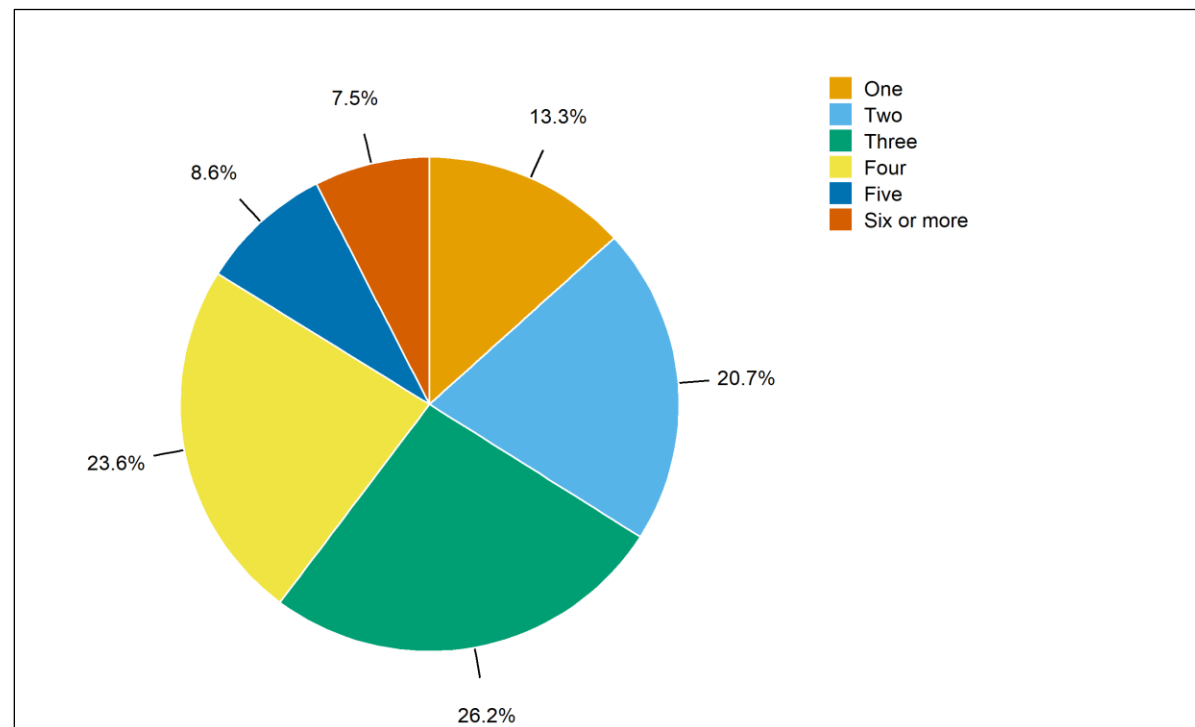
Units Arriving at Calls

The following table and figure detail the number of calls with one, two, three, and four or more units arriving to a call, broken down by call type. In this section, we limit ourselves to calls where a unit arrives. There were no arriving units for 21 canceled calls. A similar analysis for the number of arriving fire suppression units is included in Attachment II.

TABLE 6-4: Calls by Call Type and Number of Units Arriving

Call Type	Number of Units						Total Calls
	One	Two	Three	Four	Five	Six or More	
False alarm	13	24	17	7	1	0	62
Good intent	2	8	8	6	1	0	25
Hazard	8	17	13	17	1	0	56
Outside fire	0	0	5	4	1	4	14
Public service	6	9	5	7	3	4	34
Structure fire	0	1	4	3	5	7	20
Fire Total	29	59	52	44	12	15	211
EMS Total	2	8	35	34	18	11	108
Canceled	13	3	2	1	0	0	19
Mutual aid	2	2	2	3	0	0	9
Total	46	72	91	82	30	26	347
Percentage	13.3	20.7	26.2	23.6	8.6	7.5	100.0

FIGURE 6-5: Calls by Number of Units Arriving



Observations:

Overall

- On average, 3.2 units arrived at all calls; for 13 percent of calls, only one unit arrived.
- Overall, six or more units arrived at 7 percent of calls.

EMS

- On average, 3.9 units arrived per EMS call.
- For EMS calls, one unit arrived 2 percent of the time, two units arrived 7 percent of the time, three units arrived 32 percent of the time, four units arrived 31 percent of the time, five units arrived 17 percent of the time, and six or more units arrived 10 percent of the time.

Fire

- On average, 3.0 units arrived per fire call.
- For fire calls, one unit arrived 14 percent of the time, two units arrived 28 percent of the time, three units arrived 25 percent of the time, four units arrived 21 percent of the time, five units arrived 6 percent of the time, and six or more units arrived 7 percent of the time.
- For outside fire calls, three or more units arrived 100 percent of the time.
- For structure fire calls, three or more units arrived 95 percent of the time.

WORKLOAD: RUNS AND TOTAL TIME SPENT

The workload of an agency's units are measured in two ways: runs and deployed time. The deployed time of a run is measured from the time a unit is dispatched through the time the unit is cleared. Because multiple units respond to some calls, there are more runs than calls and the average deployed time per run varies from the total duration of calls.

Runs and Deployed Time – All Units

Deployed time, also referred to as deployed hours, is the total deployment time of all units deployed on all runs. Table 6-5 shows the total deployed time, both overall and broken down by type of run, for all BFD units in 2019. Table 6-6 and Figure 6-7 present the average deployed minutes by hour of day.

TABLE 6-5: Annual Runs and Deployed Time by Run Type

Call Type	Deployed Minutes per Run	Annual Hours	Percent of Total Hours	Deployed Minutes per Day	Annual Runs	Runs per Day
False alarm	26.3	62.7	8.6	10.3	143	0.4
Good intent	27.6	26.7	3.7	4.4	58	0.2
Hazard	38.2	84.6	11.6	13.9	133	0.4
Outside fire	41.4	32.4	4.4	5.3	47	0.1
Public service	58.1	91.9	12.6	15.1	95	0.3
Structure fire	111.9	156.7	21.4	25.8	84	0.2
Fire Total	48.8	455.2	62.2	74.8	560	1.5
EMS Total	43.0	213.6	29.2	35.1	298	0.8
Canceled	8.9	9.5	1.3	1.6	64	0.2
Mutual aid	145.0	53.2	7.3	8.7	22	0.1
Other Total	43.7	62.7	8.6	10.3	86	0.2
Total	46.5	731.5	100.0	120.2	944	2.6

Observations:

Overall

- The total deployed time for the year was 731.5 hours. The daily average was 120.2 minutes for all units combined.
- There were 944 runs, including 64 runs dispatched for canceled calls and 22 runs dispatched for mutual aid calls. The daily average was 2.6 runs.

EMS

- EMS runs accounted for 32 percent of runs and 29 percent of the total workload.
- The average deployed time for EMS runs was 43.0 minutes. The deployed time for all EMS runs averaged 35.1 minutes per day.

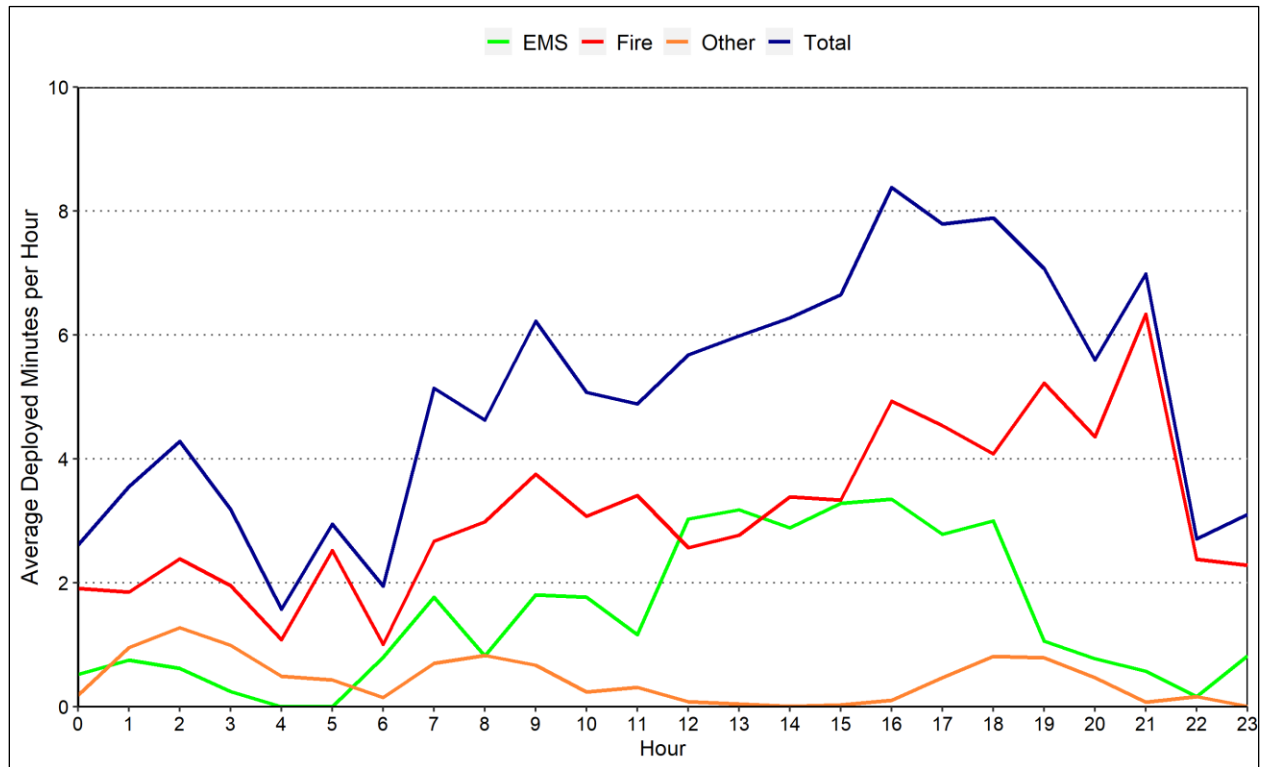
Fire

- Fire runs accounted for 62 percent of the total workload.
- The average deployed time for fire runs was 48.8 minutes. The deployed time for all fire runs averaged 74.8 minutes per day.
- There were 131 runs for structure and outside fire calls combined (13 percent of total runs), with a total workload of 189.1 hours. This accounted for 26 percent of the total workload.
- The average deployed time for outside fire runs was 41.4 minutes per run, and the average deployed time for structure fire runs was 111.9 minutes per run.

TABLE 6-6: Average Deployed Minutes by Hour of Day

Hour	EMS	Fire	Other	Total
0	0.5	1.9	0.2	2.6
1	0.8	1.9	1.0	3.6
2	0.6	2.4	1.3	4.3
3	0.2	2.0	1.0	3.2
4	0.0	1.1	0.5	1.6
5	0.0	2.5	0.4	2.9
6	0.8	1.0	0.1	1.9
7	1.8	2.7	0.7	5.1
8	0.8	3.0	0.8	4.6
9	1.8	3.8	0.7	6.2
10	1.8	3.1	0.2	5.1
11	1.2	3.4	0.3	4.9
12	3.0	2.6	0.1	5.7
13	3.2	2.8	0.0	6.0
14	2.9	3.4	0.0	6.3
15	3.3	3.3	0.0	6.6
16	3.3	4.9	0.1	8.4
17	2.8	4.5	0.5	7.8
18	3.0	4.1	0.8	7.9
19	1.1	5.2	0.8	7.1
20	0.8	4.4	0.5	5.6
21	0.6	6.3	0.1	7.0
22	0.2	2.4	0.2	2.7
23	0.8	2.3	0.0	3.1
Daily Avg.	35.1	74.8	10.3	120.2

FIGURE 6-6: Average Deployed Minutes by Hour of Day



Observations:

- Average deployed time peaked between 4:00 p.m. and 5:00 p.m., averaging 8.4 minutes.
- Average deployed time was lowest between 4:00 a.m. and 5:00 a.m., averaging 1.6 minutes.

Workload by Location

Table 6-7 breaks down the workload of BFD by the location of the call. Table 6-8 provides further detail on the workload associated with structure and outside fires calls, also broken down by location. Table 6-8 also includes structure and outside fires that are grouped under mutual aid in previous tables.

TABLE 6-7: Annual Workload by Location

Location	Calls	Pct. Annual Calls	Runs	Runs Per Day	Deployed Minutes Per Run	Annual Hours	Pct. Annual Work	Deployed Minutes Per Day
City of Baraboo	266	72.3	677	1.9	38.1	430.0	58.8	70.7
Town of Baraboo	59	16.0	161	0.4	76.7	205.9	28.2	33.8
West Baraboo	30	8.2	76	0.2	32.3	40.9	5.6	6.7
Others	13	3.5	30	0.1	109.2	54.6	7.5	9.0
Total	368	100.0	944	2.6	46.5	731.5	100.0	120.2

TABLE 6-8: Structure and Outside Fire Runs by Location

Location	Structure Fire Runs	Structure Fires Deployed Min. per Run	Outside Fire Runs	Outside Fires Deployed Min. per Run	Hours for Structure and Outside Fires	Pct. of Structure and Outside Fire Workload
City of Baraboo	69	68.4	41	43.6	108.5	47.2
Town of Baraboo	13	356.5	5	26.2	79.4	34.5
West Baraboo	2	22.7	1	26.8	1.2	0.5
Others*	17	140.4	1	69.5	40.9	17.8
Total	101	116.7	48	42.0	230.1	100.0

Note: * Runs for mutual aid.

Observations:

City of Baraboo

- Total deployed time for the year was 430.0 hours or 59 percent of the total annual workload. The daily average was 70.7 minutes for all units combined.
- There were 677 runs, including 42 runs dispatched for canceled calls. The daily average was 1.9 runs.

Town of Baraboo

- Total deployed time for the year was 205.9 hours or 28 percent of the total annual workload. The daily average was 33.8 minutes for all units combined.
- There were 161 runs, including 9 runs dispatched for canceled calls. The daily average was 0.4 runs

Village of West Baraboo

- Total deployed time for the year was 40.9 hours or 6 percent of the total annual workload. The daily average was 6.7 minutes for all units combined.
- There were 76 runs, including 5 runs dispatched for canceled calls. The daily average was 0.2 runs.

Other

- Total deployed time for the year was 54.6 hours or 7 percent of the total annual workload. The daily average was 9.0 minutes for all units combined.
- There were 30 runs, including 8 runs dispatched for canceled calls and 22 runs dispatched for mutual aid calls. The daily average was 0.1 runs.

Workload by Unit

Table 6-9 provides a summary of each unit's workload overall. Tables 6-10 and 6-11 provide a more detailed view of workload, showing each unit's runs broken out by run type (Table 6-10) and the resulting daily average deployed time broken out by run type (Table 6-11).

TABLE 6-9: Call Workload by Unit

Unit	Unit Type	Deployed Minutes per Run	Total Hours	Total Pct.	Deployed Minutes per Day	Total Runs	Runs per Day
B-5	Brush truck	69.5	22.0	3.0	3.6	19	0.1
C-1	Fire chief	44.2	165.6	22.6	27.2	225	0.6
C-2	Command car	48.8	59.4	8.1	9.8	73	0.2
C-3	Command car	32.3	12.9	1.8	2.1	24	0.1
E-1	Engine	39.7	79.4	10.9	13.0	120	0.3
E-2	Enforcer engine	91.1	22.8	3.1	3.7	15	0.0
E-3	Engine	42.9	112.2	15.3	18.4	157	0.4
L-1	Aerial platform	45.0	28.5	3.9	4.7	38	0.1
POV	Member	31.8	31.2	4.3	5.1	59	0.2
S-2	Support unit	181.5	18.1	2.5	3.0	6	0.0
S-4	Rescue truck	69.0	48.3	6.6	7.9	42	0.1
ST-1	Responder	40.7	97.1	13.3	16.0	143	0.4
T-8	Tanker tender	70.0	15.2	2.1	2.5	13	0.0
T-9	Tanker tender	112.7	18.8	2.6	3.1	10	0.0
Total		46.5	731.5	100.0	120.2	944	2.6

TABLE 6-10: Annual Runs by Run Type and Unit

Unit	False Alarm	Good Intent	Hazard	Outside Fire	Public Service	Structure Fire	EMS	Cancel	Mutual Aid	Total
B-5	0	0	3	5	5	0	5	0	1	19
C-1	41	13	30	7	19	17	77	18	3	225
C-2	7	6	11	4	7	3	25	9	1	73
C-3	5	2	1	0	1	1	12	2	0	24
E-1	3	1	13	2	15	8	76	2	0	120
E-2	3	0	1	0	2	0	0	2	7	15
E-3	35	16	32	8	9	20	34	3	0	157
L-1	10	6	5	1	2	13	1	0	0	38
POV	10	5	8	4	8	2	20	2	0	59
S-2	0	0	0	1	1	4	0	0	0	6
S-4	3	0	8	2	5	1	18	3	2	42
ST-1	24	9	19	9	15	10	30	21	6	143
T-8	0	0	0	1	5	3	0	0	1	10
T-9	2	0	2	3	1	2	0	2	1	13
Total	143	58	133	47	95	84	298	64	22	944

TABLE 6-11: Average Deployed Minutes by Run Type and Unit

Unit	False Alarm	Good Intent	Hazard	Outside Fire	Public Service	Structure Fire	EMS	Cancel	Mutual Aid	Total
B-5	0.0	0.0	0.5	0.7	1.5	0.0	0.6	0.0	0.2	3.6
C-1	3.3	0.9	3.7	0.9	1.6	5.0	10.0	0.4	1.3	27.2
C-2	0.4	0.5	1.1	0.4	1.4	1.9	3.3	0.2	0.5	9.8
C-3	0.3	0.2	0.0	0.0	0.0	0.1	1.5	0.0	0.0	2.1
E-1	0.3	0.1	1.0	0.3	1.6	2.4	7.3	0.1	0.0	13.0
E-2	0.2	0.0	0.2	0.0	0.9	0.0	0.0	0.0	2.4	3.7
E-3	2.6	1.2	3.3	0.6	1.5	5.2	3.9	0.1	0.0	18.4
L-1	0.6	0.5	0.4	0.1	0.4	2.6	0.1	0.0	0.0	4.7
POV	0.6	0.4	0.5	0.3	1.2	0.3	1.7	0.1	0.0	5.1
S-2	0.0	0.0	0.0	0.2	0.1	2.7	0.0	0.0	0.0	3.0
S-4	0.1	0.0	0.8	0.3	1.9	0.5	3.6	0.1	0.6	7.9
ST-1	1.8	0.7	2.0	0.8	1.4	3.0	3.0	0.5	2.8	16.0
T-8	0.0	0.0	0.0	0.2	1.3	1.1	0.0	0.0	0.6	3.1
T-9	0.1	0.0	0.2	0.5	0.1	1.1	0.0	0.1	0.5	2.5
Total	10.3	4.4	13.9	5.3	15.1	25.8	35.1	1.6	8.7	120.2

Observations:

- C-1 made the most runs (225 or an average of 0.6 runs per day) and had the highest total annual deployed time (165.6 hours or an average of 27.2 minutes per day).
 - EMS calls accounted for 34 percent of runs and 37 percent of total deployed time.
 - Structure and outside fire calls accounted for 11 percent of runs and 22 percent of total deployed time.
- E-3 made the second most runs (157 or an average of 0.4 runs per day) and had the second-highest total annual deployed time (112.2 hours or an average of 18.4 minutes per day).
 - EMS calls accounted for 22 percent of runs and 21 percent of total deployed time.
 - Structure and outside fire calls accounted for 18 percent of runs and 32 percent of total deployed time.

ANALYSIS OF BUSIEST HOURS

There is significant variability in the number of calls from hour to hour. One special concern relates to the resources available for hours with the heaviest workload. We tabulated the data for each of the 8,760 hours in the year. Table 6-12 shows the number of hours in the year in which there were zero to two or more calls during the hour. Table 6-13 shows the 10 one-hour intervals which had the most calls during the year. Table 6-14 examines the number of times a call overlapped with another call within the service areas of BFD.

TABLE 6-12: Frequency Distribution of the Number of Calls

Calls in an Hour	Frequency	Percentage
0	8,404	95.9
1	345	3.9
2+	11	0.1
Total	8,760	100.0

TABLE 6-13: Top 10 Hours with the Most Calls Received

Hour	Number of Calls	Number of Runs	Total Deployed Hours
6/27/2019, 3:00 p.m. to 4:00 p.m.	3	6	3.6
1/19/2019, 11:00 a.m. to noon	2	11	5.2
11/29/2019, 6:00 a.m. to 7:00 a.m.	2	9	4.5
11/12/2019, 7:00 a.m. to 8:00 a.m.	2	8	1.7
6/1/2019, 6:00 a.m. to 7:00 a.m.	2	6	8.7
3/10/2019, 6:00 p.m. to 7:00 p.m.	2	6	1.9
10/11/2019, 4:00 p.m. to 5:00 p.m.	2	6	1.7
3/22/2019, 5:00 p.m. to 6:00 p.m.	2	5	1.2
4/11/2019, 5:00 p.m. to 6:00 p.m.	2	4	2.1
9/23/2019, 8:00 a.m. to 9:00 a.m.	2	3	1.4

Note: Total deployed hours is a measure of the total time spent responding to calls received in the hour. The deployed time from these calls may extend into the next hour or hours. The number of runs and deployed hours includes all units from the studied agencies.

TABLE 6-14: Frequency of Overlapping Calls

Scenario	Number of Calls	Percent of All Calls	Total Hours
No overlapped call	347	94.3	376.8
Overlapped with one call	21	5.7	11.8

Observations:

- During 11 hours (0.1 percent of all hours), two or more calls occurred; in other words, the department responded to two or more calls in an hour roughly once every 33 days.
 - The highest number of calls to occur in an hour was three, which happened once.
- The hour with the most calls was 3:00 p.m. to 4:00 p.m. on June 27, 2019.
 - The hour's 3 calls involved 6 individual dispatches resulting in 3.6 hours of deployed time. These 3 calls included two public service calls and one hazard call.

RESPONSE TIME

In this part of the analysis, we present response time statistics for different call types. We separate response time into its identifiable components. *Dispatch time* is the difference between the time a call is received and the earliest time an agency is dispatched. Dispatch time includes call processing time, which is the time required to determine the nature of the emergency and the types of resources to dispatch. *Turnout time* is the difference between the earliest dispatch time and the earliest time an agency's unit is en route to a call's location. *Travel time* is the difference between the earliest en route time and the earliest arrival time. *Response time* is the total time elapsed between receiving a call to arriving on scene. For fire calls, we only considered the turnout and travel times, and their summation counts to the total response time.

In this analysis, we included all calls within the primary service areas of BFD to which at least one unit responded. Canceled and mutual aid calls were excluded. In addition, calls with a total response time of more than 30 minutes were excluded. Finally, we focused on units that had complete time stamps, that is, units with all components recorded, so that we could calculate each segment of response time.

Based on the methodology above, we excluded 9 mutual aid calls, 40 canceled calls, 3 calls where the first arriving unit's response time was greater than 30 minutes, and 71 calls where one or more segments of the first arriving unit's response time could not be calculated due to missing or faulty data. As a result, the analysis in this section included 245 calls.

Response Time by Type of Call

Tables 6-15 and 6-16 break down the average, 80th percentile, and 90th percentile response times by call type for all calls in BFD's jurisdictions. BFD follows the NFPA 1720 standard that benchmarks both 80th and 90th percentile response times. Figure 6-7 illustrates the components of the average response time by call type. Table 6-17 examines the average, 80th, and 90th response times of the first arriving BFD units by the time of day (in four-hour intervals).

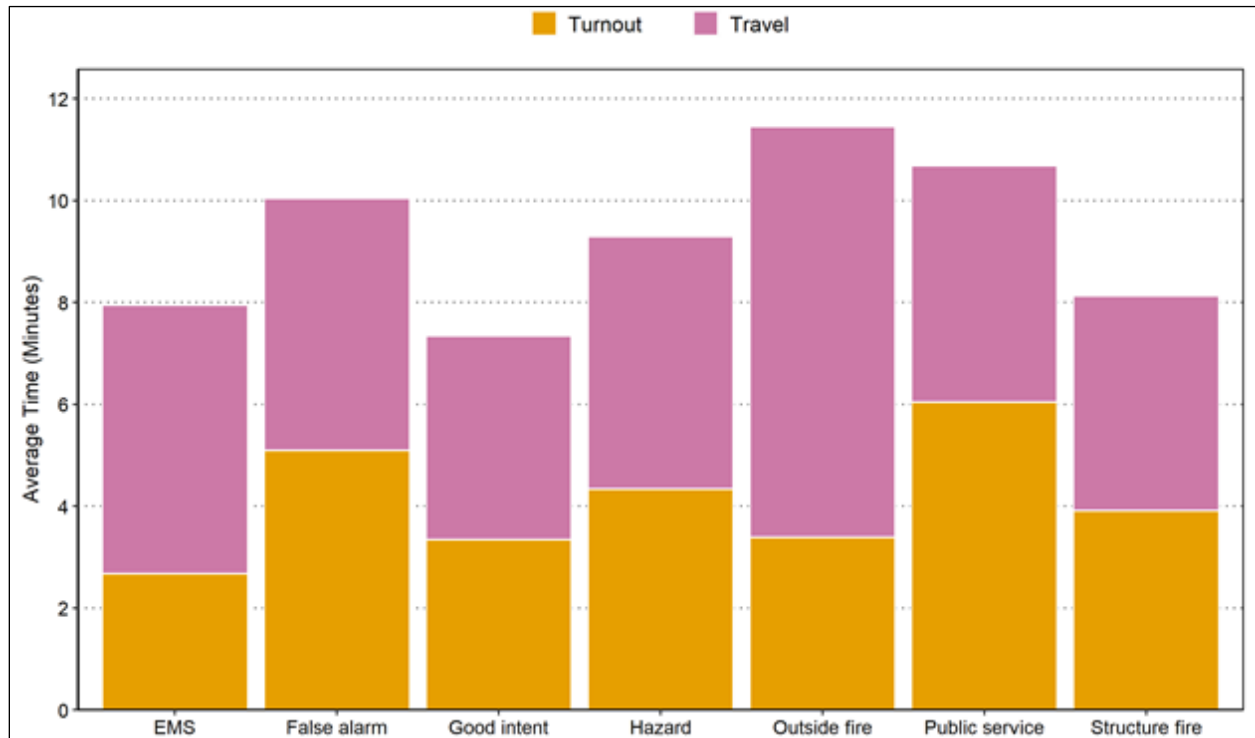
TABLE 6-15: Average Response Time of First Arriving Unit, by Call Type

Call Type	Average Response Time, Minutes			Number of Calls
	Turnout	Travel	Total	
False alarm	5.1	4.9	10.0	46
Good intent	3.3	4.0	7.3	17
Hazard	4.3	5.0	9.3	46
Outside fire	3.4	8.1	11.4	6
Public service	6.0	4.6	10.7	17
Structure fire	3.9	4.2	8.1	18
Fire Total	4.6	4.8	9.4	150
EMS Total	2.7	5.3	7.9	95
Total	3.8	5.0	8.8	245

TABLE 6-16: 80th and 90th Percentile Response Times of First Arriving Unit, by Call Type

Call Type	80th Percentile Response Time in Minutes			90th Percentile Response Time in Minutes			Number of Calls
	Turnout	Travel	Total	Turnout	Travel	Total	
False alarm	8.1	6.3	13.1	9.1	8.6	15.5	46
Good intent	7.1	5.6	12.5	9.5	8.4	14.0	17
Hazard	8.4	7.4	13.3	9.5	9.6	15.3	46
Outside fire	6.2	12.1	18.3	7.5	19.7	22.0	6
Public service	9.6	6.0	12.8	11.5	6.5	15.7	17
Structure fire	6.2	5.8	10.9	7.7	6.1	12.8	18
Fire Total	8.0	6.4	13.1	9.4	7.9	15.0	150
EMS Total	5.0	7.7	11.4	6.3	9.7	14.9	95
Total	6.8	6.8	12.7	8.7	9.1	15.0	245

FIGURE 6-7: Average Response Time of First Arriving Unit, by Call Type



Observations:

- The average turnout time for fire calls was 4.6 minutes.
- The average travel time for fire calls was 4.8 minutes.
- The average total fire response time for fire calls was 9.4 minutes.
- The average response time was 11.4 minutes for outside fires and 8.1 minutes for structure fires.
- The 80th percentile turnout time for fire calls was 8.0 minutes.
- The 80th percentile travel time for fire calls was 6.4 minutes.
- The 80th percentile total response time for fire calls was 13.1 minutes.
- The 80th percentile response time was 18.3 minutes for outside fires and 10.9 minutes for structure fires.
- The 90th percentile turnout time for fire calls was 9.4 minutes.
- The 90th percentile travel time for fire calls was 7.9 minutes.
- The 90th percentile total response time for fire calls was 15.0 minutes.
- The 90th percentile response time was 22.0 minutes for outside fires and 12.8 minutes for structure fires.

TABLE 6-17: Average, 80th, and 90th Percentile Response Time of First Arriving Unit, by Time of Day

Time of Day	Minutes					Number of Calls
	Turnout	Travel	Response Time	80th Percentile Response Time	90th Percentile Response Time	
0:00 - 3:59	6.6	5.1	11.6	14.6	15.8	16
4:00 - 7:59	4.2	5.0	9.2	12.8	14.9	18
8:00 - 11:59	2.9	5.2	8.1	13.0	16.6	39
12:00 - 15:59	2.9	5.0	7.9	12.2	14.5	52
16:00-19:59	3.7	5.1	8.8	11.8	15.0	75
20:00-23:59	4.8	4.7	9.5	12.7	14.2	45
Total	3.8	5.0	8.8	12.7	15.0	245

Response Time Distribution

Here, we present a more detailed look at how response times to calls are distributed. The cumulative distribution of total response time for the first arriving BFD unit to structure and outside fire calls is shown in Figure 6-8 and Table 6-18.

The cumulative percentages here are read in the same way as a percentile. In Figure 6-8, the 80th percentile of 12.8 minutes means that 80 percent of structure and outside fire calls had a response time of 12.8 minutes or less, and the 90th percentile of 15.0 minutes means that 90 percent of structure and outside fire calls had a response time of 15.0 minutes or less. In Table 6-18, the cumulative percentage of 54.2 represents that 54.2 percent of structure and outside fire calls had a response time under 8 minutes.

FIGURE 6-8: Cumulative Distribution of Response Time – First Arriving Unit – Outside and Structure Fires

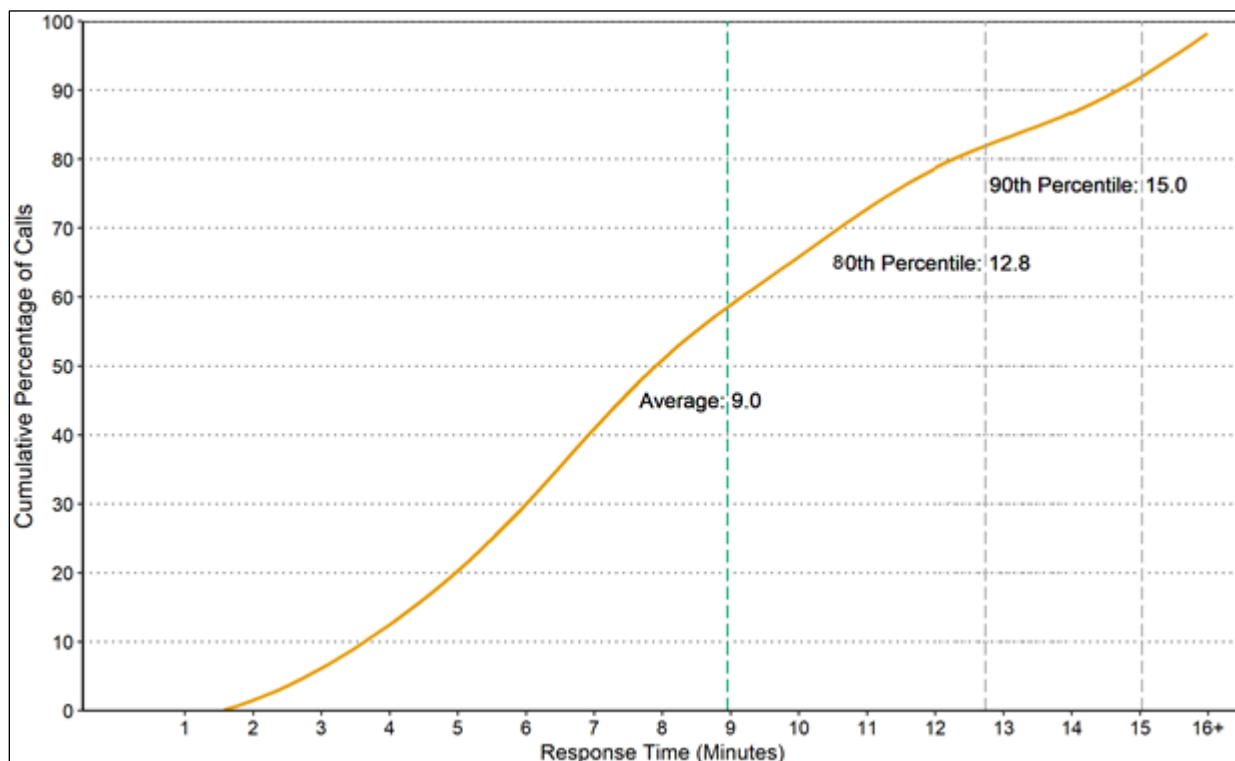


TABLE 6-18: Cumulative Distribution of Response Time – First Arriving Unit – Outside and Structure Fires

Response Time (minute)	Frequency	Cumulative Percentage
1	0	0.0
2	0	0.0
3	1	4.2
4	3	16.7
5	0	16.7
6	3	29.2
7	3	41.7
8	3	54.2
9	1	58.3
10	1	62.5
11	3	75.0
12	1	79.2
13	1	83.3
14	1	87.5
15	0	87.5
16+	3	100.0

Observations:

- For 54 percent of structure and outside fire calls, the response time of the first arriving BFD unit was less than 8 minutes.

ATTACHMENT I: ACTIONS TAKEN

TABLE 6-19: Actions Taken Analysis for Structure and Outside Fire Calls

Action Taken	Number of Calls	
	Outside Fire	Structure Fire
Extinguishment by fire service personnel	8	9
Fire control or extinguishment, other	1	0
Incident command	2	2
Investigate	1	0
Investigate fire out on arrival	1	0
Salvage & overhaul	0	1
Shut down system	1	0
Ventilate	0	8

Note: Totals are higher than the total number of structure and outside fire calls because some calls recorded multiple actions taken.

Observations:

- Out of 14 outside fires, 8 were extinguished by fire service personnel, which accounted for 57 percent of outside fires.
- Out of 20 structure fires, 9 were extinguished by fire service personnel, which accounted for 45 percent of structure fires.

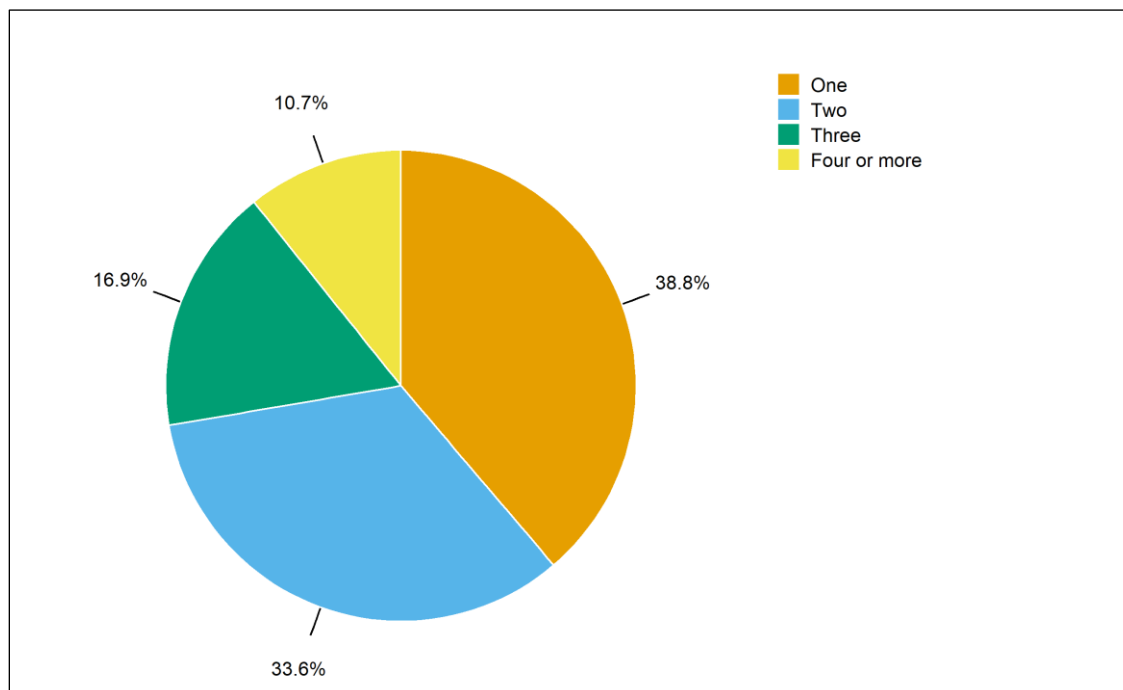
ATTACHMENT II: FIRE SUPPRESSION UNITS ARRIVING AT CALLS

This section repeats the calculations of Table 6-4 and Figure 6-5 if only fire suppression units were included.

TABLE 6-20: Calls by Call Type and Number of Arriving Fire Suppression Units

Call Type	Number of Units				Total Calls
	One	Two	Three	Four or More	
False alarm	30	11	2	0	43
Good intent	13	7	3	0	23
Hazard	24	16	7	2	49
Outside fire	2	6	3	3	14
Public service	12	3	6	5	26
Structure fire	3	3	6	8	20
Fire Total	84	46	27	18	175
EMS Total	17	51	24	15	107
Canceled	13	3	0	0	16
Mutual aid	5	3	1	0	9
Total	119	103	52	33	307
Percentage	38.8	33.6	16.9	10.7	100.0

FIGURE 6-9: Calls by Number of Arriving Fire Suppression Units



ATTACHMENT III: FIRE MUTUAL AID

Tables 6-21 and 6-22 detail the given and received mutual aid in fire incidents in 2019. All aid received calls occurred within Baraboo. Two canceled aid given calls were not included.

TABLE 6-21: Mutual Aid Given

Incident Number	Date	Receiving Agency	Call Type	Incident city
2019-51	2019-02-19	North Freedom FD	Structure fire	North Freedom
2019-70	2019-03-14	Prairie du Sac FD	Public service	Prairie Du Sac
2019-101	2019-04-10	Lake Delton FD	Structure fire	Lake Delton
2019-133	2019-05-08	Sauk City FD	Structure fire	Honey Creek
2019-148	2019-05-20	Merrimac FD	Structure fire	Merrimac
2019-160	2019-06-01	North Freedom FD	Structure fire	North Freedom
2019-250	2019-08-30	Lake Delton FD	Structure fire	Wisconsin Dells
2019-322	2019-11-08	Lake Delton FD	Structure fire	Lake Delton
2019-356	2019-12-12	Sauk City FD	Outside fire	North Freedom

TABLE 6-22: Mutual Aid Received

Incident Number	Date	Providing Agency	Call Type
2019-71	2019-03-15	Kilbourn FD	Structure fire
		Lake Delton FD	EMS assist
		Loganville Area FD	Structure fire
		Merrimac FD	Structure fire
		North Freedom FD	Structure fire
		Reedsburg FD	Structure fire
		Sauk City FD	EMS assist
		Unknown	Structure fire
2019-152	2019-05-28	Lake Delton FD	Structure fire
2019-231	2019-08-09	Lake Delton FD	EMS assist
		Prairie du Sac FD	EMS assist
2019-233	2019-08-10	Lake Delton FD	EMS assist
		Sauk City FD	EMS assist
2019-280	2019-09-28	Unknown	EMS assist
2019-282	2019-09-29	Lake Delton FD	Structure fire
		Sauk City FD	Structure fire
		Unknown	Structure fire
2019-303	2019-10-20	Lake Delton FD	Structure fire
		Sauk City FD	Structure fire
		Unknown	EMS assist

SECTION 7. BDAS DATA ANALYSIS

This data analysis was prepared as a key component of the study of the BDAS. This analysis examines all calls for service between January 1, 2019, and January 1, 2020, as recorded in the Sauk County's Computer-Aided Dispatch (CAD) system, the BFD's National Fire Incident Reporting System (NFIRS), and the BDAS's EMS Incident Reporting System.

This analysis is made up of five parts. The first part focuses on call types and dispatches. The second part explores the time spent and the workload of individual units. The third part presents an analysis of the busiest hours in the year studied. The fourth part provides a response time analysis of the studied agency's units. The fifth and final part is an analysis of unit transports.

The BDAS operates one station located in the City of Baraboo. It provides basic life support (BLS) and advanced life support (ALS) to the City of Baraboo, Village of West Baraboo, Townships of Baraboo, Greenfield, and Fairfield, and parts of the Townships of Excelsior and Sumpter. It also transports patients between medical facilities, including hospitals, medical centers, and healthcare facilities. The BDAS operates a fleet of seven ambulances, two quick response units, a rescue truck, and an ATV.

In 2019, the BDAS responded to 4,202 calls, of which 48 percent were 9-1-1 EMS calls and 49 percent were interfacility transport service. The total workload in 2019 was 6,853.1 hours. The average response time to 9-1-1 EMS calls was 8.4 minutes, and the 90th percentile response time was 13.3 minutes.

METHODOLOGY

In this report, CPSM analyzes calls and runs. A call is an emergency service request or incident. A run is a dispatch of a unit (i.e., a unit responding to a call). Thus, a call may include multiple runs.

We received CAD data from the Sauk County 9-1-1 Dispatch Center, NFIRS data from the BFD, and EMS data from BDAS. We first matched the three sets of data based on the available information of call time and location. Then, we classified the calls in a series of steps. We first used the NFIRS incident type to identify canceled calls and to assign motor vehicle accident (MVA) and fire category call types. EMS calls were then assigned detailed categories based on their problem descriptions. Mutual aid calls were identified based on the information recorded in the EMS zone field in the EMS data.

The type of EMS service that BDAS provided in 2019 mainly included 9-1-1 EMS response and interfacility/medical transport. In the analysis, the overall EMS service is broken out into two parts: 9-1-1 EMS (all EMS calls other than interfacility transport) and interfacility transport (all interfacility/medical transports).

AGGREGATE CALL TOTALS AND RUNS

The overall EMS service is broken out into two parts: 9-1-1 EMS (all EMS calls other than interfacility transport) and interfacility transport (including all interfacility/medical transports). In 2019, BDAS responded to 4,202 calls. Of these calls, 48 percent were 9-1-1 EMS calls and 49 percent were interfacility transport calls.

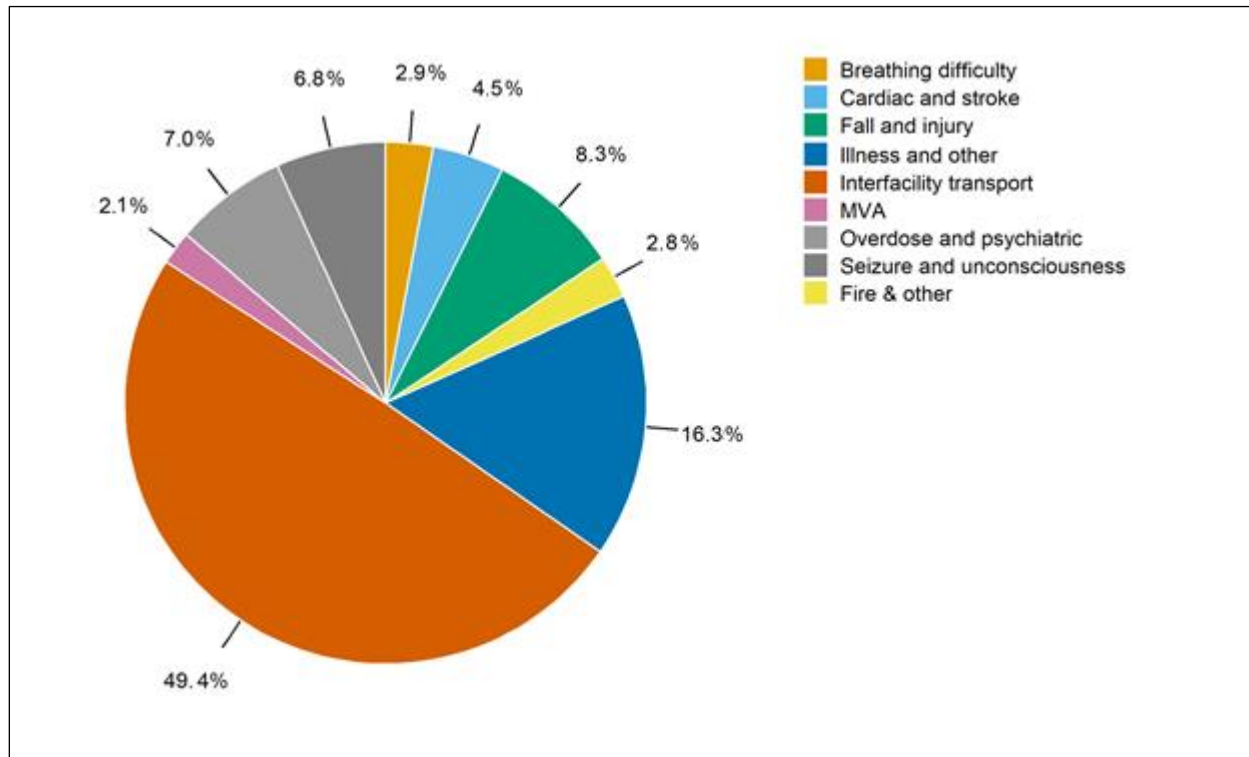
Calls by Type

The following table and figure show the number of calls by call type, average calls per day, and the percentage of calls that fall into each call type category for the 12 months studied.

TABLE 7-1: Call Types

Call Type	Number of Calls	Calls per Day	Call Percentage
Breathing difficulty	123	0.3	2.9
Cardiac and stroke	187	0.5	4.5
Fall and injury	348	1.0	8.3
Illness and other	687	1.9	16.3
MVA	87	0.2	2.1
Overdose and psychiatric	295	0.8	7.0
Seizure and unconsciousness	286	0.8	6.8
9-1-1 EMS Subtotal	2,013	5.5	47.9
Interfacility Transport	2,074	5.7	49.4
EMS Total	4,087	11.2	97.3
Fire Assist Total	79	0.2	1.9
Canceled	19	0.1	0.5
Mutual aid	17	0.0	0.4
Total	4,202	11.5	100.0

FIGURE 7-1: Calls by Type



Observations:

- In 2019, BDAS responded to an average of 11.5 calls per day.
- EMS calls for the year totaled 4,087 (97 percent of all calls), an average of 11.2 calls per day.
- Interfacility transfer calls were the largest category of EMS calls at 49 percent of total calls or an average of 5.7 calls per day.
- 9-1-1 EMS calls made up 48 percent of total EMS calls or an average of 5.5 calls per day.
 - Illness and other calls were the largest category of 9-1-1 EMS calls at 16 percent of total calls (34 percent of 9-1-1 EMS calls), or an average of 1.9 calls per day.
 - Cardiac and stroke calls made up 4 percent of total calls (9 percent of 9-1-1 EMS calls), or an average of 0.5 calls per day.
 - Motor vehicle accidents made up 2 percent of total calls (4 percent of 9-1-1 EMS calls), or an average of 0.2 calls per day.
- BDAS responded to 79 fire calls in 2019, which made up 2 percent of total calls, an average of 0.2 calls per day.

Calls by Type and Duration

The following table shows the duration of calls by type using five duration categories: less than 30 minutes, 30 minutes to one hour, one to two hours, two to three hours, and more than three hours.

TABLE 7-2: Calls by Type and Duration

Call Type	Less than 30 Minutes	30 Minutes to One Hour	One to Two Hours	Two to Three Hours	More Than Three Hours	Total
Breathing difficulty	26	81	14	2	0	123
Cardiac and stroke	18	122	37	8	2	187
Fall and injury	117	165	48	11	7	348
Illness and other	196	370	99	8	14	687
MVA	7	32	26	11	11	87
Overdose and psychiatric	109	96	47	19	24	295
Seizure and unconsciousness	58	192	31	2	3	286
9-1-1 EMS Total	531	1,058	302	61	61	2,013
Interfacility Transport	50	116	687	841	380	2,074
EMS Total	581	1,174	989	902	441	4,087
Fire Total	21	30	14	7	7	79
Canceled	5	9	4	0	1	19
Mutual aid	0	5	7	4	1	17
Total	607	1,218	1,014	913	450	4,202

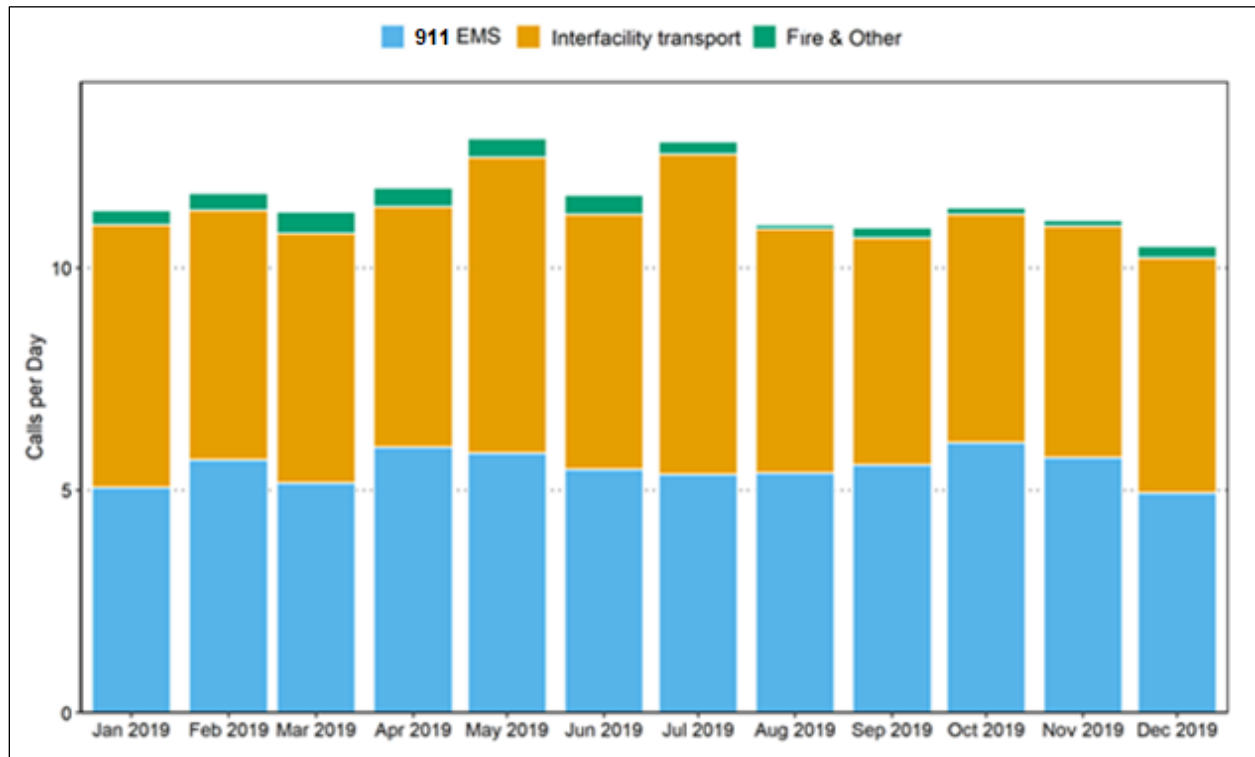
Observations:

- On average, there were 6.4 EMS calls per day that lasted more than one hour.
- A total of 1,755 EMS calls (43 percent) lasted less than one hour, 989 EMS calls (24 percent) lasted one to two hours, 902 EMS calls (22 percent) lasted two to three hours, and 441 EMS calls (11 percent) lasted three or more hours.
- A total of 140 cardiac and stroke calls (75 percent) lasted less than one hour, 37 cardiac and stroke calls (20 percent) lasted one to two hours, 8 cardiac and stroke calls (4 percent) lasted two to three hours, and 2 cardiac and stroke calls (1 percent) lasted three or more hours.
- A total of 39 motor vehicle accidents (45 percent) lasted less than one hour, 26 motor vehicle accidents (30 percent) lasted one to two hours, 11 motor vehicle accidents (13 percent) lasted two to three hours, and 11 motor vehicle accidents (13 percent) lasted three or more hours.
- A total of 166 interfacility transports (8 percent) lasted less than one hour, 687 interfacility transports (33 percent) lasted one to two hours, 841 interfacility transports (41 percent) lasted two to three hours, and 380 interfacility transports (18 percent) lasted three or more hours.

Average Calls by Month and Hour of Day

Figure 7-2 shows the monthly variation in the average daily number of calls handled by BDAS in 2019. Similarly, Figure 7-3 illustrates the average number of calls received each hour of the day over the year. In these figures, EMS calls are broken out by 9-1-1 EMS calls (all non-interfacility transport calls) and interfacility transport calls.

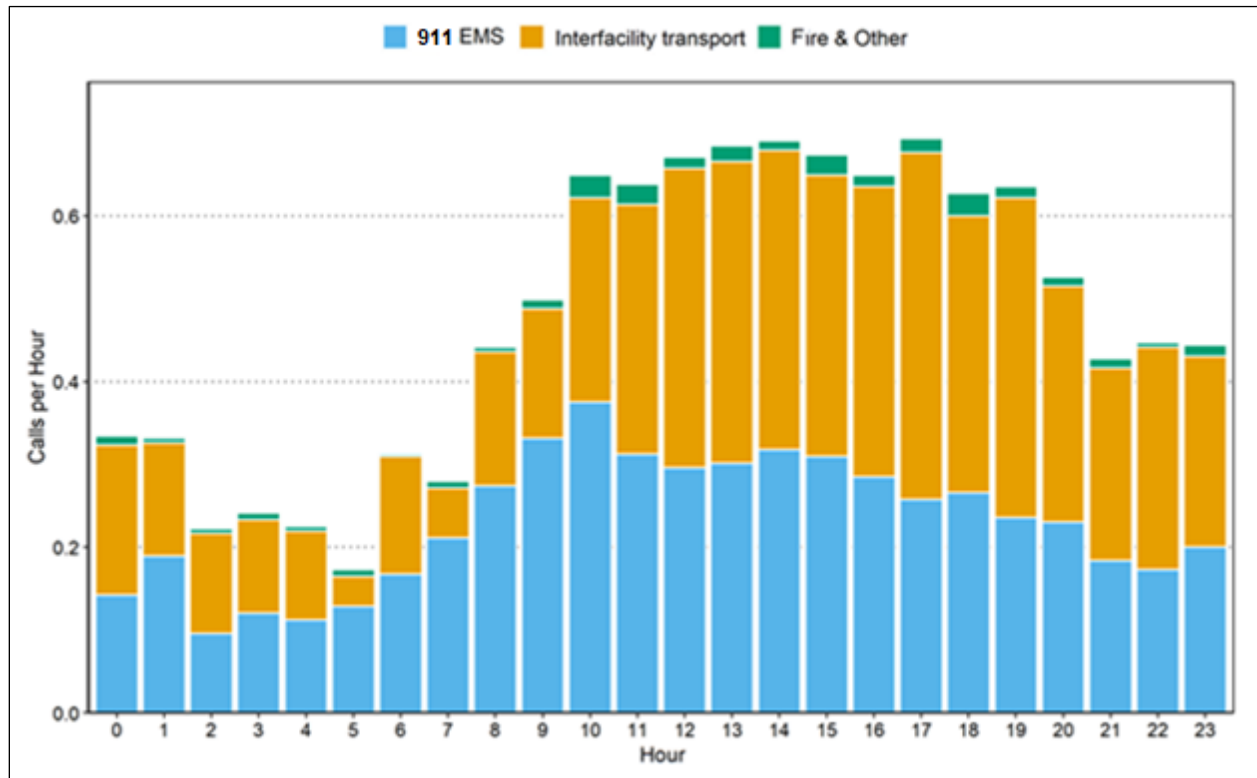
FIGURE 7-2: Average Calls by Month



Observations:

- Average 9-1-1 EMS calls per day ranged from 4.9 in December 2019 to 6.1 in October 2019.
- Average interfacility transport calls per day ranged from 5.1 in September 2019 to 7.2 in July 2019.
- Average fire & other calls per day ranged from 0.1 in August 2019 to 0.5 in March 2019.
- Average calls per day overall ranged from 10.5 in December 2019 to 12.9 in May 2019.

FIGURE 7-3: Calls by Hour of Day



Observations:

- Average 9-1-1 EMS calls per hour ranged from 0.1 between 2:00 a.m. and 3:00 a.m. to 0.4 between 10:00 a.m. and 11:00 a.m.
- Average interfacility transport calls per hour ranged from less than 0.1 between 5:00 a.m. and 6:00 a.m. to 0.4 between 5:00 p.m. and 6:00 p.m.
- Average calls per hour overall ranged from 0.2 between 5:00 a.m. and 6:00 a.m. to 0.7 between 5:00 p.m. and 6:00 p.m.

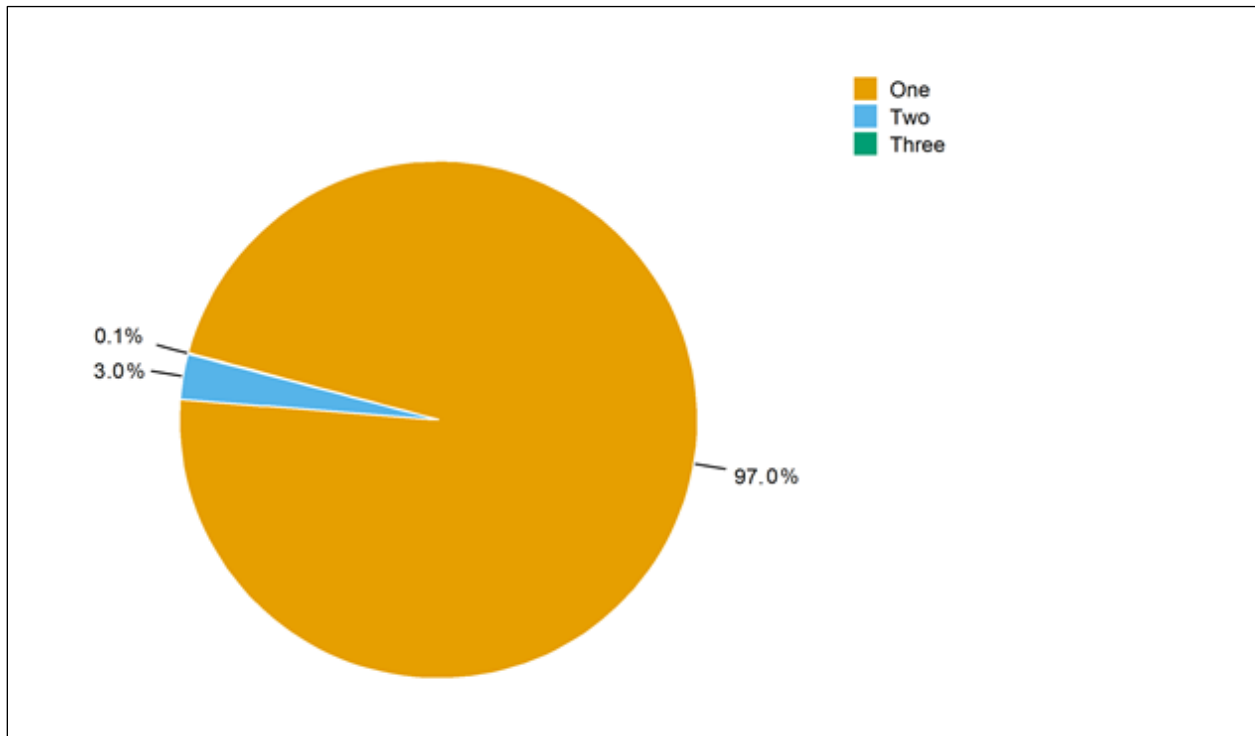
Units Arriving at Calls

The following table and figure detail the number of calls with one, two, and three units arriving to a call, broken down by call type. One canceled call with no arriving unit was excluded.

TABLE 7-3: Calls by Call Type and Number of Units Arriving

Call Type	Number of Units			Total Calls
	One	Two	Three	
Breathing difficulty	120	3	0	123
Cardiac and stroke	172	15	0	187
Fall and injury	323	25	0	348
Illness and other	660	26	1	687
MVA	69	16	2	87
Overdose and psychiatric	283	12	0	295
Seizure and unconsciousness	267	19	0	286
9-1-1 EMS Total	1,894	116	3	2,013
Interfacility transport	2,074	0	0	2,074
EMS Total	3,968	116	3	4,087
Fire Total	73	6	0	79
Canceled	16	2	0	18
EMS mutual aid	16	1	0	17
Total	4,073	125	3	4,201
Percentage	97.0	3.0	0.1	100.0

FIGURE 7-4: Calls by Number of Units Arriving



Observations:

- On average, 1.0 units arrived at all calls
- For 97 percent of calls, only one unit arrived.
- For 3 percent of calls, two or three units arrived.
- All interfacility transport calls involved exactly one unit.

WORKLOAD: RUNS AND TOTAL TIME SPENT

The workload of each agency's units are measured in two ways: runs and deployed time. The deployed time of a run is measured from the time a unit is dispatched through the time the unit is cleared. Because multiple units respond to some calls, there are more runs than calls and the average deployed time per run varies from the total duration of calls.

Runs and Deployed Time – All Units

Deployed time is the total deployment time of all units deployed on all runs. Table 7-4 shows the total deployed time, both overall and broken down by type of run, for all units in 2019. Table 7-5 and Figure 7-5 present the average deployed minutes by hour of day.

TABLE 7-4: Annual Runs and Deployed Time by Run Type

Call Type	Deployed Minutes per Run	Annual Hours	Percent of Total Hours	Deployed Minutes per Day	Annual Runs	Runs per Day
Breathing difficulty	44.8	94.1	1.4	15.5	126	0.3
Cardiac and stroke	54.6	183.9	2.7	30.2	202	0.6
Fall and injury	49.6	308.4	4.5	50.7	373	1.0
Illness and other	48.2	574.6	8.4	94.5	715	2.0
MVA	102.9	183.5	2.7	30.2	107	0.3
Overdose and psychiatric	71.7	366.6	5.3	60.3	307	0.8
Seizure and unconsciousness	44.2	224.6	3.3	36.9	305	0.8
9-1-1 EMS Total	54.4	1,935.9	28.2	318.2	2,135	5.8
Interfacility transport	137.0	4,735.1	69.1	778.4	2,074	5.7
EMS Total	95.1	6,671.0	97.3	1,096.6	4,209	11.5
Fire Total	93.3	132.1	1.9	21.7	85	0.2
Canceled	55.1	19.3	0.3	3.2	21	0.1
Mutual aid	102.1	30.6	0.4	5.0	18	0.0
Other Total	76.8	49.9	0.7	8.2	39	0.1
Total	94.9	6,853.1	100.0	1,126.5	4,333	11.9

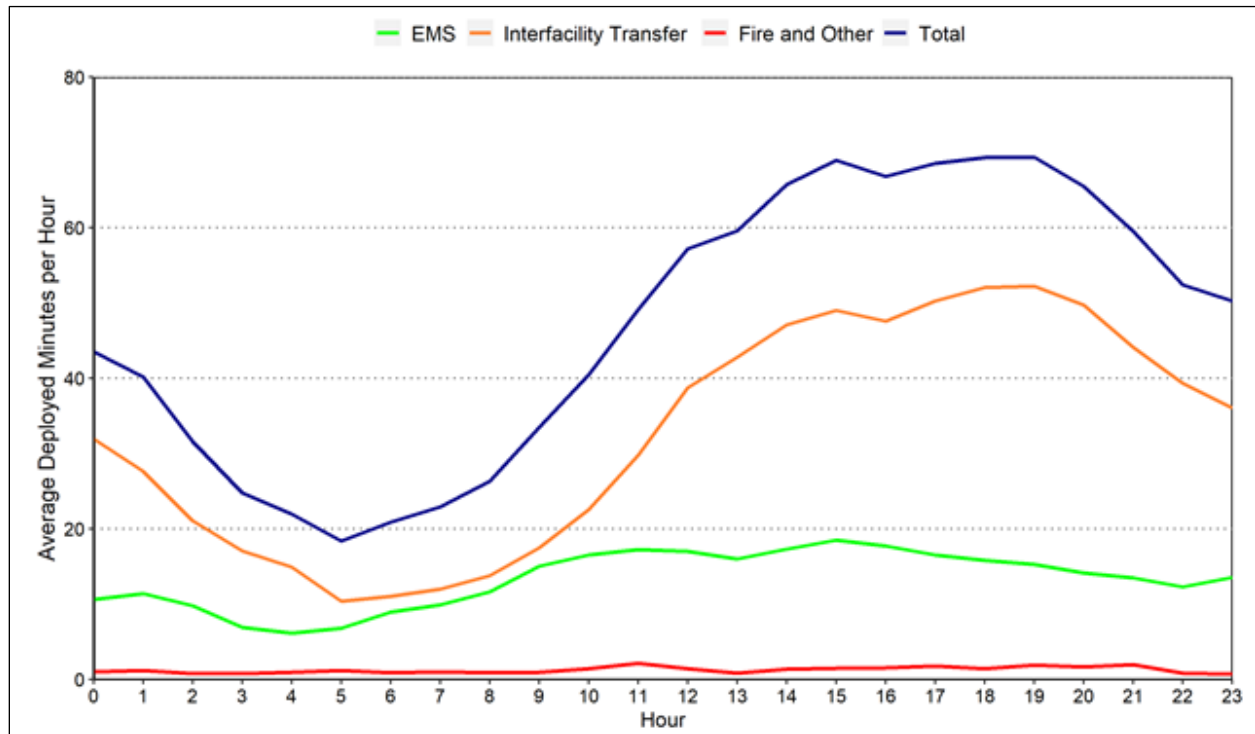
Observations:

- The total deployed time for the year was 6,853.1 hours. The daily average was 18.8 hours for all units combined.
- There were 4,333 runs, including 21 runs dispatched for canceled calls and 18 runs dispatched for mutual aid calls. The daily average was 11.9 runs.
- The average deployed time for all EMS runs (including interfacility transport) was 95.1 minutes per run. The deployed time for all EMS runs averaged 18.3 hours per day.

TABLE 7-5: Average Deployed Minutes by Hour of Day

Hour	EMS	Interfacility Transfer	Fire & Other	Total
0	10.6	31.9	1.0	43.5
1	11.4	27.6	1.2	40.2
2	9.7	21.1	0.8	31.6
3	6.9	17.0	0.8	24.8
4	6.1	14.9	0.9	21.9
5	6.8	10.4	1.2	18.3
6	8.9	11.1	0.9	20.9
7	9.9	12.0	1.0	22.9
8	11.6	13.8	0.9	26.3
9	15.0	17.5	1.0	33.5
10	16.5	22.6	1.4	40.5
11	17.3	29.8	2.1	49.1
12	17.0	38.7	1.4	57.2
13	16.0	42.8	0.8	59.6
14	17.3	47.1	1.3	65.7
15	18.5	49.0	1.5	68.9
16	17.7	47.5	1.5	66.8
17	16.5	50.2	1.8	68.5
18	15.8	52.0	1.4	69.3
19	15.2	52.2	1.9	69.3
20	14.1	49.7	1.6	65.5
21	13.5	44.1	2.0	59.5
22	12.3	39.4	0.8	52.4
23	13.5	36.0	0.7	50.2
Daily Avg.	318.2	778.4	29.9	1,126.5

FIGURE 7-5: Average Deployed Minutes by Hour of Day



Observations:

- Hourly deployed time was highest during the day from noon to 10:00 p.m., averaging between 57.2 minutes and 69.3 minutes.
- Average deployed time peaked between 7:00 p.m. and 8:00 p.m., averaging 69.3 minutes.
- Average deployed time was lowest between 5:00 a.m. and 6:00 a.m., averaging 18.3 minutes.

Workload by Unit

Table 7-6 provides a summary of each unit's workload overall. Tables 7-7 and 7-8 provide a more detailed view of workload, showing each unit's runs broken out by run type (Table 7-7) and the resulting daily average deployed time broken out by run type (Table 7-8).

TABLE 7-6: Call Workload by Unit

Unit	Unit Type	Deployed Minutes per Run	Total Hours	Total Pct.	Deployed Minutes per Day	Total Runs	Runs per Day
570	Rescue	26.7	1.3	0.0	0.2	3	0.0
571	Rope Rescue	114.0	30.4	0.4	5.0	16	0.0
572	Ambulance	97.5	359.3	5.2	59.1	221	0.6
573	Ambulance	88.8	1,658.5	24.2	272.6	1,120	3.1
574	Ambulance	130.2	4.3	0.1	0.7	2	0.0
575	Ambulance	167.0	33.4	0.5	5.5	12	0.0
576	Ambulance	147.7	263.4	3.8	43.3	107	0.3
577	Ambulance	132.5	1,066.6	15.6	175.3	483	1.3
578	Ambulance	86.3	1,546.9	22.6	254.3	1,075	2.9
579	Ambulance	86.2	1,032.8	15.1	169.8	719	2.0
580	Ambulance	89.3	856.1	12.5	140.7	575	1.6
Total		94.9	6,853.1	100.0	1,126.5	4,333	11.9

TABLE 7-7: Annual Runs by Run Type and Unit

Unit	BD	Cardiac and Stroke	Fall and Injury	Illness and Other	MVA	OD	Seizure and Uncons.	Interfac. Transfer	Fire	Other	Total
570	0	0	0	2	0	1	0	0	0	0	3
571	0	0	9	2	0	1	2	0	1	1	16
572	8	6	22	37	11	24	15	84	9	5	221
573	37	57	96	221	22	72	97	478	29	11	1,120
574	0	1	0	0	0	0	0	1	0	0	2
575	0	0	0	0	0	3	0	9	0	0	12
576	0	0	5	7	1	1	1	90	2	0	107
577	3	11	14	30	3	15	13	387	5	2	483
578	32	58	106	193	35	78	88	466	11	8	1,075
579	35	41	65	136	22	66	46	289	13	6	719
580	11	28	56	87	13	46	43	270	15	6	575
Total	126	202	373	715	107	307	305	2,074	85	39	4,333

Note: BD=Breathing Difficulty; OD=Overdose and psychiatric.

TABLE 7-8: Average Deployed Minutes by Run Type and Unit

Unit	BD	Cardiac and Stroke	Fall and Injury	Illness and Other	MVA	OD	Seizure and Uncons.	Interfac. Transfer	Fire	Other	Total
570	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2
571	0.0	0.0	3.5	0.5	0.0	0.2	0.2	0.0	0.4	0.3	5.0
572	0.7	0.8	2.5	6.2	2.1	3.0	1.8	36.5	3.8	1.7	59.1
573	4.5	8.9	13.3	28.6	9.1	17.6	11.1	167.1	10.4	1.9	272.6
574	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.7
575	0.0	0.0	0.0	0.0	0.0	0.4	0.0	5.1	0.0	0.0	5.5
576	0.0	0.0	0.8	0.8	1.1	0.1	0.1	39.8	0.7	0.0	43.3
577	0.4	1.6	1.5	3.6	0.5	2.0	1.5	163.4	0.6	0.3	175.3
578	4.4	7.7	13.5	24.6	9.5	18.1	11.1	161.3	2.0	2.1	254.3
579	4.1	6.2	7.9	19.5	4.5	11.4	5.3	108.2	1.9	0.7	169.8
580	1.4	4.9	7.7	10.5	3.4	7.5	5.7	96.4	2.0	1.2	140.7
Total	15.5	30.2	50.7	94.5	30.2	60.3	36.9	778.4	21.7	8.2	1,126.5

Note: BD=Breathing Difficulty; OD=Overdose and psychiatric.

Observations:

- BDAS made 4,333 runs (11.9 runs per day) and had 6,853.1 hours of annual deployed time (18.8 hours per day).
 - 9-1-1 EMS calls accounted for 49 percent of runs and 28 percent of total deployed time.
 - Interfacility transport calls accounted for 48 percent of runs and 69 percent of total deployed time.
- Ambulance 573 made the most runs (1,120, or an average of 3.1 runs per day) and had the highest total annual deployed time (1,658.3 hours, or an average of 4.5 hours per day).
 - 9-1-1 EMS calls accounted for 54 percent of runs and 34 percent of total deployed time.
 - Interfacility transports accounted for 43 percent of runs and 61 percent of total deployed time.
- Ambulance 578 made the second most runs (1,075, or an average of 2.9 runs per day) and had the second-highest total annual deployed time (1,547.0 hours, or an average of 4.2 hours per day).
 - 9-1-1 EMS calls accounted for 55 percent of runs and 35 percent of total deployed time.
 - Interfacility transports accounted for 43 percent of runs and 63 percent of total deployed time.

Workload by Location

For all calls that are not interfacility transport, Table 7-9 breaks down the workload of BDAS by the location of the call. The interfacility transports between various request and destination facilities in 2019 is analyzed in the "Transport Call Analysis" Section.

TABLE 7-9: Annual 911 Workload by Location

Location	Calls	Pct. Annual Calls	Runs	Runs Per Day	Deployed Minutes Per Run	Annual Hours	Pct. Annual Work	Deployed Minutes Per Day
City of Baraboo	1,866	87.7	1,980	5.4	54.3	1,791.4	84.6	294.5
Village of West Baraboo	140	6.6	148	0.4	62.2	153.4	7.2	25.2
Town of Baraboo	43	2.0	47	0.1	81.0	63.4	3.0	10.4
North Freedom	27	1.3	29	0.1	84.9	41.0	1.9	6.7
Wisconsin Dells	19	0.9	19	0.1	58.5	18.5	0.9	3.0
Other	33	1.6	36	0.1	83.5	50.1	2.4	8.2
Total	2,128	100.0	2,259	6.2	56.3	2,118.0	100.0	348.2

Observations:

City of Baraboo

- Total deployed time for the year was 1,791.4 hours or 85 percent of the total annual workload. The daily average was 4.9 hours for all units combined.
- There were 1,980 runs, including 14 runs dispatched for canceled calls. The daily average was 5.4 runs.

Village of West Baraboo

- Total deployed time for the year was 153.4 hours or 7 percent of the total annual workload. The daily average was 25.2 minutes for all units combined.
- There were 148 runs, including one run dispatched for canceled calls. The daily average was 0.4 runs.

Town of Baraboo

- Total deployed time for the year was 63.4 hours or 3 percent of the total annual workload. The daily average was 10.4 minutes for all units combined.
- There were 47 runs, including one run dispatched for canceled calls. The daily average was 0.1 runs

Other (including North Freedom and Wisconsin Dells)

- Total deployed time for the year was 109.7 hours or 5 percent of the total annual workload. The daily average was 18.0 minutes for all units combined.
- There were 84 runs, including 5 runs dispatched for canceled calls and 18 runs dispatched for mutual aid calls. The daily average was 0.2 runs.

ANALYSIS OF BUSIEST HOURS

There is significant variability in the number of calls from hour to hour. One special concern relates to the resources available for hours with the heaviest workload. We tabulated the data for each of the 8,760 hours in the year. Table 7-10 shows the number of hours in the year in which there were zero to four or more calls during the hour. Table 7-11 shows the 10 one-hour intervals which had the most calls during the year. Table 7-12 examines the number of times a call overlapped with another call within the service areas of BDAS.

TABLE 7-10: Frequency Distribution of the Number of Calls

Calls in an Hour	Frequency	Percentage
0	5,429	62.0
1	2,577	29.4
2	654	7.5
3	85	1.0
4+	15	0.2
Total	8,760	100.0

TABLE 7-11: Top 10 Hours with the Most Calls Received

Hour	Number of Calls	Number of Runs	Total Deployed Hours
10/23/2019, 11:00 a.m. to noon	5	5	7.0
12/28/2019, 3:00 p.m. to 4:00 p.m.	5	5	4.5
4/15/2019, noon to 1:00 p.m.	4	5	8.0
4/1/2019, 5:00 p.m. to 6:00 p.m.	4	5	7.8
8/19/2019, 11:00 p.m. to midnight	4	4	11.2
1/18/2019, 4:00 p.m. to 5:00 p.m.	4	4	10.3
5/31/2019, 7:00 p.m. to 8:00 p.m.	4	4	9.3
6/19/2019, 2:00 p.m. to 3:00 p.m.	4	4	8.9
1/19/2019, 11:00 a.m. to noon	4	4	8.0
9/6/2019, 11:00 a.m. to noon	4	4	6.0

Note: Total deployed hours is a measure of the total time spent responding to calls received in the hour. The deployed time from these calls may extend into the next hour or hours. The number of runs and deployed hours includes all units from the studied agencies.

TABLE 7-12: Frequency of Overlapping Calls

Scenario	Number of Calls	Percent of All Calls	Total Hours
No overlapped call	1,912	45.5	2,973.8
Overlapped with one call	1,485	35.3	1,222.4
Overlapped with two calls	622	14.8	342.7
Overlapped with three calls	163	3.9	58.8
Overlapped with four calls	18	0.4	6.3
Overlapped with five calls	1	0.0	0.3
Overlapped with six calls	1	0.0	0.0

Observations:

- During 15 hours (0.2 percent of all hours), four or more calls occurred; in other words, the department responded to four or more calls in an hour roughly once every 24 days.
 - The highest number of calls to occur in an hour was five, which happened twice.
- One hour with the most calls was 11:00 a.m. to noon on October 23, 2019.
 - The hour's five calls involved two interfacility transport calls, one cardiac and stroke call, one fall and injury call, and one illness and other call.
- Another hour with the most calls was 3:00 p.m. to 4:00 p.m. on December 28, 2019.
 - The hour's five calls involved 4 individual dispatches resulting in 1.6 hours of deployed time. These five calls included two illness and other calls, two interfacility transport calls, and one fall and injury call.

RESPONSE TIME

In this part of the analysis, we present response time statistics for different call types. We separate response time into its identifiable components. *Dispatch time* is the difference between the time a call is received and the earliest time an agency is dispatched. Dispatch time includes call processing time, which is the time required to determine the nature of the emergency and the types of resources to dispatch. *Turnout time* is the difference between the earliest dispatch time and the earliest time an agency's unit is en route to a call's location. *Travel time* is the difference between the earliest en route time and the earliest arrival time. *Response time* is the total time elapsed between receiving a call to arriving on scene. For fire calls, we only considered the turnout and travel times, and their summation counts to the total response time.

In this analysis, we included all calls within the primary service areas of BDAS to which at least one non-administrative unit responded. The interfacility transport calls were not included. Canceled and mutual aid calls were excluded. In addition, calls with a total response time of more than 30 minutes were excluded. Finally, we focused on units that had complete time stamps, that is, units with all components recorded, so that we could calculate each segment of response time.

Based on the methodology above, we excluded 2,074 interfacility transport calls, 17 mutual aid calls, 19 canceled calls, and 114 calls where the first arriving unit's response time was greater than 30 minutes. As a result, the analysis in this section included 1,978 calls.

Response Time by Type of Call

Table 7-13 breaks down the average dispatch, turnout, travel, and total response times by call type for all calls in BDAS's jurisdictions, and Table 7-14 does the same for 90th percentile response times. A 90th percentile means that 90 percent of calls had response times at or below that number. For example, Table 7-14 shows a 90th percentile response time of 13.3 minutes, which means that 90 percent of the time, a call had a response time of no more than 13.3 minutes. Figure 7-6 illustrates the components of the average response time.

TABLE 7-13: Average Response Time of First Arriving Unit, by Call Type

Call Type	Time in Minutes				Number of Calls
	Dispatch	Turnout	Travel	Total	
Breathing difficulty	1.8	1.7	3.9	7.4	122
Cardiac and stroke	1.6	1.5	4.6	7.7	186
Fall and injury	2.2	1.8	4.6	8.6	330
Illness and other	1.8	1.7	4.7	8.3	656
MVA	2.7	1.5	5.6	9.7	77
Overdose and psychiatric	2.6	1.9	4.8	9.3	254
Seizure and unconsciousness	1.8	1.4	4.6	7.7	280
Fire Assist	3.1	2.0	4.8	9.9	73
Total	2.0	1.7	4.7	8.4	1,978

FIGURE 7-6: Average Response Time of First Arriving Unit, by Call Type

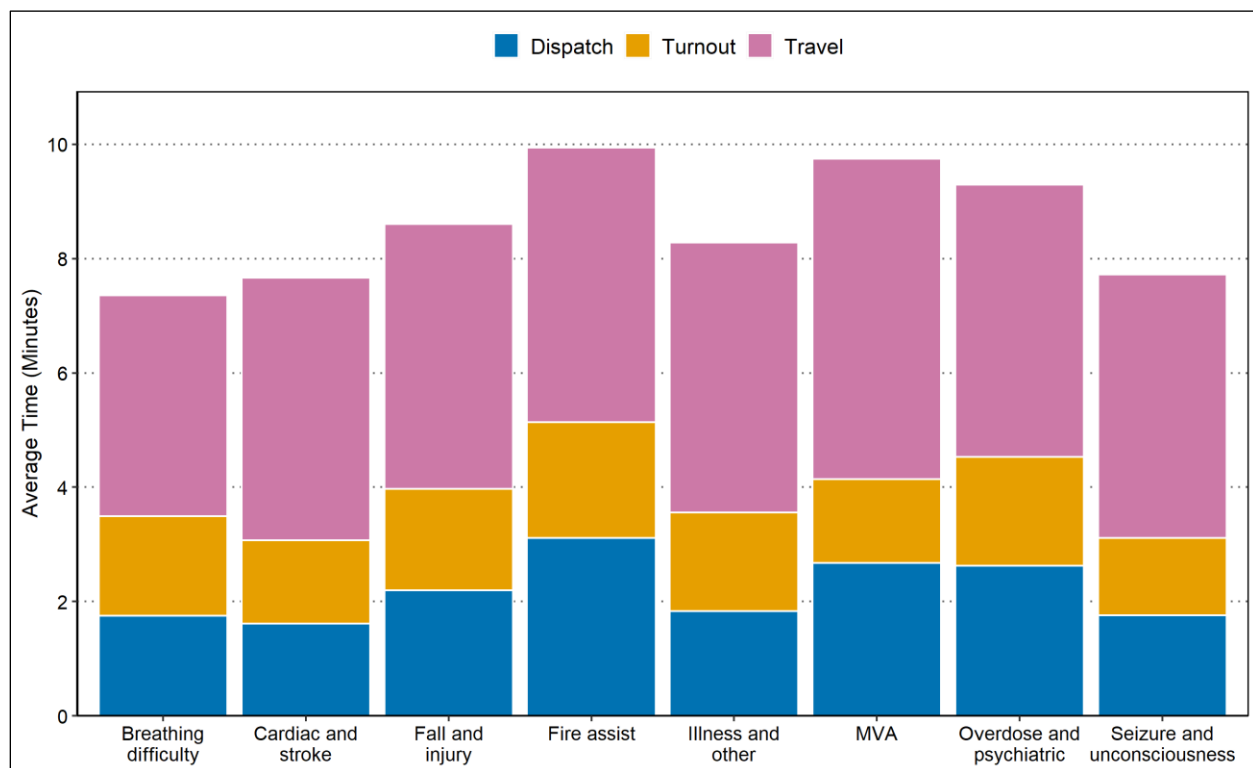


TABLE 7-14: 90th Percentile Response Time of First Arriving Unit, by Call Type

Call Type	Time in Minutes				Number of Calls
	Dispatch	Turnout	Travel	Total	
Breathing difficulty	2.9	3.5	6.1	10.2	122
Cardiac and stroke	2.6	2.8	6.8	11.8	186
Fall and injury	3.3	3.8	6.9	13.4	330
Illness and other	2.7	3.6	7.8	12.4	656
MVA	4.4	2.8	12.4	16.4	77
Overdose and psychiatric	4.4	4.1	8.7	16.5	254
Seizure and unconsciousness	2.6	2.4	7.2	11.5	280
Fire Assist	4.1	4.3	7.9	19.2	73
Total	3.0	3.4	7.7	13.3	1,978

Observations:

- The average dispatch time was 2.0 minutes.
- The average turnout time was 1.7 minutes.
- The average travel time was 4.7 minutes.
- The average total response time was 8.4 minutes.
- The 90th percentile dispatch time was 3.0 minutes.
- The 90th percentile turnout time was 3.4 minutes.
- The 90th percentile travel time was 7.7 minutes.
- The 90th percentile total response time was 13.3 minutes.

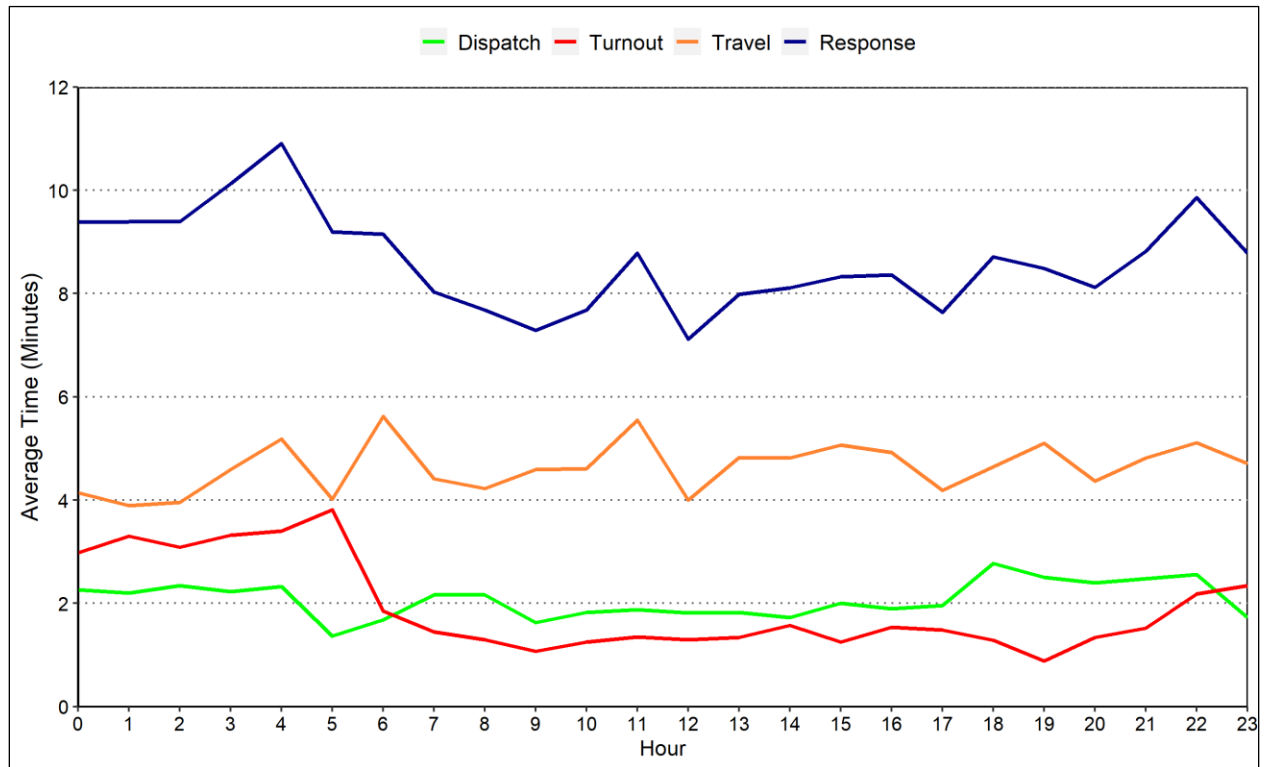
Response Time by Hour

The components of average response time by the time of day for BDAS calls are shown in Table 7-15. The table also shows the 90th appropriate percentile time. Figure 7-7 graphically displays the time components and response time by time of day.

TABLE 7-15: Average and 90th Percentile Response Time of First Arriving Unit, by Time of Day

Hour	Dispatch	Turnout	Travel	Response Time	90th Percentile Response Time	Number of Calls
0	2.3	3.0	4.1	9.4	13.4	45
1	2.2	3.3	3.9	9.4	14.5	68
2	2.3	3.1	4.0	9.4	12.5	35
3	2.2	3.3	4.6	10.1	16.3	45
4	2.3	3.4	5.2	10.9	17.5	40
5	1.4	3.8	4.0	9.2	11.2	46
6	1.7	1.9	5.6	9.2	16.2	58
7	2.2	1.4	4.4	8.0	14.2	77
8	2.2	1.3	4.2	7.7	12.4	100
9	1.6	1.1	4.6	7.3	9.7	121
10	1.8	1.2	4.6	7.7	11.4	139
11	1.9	1.4	5.6	8.8	16.5	119
12	1.8	1.3	4.0	7.1	9.9	105
13	1.8	1.3	4.8	8.0	12.1	108
14	1.7	1.6	4.8	8.1	12.3	105
15	2.0	1.3	5.1	8.3	12.8	116
16	1.9	1.5	4.9	8.4	12.3	101
17	2.0	1.5	4.2	7.6	11.3	90
18	2.8	1.3	4.6	8.7	15.1	96
19	2.5	0.9	5.1	8.5	16.5	83
20	2.4	1.3	4.4	8.1	14.4	82
21	2.5	1.5	4.8	8.8	17.2	66
22	2.6	2.2	5.1	9.9	17.4	64
23	1.7	2.3	4.7	8.8	13.4	69
Total	2.0	1.7	4.7	8.4	13.3	1,978

FIGURE 7-7: Average Response Time of First Arriving Unit, by Hour of Day



Observations:

- Average response time was between 7.1 minutes (noon to 1:00 p.m.) and 10.9 minutes (4:00 a.m. to 5:00 a.m.).
- The 90th percentile response time was between 9.7 minutes (9:00 a.m. to 10:00 a.m.) and 17.5 minutes (4:00 a.m. to 5:00 a.m.).

Response Time Distribution

Here, we present a more detailed look at how response times to calls are distributed. The cumulative distribution of total response time for the first arriving BDAS unit is shown in Figure 7-8 and Table 7-16. Figure 7-8 shows response times for the first arriving BDAS unit as a frequency distribution in whole-minute increments.

The cumulative percentages here are read in the same way as a percentile. In Figure 7-8, the 90th percentile of 13.3 minutes means that 90 percent of calls had a response time of 13.3 minutes or less. In Table 7-16, the cumulative percentage of 62.7 means that 62.7 percent of calls had a response time under 8 minutes.

FIGURE 7-8: Cumulative Distribution of Response Time – First Arriving Unit

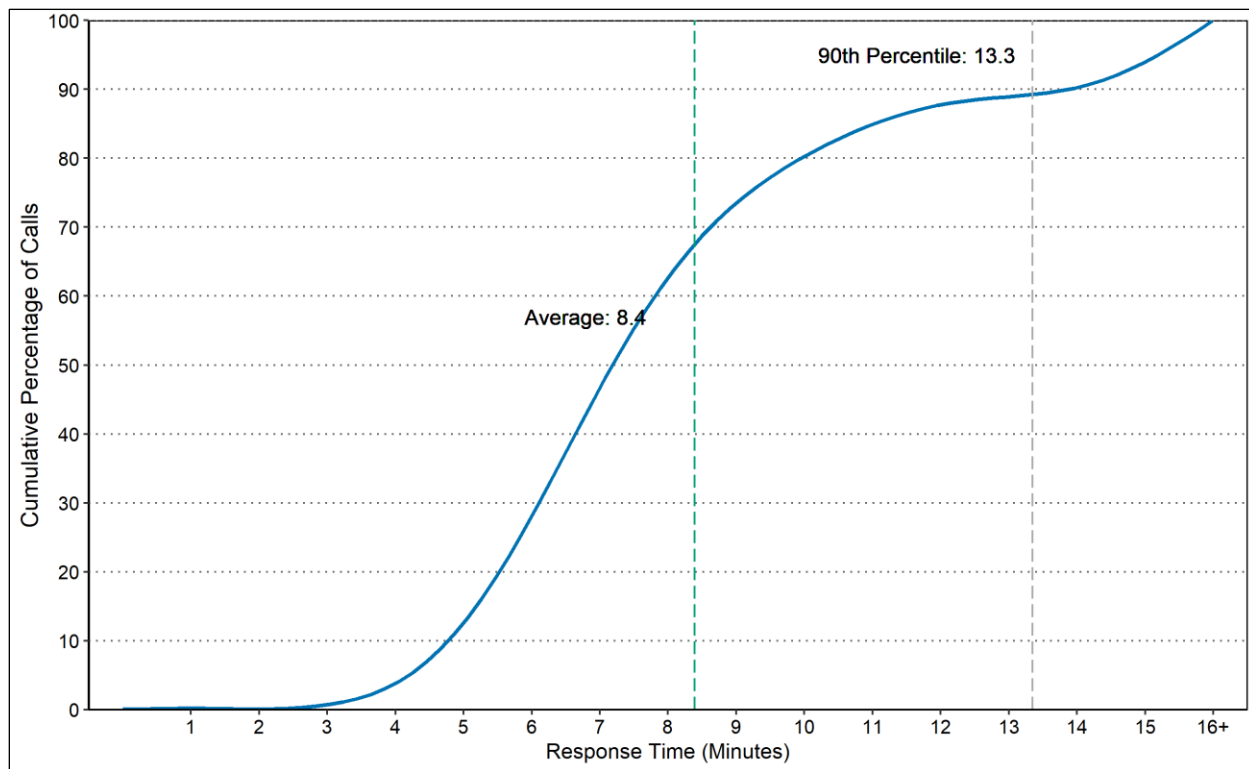


TABLE 7-16: Cumulative Distribution of Response Time – First Arriving Unit

Response Time (minute)	Frequency	Cumulative Percentage
0	1	0.1
1	0	0.1
2	2	0.2
3	13	0.8
4	55	3.6
5	165	11.9
6	327	28.5
7	360	46.7
8	318	62.7
9	221	73.9
10	130	80.5
11	74	84.2
12	69	87.7
13	37	89.6
14	24	90.8
15	29	92.3
16+	153	100.0

Observations:

- For 63 percent of calls, the response time of the first arriving BDAS unit was less than 8 minutes.

TRANSPORT CALL ANALYSIS

In this section, we present an analysis unit activity that involved transporting patients, the variations by hour of day, and the average time for each stage of transport service. We identified transport calls by requiring that at least one responding unit had recorded both a “beginning to transport” time and an “arriving at the hospital” time. Based on these criteria, we note that 23 non-EMS (fire assist and other) calls that resulted in transports are included in this analysis. In this analysis, all non-interfacility-transport calls were represented by “9-1-1 EMS.”

Transport Calls by Type

Table 7-17 shows the number of calls by call type broken out by transport and non-transport calls.

TABLE 7-17: Transport Calls by Call Type

Call Type	Number of Calls			Conversion Rate
	Non-transport	Transport	Total	
Breathing difficulty	30	93	123	75.6
Cardiac and stroke	39	148	187	79.1
Fall and injury	133	215	348	61.8
Illness and other	253	434	687	63.2
MVA	47	40	87	46.0
Overdose and psychiatric	160	135	295	45.8
Seizure and unconsciousness	78	208	286	72.7
9-1-1 EMS Total	740	1,273	2,013	63.2
Interfacility Transport	0	2,074	2,074	100.0
EMS Total	740	3,347	4,087	81.9
Fire Assist & Other Total	92	23	115	20.0
Total	832	3,379	4,202	80.2

Observations:

Overall

- 82 percent of EMS calls involved transporting one or more patients.
- On average, 9.2 EMS calls per day involved transporting one or more patients.

9-1-1 EMS Response

- 63 percent of 9-1-1 EMS calls involved transporting one or more patients.
- On average, 3.5 9-1-1 EMS calls per day involved transporting one or more patients.

Average Transport Calls per Hour

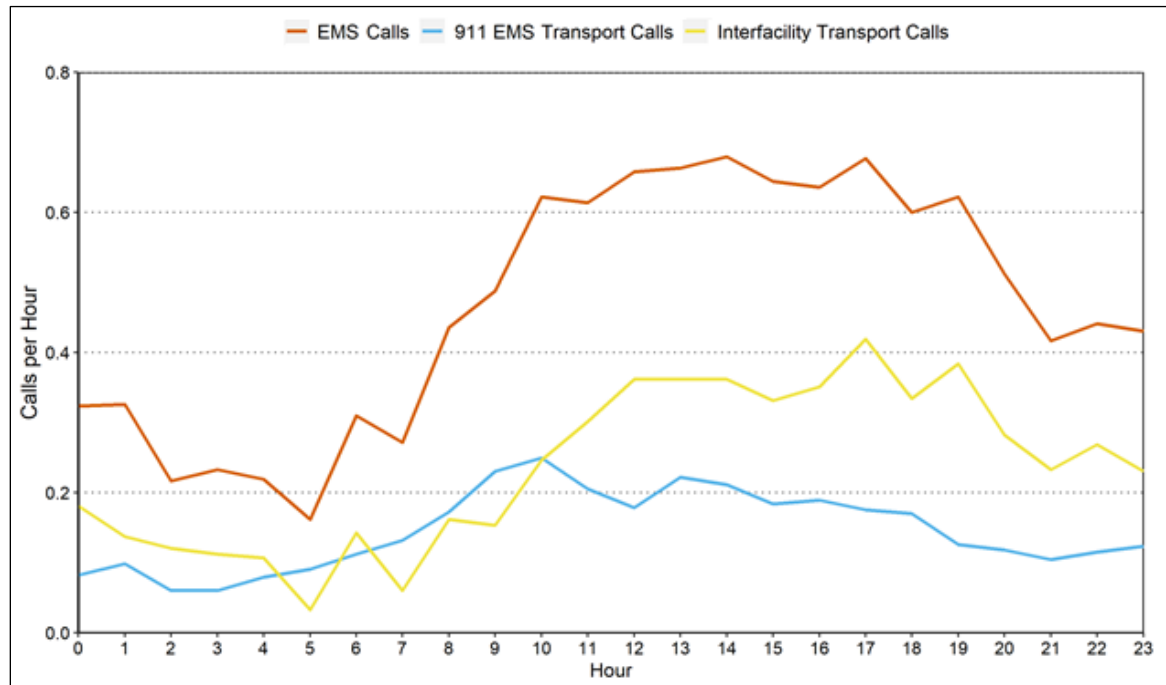
Table 7-18 and Figure 7-10 show the average number of EMS calls received each hour of the day over 2019 and the average number of 9-1-1 EMS transport and interfacility transport calls. In Table 7-18, the conversion rate measures the percent of 9-1-1 EMS calls that transported one or more patients.

TABLE 7-18: Transport Calls per Hour, by Time of Day

Hour	EMS Calls	9-1-1 Response Transport	Interfacility Transport	EMS Calls per Day	9-1-1 Response Transport per Day	Interfacility Transport per Day	9-1-1 EMS Conversion Rate
0	118	30	66	0.3	0.1	0.2	57.7
1	119	36	50	0.3	0.1	0.1	52.2
2	79	22	44	0.2	0.1	0.1	62.9
3	85	22	41	0.2	0.1	0.1	50.0
4	80	29	39	0.2	0.1	0.1	70.7
5	59	33	12	0.2	0.1	0.0	70.2
6	113	41	52	0.3	0.1	0.1	67.2
7	99	48	22	0.3	0.1	0.1	62.3
8	159	63	59	0.4	0.2	0.2	63.0
9	178	84	57	0.5	0.2	0.2	69.4
10	227	91	90	0.6	0.2	0.2	66.4
11	224	75	110	0.6	0.2	0.3	65.8
12	240	65	132	0.7	0.2	0.4	60.2
13	242	81	132	0.7	0.2	0.4	73.6
14	248	77	132	0.7	0.2	0.4	66.4
15	235	67	122	0.6	0.2	0.3	59.3
16	232	69	128	0.6	0.2	0.4	66.3
17	247	64	153	0.7	0.2	0.4	68.1
18	219	62	122	0.6	0.2	0.3	63.9
19	227	46	141	0.6	0.1	0.4	53.5
20	187	43	103	0.5	0.1	0.3	51.2
21	152	38	85	0.4	0.1	0.2	56.7
22	161	42	98	0.4	0.1	0.3	66.7
23	157	45	84	0.4	0.1	0.2	61.6

Note: The conversion rate is measured by dividing the number of 9-1-1 EMS transports by the number of 9-1-1 EMS calls. For example, between midnight and 1:00 a.m., there were 30 9-1-1 EMS transports out of 52 (118 - 66) 9-1-1 EMS calls. This gives a conversion rate of $30 / 52 = 0.577$, or 57.7 percent.

FIGURE 7-9: Average Transport Calls by Hour



Observations:

- Hourly EMS calls were highest during the day from 10:00 a.m. to 8:00 p.m., averaging between 0.6 calls per hour and 0.7 calls per hour.
- Hourly EMS calls peaked between 2:00 p.m. and 3:00 p.m., averaging 0.7 calls per hour.
- Hourly EMS calls were lowest between 5:00 a.m. and 6:00 a.m., averaging 0.2 calls per hour.
- Hourly 9-1-1 EMS transport calls were highest during the day from 8:00 a.m. to 6:00 p.m., averaging about 0.2 calls per hour.
- Hourly 9-1-1 EMS transport calls peaked between 10:00 a.m. and 11:00 a.m., averaging 0.2 calls per hour.
- Hourly 9-1-1 EMS transport calls per day were lowest between 2:00 a.m. and 4:00 a.m., averaging less than 0.1 calls per hour.
- The average hourly 9-1-1 EMS transport conversion rates peaked between 1:00 p.m. and 2:00 p.m. at 74 percent.
- The average hourly 9-1-1 EMS transport conversion rate was lowest between 3:00 a.m. and 4:00 a.m. at 50 percent.
- Hourly interfacility transports were highest during the day from 11:00 a.m. to 8:00 p.m., averaging between 0.3 calls per hour and 0.4 calls per hour.
- Hourly interfacility transports peaked between 5:00 p.m. and 6:00 p.m., averaging 0.4 calls per hour.
- Hourly interfacility transports were lowest between 5:00 a.m. and 6:00 a.m., averaging less than 0.1 calls per hour.

Calls by Type and Duration

Table 7-19 shows the average duration of transport and non-transport EMS calls by call type.

TABLE 7-19: Transport Call Duration by Call Type

Call Type	Non-transport		Transport	
	Average Duration (Min.)	Number of Calls	Average Duration (Min.)	Number of Calls
Breathing difficulty	44.8	30	45.3	93
Cardiac and stroke	67.0	39	51.7	148
Fall and injury	33.7	133	58.7	215
Illness and other	39.0	253	52.8	434
MVA	95.5	47	106.8	40
Overdose and psychiatric	54.9	160	94.3	135
Seizure and unconsciousness	36.0	78	47.7	208
9-1-1 EMS Total	46.5	740	58.4	1,273
Interfacility transport	NA	0	137.0	2,074
EMS Total	46.5	740	107.1	3,347
Fire Assist & Other Total	91.3	92	74.3	23
Total	51.4	832	106.9	3,370

Note: Duration of a call is defined as the longest deployed time of any of the units responding to the same call.

Observations:

- The average duration was 46.5 minutes for non-transport EMS calls.
- The average duration was 107.1 minutes for EMS calls where one or more patients were transported to a hospital.
- The average duration was 58.4 minutes for 9-1-1 EMS calls where one or more patients were transported to a hospital.
- The average duration was 137.0 minutes for interfacility transports where one or more patients were transported.

Transport Time Components

Table 7-20 gives the average deployed time for an ambulance on a transport call, along with three major components of the deployed time: on-scene time, travel to hospital time, and at-hospital time.

The on-scene time is the interval from the unit arriving on-scene time through the time the unit departs the scene for the hospital. Travel to hospital time is the interval from the time the unit departs the scene to travel to the hospital through the time the unit arrives at the hospital. At-hospital time is the time it takes for patient turnover at the hospital.

This table analyzes times by run. Normally, the number of runs will exceed the number of calls as a call may have multiple runs. At the same time, 8 calls lacked complete timestamps; 2 of these calls were interfacility transports. In addition, average times may differ slightly from similar averages measured per call.

TABLE 7-20: Time Component Analysis for Ambulance Transport Runs by Call Type

Call Type	Average Time Spent per Run (Minutes)				Number of Runs
	On Scene	Traveling to Hospital	At Hospital	Deployed	
Breathing difficulty	19.3	5.4	16.6	45.2	93
Cardiac and stroke	19.8	6.5	21.0	51.7	148
Fall and injury	19.4	7.5	25.0	56.2	218
Illness and other	17.8	5.6	24.7	52.7	434
MVA	18.5	7.3	72.4	103.0	47
Overdose and psychiatric	16.9	6.1	67.2	94.1	135
Seizure and unconsciousness	18.8	5.4	19.3	47.6	208
9-1-1 EMS Total	18.5	6.1	29.1	58.0	1,283
Interfacility transport	19.9	56.6	34.3	137.1	2,072
EMS Total	19.4	37.3	32.3	106.8	3,355
Fire & Other Total	19.0	11.9	43.7	77.2	24
Total	19.4	37.1	32.4	106.6	3,379

Note: Average unit deployed time per run is lower than average call duration for some call types because call duration is based on the longest deployed time of any of the units responding to the same call, which may include an engine or ladder. Total deployed time is greater than the combination of on-scene, transport, and hospital wait times as it includes turnout, initial travel, and hospital return times.

Observations:

- The average time spent on-scene for a transport 9-1-1 EMS call was 18.5 minutes.
- The average travel time from the scene of the 9-1-1 EMS call to the hospital was 6.1 minutes.
- The average deployed time spent on transport 9-1-1 EMS calls was 58.0 minutes.
- The average deployed time at the hospital was 29.1 minutes, which accounts for approximately 50 percent of the average total deployed time for a transport 9-1-1 EMS call.
- The average time spent on-scene for interfacility transports was 19.9 minutes.
- The average travel time from the scene of the interfacility transport to the destination was 56.6 minutes.
- The average deployed time spent on interfacility transport was 137.1 minutes.
- The average deployed time at the destination was 34.3 minutes, which accounts for approximately 25 percent of the average total deployed time for interfacility transports.

Transport Destination

Table 7-21 shows the number of 9-1-1 EMS transport runs broken out by destination. The number of interfacility transports between various request and destination facilities in 2019 is presented in Table 7-22.

TABLE 7-21: 9-1-1 EMS Transport by Destination

Transport Destination	Call Count
SSM Health St. Clare Hosp., Baraboo	1,242
Sauk Prairie Hospital, Prairie Du Sac	15
University of Wis. Hospitals & Clinics Authority	7
Other	19
Other	1,283

TABLE 7-22: Interfacility Transfer by Facility

Requested by	Transport Destination	Call Count
SSM Health St. Clare Hosp., Baraboo	SSM Health St. Mary's Hospital – Madison	590
	University of Wisconsin Hospitals & Clinics Authority	147
	St. Clare Meadows Care Center	61
	UnityPoint Health – Meriter – Madison	41
	Williams Middleton Memorial Veterans Hospital – Madison	33
	Golden Living Center – Wisconsin Dells	21
	Other	130
	Total	1,023
Richland Hospital	University of Wisconsin Hospitals & Clinics Authority	148
	UnityPoint Health – Meriter – Madison	90
	Gundersen Lutheran Medical Center	43
	SSM Health St. Mary's Hospital – Madison	36
	Williams Middleton Memorial Veterans Hospital – Madison	20
	Other	15
	Total	352
Upland Hills Health	SSM Health St. Mary's Hospital – Madison	87
	University of Wisconsin Hospitals & Clinics Authority	24
	UnityPoint Health – Meriter – Madison	13
	Other	11
	Total	135
Sauk Prairie Hospital, Prairie Du Sac	University of Wisconsin Hospitals & Clinics Authority	52
	SSM Health St. Mary's Hospital – Madison	42
	UnityPoint Health – Meriter – Madison	22
	Other	10
	Total	126
Other	Other	438
Total Transfer		2,074

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