City of Boise, ID

Emergency Medical Services Master Plan

January 2011

Presented by:

Emergency Services Consulting *International*
25200 SW Parkway Ave. Suite 3 • Wilsonville, Oregon 97070
www.ESCI.us • 800-757-3724

Table of Contents

Table of Figures

Acknowledgements

City of Boise

David H. Bieter, Mayor

Maryanne Jordan, Council President

Alan Shealy, Council President Pro Tem

Vern Bisterfeldt, Council Member

Elaine Clegg, Council Member

David Eberle, Council Member

TJ Thomson, Council Member

Dennis Doan, Fire Chief

Perry Oldenburg, Deputy Chief of Operations

Randy Howell, Division Chief of EMS

Aaron Hummel, IAFF Local 149 Vice President

Eric Quinn, Captain

Eric Wing, Systems Analyst

Executive Summary

The City of Boise (City) engaged Emergency Services Consulting International (ESCI) to provide an evaluation of the current delivery of emergency medical services (EMS) within the City and its contracted service areas and to provide policymakers with relevant information to formulate a plan for continued delivery of those services in the future. This document is presented as a comprehensive report of the evaluation performed and provides recommendations for future service delivery to the community. The report is segregated into three distinct sections: Evaluation of Current Conditions, Future Service Demand Projections, and Future Delivery System Models. Each of these sections is summarized in the paragraphs that follow.

Section I – Evaluation of Current Conditions

This report section begins by providing the reader with a general overview of the Boise Fire Department as well as some discussion of Ada County Paramedics since they are the current provider of transport ambulance services to the City. This section provides a general description of the primary services provided as well as an evaluation of governance and lines of authority, system financing, capital assets, staffing and personnel management, medical direction, and system performance.

Emergency Medical Services (EMS) within the City of Boise and its contracted areas is provided by the City of Boise Fire Department as the first responder agency. Patient transports by ambulance are provided by Ada County Paramedics. The Ada County Sheriff's Office Communication Center (ACSO) serves as the Primary Public Safety Answering Point (PSAP) for the entire county and is responsible for receiving a vast majority of the 9-1-1 calls placed within the County and its municipalities. In addition to the ALS services provided by BFD and ACP, five private, non-emergency/interfacility transport providers operate within the service area: Northwest Paramedics; Ada-Boise, Inc.; Injury Care; St. Alphonsus; and St. Luke's.

EMS systems are comprised of a number of disparate components that must be carefully coordinated to ensure that patient outcomes are optimized. Coordination typically involves creating goals and objectives, establishing and implementing a system-wide plan, monitoring that plan, and making improvements. Most states have authorizing statutes allowing local regulation of EMS, although few local jurisdictions provide the necessary oversight to provide appropriate safeguards for citizens.

The City of Boise actively participates in the EMS system as a provider of both BLS and ALS services to the community. While BFD provides first responder services with ACP providing transport, there is no formal contract in place nor are any funds exchanged for the services provided by BFD. Due to the lack of a formal service agreement, there exist different opinions in regard to critical components and functions such as scene management, cooperative deployment, quality assurance, funding and regulatory oversight of the system within the jurisdictional limits of the City.

Local policy makers often seek to implement regulatory oversight of at least some components of EMS. Though services are best provided only through the combined efforts of system providers and regulators, few systems have the all-inclusive oversight necessary to manage the interdependence of multiple, autonomous EMS organizations. Unfortunately the vision outlined in the EMS Agenda for the Future has not come to fruition in Ada County as the current system is fragmented and does not have a coordinated system of regulatory oversight. As a core provider of emergency medical services, the City of Boise should require that a single entity has system oversight and responsibility for the effective coordination of system elements.

NFPA 450 Guide for Emergency Medical Services and System states, "Based on the comprehensive system analysis and the identified system priorities, the system should develop a plan for ongoing system design and improvements." Importantly, planners must be able to look over the horizon in identifying environmental changes prior to those changes impacting the system. In doing so, planners should create written EMS plans, regularly review those plans, and report on the effectiveness of those plans. Plan components should, at a minimum, include;

1. Needs and resource analyses,
2. Data collection processes, and
3. A process by which data can be analyzed and evaluated to monitor the performance of the EMS system.

The ability of the Boise Fire Department to plan for and implement changes to the EMS system is clearly articulated in City Ordinance, Section 3-11-04 which confers upon the Fire Chief certain powers and duties. ESCI evaluated the presence of long-term planning documents and the contents of those documents. In that evaluation, it was learned that the planning efforts have been parochial. Neither Boise FD nor Ada County Paramedics have coordinated their efforts to achieve optimum system design and efficiency.

Long-term survival of an EMS system requires that the system be adequately funded. A poorly funded system will result in lower capital investment, deferred maintenance, and ultimately much lower service levels. Unfortunately, once service levels begin to degrade, it is both difficult and expensive to make the improvements necessary to make the system meet an appropriate standard. Although a comprehensive billing and collection analysis is outside the scope of this project, ESCI was able to conduct a cursory review of the current system costs and mechanisms in place to financially support current efforts.

The current structure for EMS in Ada County does not account for financing the entire EMS system. As mentioned previously, ACP is the transport provider in the City of Boise and, thus is the only entity allowed to bill for services provided. Although EMS first response through the fire department is a critical component of the EMS system, no provision has been established for cost recovery and therefore the EMS System is not accounting for the true cost to operate.

The delivery of fire suppression, rescue, and emergency medical services is no more effective than the sum of its parts. It requires efficient notification of an emergency and rapid response from appropriately located facilities with apparatus designed to function consistent with the organization's mission and an adequate number of trained personnel following a well-practiced plan of action. Response times are one of the most frequently used methods of measuring system performance. Policy makers and physicians require a gauge by which to measure the effectiveness of the system, and a method by which to make decisions. Unfortunately, very little medical research exists to support one response time over another. Further, because economic costs are highly sensitive to response times, a small change in response time requirements may cause a significant change in costs. Policymakers must consider carefully the balance between the economic costs, medical costs and benefits, and social costs of response time requirements.

ESCI evaluated the systems service demand (workload), resource distribution, reliability (availability for response), and actual response performance in several different ways. Emergency medical services incidents comprise a vast majority of the department's overall workload. BFD sees an average of 10,830 medical responses annually, compared to a total workload average of 16,364. In other words, EMS incidents make up approximately 66 percent of total workload annually. Overall, BFD's workload has been historically stable across all months. This is common for areas that are not high priority resort or vacation destinations. Based on workload by day of week, analysis reveals that service demand is highly variable. In 2009, the busiest days of the week were Monday and Wednesday, a change from Friday and Saturday in 2008. BFD's workload begins to increase around 6:00 a.m. and remain high until the end of the typical metropolitan activity period and then remain low during the overnight hours.

In regards to resource distribution, ESCI used Geographical Information Systems (GIS) software to map primary response locations. The analysis of potential travel time to historical incidents revealed that there are a number of areas within the City that are currently located within service gaps while a significant area of the City is redundantly covered with ALS resources, either from BFD or ACP.

The workload on emergency response units can be a factor in response time performance. The busier a given unit, the less available it is for the next emergency. If a response unit is unavailable, then a unit from a more distant station must respond, increasing overall response time. A cushion of surplus response capacity above average values must be maintained due to less frequent but very critical times, when atypical demand patterns appear in the system. Multiple medical calls and multi-casualty events are examples. Reliability of both agencies was evaluated, which revealed no unusual reliability issues.

Often the one component of an emergency services organization that receives the greatest level of attention is response performance. Most agencies that deliver emergency services to the public strive to provide that service within a minimal amount of time and to advertise exceptional response times. Unfortunately, many organizations use the average response time rather than a fractile to evaluate how well they are delivering service. BFD's overall average response time for calendar year 2009 was 4:26 while the 90th percentile response time calculated to be 6:12. ACP's overall average response time for calendar year 2009 was 6:04 while the 90th percentile response time calculated as 9:27.

Section II – Future System Demand Projections

The process of forecasting growth within the community begins with an overview of current demographic and risk categories.

According to the 2008 U.S. Census estimates, the estimated population of Ada County (including the City of Boise) was 379,350 persons. This represents a 26 percent increase in the population since 2000 when a population of 300,904 was recorded. The average annual growth rate this decade has been 0.7 percent but at times has been as high as 4.8 percent. The population within Ada County has increased only slightly this decade, but local planning officials anticipate that additional growth may continue at a higher rate than previously experienced. In developing forecasts for population growth, ESCI typically develops a forecast based on several years of census experience. For the City of Boise and Ada County, ESCI used U.S. Census Bureau data from 2000 through 2009 to create a mathematical forecast through the year 2030.

These population projections were used to generate a projection of service demand to which emergency services agencies will be required to respond. The increase in actual fire incidents is forecast to be relatively low during the study period, a reflection of trends for fire incident rates per capita and believed to be a result of improvements made in building codes and public fire education during the last several decades. EMS is expected to continue to be a predominate factor in service demand, while other emergency service calls not involving actual fires is forecasted to increase in part due to the use of automatic alarm and water flow systems. Total call volume is expected to reach just over 30,000 annual incidents by 2030.

Section III – Future Delivery System Models

The information contained in this report provides an in-depth analysis of the EMS system providing service to the citizens of Boise and the surrounding area. In the evaluation section, ESCI described the findings and provided a review of conditions or issues that require the attention of the organization. In many cases, these issues require relatively short-term effort or corrective action.

A master plan, however, is intended to provide strategies that are long term in nature. Its purpose is to identify the most critical issues the agency will face over the long haul, out as much as 20 years in the future. ESCI initiated that process in the previous section with a review of community growth, identified

risks, and evaluated service demands. This section addresses recommended long-term strategies available to the City to ensure adequate service is provided to the community through the growth and development of a healthy EMS system.

ESCI has evaluated the EMS system within the City of Boise as just that—an EMS System. ESCI is impressed that the City of Boise has successfully established a quality EMS service without the participation in EMS system oversight and planning by Ada County Paramedics. It is abundantly clear through ESCI's interviews and analysis of data, that community leaders, fire service personnel and other service providers were united in their desire to establish a "system" that would provide critical life-saving services to citizens and visitors of the city. The initiative undertaken to develop a high-quality, integrated, emergency medical system as the foundation for this new initiative requires all participants to set aside personal viewpoints in an effort to create this vital community program.

The current performance structure limits the ability of system participants to improve performance. That is why ESCI believes that economic, financial, response time and medical performance criteria must be carefully monitored. In fact, ESCI believes that some components of each option could ultimately play a role in developing an improved system design for the City of Boise.

For the purposes of this report, the City should consider how each of the recommendations will affect the current system and how those changes will affect patient care. However, the City must also consider the difficulties in monitoring and evaluating the system once the changes are made. In developing long-term recommendations for system enhancement and sustainability, ESCI first identified the most critical issues currently facing the system. Those critical issues include:

1. EMS System Fragmentation
2. Lack of Clear, Coordinated Governmental Oversight
3. Inefficiency of Ambulance Transport System
4. No Coordinated Measures of System Performance or Performance Definitions
5. Inequitable Financial Structure
6. No Single Medical Authority for the System
7. Lack of Integrated Quality Assurance Methods

In making recommendations, ESCI ha taken into account the critical issues related to the City of Boise EMS system and have analyzed the options based on those critical issues. ESCI has compared each of the options to the critical issues and has analyzed how each of the critical issues is likely to be resolved based on the option selected. The table below describes the likelihood of success for resolving each of the issues described above. A rating of "high" indicates that ESCI believes that the likelihood of success is high. ESCI has added another factor—ease of implementation—because it is believed that the ability to actually resolve the critical issues is an important consideration.

Expected Likelihood of Success—Boise EMS Options and Critical Issues

Critical Issues	Option 1 Modified Current Model: Ordinance	Option 1a Modified Current Model: JPA	Option 2 Ambulance Bid	Option 3 Fire Based Dual-Role	Option 3a Fire Based Civilian	Option 4 Ambulance Authority
1. EMS system fragmentation.	High	Medium	High	Medium	Medium	Medium
2. Lack of coordinated governmental oversight.	High	Medium	High	High	High	Low
3. Inefficiency of ambulance transport system.	Medium	Medium	Medium	Medium	Medium	Low to Medium
4. No coordinated measures of performance.	High	Medium	High	Medium	Medium	Medium to HIgh
5. Inequitable financial structure.	Medium	Medium	Medium	High	High	Medium
6. No single medical authority.	High	High	High	High	High	Medium
7. Lack of integrated quality assurance.	High	High	Medium	High	High	Medium
8. Ease of implementation	High	Medium	High	Low	Low	Low

The system is in a position to make substantive changes. Based on the analysis and on ESCI's evaluation of the critical issues facing the Boise EMS system, ESCI recommends that the system participants select Option 1, and proceed with a strong EMS ordinance that provides a structure within which the City provides strong oversight of the EMS system and places significant checks and balances in place over the performance of the ambulance provider as well the relationship between the City and County. This

option is recommended based on the belief that certain fundamental components of the system can be improved, and in fact, ESCI believes that the system should maintain those high quality components, while making improvements to the structure of the oversight process and financial processes.

Option 1a (a joint powers agreement) can work, and there may even be some short-term benefit in maintaining the status quo through a joint powers agreement, however ESCI believes that a status quo structure will not solve the system's problems because the current ambulance provider appears to not be motivated to work out issues with the City. Simply ratifying the current structure will not guarantee improved outcomes for patients, nor will it ensure improved response time, reimbursement, or any other reliability factor. It will have the effect of masking significant system issues that can and should be resolved today. Providers in the system recognize that changes are needed. That ESCI knows of, none of those recommendations have been implemented. The current system design structure, the status quo, will be less effective in making the system improvements necessary to, and minimize the impact of, the critical issues on the future of the system.

As part of ESCI's analysis, Option 2 (the private provider model) was examined as one option that could be useful in the system. While there are concerns that the private provider model might be culturally incompatible with the current participants and the processes in place within the current environment, ESCI does not believe that the current statute can prevent the City from selecting a private provider. The system's needs are related to regulation, oversight, and financial equity. Contracting for a private provider may assist the City with resolving that set of problems but may create a new set of issues to be resolved. A private ambulance provider might be more useful if the current ambulances were at capacity.

ESCI considers that Option 3 (fire department dual-role) is a viable option for the city. The fire department is capable, it has the ability to provide a competent paramedic transport, and it has a significant advantage in being able to deploy firefighter/paramedics on engine companies. First-response paramedics are important to the system because the system can structure the arrival of paramedics at the patient's side irrespective of whether the paramedics arrive on ambulances or on fire transport vehicles. This allows the service to meet reliable response time standards.

Option 3a (fire-based system using civilian, single role personnel) could work for the City. However, this type of "third service" creates an additional layer of oversight and their associated costs as well as issues related to the incumbent culture in the system. As just one example, civilians are not eligible for the Fair Labor Standards Act (FLSA) 7K exemption which is allowed for firefighters. As such the labor cost for 24-hour personnel and some 12-hour personnel may be higher than existing ambulance employees. That is why the third service option eliminates the cost savings related to the continued use of cross-trained, dual-role personnel.

Option 4 (Ambulance Authority) assumes that the City would be able to organize an ambulance (or EMS) authority with adjacent districts and departments, including Ada County and the current ambulance provider. The ambulance authority would set rules and standards for an area exceeding the geopolitical boundaries of the city. The consideration of an ambulance authority reflects the concept that there may be an opportunity to create horizontal integration as well as vertical integration in the system. An ambulance authority would provide a more integrated system, but there could be issues related to the method and structure of the governance model for the authority.

ESCI expects that, if its recommendations are adopted, the ultimate result of the system improvements suggested by this document will be 1) the development of either a strong local ordinance and/or professional services agreement, followed by 2) an incremental improvement in performance and efficiency in the current system, followed by 3) a comprehensive ability to manage and monitor the performance of the system because of the reports and data that are available to the system, and 4) an improvement to the medical oversight component by aggregating medical oversight capabilities in the systems. The following implementation schedule is provided to give policy makers the needed guidance in moving forward with the recommendations presented in the body of this report.

Phase 1: Up to three months.

1. Create the framework around developing the ambulance ordinance (or, as appropriate, the intergovernmental agreement).
2. Establish performance standards, including response times, billing rates and reliability, training, vehicle and maintenance standards, experience requirements, and other requirements aligned to the analysis sections above. Develop the process in concert with city attorneys, fire agency personnel, and purchasing management if necessary.

3. Establish timelines for implementation and review.
4. Craft and review the ordinance using contemporary professional standards and local nuances.
5. Establish information sessions with elected officials and department heads.
6. Pass the ordinance using city's non-emergency ordinance rules.

Phase 2: Three to six months.

1. Collaborate with elected officials, city staff, city attorneys, and ambulance providers to describe standards prior to implementation period.
2. Provide and post standards on city web site and with known ambulance providers.
3. Provide notice of implementation period to ambulance providers and assist them with understanding and meeting requirements.
4. Update education programs and format reporting requirements.
5. Identify contingency plans for provider failure.

Phase 3: Up to 12 months

1. Develop performance-monitoring process in concert with local providers.
2. Apply monitoring structure for system changes.
3. Establish appropriate feedback structures for emergency and non-emergency providers.
4. Reevaluate results of Phases 1 and 2.
5. Monitor system and dispatch and provider performance monthly and make improvements when needed.

The ESCI project team began collecting information concerning the EMS system in the City of Boise in June, 2010. The team members recognize that the report contains an extremely large quantity of information and ESCI would like to thank the elected officials of the City of Boise as well as the staff of Boise Fire Department and all those that participated in this process for their tireless efforts in bringing this project to fruition. ESCI would also like to thank the various individuals and external organizations for their input, opinions, and candid conversations throughout this process. It is ESCI's sincere hope that the information contained in this report is utilized to its fullest extent and that the emergency services provided to the citizens of Boise and the surrounding areas are improved by its implementation.

Section I – Evaluation of Current Conditions

The City of Boise (City) engaged Emergency Services Consulting International (ESCI) to provide an evaluation of the current delivery of emergency medical services (EMS) within the City and its contracted service areas and to provide policymakers with relevant information to formulate a plan for continued delivery of those services in the future. This report details the current organizations involved in the delivery of EMS to the City of Boise and begins with an evaluation of those organizations that allow the formulation of future feasible options

Organizational Overview

The delivery of emergency medical services within the City of Boise is a semi-coordinated effort between Boise Fire Department (BFD) and Ada County Paramedics (ACP). BFD provides Basic Life Support (BLS) and Advanced Life Support (ALS) first response services while ACP provides ALS transport services. Throughout this report each organization will be discussed individually where appropriate. In addition, the current "EMS System" will be evaluated in totality regarding the delivery of services to the community. *NFPA (National Fire Protection Association) Standard 450* defines an EMS system as, "A comprehensive, coordinated arrangement of resources and functions, which are organized to respond in a timely, staged manner to medical emergencies regardless of their cause."[1]

The components of an EMS system include every aspect of the delivery of healthcare outside the confines of a definitive care facility, including:

- Access to emergency resources (9-1-1 or other conduit).
- Delivery of appropriate medical instructions to the caller if necessary.
- Dispatch of appropriate resources.
- Response by medical personnel including first responders, specialty equipment, and transportation resources.
- On-scene treatment of the condition.
- Packaging of the patient for transport.
- Transport of the patient to a definitive care facility while providing continuing treatment.
- Delivery of the patient to definitive care staff at the receiving facility.

[1] *National Fire Protection Association (NFPA) 450: Guide for Emergency Medical Services and Systems*. 2009 Edition.

Each component listed above serves a specific purpose and is inherently connected to each of the other components. This report details the EMS system operating within the City of Boise and was completed with input from key stakeholders from each agency; review of documentation; and review of applicable policy and procedure documents, agreements, ordinances, and statutes; as well as the collective experience of the ESCI project team.

Boise Fire Department

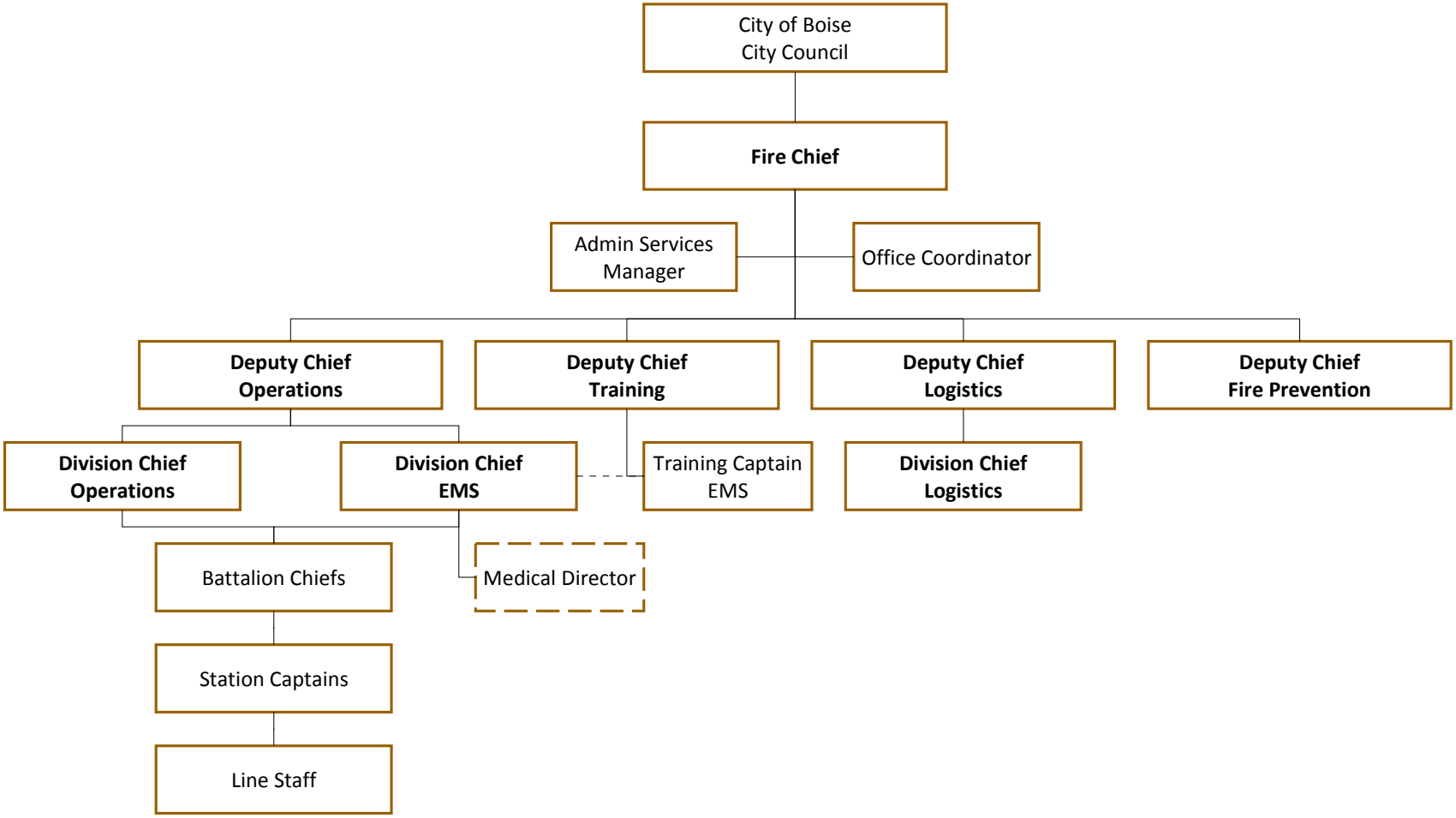
Boise Fire Department is a standing department of the City of Boise and provides fire suppression, technical rescue, hazardous materials, and both basic and advanced life support EMS first responder services from 18 facilities distributed throughout the City and two contracted service areas. The department provides these services through a fully career staff of 280[2] (including 24 EMT Paramedics) personnel within five divisions: Administration, Operations, Training, Fire Prevention, and Logistics. The total service area covers approximately 128 square miles and a resident population of approximately 241,314[3] including the City of Boise, North Ada County Fire Rescue (Garden City and unincorporated areas), and Whitney Fire District areas.

BFD has been responding to medical emergencies within the City since the 1930's. Basic Life Support services were implemented in 1975 and ALS engines were implemented in 2006 as a pilot program designed to evaluate the effectiveness of ALS first response within the City. This program has expanded to the current four ALS engines housed at Stations 8, 12, and 14 and 22 (as well as Station 6 based on available staffing).

Organizationally, BFD maintains a command staff of eight personnel (not including clerical staff) as shown in the following organizational chart.

[2] As of the time of data collection.
[3] Based on data obtained for the U.S. Census bureau and estimates of the contracted service areas.

Figure 1: BFD Organizational Structure



Clerical and administrative support services are provided by an office coordinator, administrative services manager, and four administrative assistants assigned to each of the four operating divisions of the department; Operations, Training, Prevention, and Logistics.

Recommendation:

- Additional clerical staff should be considered for the Operations Division, particularly in regard to the delivery of emergency medical services.

Ada County Paramedics

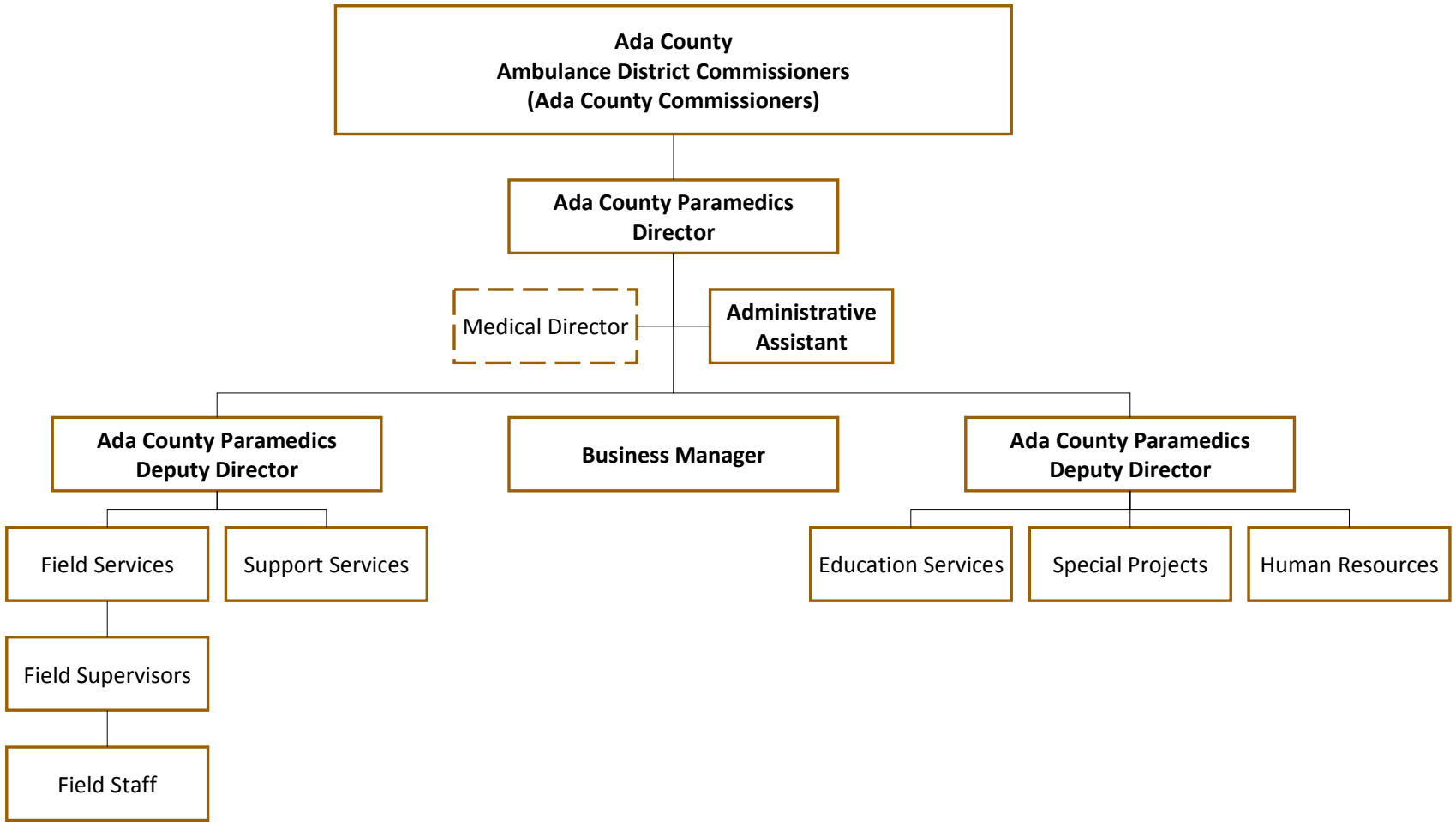
Ada County Paramedics (ACP) was formed in 1975 as a third-service agency to provide ALS transport ambulance services to all of Ada County, including the cities of Boise, Meridian, Eagle, Kuna, Star, and Garden City. Operating as a 'third-service' provider simply means that the agency is neither fire-based nor private. The organization is comprised of approximately 150[4] personnel and is funded through the Ada County Ambulance Tax District and through collection of transport user fees, motor vehicle fees and membership program fees.

ACP co-locates several transport ambulances in BFD facilities as well as houses units in independent facilities throughout the City. ACP unit locations within and in proximity to the City of Boise are identified in Figure 25. In total, ACP operates seven 24-hour transport units, three 12-hour transport units, and one unit that operates 24 hours per day but is staffed by two 12-hour shifts.

In order to fund ambulance services to Ada County, the Ada County Ambulance Tax District was established in 1975. Today, this funding comprises approximately 34 percent of ACP's current operating budget of $13.2 million, with remaining revenues coming from transport user, motor vehicle and membership program fees. Organizationally, ACPD maintains a command staff of three personnel (not including clerical staff) as shown in the following organizational chart.

[4] As of the time of data collection.

Figure 2: ACP Organizational Structure



The City of Boise EMS System

As noted in previous paragraphs, Emergency Medical Services (EMS) within the City of Boise and its contracted areas is provided by the City of Boise Fire Department as the First Responder Agency. Patient transports by ambulance are provided by Ada County Paramedics. The Ada County Sheriff's Office Communication Center (ACSO) serves as the Primary Public Safety Answering Point (PSAP) for the entire county and is responsible for receiving a vast majority of the 9-1-1 calls placed within the County and its municipalities. Telecommunicators are trained in Emergency Medical Dispatch and can provide both instructions to callers as well as enhanced patient information to responding units. In March 2010, the ACSO Communications Center converted from the Medical Priority Dispatch System© (MPDS) Card System to the MPDS ProQA© software system. This upgrade was an enhancement to the system providing better compliance for the assistance provided to callers and the agency's quality assurance programs.

For incidents within the City of Boise and its contracted service areas, BFD responds to all dispatched medical incidents. Four BFD stations house ALS engines (a fifth ALS engine is on duty when additional personnel are available) and the remaining apparatus respond as BLS resources. ACP resources are dispatched simultaneously with BFD to provide additional ALS personnel and transport services to the appropriate definitive care facility.

In addition to the ALS services provided by BFD and ACP, five private, non-emergency/interfacility transport providers operate within the service area: Northwest Paramedics; Ada-Boise, Inc.; Injury Care; St. Alphonsus; and St. Luke's. Although technically a part of the EMS system, these providers were not evaluated as a component of this report.

Although medical direction is provided for each agency independently, EMS Agencies throughout the County enjoy collaboration through regularly scheduled meetings. Once each month, the Physicians Advisory Council on EMS (PACE), a committee tasked with ensuring quality pre-hospital medical care is delivered throughout the county. The meeting is attended by representatives from each agency participating in the overall EMS system including emergency responders, hospital personnel and representatives from the two air medical response firms. While there are no documents governing the work of this committee, the ability to communicate regularly is an asset to the system. The most recent

accomplishment of this committee was the development of system-wide Standard Written Orders that have been adopted and implemented by all ALS providers within Ada County, including BFD.

Although the intent of this group is the overall quality of the delivery of EMS to the community, no formal documents exist as to the formal organization of the group. Additionally, the Medical Directorate, a group consisting of the medical directors and an agency representative of each ALS entity within the county, no formal documentation has been developed outlining the organization or function of this group.

In ESCI's opinion, the two existing groups should remain but each should develop formalized documents that outline the organization, membership, duties, responsibilities, and authorities of the respective group. For instance, the Medical Directorate should develop organizational documents that place overall medical direction and quality management issues with this group while PACE should be re-organized into more of an operational and deployment discussion and decision-making group. As the system continues to be enhanced, chair positions of each group should be rotated among the participating agencies.

One of the most prevalent controversies facing the current EMS system is overall authority. No formal agreement exists between the City and Ada County for the provision of EMS. There have been several legislative attempts to establish such authority but with multiple stakeholders involved in the process and the diverse types of systems established throughout the state, all draft proposals have failed.

Recommendation:

- The PACE committee should be re-organized and formalized into a group focused on clinical issues within the system as a whole as well as a method of communication between all system participants.
- The Medical Directorate should be formalized and adopt organizational documents that outline the duties, responsibilities and authorities concerning consistency in medical direction, clinical oversight, and quality assurance/management among EMS agencies.

Governance and Lines of Authority

There are three primary types of EMS delivery models throughout the United States,

1. Fire-based First Response with a Third Service transport agency, (8.6%)
2. Fire-based First Response with Fire-based Transport, (67.2%)
3. Fire-based First Response with Private/Commercial transport agency, (11.6%)

The percentages noted above indicate the percentage of the U.S. population served by each type of delivery system. The EMS delivery System in Ada County is one configuration type of the three that EMS Systems utilize throughout the country. The genesis of the system can be traced to the implementation of a tax levy authorized under Idaho statute by the Ada County Board of Commissioners in 1975. During this era, EMS in the United States was considered to be in its infancy. In fact, prior to the implementation of the Emergency Medical Services Systems Act of 1973, patient transports in many jurisdictions were provided by local mortuaries. The EMS Act defined the essentials elements of an EMS System.

During this same period, the role of the fire department has dramatically changed and today is recognized as the single largest provider of pre-hospital care in the country both in terms of its first-responder role but also from the perspective of providing patient transport services. Today more than 90 percent of career and combination fire departments deliver emergency medical care services[5]

In 1995, the "EMS Agenda for the Future" was published by the National Highway Traffic Safety Administration. At the time of its publication, the document was considered to be a visionary blueprint for EMS system development. One of its visions is that "EMS will be integrated with other health care providers and public health and public safety agencies." [6]

EMS systems are comprised of a number of disparate components that must be carefully coordinated to ensure that patient outcomes are optimized. Coordination typically involves creating goals and objectives, establishing and implementing a system-wide plan, monitoring that plan, and making improvements. Most states have authorizing statutes allowing local regulation of EMS, although few local jurisdictions provide the necessary oversight to provide appropriate safeguards for citizens.

[5] Report on EMS Field Experiments. (2010). *Firefighter Safety and Deployment Study.* Moore *et al.*
[6] National Highway Traffic Safety Administration – *EMS Agenda for the Future*. 1995

The City of Boise actively participates in the EMS system as a provider of both BLS and ALS services to the community. While BFD provides first responder services with ACP providing transport, there is no formal contract in place nor are any funds exchanged for the services provided by BFD. Due to the lack of a formal service agreement, there exist different opinions in regard to critical components and functions such as scene management, cooperative deployment, quality assurance, funding and regulatory oversight of the system within the jurisdictional limits of the City.

Local policy makers often seek to implement regulatory oversight of at least some components of EMS. Though services are best provided only through the combined efforts of system providers and regulators, few systems have the all-inclusive oversight necessary to manage the interdependence of multiple, autonomous EMS organizations. In many cases, allowing the marketplace and historical precedence to craft optimal EMS systems is largely unsuccessful. Part of those failures result from the inability of participants to coordinate autonomous organizations and concurrently manage their independence. That is why strong, governmental, regulatory oversight is necessary.

Unfortunately the vision outlined in the EMS Agenda for the Future has not come to fruition in Ada County as the current system is fragmented and does not have a coordinated system of regulatory oversight. As a core provider of emergency medical services, the City of Boise should require that "…a single entity has system oversight and responsibility for the effective coordination of system elements."[7]

According to Idaho Administrative Procedures Act (IDAPA) 16, Title 02, Chapter 13, the Idaho Board of Health and Welfare is the authorized agency under Section 56-1017 to adopt rules concerning the administration of the Idaho Emergency Medical Services Act. As such, the Department of Health and Welfare (DHW) promulgated "Section 16.02.03 – Rules Governing Emergency Medical Services". These rules apply more to the operation and regulation of existing EMS systems more than they apply to authority to provide service.

Idaho Code Title 31 (Counties and County Law), Chapter 39 (Ambulance Service) speaks more to the authority to establish, tax, and operate an EMS system. "Section 31- 3901 – Authorization to Establish Ambulance Service – Special Levy" states,

[7] *NFPA 450: Guide for Emergency Medical Services and Systems*. 2009 Edition.

> *The boards of county commissioners in the several counties are hereby authorized, whenever existing ambulance service is not reasonably available to the inhabitants of the county or any portion thereof, to procure an ambulance and pay for the same out of any funds available and to establish an ambulance service to serve the areas, which do not have an existing ambulance service reasonably available, both within and outside the cities and villages in their respective counties, and to levy a special tax not to exceed two hundredths percent (.02%) of the market value for assessment purposes on all taxable property within the county to support the same. Providing ambulance service is a governmental function.*

The State of Idaho has given each county the authority to establish an ambulance service to provide services throughout the county, including municipalities, and to levy a tax to pay for the operation of that service. In addition, the state has given the municipalities the authority to 'allow' the county ambulance to operate within their municipal boundaries while clearly indicating that the tax levied for operation of the service would continue regardless of whether or not the city allowed the ambulance service to operate within the municipality.

"Section 31-3908 – Ambulance District Authorized" allows resident property owners to petition the Board of County Commissioners to establish an ambulance district. The text of the statute reads,

> *…When the board of county commissioners has ordered the creation of an ambulance service district, pursuant to the provisions of this section, such district is hereby recognized as a legal taxing district, and providing ambulance service is a governmental function.*
>
> *(3) The board of county commissioners shall be the governing board of an ambulance service district created pursuant to this section, and shall exercise the duties and responsibilities provided in chapter 39, title 31, Idaho Code.*
>
> *(4) In any county where an ambulance service district is created as provided herein, the board of county commissioners is authorized to levy a special tax, not to exceed four-hundredths percent (.04%) of market value for assessment purposes, except as authorized by paragraph (a) of this subsection, upon all taxable property within the district for the purposes of the district, but the levy otherwise authorized in section 31-3901, Idaho Code, shall not be made on taxable property within the district.*

In accordance with Idaho Code Sections 31-3901 through 31-3908, Ada County received a certified petition to create an ambulance district on September 30, 1975. A public meeting was held on October 23, 1975, as required to the statute, and an Emergency Medical Services District was created on October 24, 1975, by resolution of the Ada County Board of County Commissioners. This information was provided to ESCI by ACP in the form of a copy of *Resolution No. 140* dated October 24, 1975. ESCI

submitted a Freedom of Information Request (FOIA) to Ada County requesting any and all ordinances, resolutions, or other documentation related to the formation of the ambulance district as well as formation and authority of ACP. The request was returned noting that no such documentation existed within County records.

The State of Idaho is considered to be a 'Dillon's Rule' state rather than 'home rule.' Home rule is the delegation of power from the state to its sub-units of governments and that power is typically limited to specific fields and subject to judicial interpretation. Home rule allows municipalities to operate autonomously and limits state interference in local issues. Dillon's Rule is based on a court decision in Iowa in 1868 and states that local governments only have the following types of powers:

- Those expressly granted by the state
- Those necessarily or fairly implied in or incident to the powers expressly granted
- Those essential to the declared objects and purposes of the corporation, not simply convenient, but indispensable

The second part of Dillon's rule states that if there is any reasonable doubt whether a power has been conferred on a local government, then the power has not been conferred.

There are 31 states that are considered to be Dillon's Rule states, including Idaho. Ten states are considered to be home rule states, eight states are considered Dillon's rule states but only for certain types of municipalities, and the state of Florida remains in flux due to conflicting authority issues.[8]

Currently, ACP is providing ambulance transport services in most of Ada County (The Kuna Fire Protection District provides patient transport services within their service area) and, in accordance with statute, is levying a tax throughout the County to operate that system, including within the City of Boise. It is the expressed opinion of Ada County that the County has jurisdictional authority over the provision of emergency medical services throughout Ada County, including the City of Boise. Conversely, the City of Boise contends that the City has jurisdictional authority based on statutory language that the City, "may authorize said ambulance service to operate within the boundaries of said city

[8] Information on Dillon's Rule and Home Rule obtained from the National League of Cities.

Although Idaho is technically classified as a 'Dillon's Rule' state, the Idaho Supreme Court has held that Idaho Constitution Article 12, §2 serves as a direct grant of the police powers to Idaho cities.[9] Michael Moore has written in the Idaho Law Review that,

> "*Article 12, §2 of the Idaho Constitution is a grant of local police powers to Idaho cities. It is direct, self-executing, and requires not additional grant of authority from the Idaho legislature. To this extent Idaho cities do have a grant of constitutional home rule powers. This section, however, is not a general grant of authority in all areas of municipal concern, but is limited to the police powers of the state…*"[10]

Further, "Section 31-3905 – Ambulance Service - - Operation Dependent upon Resolution of Each City - - Right to Tax Unaffected by Non-service" states,

> *"All cities and villages within the county, upon resolution duly passed and approved and presented to the board of county commissioners, may authorize said ambulance service to operate within the boundaries of said city or village, but the failure of any such governing body to authorize said ambulance service to operate within the limits of said village or city, shall not affect the right of the board of county commissioners to levy the tax as hereinbefore provided."*

Based on research conducted by ESCI, the firm could find no evidence that the City of Boise has ever passed a Resolution authorizing the provision of ambulance service by any organization including Ada County. It is recommended that the City Council authorize and pass a Resolution for the provision of ambulance service as the statute states. In addition, the City should ensure that the Resolution provides for a contract or professional services agreement which defines the scope of services to be provided.

Despite the value of ensuring comprehensive oversight in the EMS system, the City must consider its legal ability to provide that oversight. It is beyond the scope of this report to interpret State Law with respect to the City's authority to enact or enforce rules or regulations regarding ambulance service delivery within its jurisdictions. It is recommended that City obtain appropriate legal counsel to determine if its "police powers" granted to it by the State Constitution provides sufficient latitude for EMS governance and oversight.

The City should exercise its statutory power to regulate the delivery of emergency medical services within its geo-political boundaries to ensure that EMS will be integrated with other health care

[9] State v. Robbins, 59 Idaho 279, 284-86 (1938). Clyde Hess Distributing Co. v. Bonneville County, 69 Idaho 505, 510-12 (1949).
[10] Moore, M. Idaho Law Review. "Powers and Authorities of Idaho Cities: Home Rule or Legislative Control?"

providers, public health and safety agencies and that it will improve community health, result in more appropriate use of acute health care resources and recognize that EMS is the emergency medical safety net for the citizens of Boise.

Recommendation:

- The City of Boise should authorize the provision of ambulance transport services within its geo-political boundaries through a formal resolution.
- The City should develop a comprehensive service agreement that outlines the City's expectations of service delivery within the City as well as defines roles, responsibilities, and authorities.

Planning for Emergency Medical Services

NFPA 450 Guide for Emergency Medical Services and System states**, "**Based on the comprehensive system analysis and the identified system priorities, the system should develop a plan for ongoing system design and improvements."[11]

In general, Idaho statutes regulating ambulance services provide minimal requirements for system planning, however, EMS agencies participating in an EMS system should develop plans for creating ongoing improvements to the system to maintain service levels that are both effective and appropriate, to identify environmental changes, and to project future needs. The plan components work to ensure the system provides the appropriate balance between high quality patient care and system funding.

The planning process for EMS systems is a critical component to ensuring the ongoing success of those systems and to ensure that patient outcomes continually improve. While the mission and the vision statements of the authority overseeing EMS provide the strategic direction, the EMS plan provides the foundation by which the goals of the system can be achieved. Importantly, planners must be able to look over the horizon in identifying environmental changes prior to those changes impacting the system. In doing so, planners should create written EMS plans, regularly review those plans, and report on the effectiveness of those plans. Plan components should, at a minimum, include;

1. Needs and resource analyses,
2. Data collection processes, and
3. A process by which data can be analyzed and evaluated to monitor the performance of the EMS system.

Planning for System Design

The system must be designed to ensure the highest possible levels of patient care given the funding, human resources and ability of the organizations to provide services congruent with the constituents' demands.

The vast majority of EMS research regarding system design and planning has focused on resource deployment and meeting response times that would allow personnel to effectively treat cardiac arrest

[11] NFPA 450 Guide for Emergency Medical Services: 5.7 EMS System Planning

patients. In fact, various national organizations have adopted response time standards based on cardiac arrest studies including those found within NFPA Standard 1710 which recommends that BLS units arrive at the scene within four minutes or less and ALS units arrive at the scene within eight minutes or less. [12] From a pure response time perspective, a benefit of the fire department is its ability through proper planning and deployment of resources to "stop (or modify) the response time clock" and render effective patient care intervention. Due to this capability fire service planners have the opportunity to provide strategic direction with respect to overall EMS system design.

The ability of the Boise Fire Department to plan for and implement changes to the EMS system is clearly articulated in City Ordinance, Section 3-11-04 which confers upon the Fire Chief certain powers and duties including but not limited to:

- The Managerial authority for fire, medical treatment, hazardous materials and other rescue emergencies;
- Subject to Idaho State Code and Boise City codes and policies, the ability to enter into contracts and agreements that include but are not limited to medical transport, performance measures, resource deployment, scene management and dispatch services;
- Formulation of plans and programs pertaining to the Department's functions and to implement and enforce such as approved by the Mayor and Council.

Planning for response to emergency situations must be done well in advance of an emergency. Once that pre-planning is accomplished, the system participants must continuously strive to improve the performance of the emergency system. The challenge is to unceasingly evaluate and improve as many system components as possible, with the end result being better customer service and reduced life and property loss. In most EMS systems, the planning challenges are related to the system's ability to ensure that multiple, autonomous organizations—each with different missions—are able to ensure that the needs of the EMS system are effectively identified and considered.

ESCI evaluated the presence of long-term planning documents and the contents of those documents. In that evaluation, ESCI learned that the planning efforts have been parochial. Both Boise FD and Ada County Paramedics have not coordinated their efforts to achieve optimum system design and efficiency. Anecdotal reports were provided to ESCI regarding the perceived lack of coordination between system stakeholders with regard to resource deployment and system re-engineering. This was reinforced

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

through multiple stakeholder interviews and feedback sessions. It appears from our review that previous joint master planning efforts between Boise Fire Department and the Ada County EMS were either discontinued or not structured to achieve a cohesive systems approach. As just one example of the discontinuous efforts by the agencies, although Ada County Paramedics did participate in stakeholder interviews and did provide information relative to the study, they not participate in developing the Request for Proposals, selection of the successful bidder, or share any costs of conducting the study.

Another example of the lack of a cohesive and coordinated planning process was identified during interviews with field providers who expressed concerns regarding the dilution of Advanced Life Support skills due to an over-saturation of field practitioners. This is to be expected when separate autonomous organizations make independent decisions regarding resource deployment. Although there are no national *standards* for the number of paramedics that an EMS System needs or how they should be deployed, recently released research indicates that the optimal deployment of personnel is one ALS provider on a first response unit with a transport unit staffed with one ALS and one BLS personnel. The issue has not been resolved by national bodies and will require further research as to what the right number of paramedics should be in a single EMS system balancing coverage versus financial resources. A locally-established, data-driven and continually analyzed process will provide for proper system planning, improve performance, guide sound decisions for further system refinements and resolve issues such as the appropriate number of trained personnel and level of certification.

Recently however, there appears to be a desire among senior leadership of the Boise Fire Department and Ada County EMS to more closely collaborate on EMS systems planning. Certain initiatives have been successful in creating the foundation for systems planning. In particular, consistent representation by system participants and stakeholders in both “PACE” and the Medical Directorate monthly meetings are evidence of a renewed interest in system planning. These meetings have been fruitful in creating a comprehensive platform of standing medical orders for utilization by all system participants although, as mentioned previously, ESCI recommends that both of these groups be re-organized and formalized with bylaws and specific membership and responsibilities. This process also had developed into the creation of uniform training initiatives relative to the implementation of the new medical protocols. It is evident that data is captured within the various elements of the system and discussions are beginning to evolve

with respect to common data elements and data collection methods which will allow uniform system performance review.

Discussions are occurring among EMS agencies in the county and at the state level with regard to EMS governance. Legislative initiatives have been explored and it is reported that further legislative review is anticipated. As such, key stakeholders within Ada County in the provision of emergency medical services would be best served by joint planning efforts; a master planning approach would provide cohesive answers to system policy questions, allowing them to be driven analytically and locally. As management guru Peter Drucker has espoused, "You can either be the architect of change or the tenant of the results". Given the current political landscape, it appears that all EMS stakeholders have a time dependent opportunity to develop a system roadmap for governance, performance and future planning.

Recommendations:

- The City of Boise should create a plan that includes the basic elements of EMS system design, including data collection and reporting, medical oversight, financial management, communications, facilities, and equipment. The plan should include a needs-and-resources analysis and a data collection process and should serve to coordinate providers in the system. This should be done through a countywide master planning process.
- Continue the formal communications process that involves system participants on a regular basis. The process should include a structured methodology for the delivery and transmittal of statistical data and information.
- The City of Boise should establish language in ordinance that requires ambulance service participation in the planning process.
- Create an ongoing system planning process that includes members from each licensed 911 response agency in the EMS system.
- All system participants must develop a process as part of the system plan, which describes methods of capturing and analyzing uniform system data.
- Customer service reports based on reliable quality indicators should be developed as part of the system's long-term plan.

System Financing

Long-term survival of an EMS system requires that the system be adequately funded. A poorly funded system will result in lower capital investment, deferred maintenance, and ultimately much lower service levels. Unfortunately, once service levels begin to degrade, it is both difficult and expensive to make the improvements necessary to make the system meet an appropriate standard. Although a comprehensive billing and collection analysis is outside the scope of this project, ESCI was able to conduct a cursory review of the current system costs and mechanisms in place to financially support current efforts.

Analyzing transport system financing typically involves identifying transport information, receiving payer source information, understanding the accounts receivable turnover rate (lag times between when the service was provided and when the payment was received), identifying degree of contractual allowance (difference between the invoice and the payment from a capitated payer source such as Medicare), and defining other financial/operational ratios. Although ACP has other sources of revenue such as membership programs, levies, and motor vehicle registration fees, *this* analysis is intended only to make projections (not predictions) of ambulance transport revenue. Other ratios can include cost per transport mile, net revenue per patient transport, bad debt expense, private payor mix as compared to captivated payors, other third party payors, and unit-hour utilization ratio.

System Revenue

The current structure for EMS in Ada County does not account for financing the entire EMS system. As mentioned previously, ACP is the transport provider in the City of Boise and, thus is the only entity allowed to bill for services provided. Although EMS first response through the fire department is a critical component of the EMS system, no provision has been established for cost recovery and therefore the EMS System is not accounting for the true cost to operate. Some jurisdictions have implemented first-responder fees to offset the role of the fire department. Others including Kootenai County, ID and Pinellas County, FL utilize an EMS tax levy as a source of revenue for reimbursing multiple first responder agencies. More jurisdictions such as Santa Clara County, CA and Salem, OR have moved towards a contract for services agreement established with the ambulance agency in which the transport provider offsets a portion of the cost of first response services provided by the fire department.

Transport distribution is generally considered the percentage of revenues generated by the various service levels provided by the transport agency. The ability to accurately capture service levels is important recognizing that the Centers for Medicare Services requires all providers to submit charges based on level of service provided (effective January 1, 2006).

The following information was provided by ACP and is based on billing and collection data from fiscal year 2009.

Figure 3: Revenue by Service Level - FY 2009[13]

Ada County Emergency Medical Services System Revenue Source by Service Level – FY 2009			
Service Level	**Number**	**Revenue**	**%**
BLS Non-Emergency	27	$9,450.00	<1%
BLS Emergency	4,717	$2,944,500.00	25%
ALS 1 Non-Emergency	7	$5,250.00	<1%
ALS 1 Emergency	8,436	$7,777,575.00	67%
ALS 2 Emergency	772	$790,475.00	6%
Specialty Care Transport (SCT)	2	$2,300.00	<1%
Treatment without Transport	0	$0.00	0%
Total Transports	13,961		
Mileage			
Total Mileage	70,959	$945,577.00	
Memberships	421	$25,878.00	
Supplies/Procedures/Treat &Release		$1,836,986.00	
Total Gross Revenue Billed		**$14,337,991.00**	
Less Contractual Adjustments		$4,890,144.00	
Less Refunds		$75,784.00	
Potential Net Revenue		$9,372,063.00	
Actual Net Revenue		$7,032,414.00	
Differential		$2,339,649.00	
Net Collection Rate		75.04%	
Gross Collection Rate		49.05%	

Based on the information noted above, the net revenue per transport is calculated to be approximately $503.72. The following figure shows how that calculation is made.

[13] Net and gross collection rates include revenue from all sources except taxes.

Figure 4: 2009 Revenue per Call

Net Revenue	Transports	Net Revenue per Call
$7,032,414.00	13,961	$503.72

Not every call to which the agencies respond results in a transport. One measure of the function of the EMS system is the ratio of responses to transports. According to the information provided, the number of responses as compared to the transports is listed in the table below.

Figure 5: Transport Ratio

Patient Transports	Non-Transports	Total Calls for Service
13,961	6,315	20,276

Using the same methodology as determining cost per transport, a cost per incident can be approximated at $648.00 per incident.

The transport ratio (percent of patients who are transported divided by the total number of responses) is approximately 68 percent compared to the national averages of between 47-52 percent of gross billables. This value should be monitored regularly since a high transport ratio may mean that system resources are being used unnecessarily, while a low transport ratio may mean that providers are failing to transport patients when appropriate. Responses to a high number of traffic incidents will typically lower the transport ratio because many calls are made to 9-1-1 after motor vehicle crashes, often without knowing the condition of the patient.

Ambulance Rates

Ambulance rates are important because they represent one of the critical funding sources for emergency medical services systems. The transport rates represent the agencies' value system in determining the amount of the costs in the system to recover.

Figure 6: Ada County Ambulance Fees[14]

Ada County Paramedics Fee Schedule	
Base Rates	
BLS	$625.00
ALS I	$925.00
ALS II	$1,025.00
ALS Non-Transport	$400.00
Specialty Care Transport (SCT)	$1,125.00
Paramedic Intercept	$290.00
Non-Resident Fee	$110.00
St. Luke's Assist	$290.00
St. Al's Heliport Transfer	$100.00
Special Transport	$75.00
Waiting Time – Per 15 Minutes	$40.00
Mileage Rates	
Inclusive per Mile	$13.50

The figure above is simply a listing of what Ada County Paramedics is charging for the services provided. These figures alone are of relatively little value in determining the appropriateness of these rates. Without an in-depth analysis of ACP's billing and cost recovery efforts, a definitive opinion in regards to service fees cannot be provided. For illustrative purposes, the figures below compare ACP rates against other EMS agencies from across the country. Comparisons have been made to the following jurisdictions.

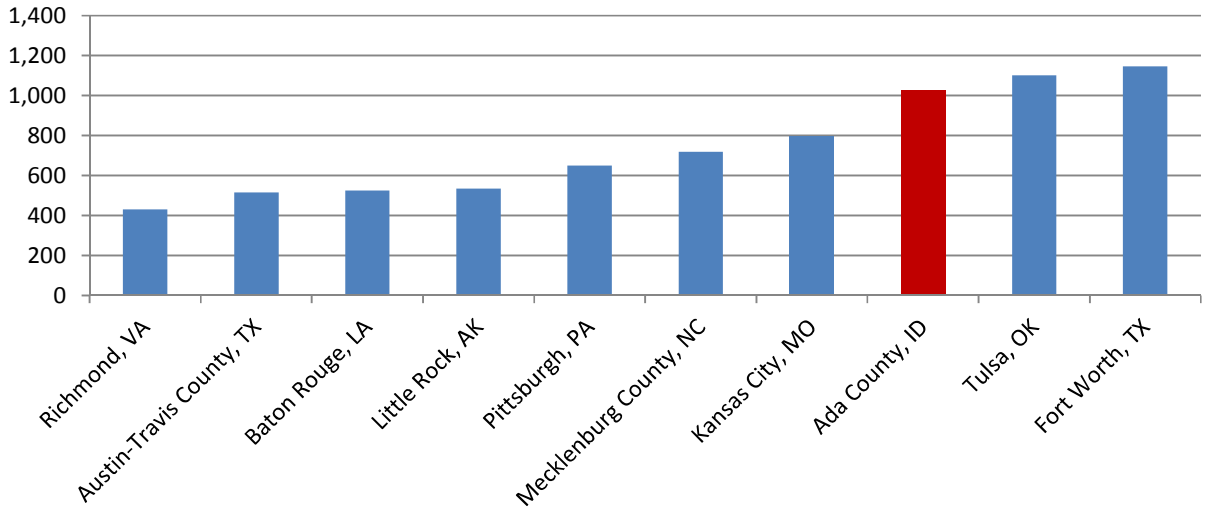
Figure 7: Comparison Jurisdictions

Jurisdiction	Population	Type	Governance	Tax Support
Richmond, Virginia	197,733	Third Service	Authority	Subsidy
Ada County, Idaho	300,904	Third-Service	County	Levy
Pittsburgh, Pennsylvania	334,563	Third-Service	City	General Fund
Tulsa, Oklahoma	393,049	Third-Service	Authority	Subsidy
Baton Rouge, Louisiana	412,852	Third-Service	City	General Fund
Kansas City, Missouri	441,545	Fire-Based	City	General Fund
Little Rock, Arkansas	500,000	Third Service	Authority	Subsidy
Fort Worth, Texas	534,694	Third-Service	Authority	Subsidy
Mecklenburg County, North Carolina	695,378	Third-Service	Authority	Subsidy
Austin-Travis County, Texas	820,916	Third-Service	Authority	Subsidy

Each of the comparable systems noted in the figure above is tax supported either through an independent levy for EMS or through the general fund of the jurisdiction within which they operate.

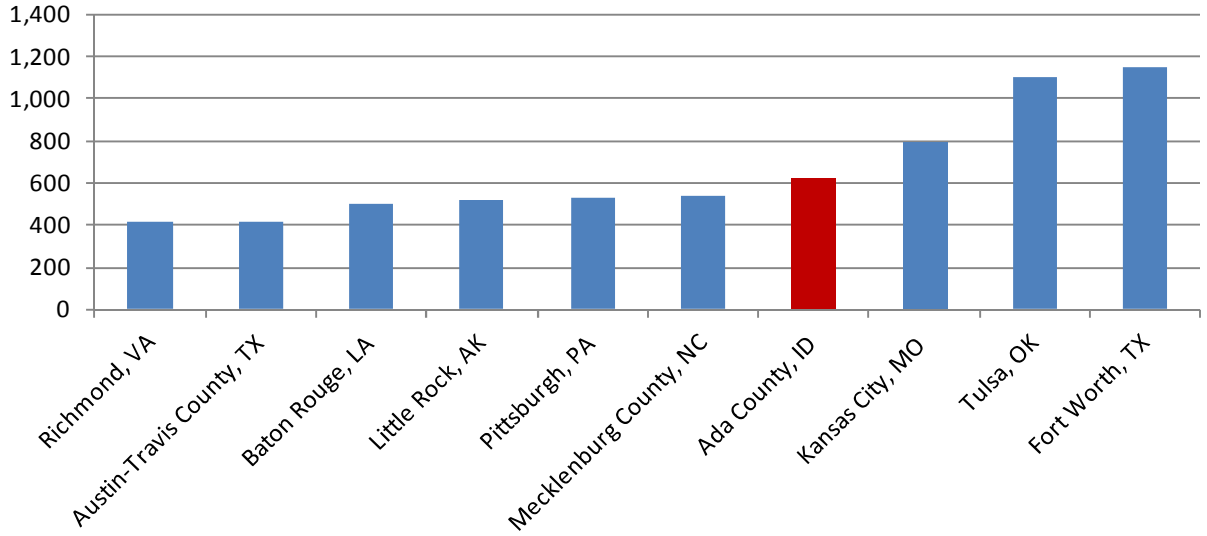
[14] Rates effective 10/1/08 and will be reduced by three percent October 1, 2010.

Figure 8: ALS Emergency Comparison[15]



As can be seen from the figure above, although population for Ada County is on the lower end of the scale of comparative jurisdictions, the ACP rate for ALS emergency transports is at the high end of the scale. Likewise, the rate charged for BLS Emergency transports is on the high end of the scale.

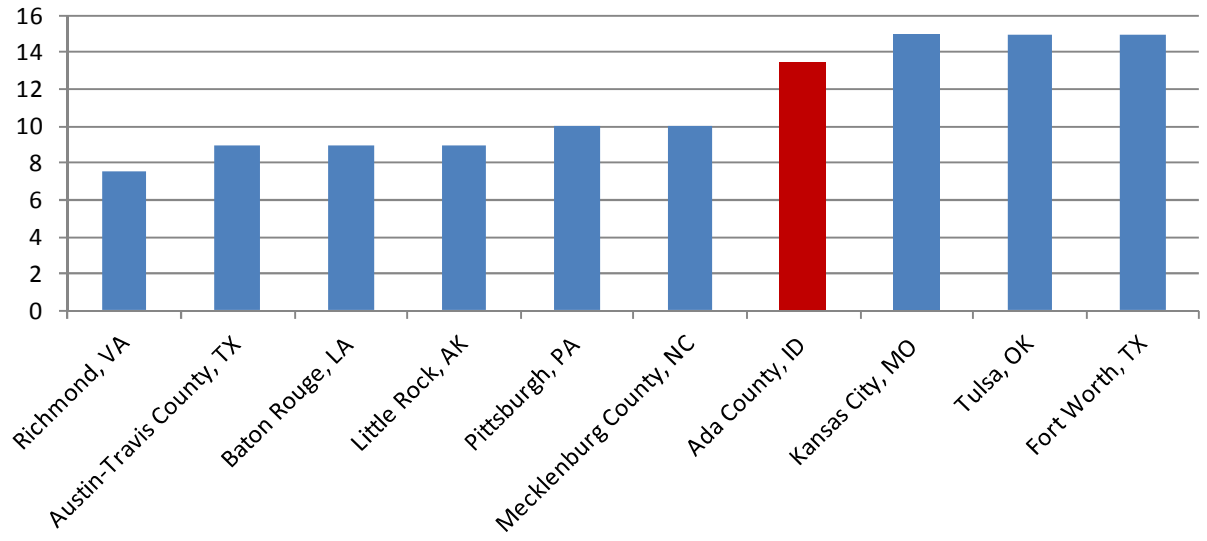
Figure 9: BLS Emergency Comparison



[15] ACP ALS I and ALS II rates were averaged to produce a single ALS rate for comparison purposes.

The same is true of ACP's charges for mileage, as illustrated below.

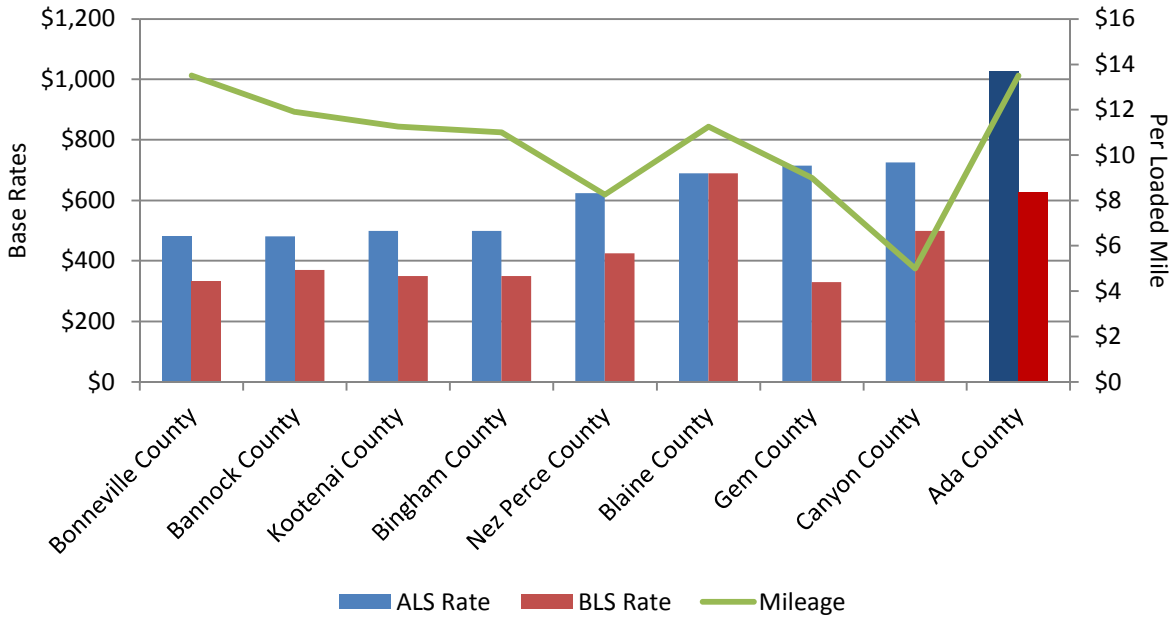
Figure 10: Mileage Rate Comparison



Although the three rates are at the high end of the scale of comparable jurisdictions, it should be noted that these figures do not consider the total budget, land area covered, incident volume, or subsidy received by the individual agencies. No consistent budget information is available from each of the jurisdictions presented in the comparables but suffice it to say there is a wide range of variability in the aforementioned components. The most important fact to remember is that the cost of operating an emergency medical services system is not reliant on simply the rates charged by the provider. Rather, a system that relies on user fees to offset the tax burden within the community would be expected to have a higher user fee schedule in order to recover a larger share of the total operating costs to those utilizing the system.

The preceding figures compare ACP against other similar operations across the country with varying populations and demographics. The following figure compares ACP to other counties within Idaho.

Figure 11: Idaho Transport Rate Comparison



ACP's transport charges are higher than most other jurisdictions surveyed within Idaho. Many jurisdictions rely on a tax subsidy to support the delivery of EMS services. Some communities utilize these taxes to subsidize multiple components of the system such as medical direction, communications and first responder agencies. Others limit the subsidy strictly to the provider of ambulances. Ada County is typical of the latter relying on a dedicated EMS district tax to subsidize the ambulance transport provider. The levy is based on property tax values and is constrained through Idaho statute by limiting increases in mill rates to no more than 3 percent annually. Approximately 34 percent of the operating revenue for the system is provided through the taxing district. The following figure illustrates how revenue is distributed.

Figure 12: Total Revenue by Category

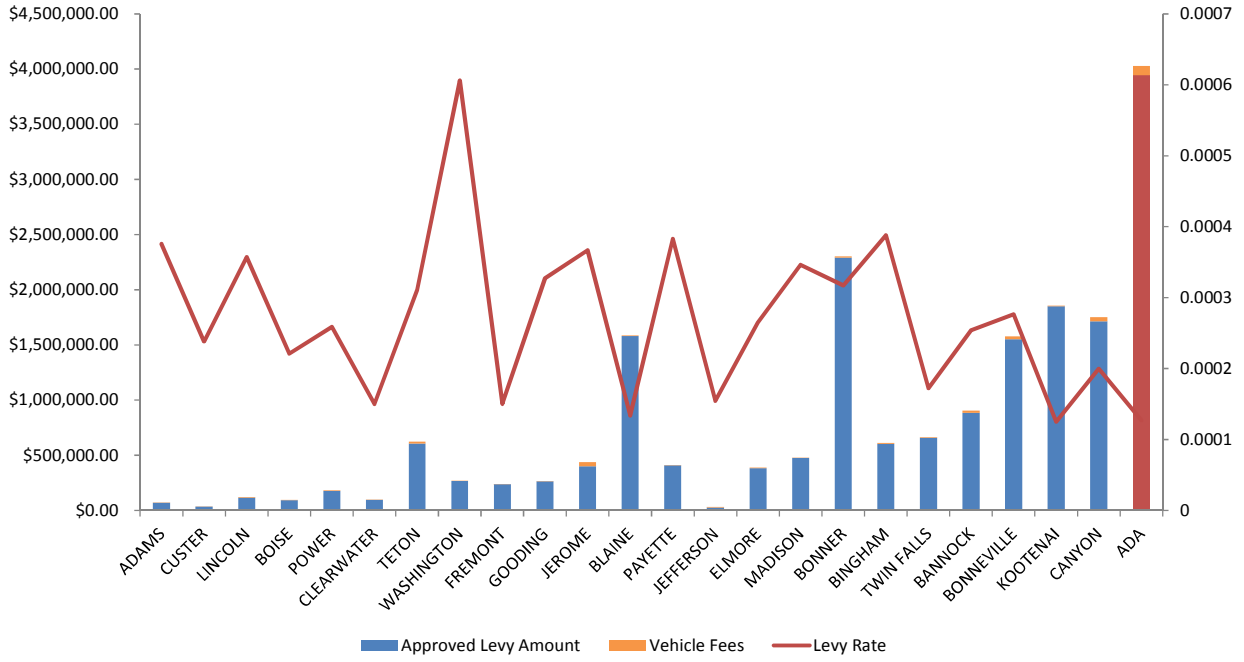
Revenue Source	Total	%
EMS Tax District	$3,723,579.00	34.3%
Transport Revenue	$7,032,414.00	64.70%
Motor Vehicle Fees	$83,748.00	>1.0%
Membership Revenues	$25,878.00	>1.0%
Total	**$10,781,871.00**	**101.0%**

The figure above does not include revenues collected during 2009 for prior fiscal year accounts receivables collections or fund balance interest income. Based on information received from ACP, the

total revenue from intergovernmental sources (sales tax and vehicle registration monies) along with investment interest is estimated at approximately $500,000 for 2009.

Within Idaho, there are 24 counties that have chosen to implement an ambulance tax as allowed under the statutes. The following figure compares the millage rate and total public revenue of ACP to other counties within Idaho that also have an ambulance tax in place.

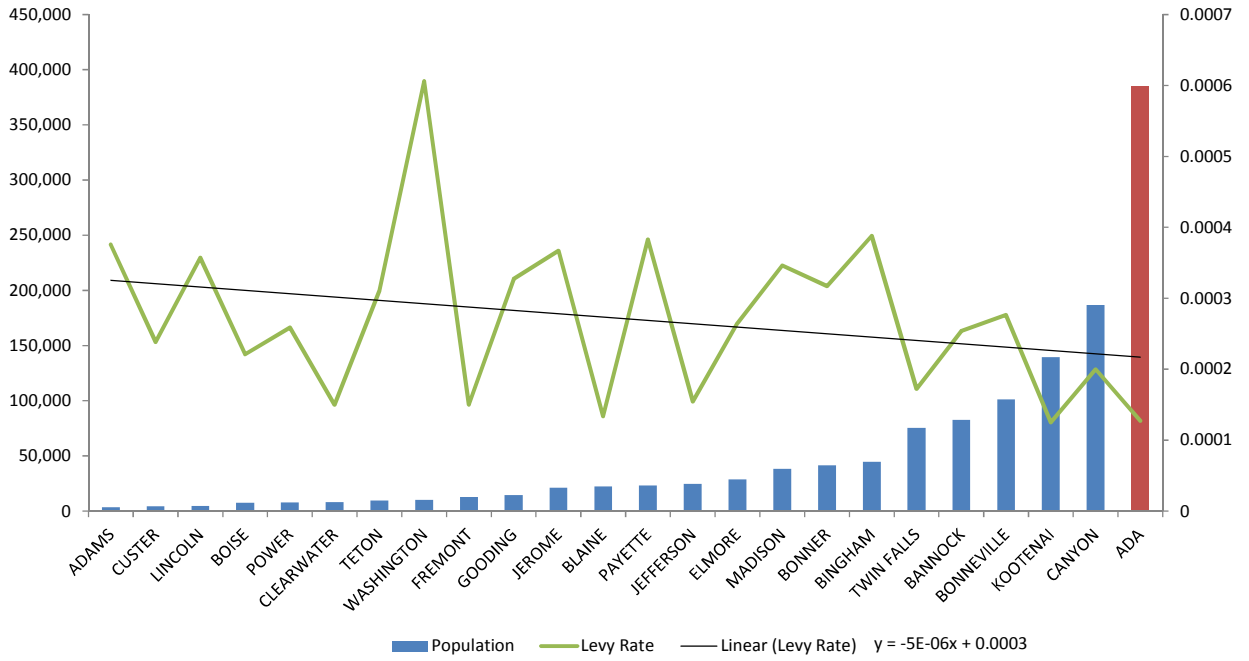
Figure 13: Comparison of EMS Levies and Total Public Revenue[16]



From the information illustrated in the figure above, Ada County has the highest total revenue from the established ambulance tax district as well as the highest revenue from motor vehicle registration fees but the second lowest levy rate, behind Kootenai County. Based on population estimates from the 2009 census, it is understandable that Ada County has the highest revenue of any other county within Idaho using an ambulance tax to fund EMS. The following figure illustrates how population relates to tax rates across Idaho.

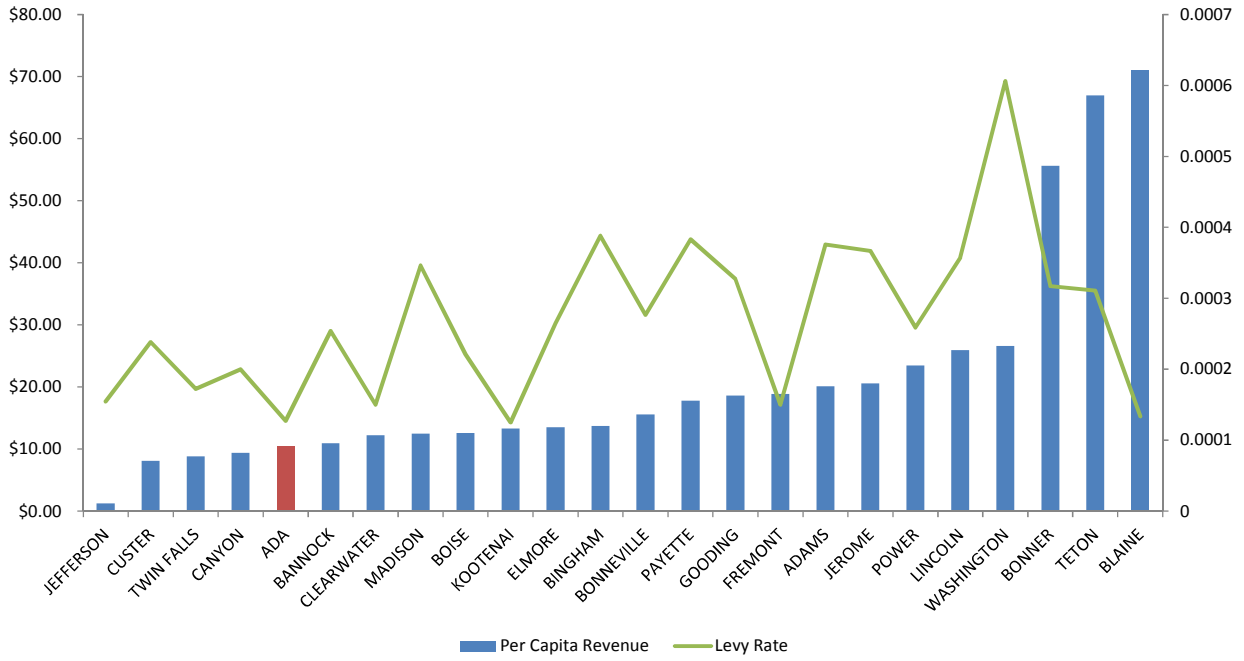
[16] Information provided by the Idaho Office of EMS.

Figure 14: Comparison of EMS Levy to Population



As illustrated, Washington County has the highest ambulance tax rate at 0.000606111 while the lowest rate is maintained by Kootenai County at 0.000125078. The average ambulance tax rate across Idaho is calculated at 0.000270936 compared to Ada County's rate of 0.0001273, a difference of -0.000143636. Statewide, the trend is a lower tax rate as population increases. Although total public revenue and ambulance tax levy is one way to look at the cost of services to the community, based on the wide range of populations across the 24 counties levying an ambulance tax, how revenue is distributed across the population is a more accurate picture of public cost. The following figure illustrates a per capita cost of total public revenue.

Figure 15: Comparison of EMS Levy to Per Capita Revenue



As can be seen from the figure above, Ada County has the fifth lowest per capita total public revenue ($10.47 per capita) of the 24 counties in Idaho levying an ambulance tax.

If ACP were to increase its levy to the average, the system would see an increase in subsidy from its current level of $3,723,579 to approximately $5,108,264. Assuming that the organizational budget would remain the same, user fees could be adjusted downward accordingly. The relationship between the level of user fees and tax levies to support EMS services should be one of public policy recognizing that the tax levy results in a higher proportional costs being borne by all taxpayers for system support. Conversely, high user fees transfers a greater percentage of the costs directly on the users of the system those who are transported by ambulance. In addition, system efficiencies through coordinated deployment of resources among all system participants could substantially reduce the amount of annual capital reserves currently being surplused by ACP.

Capital Assets

Inadequate facilities for housing personnel and apparatus detract from a department's mission. Limited space can significantly impact the available options for resource assignment, hinder the ability to maintain a well-trained and fit workforce, and may affect member and employee morale. The primary

functions that take place within the station environment should be closely examined and adequate, efficient space for all functions should be provided. Some examples include:

- Housing and cleaning of apparatus and equipment
- Administrative office duties where necessary
- Training
- Fitness
- Residential living that is gender compatible for on-duty members

While this list may seem elementary, the lack of dedicated space compromises the ability of the facility to support these functions, and can detract from its primary purpose. In addition to the tax levy, the city subsidizes ACP through provision of space for housing ambulances and personnel at stations 2, 3, 8, and 10. The Opticom® system which allows emergency responders to activate traffic signals for faster response times is maintained by the City including all upgrades. ACP utilizes this system without participating in any of the system's costs.

Boise Fire Department

BFD maintains 19 stations throughout the City of Boise, Whitney Fire Protection District, and North Ada County Fire and Rescue District with the newest, Station 17, built in 2009. Only two other stations are less than ten years old and six others are less than 20 years old. The average age of all BFD operational facilities is 26.3 years. In addition to the fire stations, BFD has a warehouse facility and shares an administrative office complex with the Boise Police Department. The following figure summarizes the BFD facilities.

Figure 16: Facility Overview and Condition Summary

Station Number	Year Built	Condition	Comments	Staffing
1	1980	Good		BFD
2	1996	Excellent	Dive Rescue	BFD
2A		Fair	ACP Medic 57 utilizes this station	ACP
3	1978	Good	Remodeled in 2000. Houses ACP M53	ACP
4	1972	Good	Remodeled in 2006	BFD
5	1912	Fair		BFD
6	1991	Excellent	ALS Engine when staffing is available	BFD
7	2003	Excellent	Rescue 7	BFD
8	1956	Good	ALS Engine. Houses M68	BFD, ACP
9	1975	Good		BFD
10	1994	Excellent	Houses ACP M60	BFD, ACP
11	1979	Excellent	Remodeled in 2004	BFD
12	1998	Excellent	Hazardous Materials Unit. ALS Engine	BFD
14	2007	Excellent	ALS Engine	BFD
16	1967	Fair	Previous NACFR station	BFD
17	2010	Excellent	Hazmat Unit	BFD
18	1996	Good	NACFR station – not staffed	
19		Good	AARF Unit (Airport)	BFD
20	1999	Excellent	NACFR station – not staffed	
22		Fair	Whitney Fire District station – ALS Engine	BFD

Ada County Paramedics

ACP operates from 12 facilities spread across Ada County. Four of those facilities are co-located with area hospitals or medical centers; four facilities are owned by BFD; two facilities are owned by Meridian FD; and two facilities are owned by ACP. Three of ACP's stations (M54, M58, and M63) are in extremely close proximity of either a BFD or Meridian FD station. Additionally, M68 is located in a BFD station that also houses an ALS engine company. A lack of coordinated planning between Ada County Paramedics and Boise Fire Department has created a system with multiple areas of redundancy in regard to resource deployment. Locating stations so closely together creates redundancy and waste.

The combination of user fees and tax levy to support the EMS System in Ada County is singularly limited to the ambulance transport provider and does not take into consideration the services provided by other components of the system including first responder services such as those provided by the Boise Fire Department. It should be recognized that the majority of transports occur from within the jurisdictional boundaries of the City of Boise and a substantial percentage of the tax levy is generated

from properties within the City. The net effect is that the City generates proportionately higher revenues than other jurisdictions to support the EMS System without any ability to determine how those services are provided and whether or not they are being provided efficiently or effectively within the city.

Recommendations:

- The City of Boise should develop an EMS System deployment plan that includes both first response and transport resources. The plan should reflect effective and efficient utilization of EMS System resources.
- The City of Boise should include in any service agreement that the transport agency be required to adhere to the City's established EMS System deployment plan in an effort to maximize efficient utilization of resources, reduce service gaps and eliminate redundancies. Any resource changes will require authorization from the City.
- The City should seek to recover a portion of its first responder costs resulting from efficiencies implemented through its deployment plan from the transport provider agency.

Staffing and Personnel Management

Regardless of how physical resources are deployed, without sufficient human resources to staff those field units, no system can function effectively. Nor is simply providing adequate numbers of personnel enough to ensure the system is functioning as intended. Other aspects of the human resources function are also important, such as ensuring minimum standards of qualification and credentialing, sufficient and relevant training and educational programs, and safety and wellness of personnel.

Staffing Resources

Administrative positions excluded, BFD consists of 246 personnel distributed throughout the City's staffed fire stations. Operations-level personnel work a 48/96 schedule with three shifts that staff 19 engines, 3 aerial trucks, 3 aircraft fire/rescue (ARFF) apparatus, and three command vehicles. Personnel also cover one heavy rescue, one quick response rope rescue vehicle, five wildland vehicles, one dive unit, one technical rescue unit, and one hazardous materials unit by cross-staffing.

All BFD personnel are required to be certified at least to the Emergency Medical Technician – Basic level, and 28 personnel have achieved the EMT-P credential. These personnel are assigned to the four-to-five ALS engines the City has deployed based on available staffing. Those apparatus without EMT-P personnel are staffed with EMT-Basic or EMT-Advanced (EMT-A) personnel, of which BFD currently has five credentialed EMT-A staff. Although these EMT-A personnel are able to complete more advanced skills that EMT-B personnel, proper distribution of EMT-P apparatus throughout the system, accompanied by quick response of BLS personnel, is considered the ideal deployment, as will be discussed later in this report.

The department's role in the delivery of EMS is well documented with approximately 66 percent of total emergency responses consisting of emergency medical incidents. During on-site observations and interviews, it was noted that the only administrative and support position dedicated to EMS is the Division Chief of EMS. One additional FTE is assigned to the Training Division with specific responsibilities for EMS education, but the EMS Chief has no direct responsibility for coordination of that program. There are no staff support personnel and there are no permanent field supervision of EMS activities. Many fire departments have established ALS trained officer level positions that have an active role in Operations and improve communications in the areas of patient care follow up, EMS training, and respond to major medical incidents. The position would work closely with the on duty

Battalion Chiefs. Additional ALS first response units will make this position essential for the management of the EMS Program. As the department continues to develop its emergency medical services division it is evident that a significant amount of time and energy must be expended on preparing for any expanded service delivery of EMS.

ACP consists of 130 field direct care providers distributed throughout 12 stations. Each ALS unit is staffed with a minimum of one Paramedic and one EMT, but many times two Paramedics are on each unit.

Recommendations:

- BFD should restructure the EMS Program by assigning the EMS Training Captain as a direct report to the EMS Division Chief.
- BFD should implement an ALS Field Officer/Supervisor on each shift to improve communication and focus on the delivery of quality emergency medical services. These positions should report to the Division Chief – EMS.

Qualifications and Credentialing Requirements

All EMS systems should have processes in place that ensure that all personnel meet the minimum qualifications. In addition, administrators should strive to provide personnel the appropriate information to maintain their credential. The state of Idaho is currently undergoing changes to the rules that govern EMS systems and their personnel. Idaho APA 16, Title 01, Chapter 03, Section 500 addresses licensure of personnel at the Emergency Medical Responder (EMR), Emergency Medical Technician (EMT), Advanced EMT (AEMT), and Paramedic levels.

Personnel submitting an application for initial licensure must be affiliated with a licensed EMS service functioning at or above the level of license being applied for. In addition, each individual must present a valid form of government issued identification, undergo a criminal background check, and submit the current licensure fee. Each applicant must also pass a written examination at the level of licensure.

For renewal of an existing license, personnel must submit the appropriate documentation to the Idaho EMS Bureau prior to license expiration. No extensions grace periods are allowed under the statute. Renewal periods adhere to the following schedule.

Figure 17: Licensure Renewal Duration

License Level	License Duration
Emergency Medical Responder	42 months
Emergency Medical Technician	3 years
Advanced – EMT	2 years
Paramedic	2 years

Each agency currently has a mechanism in place to ensure that personnel are meeting minimum requirements for initial licensure and renewal.

Training Programs

An EMS system should have a comprehensive training program in place to deliver relevant information to system personnel. Training programs should be such that varying levels of licensure and experience each receive information pertinent to their skill and knowledge level. In addition, training opportunities should be scheduled such that all personnel have an equal opportunity to attend those sessions without placing an undue burden on either the system or the individual.

BFD and ACP each develops, conducts, and evaluates its own individualized training programs and offerings. While there are certain commonalities in the EMS-related training provided due to state requirements, there should be a more coordinated effort between the agencies to ensure that all personnel within the system are receiving the same educational content.

Within BFD, EMS training falls under the purview of the Deputy Chief of Training with the assistance of an EMS Training Captain assigned primarily to conduct EMS training. There is very little coordination or input into the training process from the Division Chief of EMS. BFD should ensure that EMS training is coordinated through and input is provided from the EMS Division.

EMS education should be based on outcomes from the EMS Quality Management Program which identifies areas of improvement through retrospective chart reviews and concurrent field observation by command-level personnel. This function is a responsibility of the Division Chief of EMS. By having

the EMS Training Captain reporting to the EMS Division Chief, EMS program goals can be better aligned, improved communication both internally and externally will occur and a single message will be established. The delivery of EMS education should be coordinated through the Deputy Chief of Training in order to accommodate the department's training schedule.

Recommendations:

- All EMS agencies within Ada County should coordinate their EMS educational efforts by developing and sharing a common training schedule and instructors.
- EMS Education should be coordinated through the Deputy Chief of Training to ensure integration into the department training calendar.
- EMS Training should be determined through EMS Quality Management processes.

Health, Wellness, and Safety Programs

Administrators of EMS systems should establish comprehensive programs to address the health, wellness, and safety of EMS personnel. These programs should include policies, procedures, and processes that address infection control, vehicle operation, general scene safety, incident command and situational control, critical incident stress management, vaccination/immunization, personal protective equipment, and other safety-related issues.

Both BFD and ACP indicate that there are policies, procedures, and processes in place to address employee safety, health, and wellness within each organization. Each agency maintains an infection control policy, has established minimum standards for driver training and vehicle operation, and follows the National Incident Management System (NIMS) and Incident Command System (ICS) guidelines for incident control and management. Personal protective equipment is made available to all personnel and each individual either receives the necessary vaccinations/immunizations or is required to sign a declination. BFD personnel routinely drive ACP ambulances. Both agencies need to ensure that anybody operating an emergency vehicle complete ongoing emergency vehicle operator training.

Recommendation:

- BFD and ACP should coordinate their efforts in regards to development, implementation, review, and revision of infection control plans, driver/operator training, and other safety and wellness policies, procedures, and processes

Communications and Dispatch

Emergency communications and dispatch is a critical component of the overall EMS system. Without an effective method for the public to report emergencies, there can be no initialization of the EMS system. Likewise, without appropriate methods of information collection and dispatch, the appropriate resources cannot respond when needed.

The 9-1-1 system is a critical link in the chain for the survival for emergency patients. The system must ensure that a single access number is available, that one lead agency is responsible for coordinating EMS communications, and that planning and monitoring structures are in place to promote ongoing improvements. In addition, the communication system must provide for appropriate communications between all responders, that computer aided dispatch systems provide appropriate reporting of incidents, and that online medical control is available to provide medical advice to EMTs and paramedics at the patient's side.

Most EMS systems will have a method in place to ensure the quality of the dispatch system. That quality measurement can take a number of forms so long as the system has a formalized method to record, analyze, and report on quality. To do so, the agencies must:

- Create standards for quality.
- Monitor that quality.
- Create quality responsibilities throughout the organization.
- Develop a quality assurance team that regularly meets and reports on dispatch quality.

Emergency communications and dispatch for all of Ada County is contracted through and provided by the Ada County Sheriff's Office, Communications Division. A single access number (9-1-1) is operational throughout the County as well as the City of.

While a detailed evaluation of the dispatch center is beyond the scope of this report, the process of emergency medical dispatch (EMD) has a significant impact on patient outcomes and is a matter of some importance to the EMS system. Emergency medical dispatch provides for two significant EMS system functions. First, it allows callers to receive pre-arrival instructions so that they can begin to deliver appropriate treatment before the arrival of the emergency responders. Second, it allows calls to be prioritized based on the seriousness of the event. Knowing whether an event is serious allows emergency service providers to respond without lights and siren, respond with fewer personnel, or otherwise modify the response. Importantly, responding without lights and siren reduces risk to both the community and to the responder because emergency driving is inherently more risky to all motorists. This type of system can also be used to determine the most appropriate resources to dispatch and allow field providers to measure performance based on the types of incidents to which the agencies respond.

All telecommunications personnel are trained to use Medical Priority Dispatch System (MPDS) tools and as of March 2010 the standard is utilization of ProQA™ with National Academy of Emergency Dispatch (NAED) hard cards as a back-up. There is a formal internal quality assurance program in place for medical dispatches but there is no current system for allowing regular input from the customers of the communications center. Quality assurance and management programs should be expanded to include system customers.

Recommendations:

- Ada County Sheriff's Office should establish a communications users group to allow customers of the system to provide input and feedback into daily operations.
- Ada County and the City of Boise should work with the ACSO to enhance the internal quality assurance program within the communications center, specifically evaluating the handling of medical incidents.

Much of this report has focused on the needs of the system rather than any individual agency. As a critical element in the continuum of an EMS event, the dispatch function and electronic call processing equipment is a critical element in acquiring sentinel event data from which system design or redesign decisions can be made. *NFPA 450: Guide to EMS System Design* provides a template of critical event

time stamps that every system should be able to capture. The Computer Aided Dispatch (CAD) System is able to capture timestamps of multiple units and is considered sufficient for its current uses.

Emergency Medical Service Delivery and Performance

The delivery of fire suppression, rescue, and emergency medical services is no more effective than the sum of its parts. It requires efficient notification of an emergency and rapid response from appropriately located facilities with apparatus designed to function consistent with the organization's mission and an adequate number of trained personnel following a well-practiced plan of action.

Response times are one of the most frequently used methods of measuring system performance. Policy makers and physicians require a gauge by which to measure the effectiveness of the system, and a method by which to make decisions. Unfortunately, very little medical research exists to support one response time over another. Further, because economic costs are highly sensitive to response times, a small change in response time requirements may cause a significant change in costs. Policymakers must consider carefully the balance between the economic costs, medical costs and benefits, and social costs of response time requirements.

Medical studies on response times are not consistent, nor do they suggest the optimal time. Several medical studies suggest that shorter response times lead to improved outcomes in cardiac arrest. A Scottish study[17] noted that reducing response times from 15 minutes to 8 minutes (with 90 percent reliability) would increase the predicted cardiac arrest survival from about 6 to 8 percent. Improving response times to five minutes would provide for expected survival rates in the range of 10 to 11 percent. But other studies are less optimistic. For example, Blackwell and Kaufman discovered that reducing response times to less than eight minutes had little effect unless those times were reduced to less than five minutes.[18]

While the studies are not consistent in their conclusions, one thing is consistent: the studies focus on the most critical 1 percent or 2 percent of the patients. They do not focus on the more common emergencies (i.e., chest pain, diabetic coma, stroke, and respiratory events) at which advanced personnel can have an impact on patient outcomes. Very little reliable scientific data is available to support any response time requirement in these cases. Yet despite the confusing nature of the studies,

[17]"Effect of reducing ambulance response times on deaths from out of hospital cardiac arrest: cohort study". Pell JP, Sirel JM, Marsden AK, Ford I, Cobbe SM. *BMJ*. 2001 Jun 9; 322(7299):1385-8.
[18]"Response time effectiveness: comparison of response time and survival in an urban emergency medical services system". Blackwell TH, Kaufman JS., *Academic Emergency Medicine*. 2002 Apr, 9 (4)320-1.

intuitively ESCI believes that delivering faster emergency services will have an effect on patient satisfaction, it will improve 9-1-1 use in emergency events, and it will improve patient outcomes.

The American Heart Association (AHA) considers critical components of EMS systems to include appropriate access by citizens, as well as timely dispatch of responders. According to the AHA, "…Passage of time drives all aspects of emergency cardiac care and determines patient outcomes." That is why it is essential that patients are able to access the 9-1-1 system as quickly as possible, and that responders are immediately dispatched to the scene with appropriate pre-arrival information.

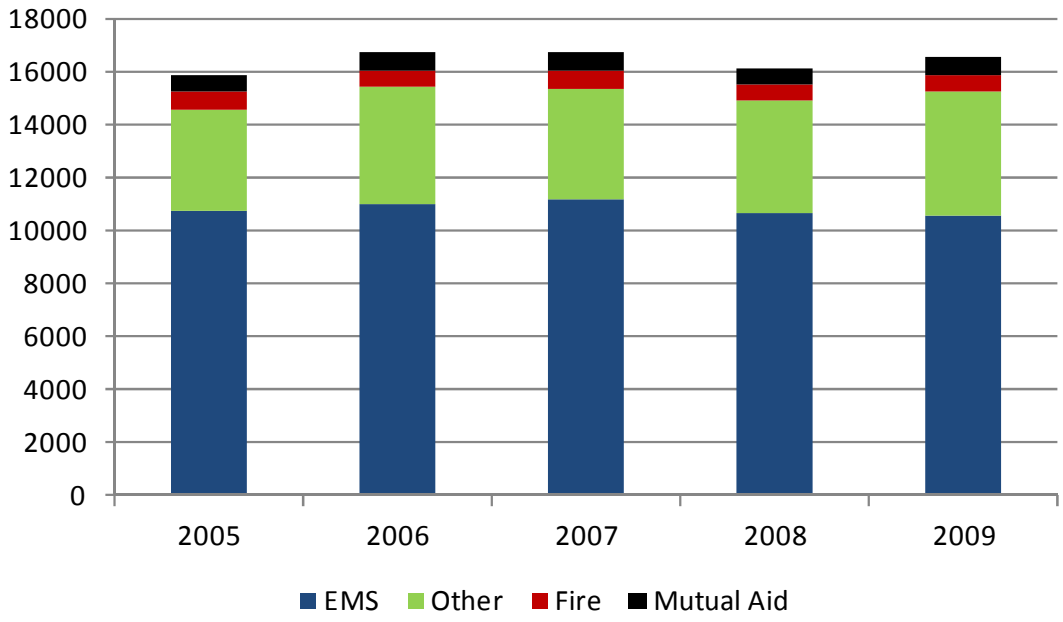
Service Demand

Ada County Sheriff's Office Communications Center provided incident data covering calendar years 2006 to 2009 for ACP while BFD provided National Fire Incident Reporting System (NFIRS) data for the same period. Information and response time performance analysis for ACP was conducted on service demand occurring within the City of Boise only. The following charts detail the volume of incidents over that data period.

Boise Fire Department

BFD has seen a variable service demand over the last five years as illustrated in the following figure.

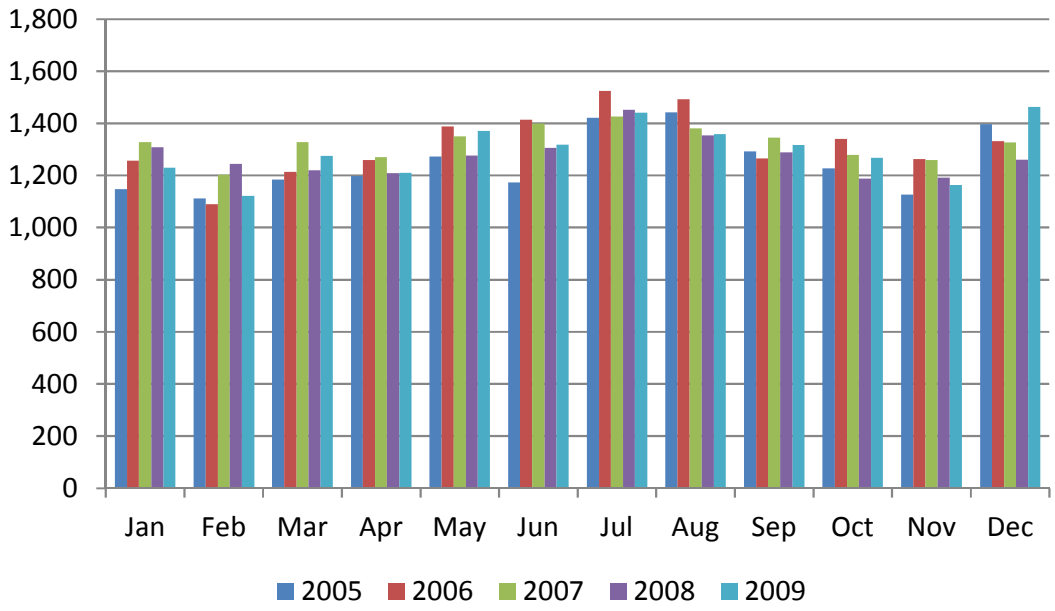
Figure 18: BFD Historic Workload



Emergency medical services incidents comprise a vast majority of the department's overall workload. BFD sees an average of 10,830 medical responses annually, compared to a total workload average of 16,364. In other words, EMS incidents make up approximately 66 percent of total workload annually.

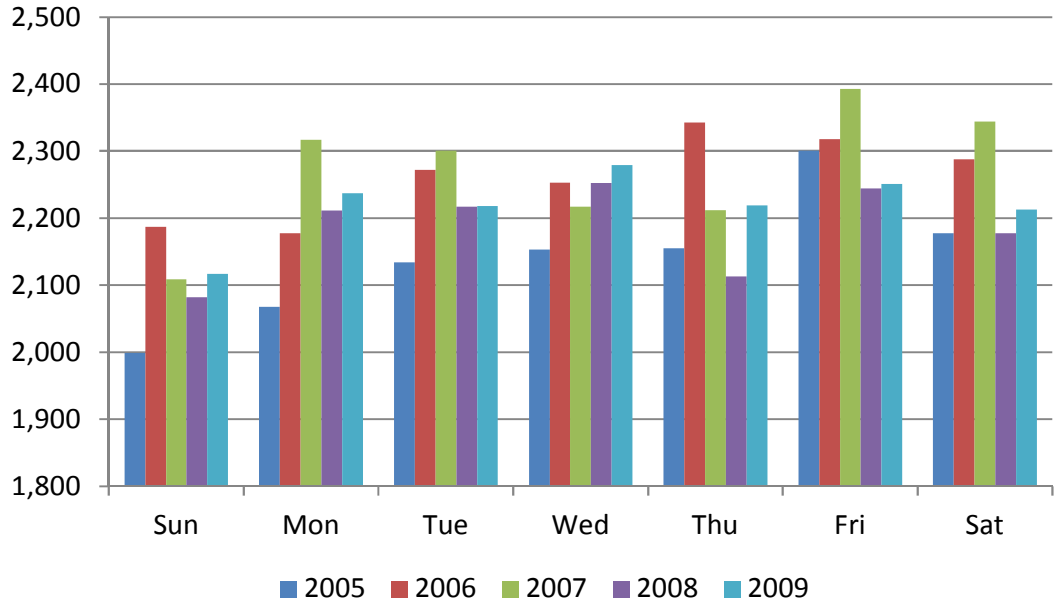
It is often useful to analyze workload temporally to identify any potential trends that would allow an organization to more effectively deploy appropriate resources. The following figures evaluate workload by month, day of week, and hour of day.

Figure 19: BFD Historical Workload by Month



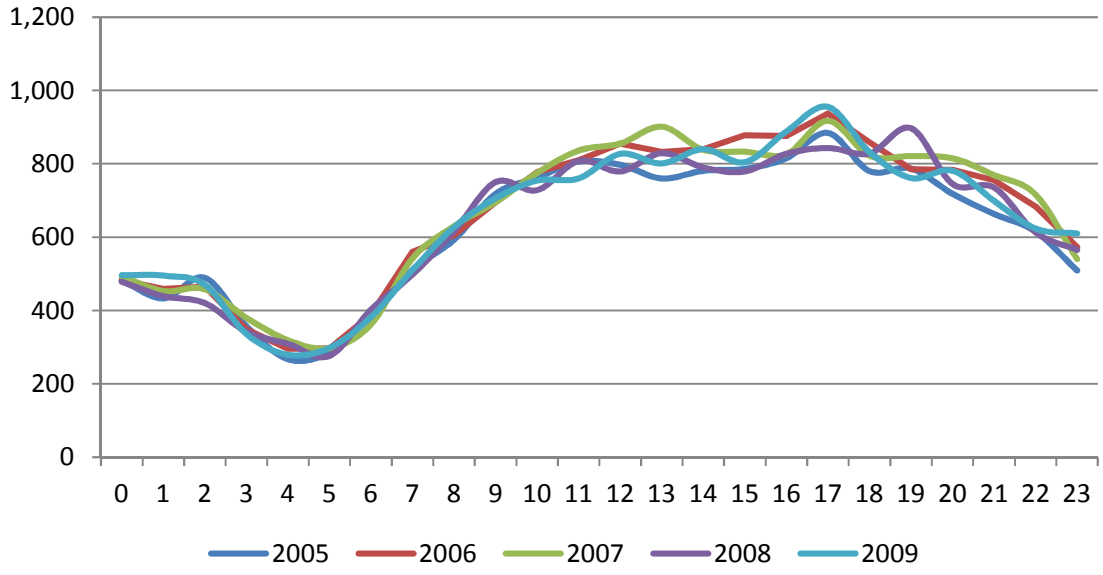
Overall, BFD's workload has been historically stable across all months. This is common for areas that are not high priority resort or vacation destinations. Workload by day-of-week was analyzed next.

Figure 20: BFD Historical Workload by Day of Week



Based on workload by day of week, analysis reveals that service demand is highly variable. In 2009, the busiest days of the week were Monday and Wednesday, a change from Friday and Saturday in 2008. Finally, workload by hour-of-day was analyzed in the following figure.

Figure 21: BFD Historical Workload by Hour of Day

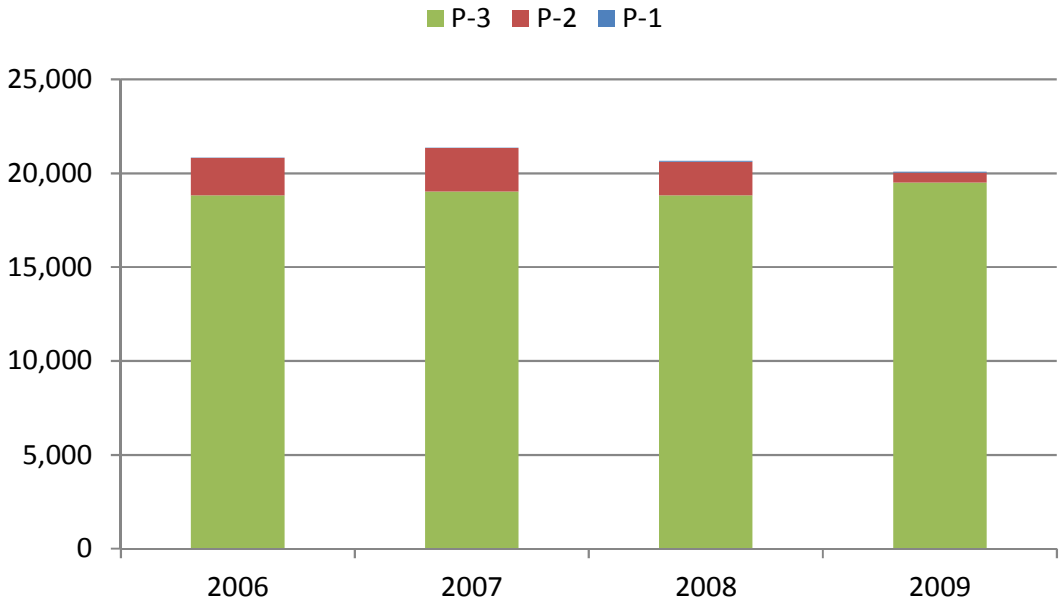


As expected, BFD's workload begins to increase around 6:00 a.m. and remain high until the end of the typical metropolitan activity period and then remain low during the overnight hours.

Ada County Paramedics

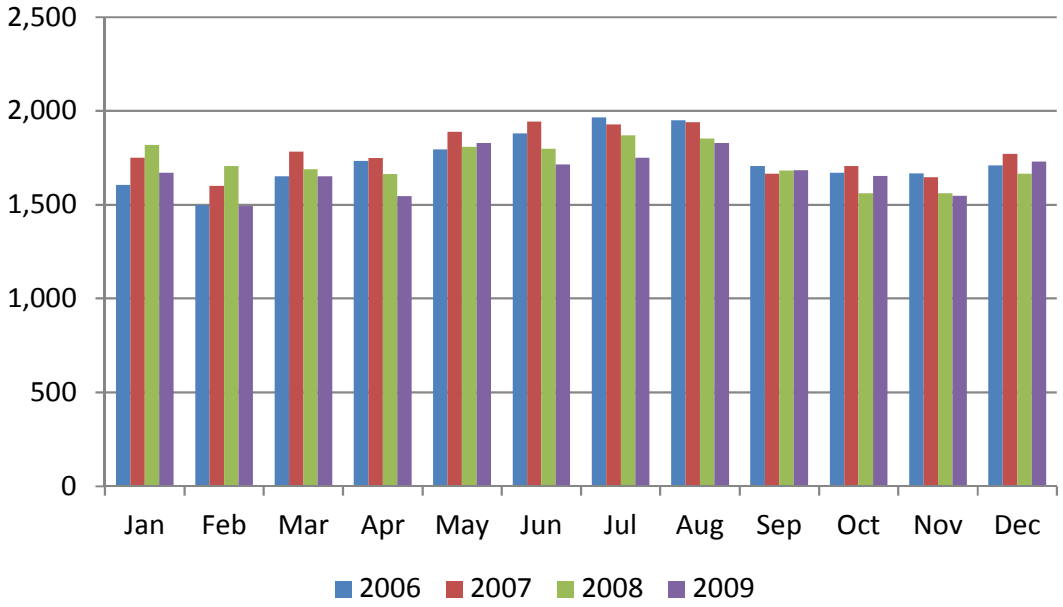
ACP has seen a nearly steady service demand over the last four years, hovering around 20,000 incidents annually as illustrated in the following figure.

Figure 22: ACP Historical Workload



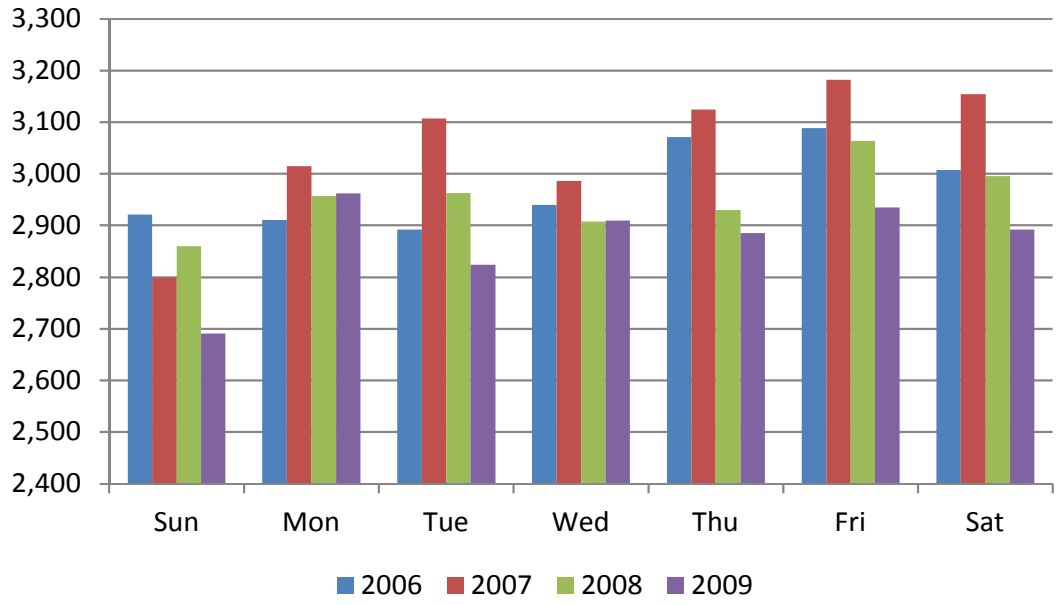
A majority of ACP annual workload is comprised of Priority 3 (P-3) incidents. These incidents tend to be those that are more serious in nature, at least at the time of dispatch, and require a more rapid response in order to provide potentially life-saving interventions. Priority 1 and 2 incidents are typically less urgent and allow for a slightly slower response by the responding units. Although overall workload for ACP is comprised of P-3 dispatched incidents, there is no national benchmark against which to compare in order to determine if this distribution of incident priority is comparable to other jurisdictions. Anecdotally, most ALS systems dispatched by a central communications center that is not under direct control of the EMS agency will tend to have a higher percentage of high-priority dispatches, regardless of actual incident found on the scene of the emergency. The following figures evaluate workload by month, day of week, and hour of day.

Figure 23: ACP Historical Workload by Month



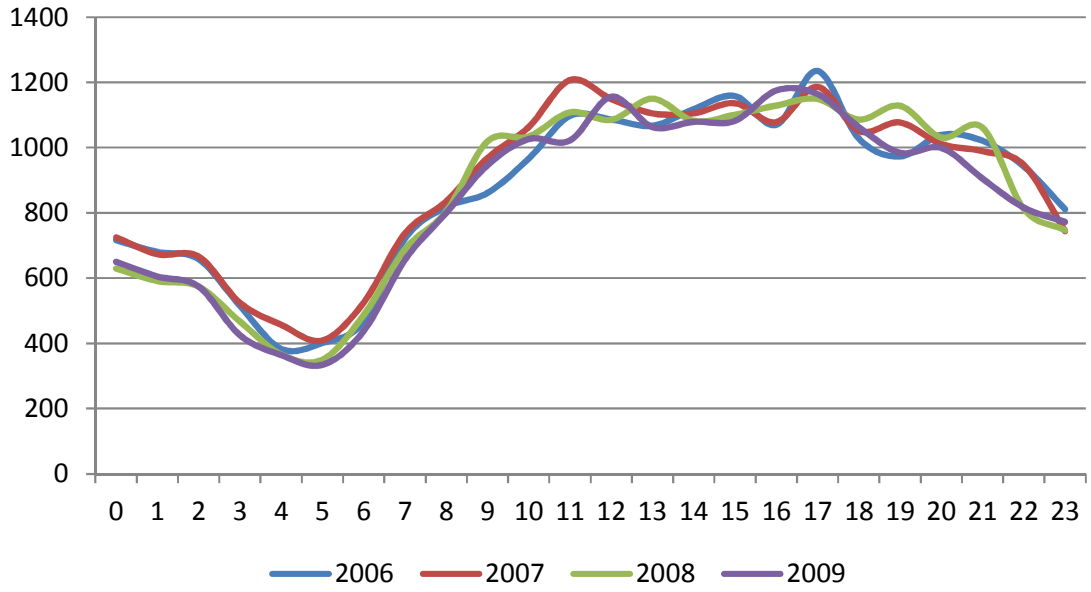
Overall, CPD workload has been historically stable across all months but tends to increase during the summer months, which is typical of regions that have temperate climates ideal for outdoor summer activities. Workload by day of week was analyzed next.

Figure 24: ACP Historical Workload by Day of Week



Based on workload by day of week, analysis reveals that service demand is highly variable. Over the four-year period analyzed, ACP incident volume was substantially lower on Sundays while the busiest day of the week shows to be Fridays. Finally, workload by hour of day was analyzed.

Figure 25: ACP Historic Workload by Hour-of-Day



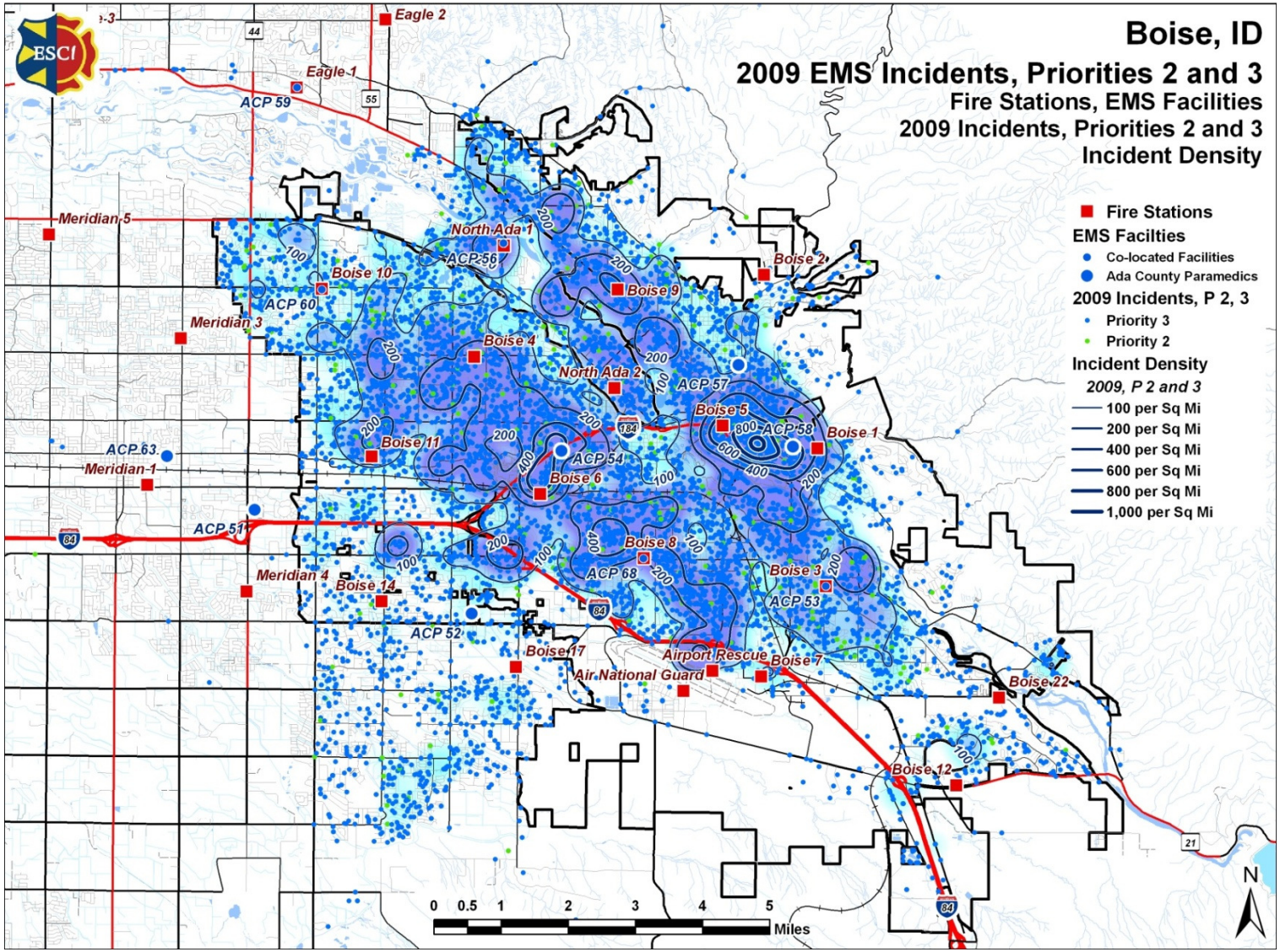
As expected, ACP's workload begins to increase around 6:00 a.m. and remain high until the end of the typical metropolitan activity period and then remain low during the overnight hours.

In regard to workload, it should be noted that a significant portion of the Ada County total population resides within the City of Boise. In fact, as of the 2000 census, 185,787 of the 300,904 total Ada County population resided within the City of Boise, representing approximately 61 percent of the population. This total does not include the populations within the North Ada County Fire Rescue District or the Whitney Fire District where exact population determination is impossible.

Most emergency services requests are due to human activity and more service demand occurs when populations are more active. Response data provided by ACP incidents was analyzed for service demand distribution and is illustrated in the following figure. Based on the distribution of Priority 2 and 3 incident responses by ACP over the past four years, a majority of all Priority 2 and 3 incidents are occurring inside the City of Boise and its contracted service areas. Since the focus of this study is EMS

delivery within the City of Boise, only ACP incidents occurring within the City and the contracted service areas are displayed on the following map.

Figure 26: Service Demand Distribution – 2009



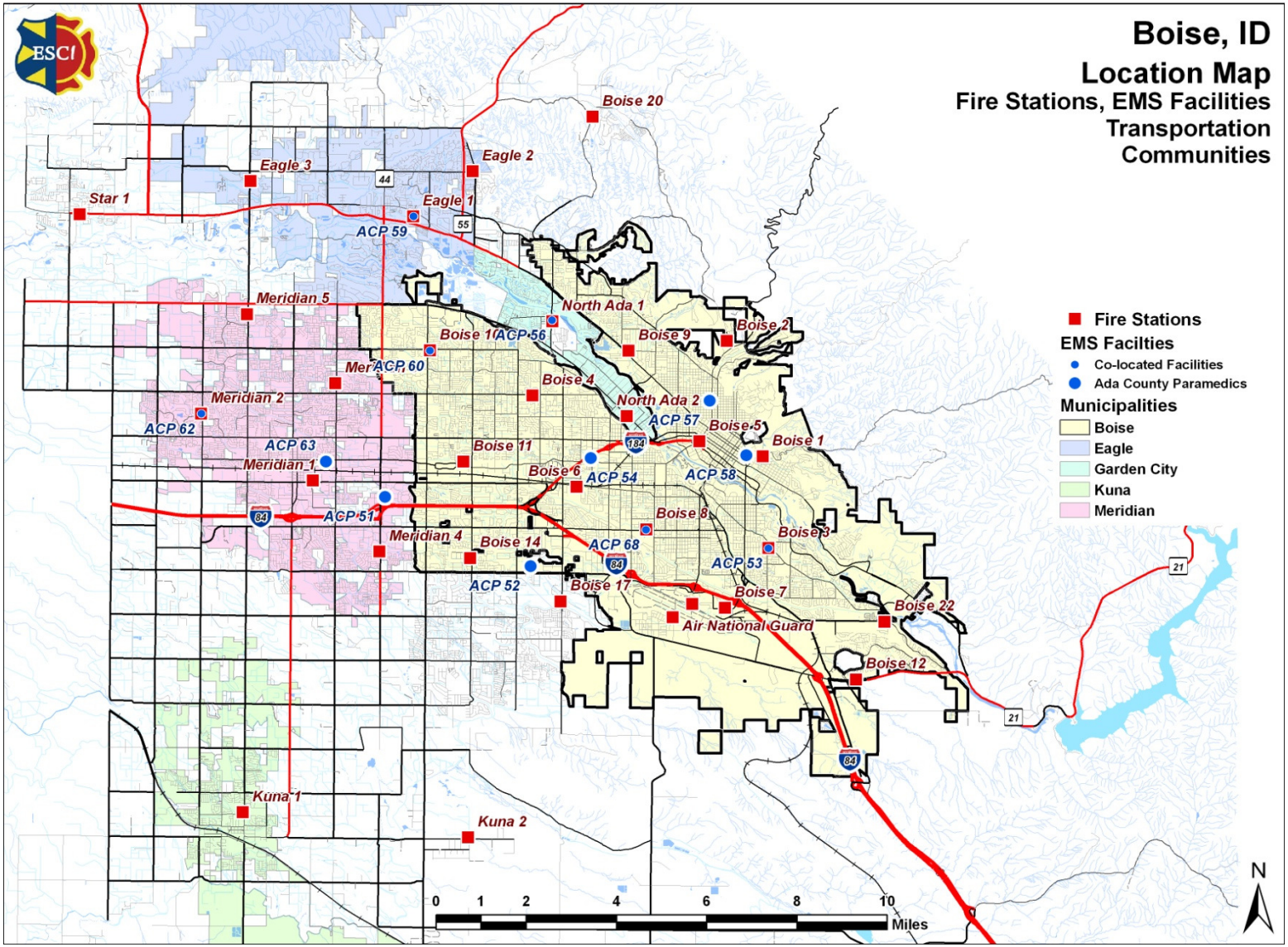
As can be seen from the previous figure, the areas between BFD Stations 1 and 5 (ACP 58) and Stations 4 and 6 (ACP 54) had the highest incident density during 2009.

Resource Distribution

Boise Fire Department

As described previously, BFD operates from 19 operations facilities (two of which are unstaffed) distributed throughout the City of Boise and its contract service areas covering a total of 129 square miles. The primary response area is located in northern Ada County, Idaho, and includes the City of Boise as well as the contract areas of North Ada County Fire and Rescue and Whitney Fire District. BFD locations, as well as ACP facilities located within the BFD primary response area, are illustrated in the following figure.

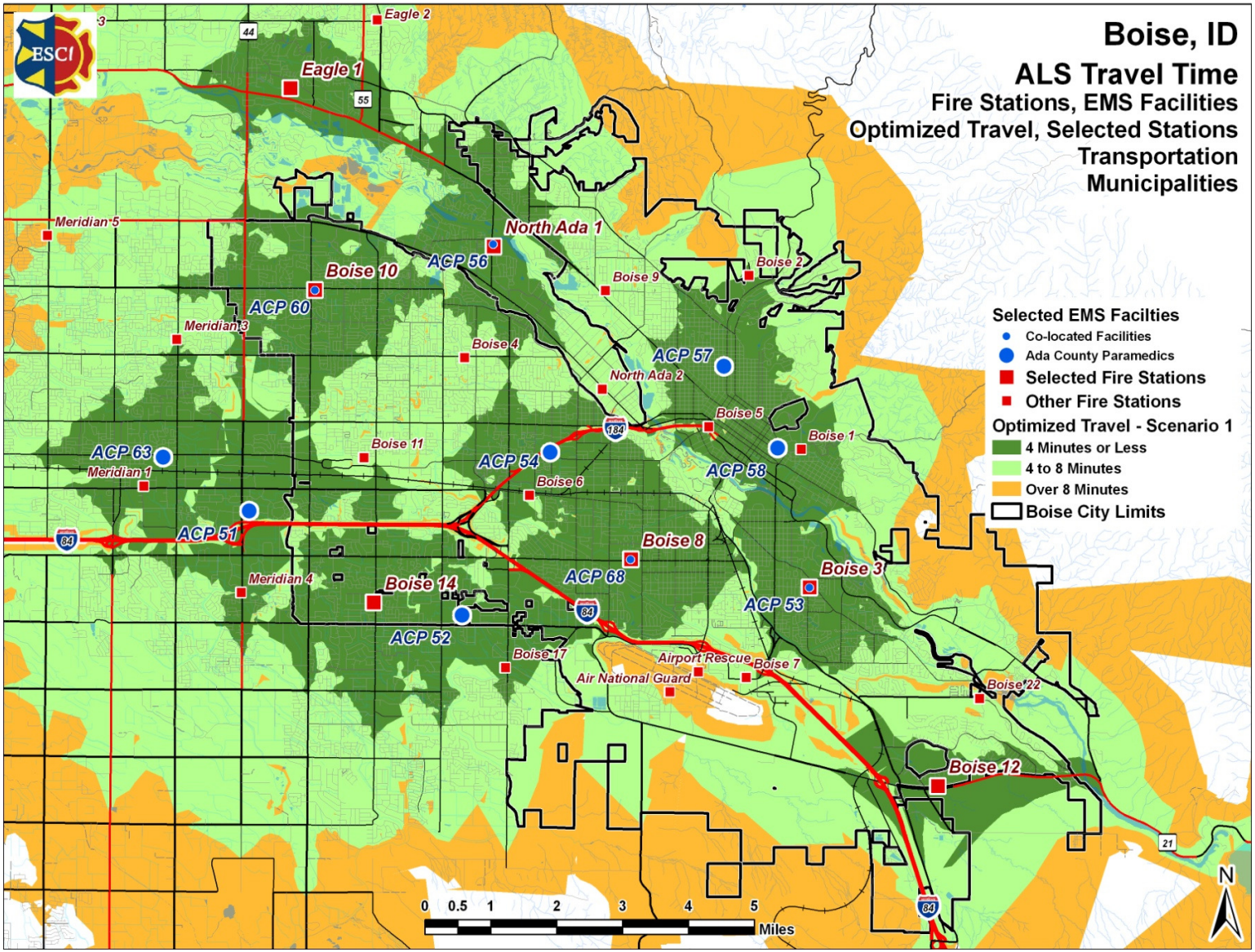
Figure 27: Resource Distribution Map



As noted in the preceding map, ACP deploys eight Advanced Life Support (ALS) transport ambulances within the City of Boise, three of which are co-located with BFD stations (Stations 3, 8, and 10). In addition to ACP resources, BFD deploys ALS personnel at Stations 8, 12, and 14 and can deploy one additional paramedic at Station 22 when staffing levels allow.

The following map illustrates various travel time models from current station locations for both BFD and ACP.

Figure 28: Travel Model - ALS Coverage



As can be seen from the preceding figure, there are a number of areas within the City that are currently located within service gaps while a significant area of the City is redundantly covered with ALS resources, either from BFD or ACP. Strategies to cover the existing gaps and alleviate existing redundancies will be addressed later in this report.

Reliability

The workload on emergency response units can be a factor in response time performance. The busier a given unit, the less available it is for the next emergency. If a response unit is unavailable, then a unit from a more distant station must respond, increasing overall response time. A cushion of surplus response capacity above average values must be maintained due to less frequent but very critical times, when atypical demand patterns appear in the system. Multiple medical calls and multi-casualty events are examples.

UHU_i (unit hour utilization - incident) was calculated utilizing the total incident volume for each unit. Unit hour utilization is an important workload indicator because it describes the amount of time a unit is not available for response since it is already committed to an incident. There are several different methods in determining UHU dependent upon the desired measure. For instance, UHU_t (total) measures the total amount of time specific units are engaged in responses from dispatch through clearing a receiving facility or cancelling the response. UHU_{tr} (transport) only evaluates those incidents that the units were involved in the transport of a patient to a receiving facility. This is the typical measure since UHU, after all, is an economic measure of system efficiency and transports are typically the only incidents that generate revenue.

The larger the number, the greater the unit's utilization and the less available it is for assignment to an incident. Several studies over the years have shown Employee burnout has been directly related to UHU. Acceptable ranges of UHU are dependent on several factors including shift length, system design and time on task. Time on task is a function that measures additional duties such as training, performing firefighting activities, technical rescue, water rescue, hazardous materials response, and prevention activities. According to a study conducted by the Journal of Emergency Medical Services [1992], dual-role fire-based systems typically result in higher employee satisfaction and less burn-out which the study concludes leads to fewer clinical errors or episodes of patient mistreatment. Therefore

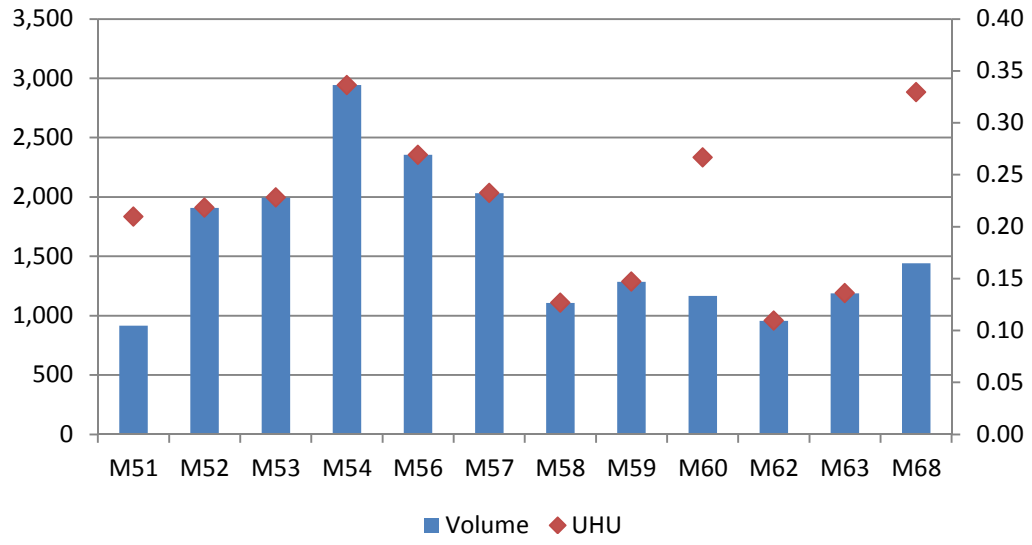
an optimum design utilizing the advantages of dual-role cross trained firefighter paramedics should have a slightly lower UHU in the range of 0.20 - 0.25.

These variations in UHU ratio thresholds are due in part to the length of a typical shift for the paramedics. Typically, fire-based EMS units work 24-hour shifts, while third party EMS providers typically work some other periods, commonly a 12-hour shift. Private providers, which are profit-driven, typically work 8 or 12-hour shifts. Private providers also perform a large amount of non-emergency transportation services which are not dependent upon response time standards or geographic proximity. Since ACP operates on a 24-hour shift schedule (with the exception of one unit that works a 12-hour schedule), the third service based UHU threshold of 0.35 to 0.40 is most comparable.

Ada County Paramedics

With the exception of units M51, M60, and M68, which work 12-hour shifts during daytime hours only, all ACP units are on duty 24-hours each day. Each 24-hour unit has 8,760 hours of availability in any given year while each 12-hour unit has 4,380 hours of availability. Typically, organizations will attempt to appropriately divide workload relatively equally among the various response units. As can be seen in the following figure, however, geographic extents and service demand variances create an unequal distribution of workload.

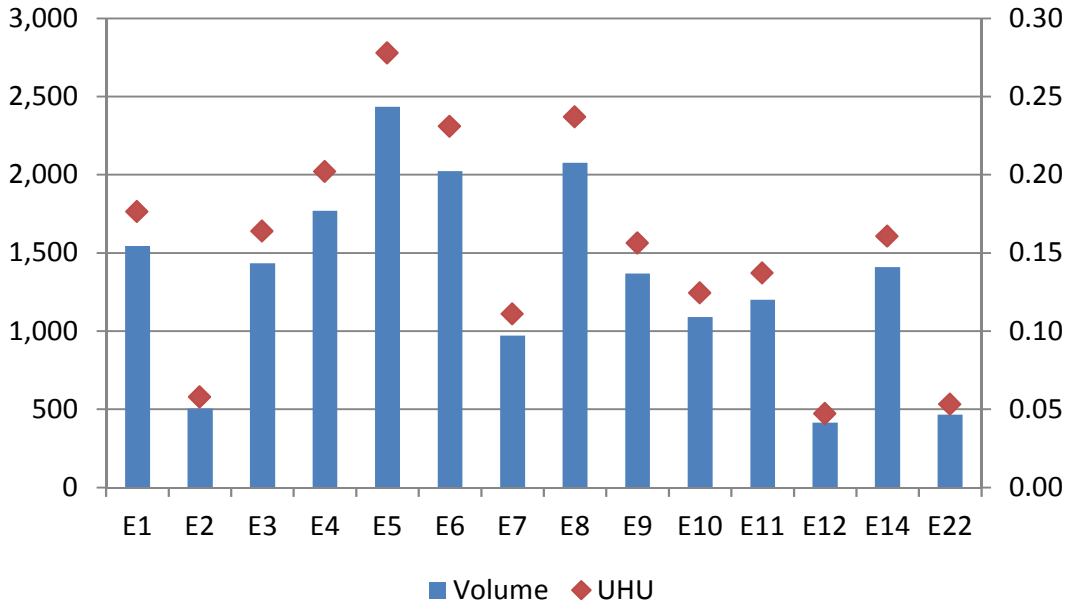
Figure 29: ACP Unit Hour Utilization – Incident (UHU_i), 2009



Boise Fire Department

All BFD emergency response units work 24-hour shifts and operate on static deployment (that is they are assigned to a single station/response area and, with the exception of move-ups, remain within that area throughout their shift). BFD operates 19 stations within the City of Boise and its contracted areas within Whitney and North Ada County, three of which are staffed with EMT-Paramedic personnel. The following figure illustrates each primary apparatus' utilization in similar fashion as presented for ACP.

Figure 30: BFD Unit Hour Utilization, 2009



It should be noted that UHU measures crew activity related to actual delivery of emergency services only. For example, the amount of time it takes for a crew to return to its station from a hospital transportation or scene of a call is not measured because it is recorded as 'available' for service. Other necessary activities for crews include crew change, station duties, restocking supplies, daily unit checks for mechanical and supply inventory, meals, and rest room breaks. While high UHU measures indicate the need for additional units to handle workload, low UHU measures do not necessarily indicate the need for a reduction in current resource capacity.

Response Performance

Often the one component of an emergency services organization that receives the greatest level of attention is response performance. Most agencies that delivery emergency services to the public strive to provide that service within a minimal amount of time and to advertise exceptional response times.

Unfortunately, many organizations use the average response time rather than a fractile to evaluate the how well they are delivering service. This section begins with a brief overview of statistics that should aid the reader in interpreting the information presented in this portion of the report.

Average

The 'average' measure is a commonly used descriptive statistic also called the mean of a data set. It is a measure which is a way to describe the central tendency, or the center of a data set. The average is the sum of all the points of data in a set divided by the total number of data points. In this measurement, each data point is counted and the value of each data point has an impact on the overall performance. Averages should be viewed with a certain amount of caution because the average measure can be skewed if an unusual data point, known as an outlier, is present within the data set. Depending on the sample size of the data set, the magnitude of skew can be either very large or very small.

As an example, assume that a particular fire station with a response time objective of six minutes or less had five calls on a particular day. If four of the calls had a response time of eight minutes while the other call was across the street and only a few seconds away, the average would indicate the station was achieving its performance goal. However, four of the five calls, or 80 percent, were beyond the stated response time performance objective.

The opposite can also be true where one call with an unusually long response time can make otherwise satisfactory performance appear unacceptable. These calls with unusually short or long response time have a direct impact on the total performance measurements and the farther they are from the desired performance, the greater the impact.

The reason ESCI does compute the average is because of its common use and ease of understanding that is associated with it. The most important reason for not using averages for performance standards is that it does not accurately reflect the performance for the entire data set. As illustrated above, one extremely good or bad call skewed the entire average. While it does reflect all values, it does not really speak to the level of accomplishment in a strong manner.

Percentile

With the average measure, it is recognized that some data points are below the average and some are above the average. The same is true for a median measure which simply arranges the data set in order and finds the value in which 50 percent of the data points are below the median and the other half are above the median value. This is also called the 50th percentile.

When you deal with fractile or percentages, the actual value of the individual data does not have the same impact as it did in the average. The reason for this is that the fractile is nothing more than the ranking of the data set. The 90th percentile means that 10 percent of the data is greater than the value stated and all other data is at or below this level.

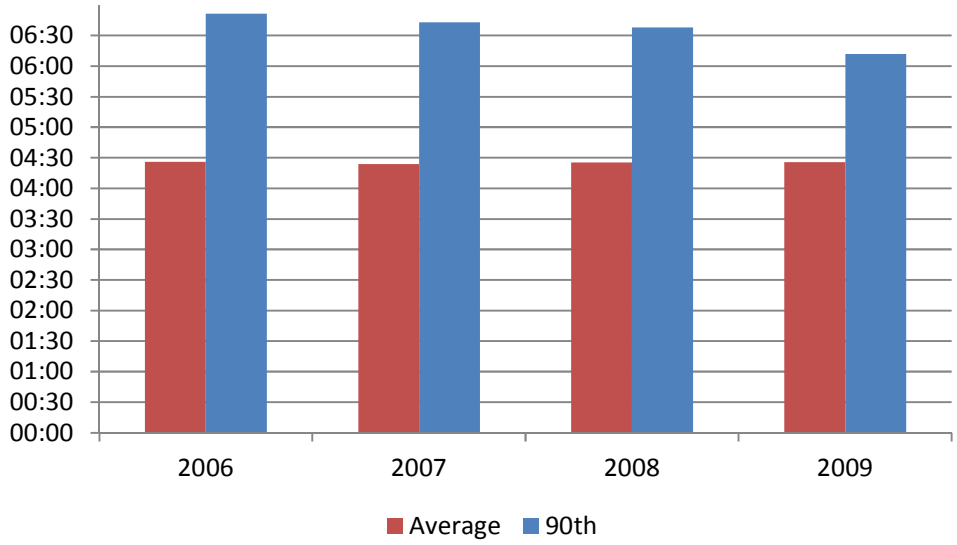
Higher fractile measurements are normally used for performance objectives and performance measurement because they show that the large majority of the data set has achieved a particular level of performance. This can then be compared to the desired performance objective to determine the degree of success in achieving the goal.

The following response performance analysis has been completed with certain types of incidents removed from the dataset. For BFD, all mutual aid responses have been removed as well as all dataset outliers with data that was not able to be verified. For ACP, all Priority 1 incidents were removed as well as all dataset outliers that with data that was not able to be verified.

Boise Fire Department

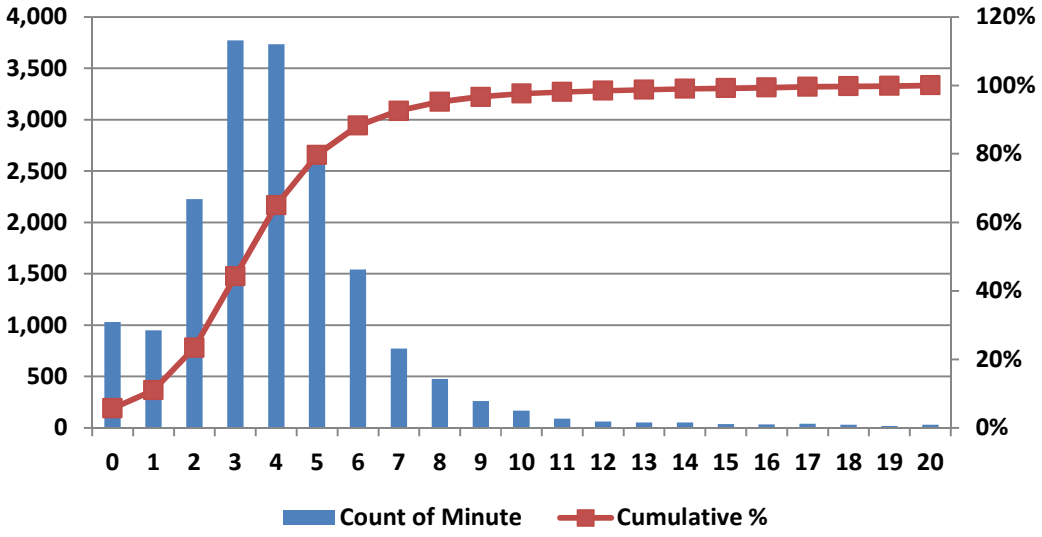
Only emergency, non-mutual aid incidents were used for analysis of BFD response performance over the four-year period of data provided by the department. The following figure illustrates the average and 90th percentile response performance for BFD.

Figure 31: BFD Historic Response Time Performance - EMS Incidents



The following chart represents the response time frequency for BFD during calendar year 2009

Figure 32: BFD Response Time Performance Frequency – 2009

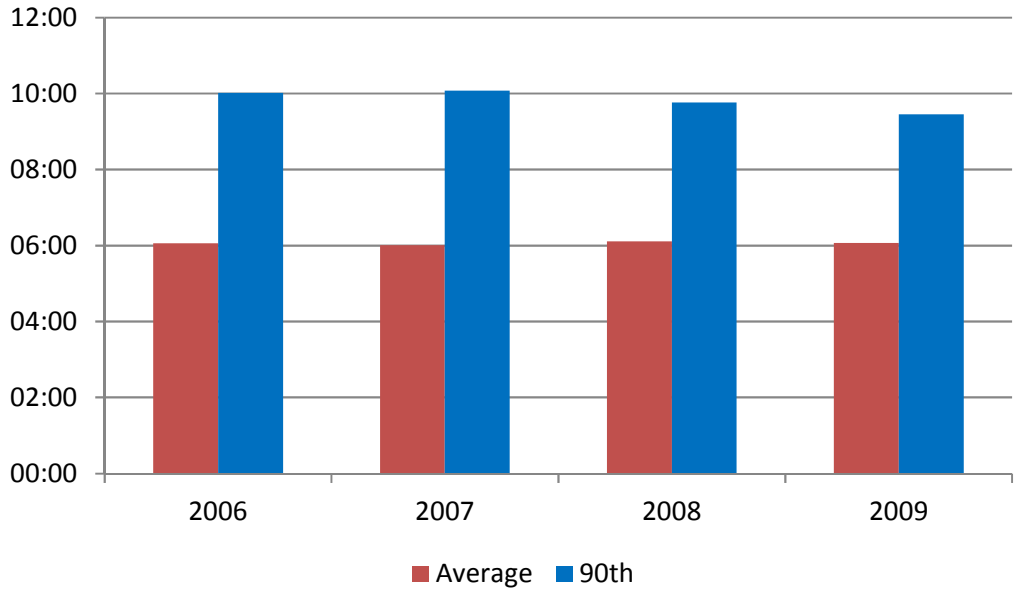


BFD's overall average response time for calendar year 2009 was 4:26 while the 90th percentile response time calculated to be 6:12.

Ada County Paramedics

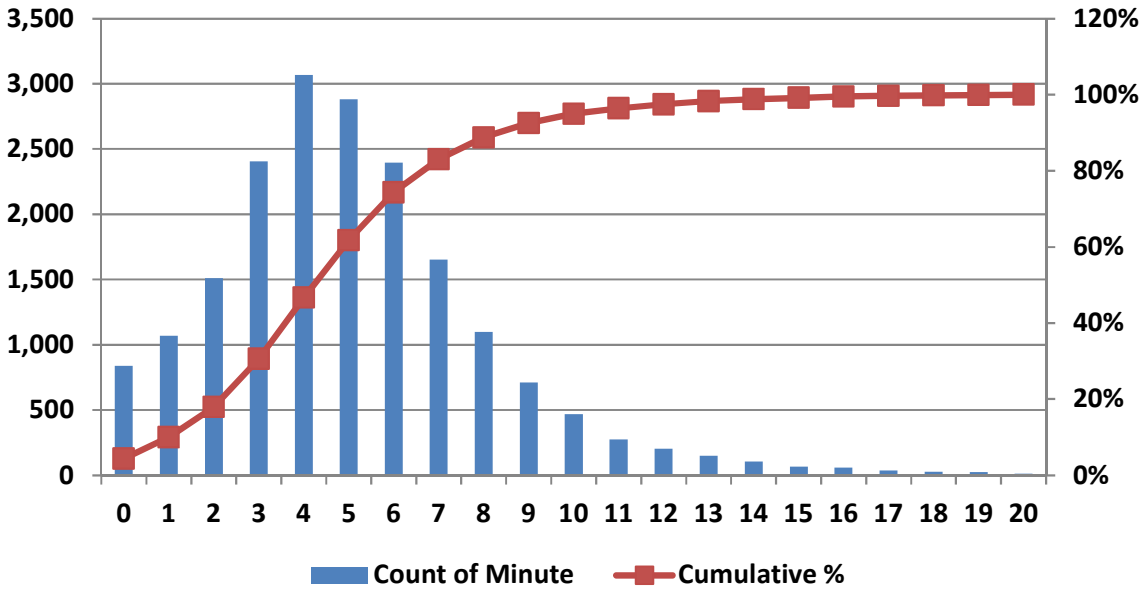
Only Priority 2 and 3 incidents were used for analysis of ACP response performance over the four-year period of data provided. The following figure illustrates the average and 90th percentile response performance for ACP.

Figure 33: ACP Historic Response Time Performance



The following chart represents the response time frequency for ACP during calendar year 2009.

Figure 34: Response Time Performance Frequency - 2009



ACP's overall average response time for calendar year 2009 was 6:04 while the 90th percentile response time calculated as 9:27.

Medical Direction

NFPA 450 recommends that a single medical authority should be in place within every EMS System. The medical authority should provide oversight for the EMS system; however, the medical authority, in some cases, may be the same person as the medical director. ESCI notes that the term "medical authority" is distinct from medical director because a medical authority may be comprised of multiple physicians (or other medical personnel in some states) while medical director is typically one person.

Like many states, Idaho requires that personnel functioning within an EMS system do so under the direction of a state licensed physician. Both BFD and ACP comply with this requirement but do so through separate physicians. BFD contracts with Dr. Doug Kartel to provide medical direction and oversight to personnel currently holding an EMS credential through the State of Idaho. Dr. Kartel has been in this role for the past four and a half years and has been the only medical director utilized by BFD.

The emergence of the Physicians Advisory Council on EMS and participation in its activities by system participants recognizes the criticality of medical oversight. However, the Medical Directorate is the appropriate body to serve as the system's medical authority and as such should be formalized within the EMS System Plan and empowered to discharge the following responsibilities: Recommend certification, recertification, and decertification of non-physician pre-hospital personnel to the appropriate certifying agency

- Provide direction and authorization for the development and revision of system-wide protocols, policies, and procedures for all patient-care activities from dispatch through triage, treatment, and transport.
- Establish criteria for the provider training level of initial emergency response
- Establish criteria for determining the most appropriate patient destination
- Ensure the competency of personnel who provide direct medical oversight to pre-hospital personnel including, but not limited to, physicians, EMTs, and nurses
- Establish the procedures or protocols under which non-transport of patients is permitted
- Provide direction and authorization for the educating and testing to the level of proficiency approved for the different certification levels within the EMS system
- Provide direction for an effective system-wide quality improvement program

- Provide direction and authorization for personnel eligibility to provide patient care
- Establish functional criteria for equipment used in patient care

As noted previously, the medical directors of both agencies regularly attend PACE meetings and have recently collaborated on system-wide Standard Written Orders for all medically credentialed pre-hospital personnel. Although there has been recent collaboration and coordination of efforts regarding medical direction and optimally, the EMS system should have a dedicated fully engaged full-time Medical Director. As an example, Kansas City, Missouri EMS (a part of Kansas City fire) employs a full-time Medical Director charged with clinical oversight of all pre-hospital services offered by KCFD. In the alternative the EMS system should strive to develop a formalized medical authority while retaining their individual medical directors for agency specific direction. As such and as mentioned previously, PACE and the Medical Directorate should be re-organized and formalized with specific duties, responsibilities and authorities assigned to each group.

In addition, for the system to become more efficient and consistent in the delivery and quality assurance of EMS to the community, a single point of medical direction should be established. This single medical director should oversee any assistant medical directors assigned to individual agencies but should have the authority to regulate the quality assurance/management program and clinical activities of the entire system.

Currently, each service provider within the county uses an independent records management system for capturing incident and patient data. In order for a quality management program to be most effective, a single reporting system should be utilized throughout the system with a single repository of data and information available to system quality assurance/management personnel. Creating a single data entry system with a single repository for collected data will allow personnel tasked with quality management responsibilities easier access to data from multiple agencies and allow for a complete record of patient care from first response through patient disposition at the receiving definitive care facility.

Recommendations:

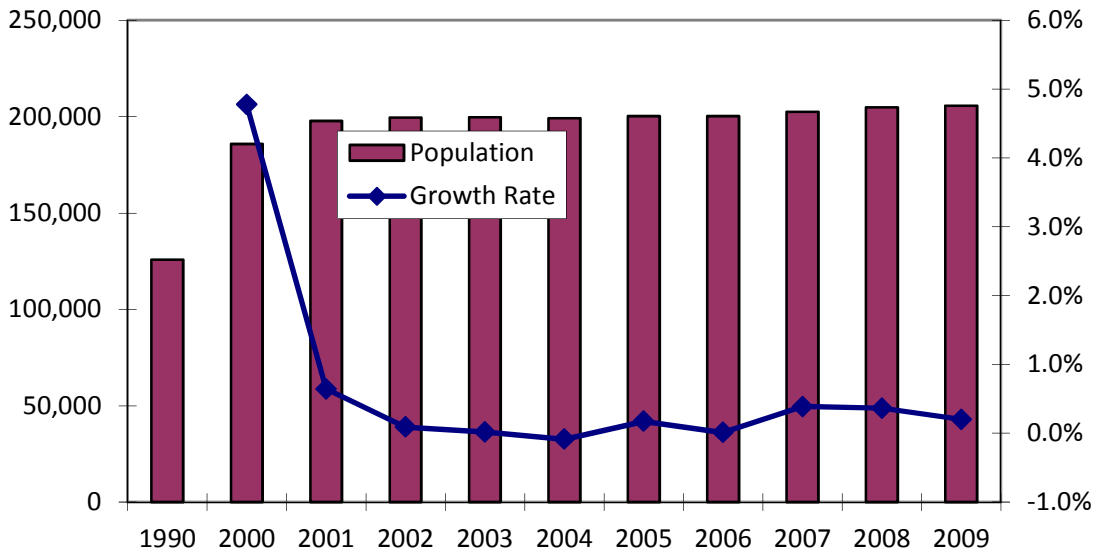
- The City of Boise should include a requirement for a single Medical Authority for the EMS System oversight in accordance with NFPA 450 and the American Ambulance Association recommendations.
- The Medical Authority for the EMS System should be empowered with the duties and responsibilities enumerated in accordance with NFPA 450.
- A single medical authority should be implemented to oversee and authorize a system-wide quality assurance program.
- As single system for collecting data should be implemented throughout the county along with a single repository of collected incident and patient care information.

Section II – Future Service Demand Projections

The process of forecasting growth within the community begins with an overview of current demographic and risk categories.

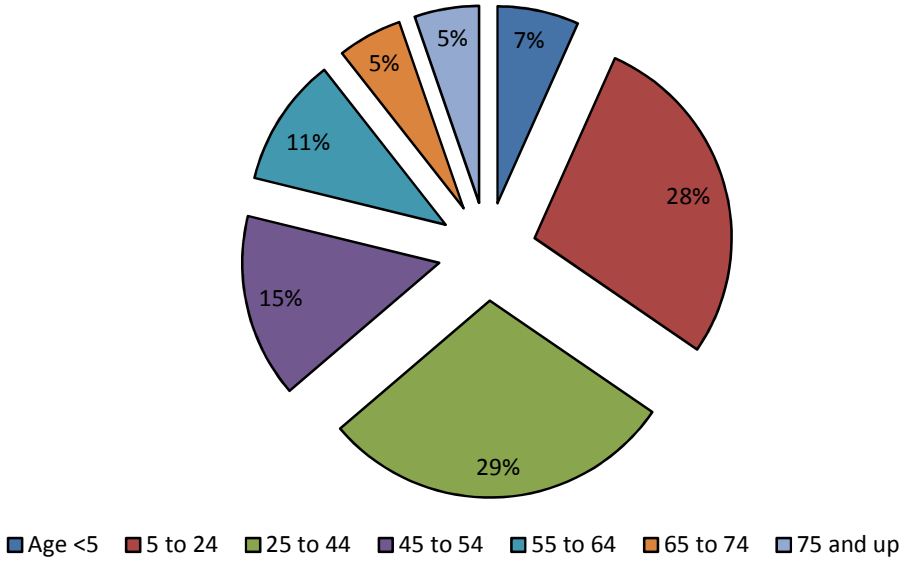
According to the 2008 U.S. Census estimates, the estimated population of Ada County (including the City of Boise) was 379,350 persons. This represents a 26 percent increase in the population since 2000 when a population of 300,904 was recorded. The average annual growth rate this decade has been 0.7 percent but at times has been as high as 4.8 percent. The growth rate has slowed in the most recent years as depicted in the following figure.

Figure 35: Population Growth History



How this population is composed by age group can have a significant effect upon the fire services. The following chart distributes the population into age groups based on available U.S. Census information.

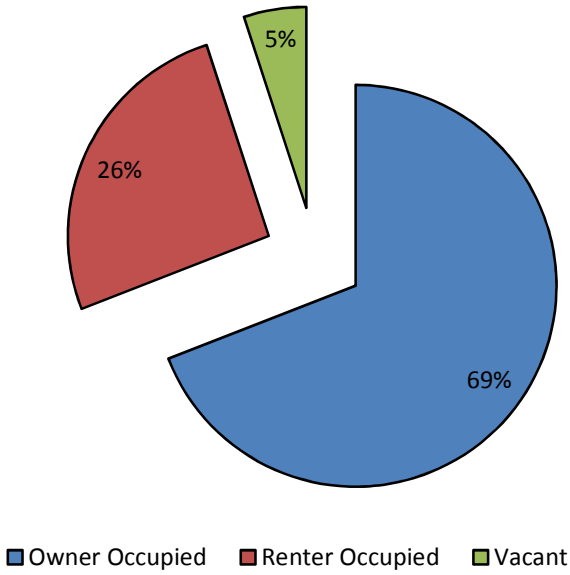
Figure 36: Population by Age



Approximately 10 percent of the population is 65 years of age or older and 7 percent is under 5 years of age, placing a total of 17 percent of the area's population within the significant target age groups that pose the highest volume of workload for most EMS systems.

Figure 37 examines the housing by occupancy types in the area. Numerous rentals and vacancies can signal negative economic conditions, which correlate with higher rates of emergency incidents.

Figure 37: Housing by Occupancy

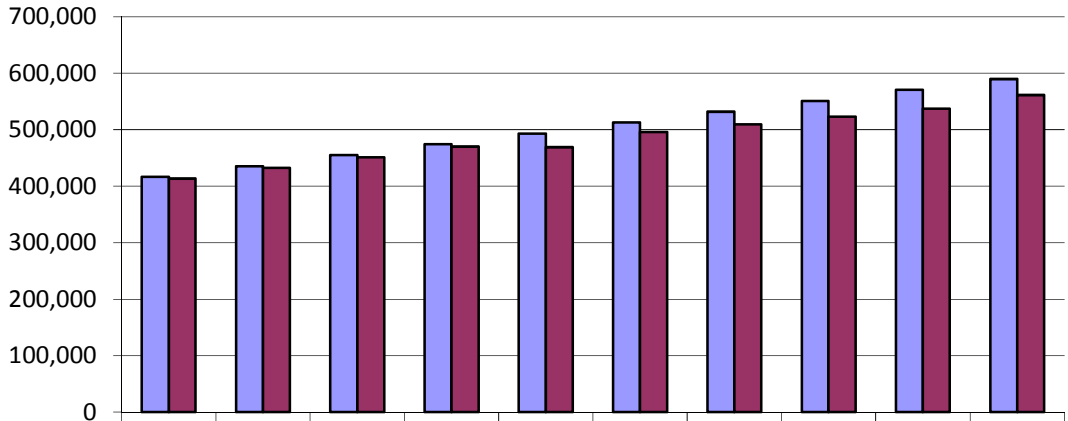


The high level of owner-occupied housing indicates a stable economic environment that would attract higher income wage earners.

Population Growth Projections

The population within Ada County has increased only slightly this decade, but local planning officials anticipate that additional growth may continue at a higher rate than previously experienced. In developing forecasts for population growth, ESCI typically develops a forecast based on several years of census experience. For the City of Boise and Ada County, ESCI used U.S. Census Bureau data from 2000 through 2009 to create a mathematical forecast through the year 2030. In addition, information obtained from Blueprint Boise (a local planning and development vision plan) was adjusted based on an extrapolated rate of population growth. Population figures used by Blueprint Boise have historically lagged slightly behind those posted by decennial census estimates but are provided here to generate a potential range of population growth.

Figure 38: Population Forecast – Ada County



	2012	2014	2016	2018	2020	2022	2024	2026	2028	2030
Census	416,40	435,64	454,88	474,12	493,36	512,59	531,83	551,07	570,31	589,54
Blueprint Boise	413,51	432,28	451,05	469,82	469,01	495,89	509,34	523,13	536,96	561,15

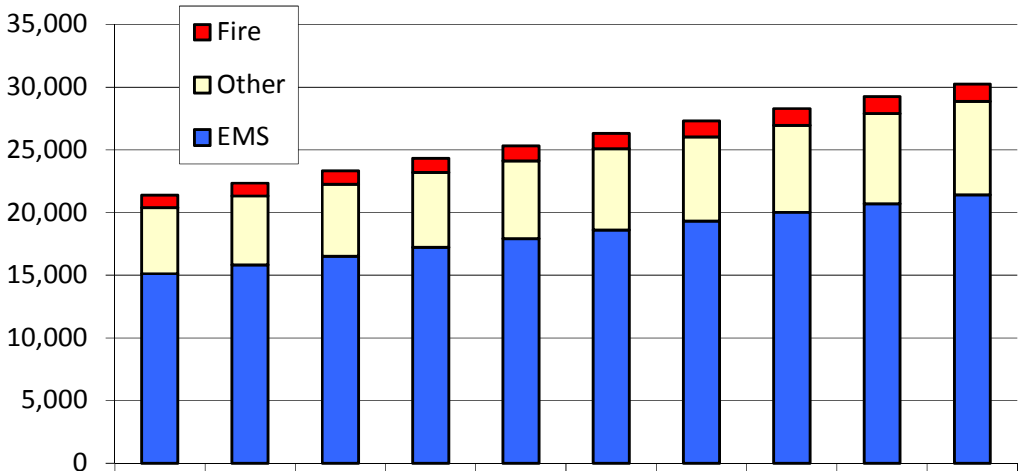
It is not the intent of this study to be a definitive authority for the projection of future population in the service area but rather to base recommendations for future service delivery needs on a reasonable association with projected service demand. Since it is known that the service demand for emergency agencies is based almost entirely on human activity, it is important to have a population-based projection of the future size of the community. While variations in population projections have been discussed here, one thing that can be certain is that the area will continue to be an emergency service

provider to a growing population, likely reaching a total population of over 550,000 by 2030. Planning should begin now to maintain the resources needed to meet the continuing demand for services.

Service Demand Projections

In evaluating the deployment of facilities, resources, and staffing, it is imperative that consideration be given to potential changes in workload that could directly affect such deployment. Any changes in service demand can require changes and adjustments in the deployment of staff and resources in order to maintain acceptable levels of performance. For purposes of this study, ESCI utilized population projections obtained through community development research and multiplied these by a forecasted incident rate derived from a five-year history of incident per capita rates to identify workload potential through the year 2030. The results of the analysis are shown in the following chart and table.

Figure 39: BFD Total Workload Forecast



	2012	2014	2016	2018	2020	2022	2024	2026	2028	2030
Fire	993	1,039	1,084	1,130	1,176	1,222	1,268	1,314	1,360	1,405
Other	5,254	5,496	5,739	5,982	6,224	6,467	6,710	6,953	7,195	7,438
EMS	15,119	15,817	16,516	17,214	17,913	18,611	19,310	20,008	20,707	21,405

The increase in actual fire incidents is forecast to be relatively low during the study period, a reflection of trends for fire incident rates per capita and believed to be a result of improvements made in building codes and public fire education during the last several decades. EMS is expected to continue to be a predominate factor in service demand, while other emergency service calls not involving actual fires is forecasted to increase in part due to the use of automatic alarm and water flow systems. Based on the predominance of EMS incidents within BFD, it is advisable for the department to work closely with ACP to utilize the resources of both agencies in a way that is efficient and economical for the system as a

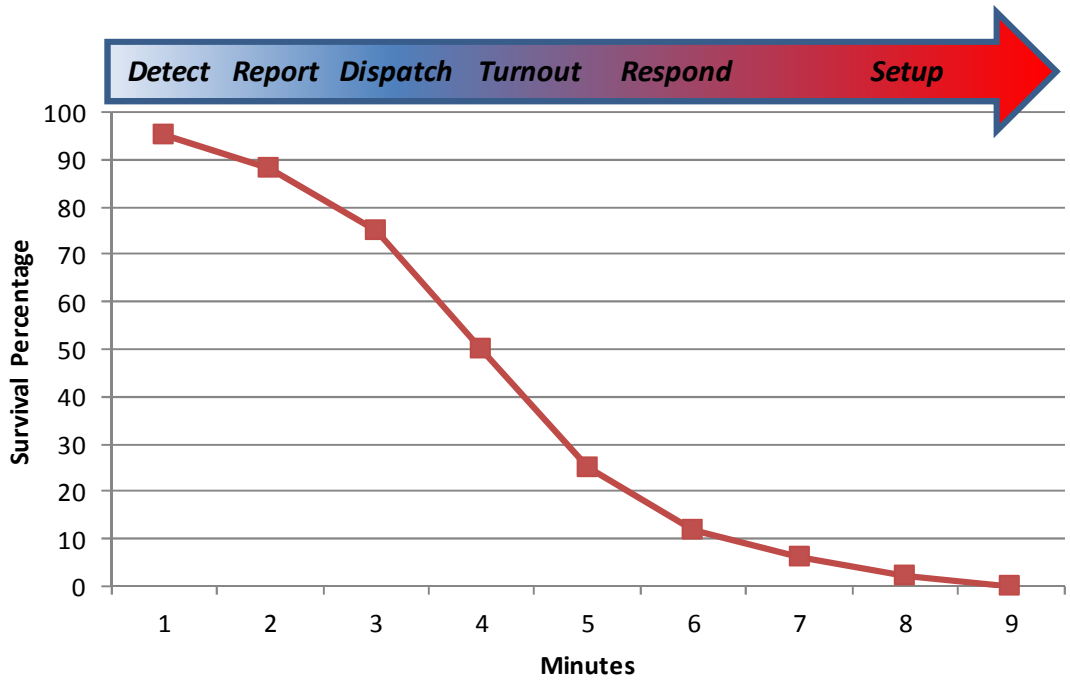
whole. Although a separate workload forecast was not completed for ACP, it is presumed that, since BFD responds to all medical incidents within the City, ACP's workload will increase in kind.

Community Risk Analysis and Standard of Cover

The fire service assesses the relative risk of properties based on a number of factors. Properties with high fire and life risk often require greater numbers of personnel and apparatus to effectively mitigate a fire emergency. Staffing and deployment decisions should be made with consideration of the level of risk within geographic sub-areas of a community. In regard to EMS, however, determining risk is somewhat more difficult since EMS service demand is tied strictly to human activity rather than static properties.

Cardiac arrest is the most significant life threatening medical event. A victim of cardiac arrest has mere minutes in which to receive definitive lifesaving care if there is to be any hope for resuscitation. In general, the likelihood of survival decreases by about 10 percent for each minute that passes without intervention. The following chart graphically illustrates the impact of time on survival and the time associated with emergency response organizations to react.

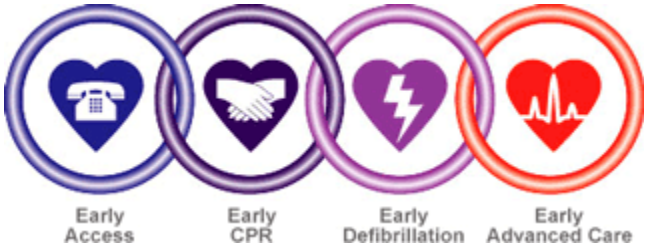
Figure 40: Cardiac Arrest Event Sequence



To improve survivability from a cardiac arrest it is essential that a coordinated effort be undertaken within the community. The American Heart Association's Chain of Survival provides a template for a comprehensive coordinated community approach to improve out-of-hospital cardiac arrest survival.

The model developed by the AHA recognizes that the first element is early recognition of the cardiac arrest event by the public, followed by early initiation of CPR, early defibrillation and finally early advanced care as represented in the following 'Chain of Survival' illustration.

Figure 41: Chain of Survival



In cities such as Seattle, Washington, where CPR training is widespread and EMS response and time to defibrillation is short, the survival rate for witnessed cardiac arrest is about 30 percent.

Some recent studies have documented the positive effect of lay rescuer AED programs in the community. These programs all ensure adequate training, and a planned response to ensure early recognition of cardiac arrest and EMS call, immediate bystander CPR, early defibrillation and early advanced care. Lay rescuer AED programs consisting of police in Rochester, Minn., security guards in Chicago's O'Hare and Midway airports, and security guards in Las Vegas casinos have achieved 50–74 percent survival for adults with sudden, witnessed, VF cardiac arrest. These programs are thought to be successful because lay personnel are trained to respond efficiently and all survivors receive immediate bystander CPR plus defibrillation within 3–5 minutes

The City of Boise should strengthen the community response element in the Chain of Survival through the provision of scheduled CPR classes as well as the implementation of a community wide Automated External Defibrillator (AED) program.

As stated, time is critical in the achievement of an effective outcome to an emergency event. In addition to an educated public , completing the Chain of Survival requires delivering sufficient numbers of properly trained, appropriately equipped, personnel within the critical time period. For a cardiac arrest incident, this can be up to six personnel: two to perform CPR, two to set up and operate advanced medical equipment, one to record the actions taken by emergency care workers, and one to direct patient care.

A recent report released jointly by several national organizations evaluated how first responder crew size, ALS provider placement, and the number of ALS providers is associated with the effectiveness of and EMS system.[19]

The report identifies two significant findings in regards to placement of personnel for the most effective delivery of EMS to the community. First, in regard to trauma patients, the study found that, "…crews with an ALS provider on the fire engine and one ALS provider on the ambulance completed all required tasks 2.3 minutes faster than crews with a BLS engine and two ALS providers on the ambulance."[20] Second, in regard to cardiac patients, the report found that, "…crews with an ALS provider on the engine and one ALS provider on the ambulance completed all required tasks 45 seconds faster than crews with a BLS engine and two ALS providers on the ambulance."[21]

BFD staffs four engines with ALS personnel (periodically, a fifth ALS engine is in service based on available staffing) while ACP provides a minimum of one and a maximum of two ALS providers on the transport units stationed throughout Ada County.

Recommendation:

- The City of Boise should require a coordinated deployment plan from EMS responders within the City of Boise to ensure that response times and resources are effectively and efficiently utilized.
- The City of Boise should strengthen the community response element in the Chain of Survival through the provision of scheduled CPR classes as well as the implementation of a community Automated External Defibrillator (AED) program.
- The City should strive to expand its service delivery model to include ALS care capability from all engine companies.

[19] *Firefighter Safety and Deployment Study. Report on EMS Field Experiments.* Moore-Merrell, L., et al.
[20] Ibid. Page 11.
[21] Ibid. Page 12.

Section III – Future Delivery System Models

The information contained in this report provides an in-depth analysis of the EMS system providing service to the citizens of Boise and the surrounding area. In the evaluation section, ESCI described the findings and provided a review of conditions or issues that require the attention of the organization. In many cases, these issues require relatively short-term effort or corrective action.

A master plan, however, is intended to provide strategies that are long term in nature. Its purpose is to identify the most critical issues the agency will face over the long haul, out as much as 20 years in the future. ESCI initiated that process in the previous section with a review of community growth, identified risks, and evaluated service demands. Now, the information collected, as well as the evaluation of future service demand, will be used to provide a recommended long-term strategy for the growth and development of a healthy EMS system, capable of providing the services that are valued most by the community in the most efficient and effective manner.

Emergency Medical Service Deployment Plan Development

ESCI has evaluated the EMS system within the City of Boise as just that—an EMS System. ESCI is impressed that the City of Boise has successfully established a quality EMS service without the participation in EMS system oversight and planning by Ada County Paramedics. It is abundantly clear through our interviews and analysis of data, that community leaders, fire service personnel and other service providers were united in their desire to establish a "system" that would provide critical life-saving services to citizens and visitors of the city. The initiative undertaken to develop a high-quality, integrated, emergency medical system as the foundation for this new initiative requires all participants to set aside personal viewpoints in an effort to create this vital community program.

As the system continues to mature, pressures have emerged that require modification to the current system design. As such, these recommendations do not fundamentally change the vision for the current system or the foundation of its structure. Rather, our recommendations are designed to

1) Provide for an appropriate governance structure to oversee the provision of EMS in Boise,
2) Enhance the operational efficiency of what is already in place,
3) Ensure that those charged with system oversight can monitor the system's performance over time, and

4) Provide for appropriate planning so that backup systems and surge capacity exist to protect providers and citizens.

Once these are accomplished, the providers can be confident that the provision of EMS in Boise remains a valued and efficient public service.

Any changes to the system in the absence of establishing an appropriate governance structure will lead to substandard performance, reduced provider safety, and degraded patient outcomes. The current governance structure provides only limited and parochial oversight; it provides the playing field for continuing provider discontinuity. The governance structure therefore should include a comprehensive oversight mechanism with real authority to ensure that patient-centered performance standards exist and that appropriate system efficiencies are imbedded in the system design.

The current performance structure limits the ability of system of participants to improve performance. That is why ESCI believes that economic, financial, response time and medical performance criteria must be carefully monitored. In fact, ESCI believes that some components of each option could ultimately play a role in developing an improved system design for the City of Boise.

For the purposes of this report, the City should consider how each of the recommendations will affect the current system and how those changes will affect patient care. However, the City must also consider the difficulties in monitoring and evaluating the system once the changes are made. The strategic recommendations, their descriptions, and their primary system impacts are described more fully below.

If the Council elects not to pursue the master plan recommendations established herein, the system will remain with the status quo. The “status quo” assumes that the City of Boise will continue with the current fire-based first responder system, with patient transport system provided by a separate government agency and will operate it in essentially the same manner. However, “status quo” is probably a misnomer. It is not possible in the long term to support the current inefficient structure of the system when the local ambulance company demands for revenue increases exceed the system’s ability to support those demands. As such, ESCI does not believe that the status quo is sustainable.

In addition, system stakeholders most likely will demand performance improvements. ESCI has already articulated improvement opportunities necessary to make the system more functional in the previous sections.

The status quo will most likely require that additional resources be applied to the system so that response times and accountability can be improved as the system continues to witness increased demand as the community grows. It will also require that significant adjustments occur in ratepayer and taxpayer subsidies to account for the additional costs the system will incur.

The model that is currently employed in the system is fractured, in that there is no comprehensive system oversight, there is no structured system planning, there is no method of ensuring performance criteria or standards and there is limited collaboration between the ambulance and first response community. The system should be structured toward a more fully integrated EMS system design, operating for the best interest of the larger community and utilizing all response agencies to the greatest extent possible.

ESCI's patient-centric design recommendations are intended to ensure that the patient receives coordinated services from first response to ambulance transport—high quality medical care throughout the incident until arrival at the hospital or tertiary care facility. This continuity provides EMS systems with better tracking of quality assurance issues. In adopting these recommendations, the system should be able to ensure that all scene responders are integrated into an appropriate incident command system and that the on-scene resources are centrally coordinated.

That means that the system administrators must carefully balance multiple independent agencies and assist them in functioning as if they are one. Convincing agencies to surrender some of their autonomy in favor of the benefits of a larger system is no small task. However, given the commitment that fire agencies have shown to date, ESCI believes that there are opportunities to continue to develop the current system and to make improvements. It is the hope of ESCI that Ada County Paramedics will also adopt this larger view in order to improve patient outcomes while at the same time creating a more efficient EMS system.

Assuming that City of Boise implements some or all of the master plan improvements listed below, the fire department must continue to coordinate its levels of first response.

Critical Issues Affecting the Provision of EMS Services

Boise Fire Department is now faced with the unique opportunity to make substantive improvements in the design of its emergency medical operations. ESCI has noted that there continues to be strong internal pressure by some system participants to maintain the status quo, while others seek significant changes. ESCI has made the following recommendations based on a reasoned approach to evaluating EMS system design. ESCI has evaluated the system based on contemporary professional standards and have considered the local operating, governance, and financial environments as the basis for our recommendations.

Yet, of critical importance to ESCI, is the interrelationship between these strategic recommendations. These strategies are part of a proposed business architecture that does not consider these recommendations as single items, rather they should be considered as an aggregated package to make improvements to the system.

In evaluating the potential changes to the system, EMS participants should consider how these recommendations will affect the current system and how those changes will affect patient care. As has been previously noted, any changes to the system in the absence of establishing performance criteria will limit the ability of the system participants to make substantive improvements. In the absence of establishing performance criteria, selecting any option will have roughly the same impact on the community.

The recommendations have been formed using a structured process that ESCI believes is most likely to provide the most reliable and achievable system improvements. First, the analysis considers the details of each of the system components. As part of that analysis, specific recommendations have been noted that can be implemented irrespective of any system redesign options. Next, based on the analysis, the evaluators identified the critical issues facing the system and how those issues impact services. System-design options are then crafted that the evaluators believe will provide likely opportunities to improve services to the community. Those options are evaluated against the critical issues facing the EMS system and a final recommendation is provided. ESCI believes that, irrespective of the option selected,

financial, response time, and medical performance must be carefully monitored. While each of the recommendations we have provided above has implementation nuances, there may be additional derivations of these recommendations that go beyond those articulated in this report.

Critical Issue 1 – EMS System Fragmentation

Ada County and the City of Boise have a long history of apparent enmity on issues related to EMS. This animus appears to have exacerbated system fragmentation issues. Fragmentation impacts the EMS system in a number of important ways. First, fragmented deployment design causes some patients to receive multiple paramedics in a very short period while others wait an exceedingly long time to receive ALS services. This happens in the City of Boise because the two agencies independently develop deployment plans without regard to the location of the other resources in the system. Fragmented training and medical oversight means that some ALS personnel receive one message from medical training personnel while other ALS personnel receive another. Fragmented regulatory oversight means that multiple regulators oversee enterprises that have multiple and often contrary missions. Finally, fragmented incident command policies mean that some personnel could be placed at risk if following different command rules on scenes. The City of Boise and other EMS system providers must reduce system fragmentation in order to make EMS system improvements.

Critical Issue 2 – Lack of Clear, Coordinated, Governmental Oversight

In the City of Boise, there is no single agency charged with the responsibility for the management of the EMS system. While elements of management and a regulatory structure are in place, administrative authority is limited to one of a support role to numerous autonomous agencies. Currently, the lack of regulatory oversight limits the ability to resolve the system fragmentation and safety issues. While the lack of oversight may not directly degrade the system, it is difficult if not impossible to resolve many of the fragmentation and other issues that will continue as the system matures.

As part of its strategic process, the system should ensure that appropriate regulatory oversight is in place to more effectively meet the needs of the system. At a minimum, the regulatory process should meet the following goals:

1. Create a regulatory process that can ensure that minimum standards are established for EMS providers in the City of Boise. The process should also ensure that the regulatory agency can effectively administer the performance requirements created by the provider agreements.
2. Establish an appropriate, overarching and formal planning process to ensure that the system establishes a strategic, long-term plan for making system improvements over time.

3. Ensure that the regulatory authority has the ability to establish reliable performance standards that reflect medical, financial, equipment maintenance, and response requirements.
4. Establish a formal communications process that includes a structured methodology for the delivery and transmittal of statistical data and information. This process should provide an avenue for the representation and involvement of system stakeholders.
5. Create a Technical Advisory Committee, comprised of system participants, to provide recommendations to the City Council on operational issues.

Critical Issue 3 – Inefficiency of Ambulance Transport System

Though no national standards exist, ESCI has evaluated numerous EMS systems and has developed ranges of UHU measures based on the system design. For example, in fire-based (or dual-role) delivery systems, a UHU of .20 is an appropriate efficiency measure. For single-role ambulance services, UHU rates of up to .35 can be achieved, and in "high performance" EMS systems, UHUs can exceed 0.45. Essentially, a 0.45 UHU results in a single ambulance transport capability of approximately 11 patients in any 24-hour operating period. On an annual basis, this would result in a capacity of about 4,000 transports per unit.[22] Importantly, response time requirements, rurality, transport times, shift schedules, and the level of system integration can all impact system efficiency.

Ada County Paramedics have a relatively low (inefficient) unit hour utilization rate. Of up to 12 units deployed daily, a third have a UHU of less than 0.20, and four units have a UHU of more than 0.25. No units exceed 0.35 UHU. The operational efficiency of the ambulance service is important to the system because resources intended for ambulance operations are diverted to wasted deployment, leading to higher ambulance rates and potentially higher taxes for service.

Critical Issue 4 – No coordinated measures of system performance or performance definitions

Within the City of Boise, there are no established system-wide performance standards nor are there definitions for what performance is appropriate to monitor and improve. Ada County Paramedics reports response time "goals" of nine minutes or less with 90 percent reliability, and the fire department has similar standards. Yet standards for performance go beyond simply creating standards for response time. Performance standards should also include standards for medical quality, maintenance, breakdown rates, supplies and pharmaceuticals, vehicle design, training hours and delivery methods, employee turnover rates, and so on.

[22] Private ambulance services frequently exceed a 0.30 UHU ratio, however that analysis is based on units staffed for less than 24 hours.

Yet even basic performance standards must have clearly structured definitions so that the measurement of performance against the standard is meaningful. For example, response time standards may at first seem straightforward, but definitions are complex. The system should define what starts and stops the clock, it should describe reasonable exceptions to response performance—such as weather, upgrades, downgrades, dispatch errors, staged calls, and inaccurate addresses, and it should describe response zones that receive urban, suburban, or rural levels of performance. Without these clear definitions, the reporting of response performance can be confusing, inaccurate, or simply wrong.

In addition, the system has not defined the important questions regarding quality, performance, and patient outcomes. Despite each of the system responder's parochial response goal, there is no goal regarding how the system should perform. For example, the system should define how long it should take to deliver a paramedic to a patient's side rather than focusing on whether that paramedic arrives on an ambulance or fire apparatus. A critical issue for the City of Boise and the EMS system therefore is to describe and define appropriate performance standards and measures for the system.

Critical Issue 5 – Inequitable Financial Structure

Another critical issue facing the City of Boise is the inequitable financial structure in the system. Typically, tax levies to support ambulance service are based on either 1) ensuring the reliable provision of ambulance service in rural areas where citizens could ordinarily expect long response times inordinately high ambulance rates, low quality, or a combination of all three, or 2) offset the high rates necessary to ensure the provision of ambulance services in other areas. The financial structure in Boise requires unusually high service fees, presumably to maintain the availability of service in rural areas. While ESCI has not conducted an analysis specific to the City of Boise, it is believed that Boise residents are subsidizing ambulance services in other parts of the county—both in rates and in taxes. As such, this inequitable financial structure is in place today and it will remain even if another ambulance provider is selected. While the inequity will endure irrespective of the options chosen, it should remove any accusations of double taxation should another provider ultimately be selected to operate the service.

Critical Issue 6 – No single medical authority for the system

A critical issue for the City of Boise is that multiple medical advisors provide varying levels of oversight over paramedics in EMTs in the system. The system has made great strides in aligning the medical protocols, aligning the medical training processes, and making better use of training resources. This

alignment should be extended to the medical oversight processes. A single medical authority does not necessarily mean a single physician; rather a single medical authority could mean a group of physicians who, through any number of structures, act as a single physician. The current system currently has a Medical Directorate established where all Medical Director's meet monthly to discuss system issues. The weakness of this lies in the message/opinions being provided to each of the individual agencies and the lack of coordination between the Medical Directors. A political component is also a problem when one Medical Director lobbies for an issue that favors one agency over another. While there are other structures to align physicians, a critical issue for the City of Boise is to ensure that the medical oversight in the city is united in its methods and approaches of overseeing and providing advice to paramedics operating in the city.

Critical Issue 7 – Lack of integrated quality assurance methods.

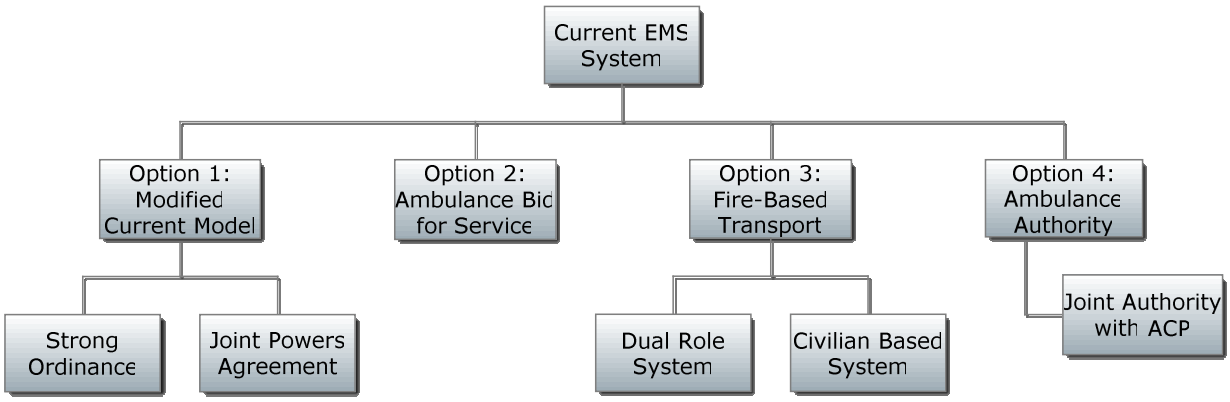
Quality assurance is an industry-adopted method of ensuring that the highest quality medical care is provided to citizens. Typically, each service provides its own quality assurance processes and those processes don't interact with the downstream pipeline. In the continuum of medical care, EMS systems must aggregate the first response as well as ambulance and hospital (emergency room) care so that both individual and system-wide improvements can be made to the medical care. Then, those processes must integrate with medical outcomes so that providers can reliably determine whether medical interventions are appropriate for the outcomes produces by the system.

Summary of System Redesign Options

As has been previously noted, any changes to the system in the absence of establishing performance criteria will limit the ability of the system participants to improve performance. That is why ESCI believes that financial, response time, and medical performance must be carefully monitored irrespective of which option is selected. While each of the options has both advantages and disadvantages, there may be additional options and considerations other than those articulated in this report. In fact, ESCI believes that some components of each option could ultimately play a role in developing an appropriate system design for the City of Boise.

The figure below describes the basic options available to the local EMS system. First, the system as it currently exists can opt to remain with the status quo or can make changes in any of three major ways: creating a competitive bid for ambulance services, create a fire-based transport system, or establish a local ambulance authority. For the purposes of this report, the additional options will be described under the most common or likely scenarios, however, with each scenario, a number of potential permutations may impact either the operations or financing of the system.

Figure 42: Boise, Idaho--EMS System Design Options



- Option 1: Modified Current Model - Continue with current basic system, including the current transport model for ambulance service while making certain improvements based on the recommendations in this report. In proceeding with this option, the City could maintain ACP as the ambulance provider by either crafting a strong ordinance for regulating ambulance service within the boundaries of the city or crafting a joint powers agreement (JPA) with Ada County that details the structure of how services will be provided.

- Option 2: Competitive Bid for Ambulance Services Model – Many cities throughout the United States have established competitive bids for ambulance service. In the bidding process, the City could establish clear and appropriate performance requirements that describe the level of services to be rendered as well as penalties for non-performance.
- Option 3: Fire-Based Transport Model – Using the structure and authority already in place in the system, the City of Boise has the authority to expand upon the current model and create a structure for ambulance service that provides for a public sector ambulance service operated within the fire service. The Fire-Based Model may take one of two forms, either a model that provides services using dual-role firefighter paramedics or a model that uses civilian paramedics under the direction and control of the fire department command system.
- Option 4: Ambulance Authority – The City of Boise, in concert with ACP and other EMS system participants, could establish an EMS authority that uses the joint expertise and resources of the participating agencies to create an oversight and governance model for the City and potentially for the region.

In evaluating the local system design, the Boise City Council and executive staff should consider how each of the possible options will affect the current system and how those changes will affect patient care. However, irrespective of the option selected, the board must also consider the difficulties in monitoring and evaluating the system once the changes are made. The basic options and their primary system impacts are described more fully below. However, because each option may itself be comprised of a number of different nuances, not all of the potential ramifications are discussed.

Option 1: Modified Current Model

The "modified current model" option assumes that the City of Boise will continue with the current transport system and operate it in essentially the same manner. This option could be referred to as an enhanced status quo, however; "status quo" is probably a misnomer. System stakeholders most likely will demand improvements to the system. ESCI has already articulated improvement opportunities necessary to make the system more functional in the above sections.

Continuing with the current system presupposes that the current number of EMTs and paramedics remains substantially the same. EMS training costs and advertising/marketing costs are stable, that the management structure remains, and that the system continues to respond to an equal number of EMS calls.

This option will require additional resources be applied to the system so that response times and accountability can be improved. It will also require that certain adjustments occur in stakeholder subsidies to restore a sense of fairness among participating agencies.

This option would cause less of an EMS system impact, and also provide for a number of system improvements. It would also require minimal buy-in from the current ambulance provider and would have the lowest cost. However, in the face of the existing perception of financial inequity, the City of Boise will continue to be frustrated. The City will believe (and perhaps appropriately so) that citizens of the City receive an inordinately low level of service while contributing an inordinately high level of system revenue.

To offset some of these issues the City can establish a strong ordinance regulating the provision of ambulance service within the geopolitical boundaries of the City. That ordinance could (and should) specify the details of performance requirements, including resource deployment and response times, training, quality assurance, ambulance personnel conduct, incident command, safety, vehicle maintenance and permitting, reporting, and medical oversight, all of which should be outlined in a professional services agreement between the City of Boise and Ada County.

Option 2: Competitive Bid for Ambulance Service

Under this scenario, the City of Boise would assume control of all EMS activities within the City but then conduct a competitive bid for emergency (and potentially non-emergency) ambulance services to a contracted provider. ACP could be a bidder for the right to provide services to the City if it qualified under the rules of the competitive proposal process. This scenario would still require an ordinance establishing the authority of the City to conduct the process and would require the development of a competitive request for proposals that outlines the requirements of the ambulance provider as well as a comprehensive contract with the winning bidder that establishes those requirements as well as a contract with the selected proposer to ensure sufficient deployment and staffing, outline response performance criteria, and define financial obligations and reporting requirements. The City could (and most systems do) establish a franchise fee that reimburses their efforts for overseeing the provision of services by the ambulance provider.

The most important aspect of this process is that the process is based on competition—that is the process removes competition "within the market" and instead establishes competition "for the market." As such, periodically, the City could conduct additional RFPs for ambulance service if the City was dissatisfied with the performance of the existing provider or if it wished to seek the benefits of additional proposals.

Such a process would not necessarily inhibit BFD's ability to also provide EMS within the City of Boise. In coordination with contracting EMS services to a private provider, the City of Boise could also operate transport ambulances either in support of the contract provider or as the primary provider of EMS within the City being supported by the contract provider. The deployment of this joint effort would vary greatly based on what role BFD would assume within this joint provider system.

Contracting for transport ambulance services would provide the ability for the City of Boise to reduce the fragmentation in the EMS system. A contract could clearly specify the roles of each provider and could ensure that incident command structures protect the safety of providers and appropriately manage complex medical incidents. A properly structured transport ambulance contract would ensure accountability of the transport ambulance provider to both the medical community as well as a structured governance process.

A properly constructed contract for transport ambulance service may also improve the quality in the system. The contract could specify quality assurance requirements, maintenance requirements, employee standards, work hour and fatigue limitations, and vehicle design specifications. These standards could be embedded in the RFP to ensure that all qualifying ambulance services meet the appropriate standards designed by the system overseers.

Yet contracting for ambulance service would be met with some level of political controversy. Ada County Paramedics would claim that the taxpayers in the city are paying for services they don't receive. The common mantra from the local ambulance service is that the citizens would be taxed without receiving the benefit of that tax. ESCI disagrees with this opinion. The citizens of Boise most likely subsidize the system now through both taxes and rates without the ability to determine either the provider or the standards established in the system. A contract for service would resolve this issue. The same structure is in place within Ada County through the provision of law enforcement services. All

Boise residents pay a tax to Ada County to support the services provided by Ada County Sheriff's Office and also fund the City of Boise Police Department through city taxes. This is a common system across the country to improve the level of service within urban areas.

Option 3: Fire-Based Transport Model

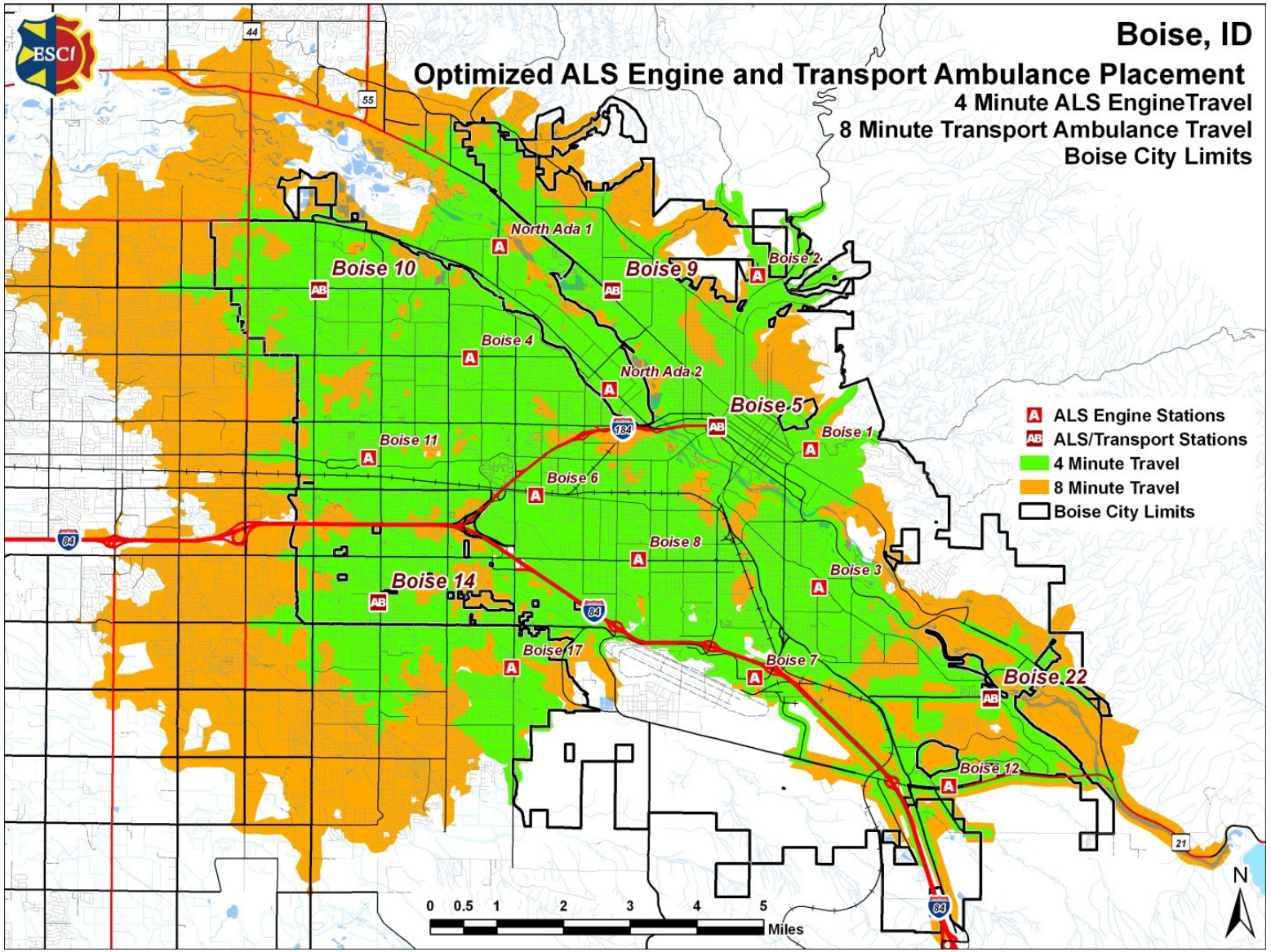
Operating an independent fire-based EMS transport service within the City of Boise would be a significant undertaking requiring a substantial financial commitment from the City. Considering that a large portion of ACP responses occur within the City of Boise, the current revenue stream to ACP from user fees would be significantly reduced. In addition, there is nothing within current legislation to require Ada County to share or redistribute taxes collected as part of the existing ambulance district; thereby the City would rely on user fees and general fund revenues to support the system.

As noted previously, a fire-based transport model could take one of two forms within the City of Boise: Dual-role paramedics or civilian paramedics. In either case, a certain number of ALS personnel will need to be deployed throughout the system, whether as ALS engines, ALS transport units, or a combination of the two. A report released through a partnership with the National Institute of Science and Technology (NIST) concluded that, in order to complete critical tasks most efficiently on emergency medical scenes, the optimum personnel deployment consisted of a three to four-person first response unit (engine) with one ALS provider on board followed up by an EMS transport unit staffed with one ALS provider and one BLS provider.[23]

Based on the information contained in the NIST report, should the city decide to implement this option, ESCI recommends that BFD begin a coordinated deployment of resources to establish capability of ALS engines reaching at least 90 percent of the City of Boise in less than four minutes of travel while deploying sufficient ALS transport resources such that at least 90 percent of the City of Boise can be reached in less than eight minutes of travel. Based on this recommendation, resources would need to be deployed as indicated in the following.

[23] Report on EMS Field Experiments. (2010). *Firefighter Safety and Deployment Study.* Moore et al.

Figure 43: Four-Minute ALS Engine Travel with Eight-Minute Transport Travel



Based on the preceding figure, there are very few areas within the City of Boise that are outside the four-minute travel model from existing stations. In fact, 88 percent of the 2009 service Priority 2 and 3 service demand falls within the current four-minute travel model. Following this recommendation would necessitate the placement of ALS engines at each current BFD facility and five ALS transport units stationed at Stations 5, 9, 10, 14, and 22.

BFD currently employs 27 EMT-Paramedic personnel. Information provided by the department indicates that paramedic pay for a senior firefighter averages $1,844 annually in addition to the base salary and other benefits and special pay. Although paramedic special pay ranges from $308 to $1,844, the higher end of the scale is used to calculate potential fiscal impact for this strategy. Based on the recommendation to place paramedics at each of the primary BFD stations, increasing the total number of paramedics from 27 to 102 (2 per shift at each primary station) would cost approximately $188,088 annually.

If BFD continues to staff response units with firefighter/paramedic personnel rather than make use of civilian paramedics, the approximate cost to place one 24-hour unit in service is estimated to be $886,620 annually[24]. This accommodates 7.5 FTE (two personnel per shift for three shifts). Considering the current deployment of eight transport ambulances within the City of Boise, the total cost is estimated to be $7,092,960. While this requirement supplies the personnel resources, it does not include equipment, materials, supplies, or other miscellaneous costs. With these additional costs and inclusion of capital replacement of ambulances and equipment, the total cost to deploy eight ambulances within the City of Boise is estimated to be $8,866,200.

Yet there are significant financial advantages to the City by using dual-role personnel to provide the service. If this option is selected, the City will have the advantage of using both first response and ambulance paramedics. Using ALS to "stop the response time clock" the fire department could provide the service using far fewer deployed ambulances. This type of deployment alteration could be used to reduce the overall expense to the system, particularly in the terms of first year capital costs. Using this structure, the city could deploy five ambulances with an average UHU of 0.216—easily achievable for a fire department deployment structure. The labor cost for deploying five ambulances would be

[24] Based on the average salary and benefits of a Senior Firefighter/Paramedic of $118,216 calculated at 1.25 FTE per position for a total of 7.5 FTE.

$4,433,100. Adding in the cost for additional supplies and materials as well as capital costs, the estimated requirements for this option would be 5,541,375.

In terms of potential revenue, ESCI evaluated the 2009 revenue for ACP and applied some general assumptions about that information as noted below.

- 70 percent of ACP volume occurs within the City of Boise.
- Incident type is distributed across five categories (BLS-Non Emergency, BLS-Emergency, ALS 1-Non Emergency, ALS 1-Emergency, and ALS 2).
- Supplies, procedures, and mileage revenue comprise only a fraction of total revenue.
- Contractual allowances and adjustments significantly reduce gross revenue.
- Gross collection rates average 49 percent while net collection averages 75 percent.

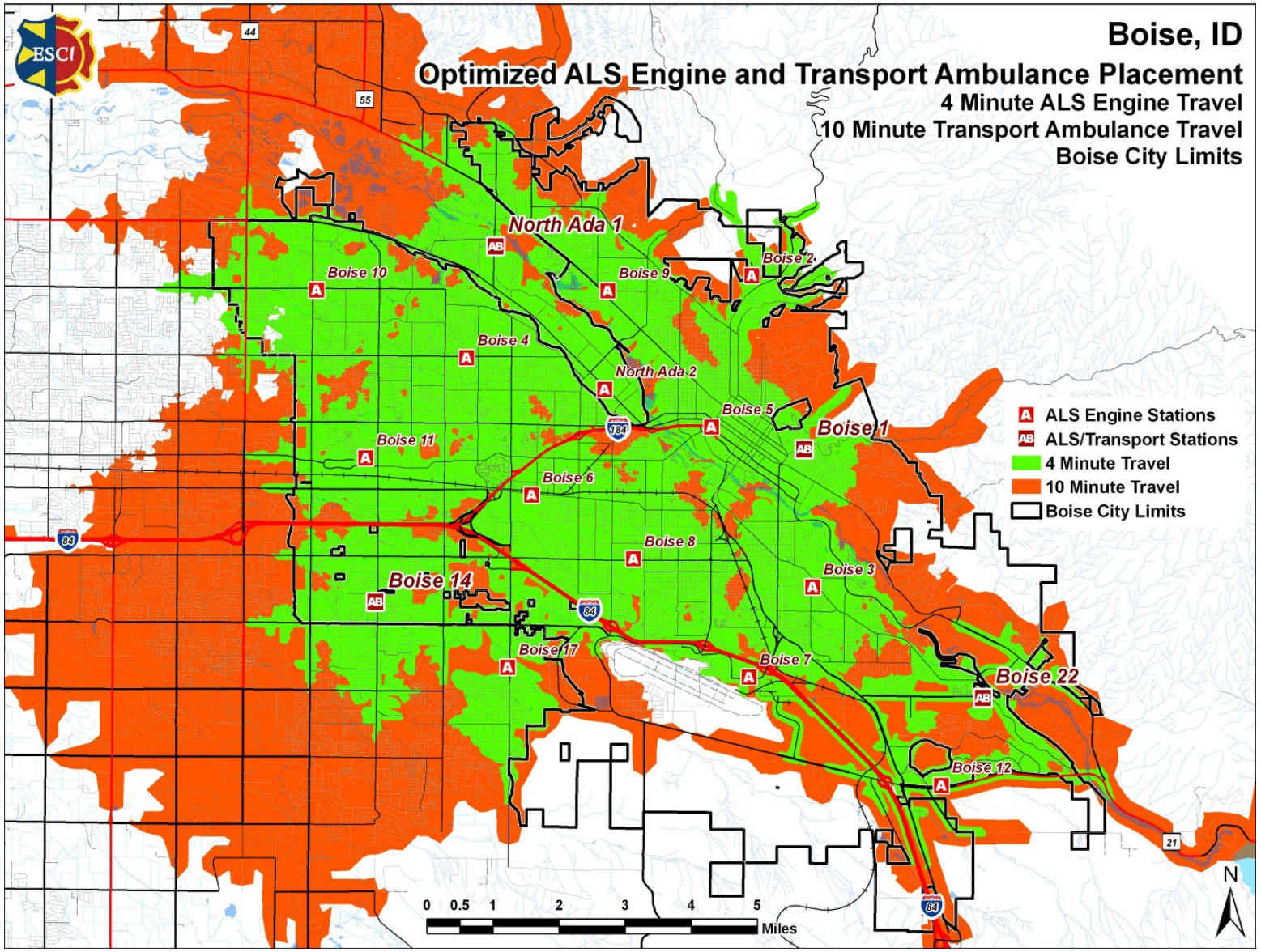
Based on these assumptions, ESCI estimates that BFD could generate approximately $4,905,172 in net operating revenue. ESCI would also recommend that the City develop an RFP for ambulance billing services because ambulance service billing is perhaps the most complex of all medical billing. Typically, medical billing contracts are much more efficient than governmental billing services; however they typically charge a percentage of collections. That charge is roughly six to eight percent of the total collections but is far less than conducting the same services in-house and the collection rates are generally higher.

Employing another sub-option, the city could make use of civilian paramedics, operating under the aegis of the Boise Fire Department. This option would reduce labor costs as the civilian paramedics would not be subject to the same salaries and benefits as firefighter paramedics. Currently labor costs per paramedic are about 30 percent less for civilian paramedics. There are other differences in a civilian versus a fire/paramedic ambulance operation. For example, an additional level of effort will be required by the human resources department (because of the unique scheduling, overtime, and FLSA issues) so ESCI would recommend that the total labor differences be estimated at no more than 25 percent.

Regardless of which direction the City chooses the number of ALS engines and/or ALS transport ambulances remains the same given the four and eight minute responses for first response and transport ambulance respectively. There are, however, other options available based on the desired response performance.

Assuming that the four-minute travel model for first response and assignment of ALS personnel to each current BFD station remains constant, the response time of the transport ambulance can be adjusted upward to evaluate the effect on deployment. The following figure illustrates a four-minute ALS engine response and a 10-minute transport unit response.

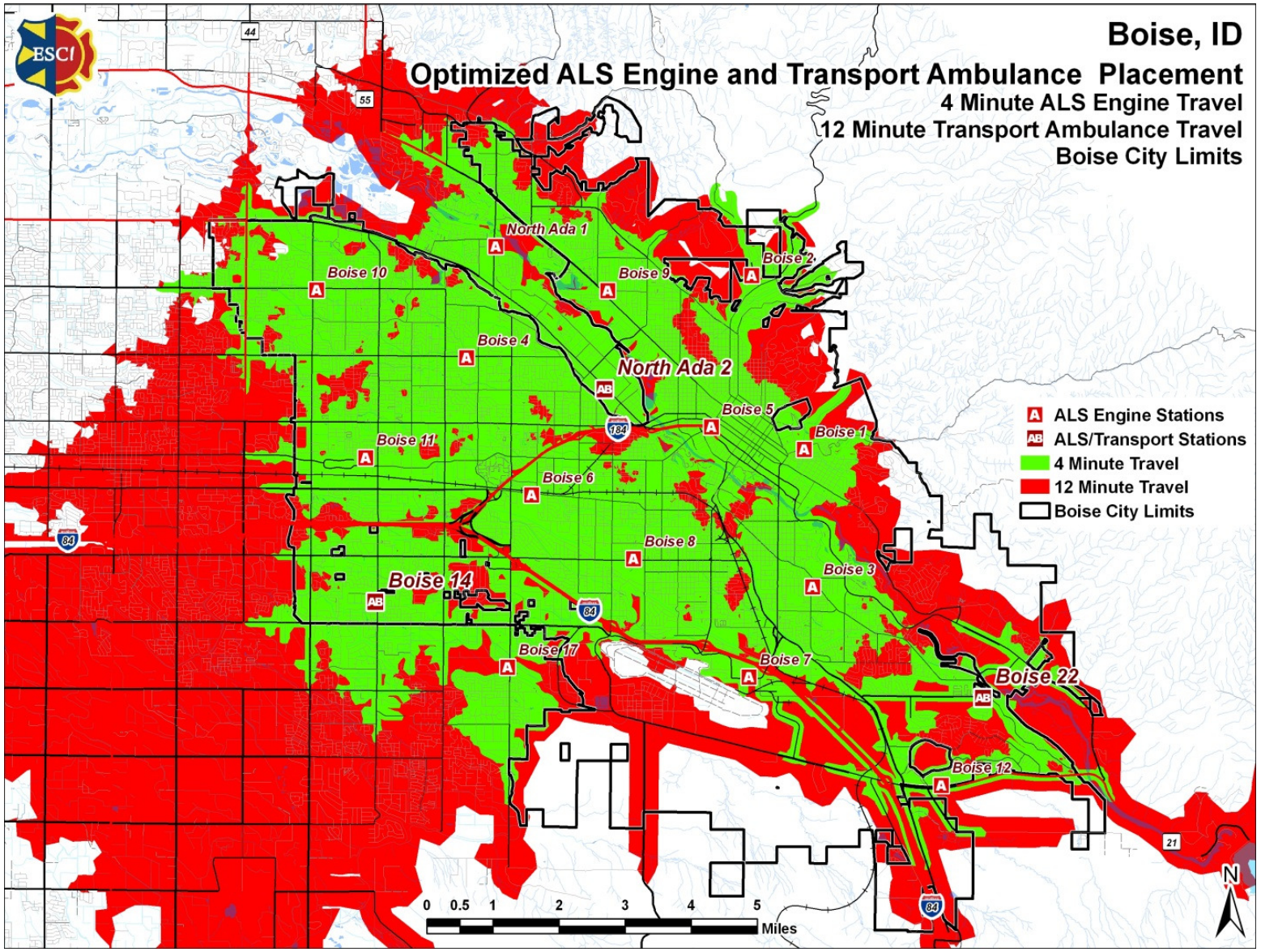
Figure 44: Four-Minute ALS Engine Travel with 10-Minute Transport Travel



As can be seen in the figure above, under the 10-minute transport travel time scenario, only four ALS transport units would be required to meet the travel time response performance objective. This, however, does not take into consideration the workload and potential call concurrency (simultaneous incidents) that could over stress and reduce the reliability of the system.

In further attempts to evaluate the effect of extended transport unit response times, ESCI analyzed the deployment of transport units based on a 12-minute travel model as indicated in the following figure.

Figure 45: Four-Minute ALS Engine Travel with 12-Minute Transport Travel



As illustrated in the figure above, under this scenario only three transport units would be required to meet the travel time performance objective. As with the 10-minute travel model, this does not take into account concurrent calls and the effect those incidents have on the overall reliability of the system.

In evaluating the efficacy of the 10- and 12-minute transport unit scenarios, ESCI analyzed the potential UHU that those units could potentially experience given historical service demand within the City of Boise. For calendar year 2009, ACP transported 9,461 patients within the City of Boise. Using this number to calculate an estimated UHU, deploying six units would generate a UHU of 0.18, five units would generate an estimated UHU of 0.22, four units would generate an estimated UHU of 0.27, and three units would generate an estimated UHU of 0.36. From these calculations, it is apparent that the deployment of less than five units would generate a UHU that would not be sustainable for BFD.

Although UHU is one effective method in determining how many units to deploy within a system based on workload, a more useful measure is call concurrency. Call concurrency evaluates data over a specific period and determines how many incidents occurred simultaneously during any given period of time. Although ESCI was outside the scope of work for this project, ESCI felt it prudent to evaluate call concurrency of ACP during calendar year 2009 in order to determine how many units could potentially be needed within the City of Boise to handle multiple incidents. Based on the analysis, ESCI determined that during calendar year 2009, ACP experienced one occurrence of call concurrency greater than five. In other words, 95 percent of the time, four units can handle the occurrences of simultaneous incidents within the City of Boise. The average necessary number of deployed units is two but having a sufficient amount of surplus in the system to handle multiple incidents is highly recommended.

Option 4: Establish a local or regional ambulance authority.

The City of Boise, in concert with ACP and other EMS system participants, could establish an EMS authority that uses the joint expertise and resources of the participating agencies to create an oversight and governance model for the City and potentially for the region. The ambulance authority would set rules and standards for an area exceeding the geopolitical boundaries of the city, presumably all of Ada County. The consideration of an ambulance authority reflects the concept that there may be an opportunity to create horizontal integration as well as vertical integration in the system.

While the authority creates an improved governance model, establishing the authority is complex and requires significant issues related to the balance of power within the agencies that make up the authority. ESCI has attempted to provide options that establish opportunities to improve performance in the system without regard to geopolitical boundaries or political makeup. The complexity of establishing the ambulance authority is why ESCI believes this option is less desirable than others that are described herein.

If a regional ambulance authority is developed, one method to enhance the current EMS system is to share staff between the system participants in order for personnel to gain experience on both sides of the pre-hospital environment: first response and transport. Both BFD and ACP have previously worked on an agreement to share staff but have been unable to reach agreement due to funding and budgetary issues.

The extent of the fiscal impact to either the City of Ada County for enhanced staff sharing will be dependent upon to what extent staff is shared and what types of accommodations are made by each agency to offset differences in personnel costs. The "Concept Proposal for Joint EMS-Fire Staffing Agreement" developed internally is included in the appendix of this report.

There exists a substantial difference in total salary and benefits for personnel of each organization. The total salary and benefits of the average BFD Firefighter/Paramedic calculates to $118,216, whereas the total salary and benefits of the average ACP Paramedic calculates to $66,778. This results in a difference of $51,438 per person, on average.[25]

Based on estimates calculated at the time the aforementioned concept document was created, the fiscal impact to the City of Boise would equate to approximately $148,644 annually. This would allow two BFD personnel per shift to occupy slots on ACP transport units. Unfortunately, if current BFD shift personnel were to staff ACP units, slots vacated on BFD apparatus would also have to be filled, resulting in an additional impact of $616,095 (approximately), not including any overtime costs incurred.[26]

[25] Average salary figures obtained from BFD as well as the proposed agreement between BFD and ACP to allow BFD personnel to function as personnel on ACP ambulances. This agreement was never implemented.
[26] Ibid.

The intent of staff sharing is not for BFD to supplement ACP units or to simply allow BFD personnel to gain more patient contact time through transport experience, but for personnel of each agency to gain experience within the other organization. Personnel within ACP that have the requisite training and desire should be 'swapped' for BFD personnel that have the requisite training and desire. The City of Overland Park and Johnson County, Kansas, implemented this type of system and now MedAct (the ambulance provider for Johnson County) jointly staffs six ambulances within Overland Park fire stations.[27]

[27] Based on information obtained from the resolution from Overland Park, Kansas city council creating the shared services agreement.

Long-Term Recommendations

ESCI has made the following recommendations based on a reasoned approach to evaluating EMS system design. ESCI has evaluated the system based on contemporary professional standards and have considered the local operating, governance, medical quality, and financial environments as the basis for our recommendations. The City of Boise is now in a unique position to drive substantive improvements in the design of its emergency medical operations. ESCI has noted that there continues to be strong internal pressure by some system participants to maintain the status quo, while others seek significant changes. The initial design of the options considered both possibilities.

Method of Developing Recommendations.

In evaluating the potential changes to the system, ESCI considered how each of the potential options will allow the City to resolve the critical issues affecting the system. While the critical issues have not been prioritized, ESCI believes that the system overseers must consider how changes to the current system will affect patient care, or at least how those changes are likely to affect patient care. That is why, as previously noted, any changes to the system in the absence of establishing performance criteria and other system standards will limit the ability of the system participants to make substantive improvements. In the absence of establishing performance criteria, selecting any option will have roughly the same impact on the community. That is why ESCI believes that, irrespective of the option selected, financial, response time, and medical performance must be carefully monitored. While each of the options presented have provided above has both advantages and disadvantages, there may be additional derivations of options and considerations other than those articulated in this report.

In making our recommendations, ESCI has taken into account the critical issues related to the City of Boise EMS system and have analyzed the options based on those critical issues. ESCI has compared each of the options to the critical issues and have analyzed how each of the critical issues is likely to be resolved based on the option selected. The table below describes the likelihood of success for resolving each of the issues described above. A rating of "high" indicates that it is believed that the likelihood of success is high. ESCI has added another factor—ease of implementation—because ESCI believes that the ability to actually resolve the critical issues is an important consideration.

Figure 46: Likelihood of resolving each of the critical issues facing the City of Boise

Expected Likelihood of Success—Boise EMS Options and Critical Issues						
Critical Issues	Option 1 Modified Current Model: Ordinance	Option 1a Modified Current Model: JPA	Option 2 Ambulance Bid	Option 3 Fire Based Dual-Role	Option 3a Fire Based Civilian	Option 4 Ambulance Authority
1. EMS system fragmentation.	High	Medium	High	Medium	Medium	Medium
2. Lack of coordinated governmental oversight.	High	Medium	High	High	High	Low
3. Inefficiency of ambulance transport system.	Medium	Medium	Medium	Medium	Medium	Low to Medium
4. No coordinated measures of performance.	High	Medium	High	Medium	Medium	Medium to HIgh
5. Inequitable financial structure.	Medium	Medium	Medium	High	High	Medium
6. No single medical authority.	High	High	High	High	High	Medium
7. Lack of integrated quality assurance.	High	High	Medium	High	High	Medium
8. Ease of implementation	High	Medium	High	Low	Low	Low

System Design Recommendations

The system is in a position to make substantive changes. Based on the analysis and on ESCI's evaluation of the critical issues facing the Boise EMS system, ESCI recommends that the system participants select **Option 1**, and proceed with a strong EMS ordinance that provides a structure within which the City provides strong oversight of the EMS system and places significant checks and balances in place over the performance of the ambulance provider as well the relationship between the city and county. This option is recommended based on the belief that certain fundamental components of the system can be improved, and in fact, ESCI believes that the system should maintain those high quality components, while making improvements to the structure of the oversight process and financial processes.

Option 1a (a joint powers agreement) can work, and there may even be some short-term benefit in maintaining the status quo through a joint powers agreement, however ESCI believes that a status quo structure will not solve the system's problems because the current ambulance provider appears to not be motivated to work out issues with the City. Simply ratifying the current structure will not guarantee improved outcomes for patients, nor will it ensure improved response time, reimbursement, or any other reliability factor. It will have the effect of masking significant system issues that can and should be resolved today. Providers in the system recognize that changes are needed. That ESCI knows of, none of those recommendations have been implemented. The current system design structure, the status quo, will be less effective in making the system improvements necessary to and minimize the impact of the critical issues on the future of the system.

As part of ESCI's analysis, **Option 2**(the private provider model) was examined as one option that could be useful in the system. While there are concerns that the private provider model might be culturally incompatible with the current participants and the processes in place within the current environment, ESCI does not believe that the current statute can prevent the City from selecting a private provider. The system's needs are related to regulation, oversight, and financial equity. Contracting for a private provider may assist the City with resolving that set of problems but may create a new set of issues to be resolved. A private ambulance provider might be more useful if the current ambulances were at capacity.

ESCI considers that **Option 3** (fire department dual-role) is a viable option for the city. The fire department is capable, it has the ability to provide a competent paramedic transport, and it has a significant advantage in being able to deploy firefighter/paramedics on engine companies. First-response paramedics are important to the system because the system can structure the arrival of paramedics at the patient's side irrespective of whether the paramedics arrive on ambulances or on fire transport vehicles. This allows the service to meet reliable response time standards.

In addition, the use of fire department dual-role system synchronizes the use of quality assurance, medical control, and other performance standards. These solid benefits allow the fire department to create a top-to-bottom EMS system within the city by ensuring the aggregation of important tasks.

Yet the fire department system is not without concerns. First, on its face, the fire transport system appears to achieve revenues that are about $500,000 less than the full cost of the ambulance program. However, the role of firefighter/paramedics is much more than ambulance work. They provide additional personnel and other resources to fire, rescue, and hazardous materials events. As such, an appropriate cost accounting system would allocate the cost of those of other activities to those other tasks. Hence, ESCI believes that the personnel cost allocated to ambulance efforts may be reduced (easily) by more than 20 percent. Appropriate costing using an activity-based method, could remarkably reduce costs, thereby making those costs less than the revenues attained by the transport component of the system.

Because the fire department does not currently transport, enhancing the management system and processes is critical to ensure that the system has the appropriate departmental oversight. New policies and procedures will be required, new personnel will be deeded to oversee and manage the new enterprise, and a new management team or structure will be important. Using fire transport as an additional enterprise will require additional management oversight, additional management structure and some level of capital investment.

Option 3a (fire-based system using civilian, single role personnel) could work for the Fire Department. However, this type of "third service" creates an additional layer of oversight and their associated costs as well as issues related to the incumbent culture in the system. As just one example, civilians are not eligible for the Fair Labor Standards Act (FLSA) 7K exemption which is allowed for firefighters. As such the labor cost for 24-hour personnel and some 12-hour personnel may be higher than existing ambulance employees. That is why the third service option eliminates the cost savings related to the continued use of cross-trained, dual-role personnel.

Option 4 (the Ambulance Authority Options) assumes that the City would be able to organize an ambulance (or EMS) authority with adjacent districts and departments and even perhaps the current ambulance provider. The ambulance authority would set rules and standards for an area exceeding the geopolitical boundaries of the city. The consideration of an ambulance authority reflects the concept that there may be an opportunity to create horizontal integration as well as vertical integration in the system. An ambulance authority would provide a more integrated system, but there could be issues related to the method and structure of the governance model for the authority. There may be some

advantages in that this option could lead to creating system-wide performance measures that lead to improved overall performance. Yet, an authority-based system does not solve the financial issues in the system. In addition, while the authority creates an improved governance model, establishing the authority is complex and requires significant issues related to the balance of power within the agencies that make up the agencies that make up the authority. ESCI has attempted to provide options that establish opportunities to improve performance in the system without regard to geopolitical boundaries or political makeup. The complexity of establishing the ambulance authority is why ESCI believes this option is less desirable than others that are described herein.

How the Options Resolve the Critical Issues

Resolving System Fragmentation

One of the issues that ESCI considered in the development of our recommendation for improvements is the process by which ESCI can resolve the fragmented oversight. It is noted throughout this document that the fragmentation is related not only to the number of participants in the system, but also those who are dependent on the system and have no formal structure in which to impact system change.

ESCI's recommendation of a strong City ordinance regulating ambulance service involves creating a formal governance structure to make strategic decisions in guiding the system. It is anticipated that the agencies involved—notably Ada County Paramedics, the City of Boise, and the medical directors—should have a formal structure by which they can make financial decisions, establish appropriate system standards, monitor the system performance and engage in a structured method of oversight. The level and degree of authority and autonomy with which the city is empowered is a decision for the city.

An ordinance provides a formal level of governance that can range from a strict advisory capability to one that empowers the fire department to address the multiple aspects of the local EMS system. Examples of this level of authority can include the ability to select the system medical director, obtain quotes (or bids) for ambulance services, establish quality and safety criteria, create a report structure that provides valid reliable data about the performance of the system, establish franchise fees, create dispatch requirements, establish limits on user-fee rates and other essential system decision making capabilities.

A well-written professional services agreement will provide the essential framework for the City to address most issues and, notwithstanding stated concerns of equity among certain members, provides for a method of communications and accountability of all provider agencies. With that said, however, there is the issue of equity, real or perceived which must be considered. Because of concerns related to contributions to the EMS system—as well as the benefits derived—the equity, or balance, must be established to serve the needs of all participants.

While the specifics of either an ordinance and/or a professional services agreement are beyond the scope of this report, ESCI believes that a consortium of local agencies must be formed to establish performance equity, financial equity, regulatory equity, and baseline expectations for the EMS system.

Resolving Uncoordinated Governmental Oversight

Making use of the status quo to either create a strong regulatory ordinance or establishing an IGA among the local providers are two ways for the city to coordinate the governmental and regulatory functions of the EMS system. Yet other system design options will work to coordinate the system as well. If the City creates an ambulance bid the city will be able to ensure the level of regulatory control that the system requires. Similarly, if the City establishes a fire-based system, whether dual-role personnel or civilians provide the service, it will have the opportunity to ensure that an appropriate level of regulatory oversight exists.

A competitive bid for ambulance service also provides a significant level of regulatory oversight because the City will have the opportunity to design all of the regulatory factors the make for a ll-designed ambulance service. However creating a competitive process for ambulance service is complex and requires a high level of sophistication on the part of the City. Similarly, creating a fire based system is not without its complexities and requires intense understanding of EMS system design by City staff.

Inefficiency of Ambulance Transport System

The ambulance service is inefficient in that it requires high unit-hour production without the expected level of output. Part of this inefficiency is the result of the financing structure of the service and part is the nature of the demographic and geographic service area that the ambulance provider serves. With high ambulance rates supplemented by countywide taxes, the provider has no real need to be efficient.

Yet regardless of the system design option selected by the City, fixing the ambulance inefficiencies will be difficult if not impossible. The city might be able to make some modest improvements by using the first response personnel to modify the response time clock—either through an ordinance, professional services agreement, fire service provision of ambulance service, or through an ambulance authority, the City will have little ability to impact the current ambulance provider's efficiency. The structural inefficiencies of the ambulance service, are imbedded in the structure—which means that the urban areas could expect some higher levels of performance, but without radical changes by the ambulance provider the City's influence will be limited.

No Coordinated Measures of Performance

Performance issues are a critical concern to ESCI. Because there are currently no structured, verified, quantifiable measures of performance, neither the system nor the City can tell whether the service provided is consistent with contemporary professional standards. In the status quo options, the fire service options, and the ambulance bid option, ESCI believes that there are appropriate opportunities for the City to establish measures of performance that not only include the first response agencies but also the ambulance entity.

The current operating environment limits the ability of the system to significantly modify deployment strategies because to do so would require a significant amount of data to be provided by the ambulance service. To date—largely because of the animus that exists in the system—the ambulance provider has refused to do so. Concurrently, concerns regarding system equity between participating jurisdictions can be resolved based on performance data rather than on physical location of response units. Analyzing emergency and non-emergency responses from a systems perspective will allow for the identification and implementation of cost effective modifications to deployment decisions and unit utilization measures.

Inequitable Financial Structure.

Current Idaho statute limits the ability of the City to resolve some of the financial inequities in the EMS system. The issue of the tax levy is well documented and irrespective of the option ultimately decided upon the City, there is no mechanism currently that would eliminate this levy. However, without adequate oversight and authority the City has very little control over other system costs such as the current fees being charged by the ambulance transport agency for patient transports.

Establishing a system of oversight and authority as recommended by ESCI through various options identified will enable the City to influence overall system cost through the elimination of duplication of services, by determining unit deployment based on established performance standards, creating a single medical control and a structured process for initiating changes to the system that have a financial impact on the system including planning for future capital costs. Initiatives such as those previously identified and based on the authority of the City to regulate service delivery within its geopolitical boundaries, should result in lower costs to its citizens and more equity in the financial support of the overall system.

No Single Medical Authority

One fundamental requirement of a well-functioning EMS system is that the system ensures appropriate medical oversight. The system currently has multiple physicians providing medical oversight, and though the physicians have agreed on a medical protocol, there is no system-wide, formalized structure to provide medical administration, structured quality assurance, multiagency training, and appropriate clinical experience.

ESCI believes that a single medical authority is a critical issue for the City of Boise. That is why many of the system design options are aligned to ensure that a single medical authority is likely for the city. Either of the modified current model options can be structured to ensure appropriate medical oversight. An ambulance bid, if selected, would be written to ensure that the single medical authority is a component of each provider's proposal. In addition, either of the fire-based options would ensure that a single system medical authority is present. The ambulance authority issue is a more troublesome as the developers of the authority must negotiate to determine how the medical authority would function within the system and the appointed Medical Director would be a full-time position.

Lack of Integrated Quality Assurance

The quality assurance, as currently established is flawed. While system providers have each established their parochial quality assurance programs, those structures are insufficient to guarantee consistent quality within the system. To be effective, quality assurance must evaluate the continuum of medical

care from the moment that the call is made to the 9-1-1 center until the patient arrives at the hospital[28]. Without an integrated quality assurance program, significant quality indicators may be missed, leading to suboptimal patient outcomes.

Integrated quality assurance processes can be established with a high degree of reliability through an ordinance process or through a joint powers agreement with the ambulance entity. An ambulance bid can enforce certain levels of quality assurance; however, the city will still rely on the contractor to propose all of the quality assurance levels that are desired. In a fire-based system—either dual role or civilian based—the city will have full control over the pre-hospital quality assurance provided by city personnel. Finally, the ambulance authority option will yield only medium control over quality assurance, as the participants to the authority will necessarily negotiate the quality standards.

Ease of implementation

As has been previously suggested, any proposed option without the ability to implement that option is mostly without merit. As such, in addition to the critical issues described above, ESCI has also considered that the city's ability to implement a proposed option.

ESCI believes that the implementation processes that are most likely to yield results are the ambulance ordinance and the ambulance bid for services. The ambulance ordinance is most likely to achieve implementation because the city is in control of the process. While it is recognized that there are some issues related to SB 1108 and ESCI understands the complexities of the political processes, ESCI still believes that the city is in the best position to use the ordinance process to enact change. Similarly, the ambulance bid for services will provide the city opportunities to create changes to the system that are within the control the city.

Fire-based options may be difficult to implement. The fire department will have to adopt some significant changes and establish ambulance service deployment and additional quality assurance measures, as well as to determine which staffing model is most appropriate (dual certified or civilian personnel), the financial impact of capital investments, and potential cultural differences that may not come easy for the department. As such, ESCI rated it more difficult to implement. Finally, the

[28]Ideally, the quality assurance program would include the emergency room care and even specialty care as appropriate.

ambulance authority is deemed to be more difficult to implement because a great deal of negotiating is involved with numerous agencies that may have parochial outcomes that they desire.

Implementation

ESCI expects that, if its recommendations are adopted, the ultimate result of the system improvements suggested by this document will be 1) the development of either an strong local ordinance or IGA, followed by 2) an incremental improvement in performance and efficiency in the current system, followed by 3) a comprehensive ability to manage and monitor the performance of the system because of the reports and data that are available to the system, and 4) an improvement to the medical oversight component by aggregating medical oversight capabilities in the systems[29].

Phase 1: ***Up to three months.***

1. Create the framework around developing the ambulance ordinance (or, as appropriate, the intergovernmental agreement).
2. Establish performance standards, including response times, billing rates and reliability, training, vehicle and maintenance standards, experience requirements, and other requirements aligned to the analysis sections above. Develop the process in concert with city attorneys, fire agency personnel, and purchasing management if necessary.
3. Establish timelines for implementation and review.
4. Craft and review the ordinance using contemporary professional standards and local nuances.
5. Establish information sessions with elected officials and department heads.
6. Pass the ordinance using city's non-emergency ordinance rules.

Phase 2: ***Three to six months.***

1. Collaborate with elected officials, city staff, city attorneys, and ambulance providers to describe standards prior to implementation period.
2. Provide and post standards on city web site and with known ambulance providers.
3. Provide notice of implementation period to ambulance providers and assist them with understanding and meeting requirements.
4. Update education programs and format reporting requirements.
5. Identify contingency plans for provider failure.

Phase 3: ***Up to 12 months***

1. Develop performance-monitoring process in concert with local providers.
2. Apply monitoring structure for system changes.
3. Establish appropriate feedback structures for emergency and non-emergency providers.
4. Reevaluate results of phases 1 and 2.
5. Monitor system and dispatch and provider performance monthly and make improvements when needed.

[29]The implementation plan assumes that the city proceeds with the development of a strong local ordinance or the negotiation of an IGA with the appropriate system providers. .

Although ESCI has presented several options along with a plan of implementation for improving the EMS system for the City of Boise, there is the potential that some system participants will resist modification of the current service delivery model. In this event, the City should work with legal counsel to determine what legal remedies may be available to ensure implementation of those system modifications that are in the best interest of the citizens of Boise.

Short and Mid-Term Recommendations

Throughout this report, ESCI has provided a number of recommendations that are intended to be implemented in the short and mid-term ranges rather than in the long-term. These recommendations are meant to improve and/or enhance the delivery of the current levels of service within the current deployment model. Recommendations have been prioritized based on a scale from one to five. A description of each priority is provided prior to the recommendations associated with that level.

Priority 1 – Immediate Internal Safety

The recommendation deals with an improvement or initiative that solves an issue affecting the safety of firefighters and/or other personnel. These are not matters that simply make it easier to do a particular function but in fact make a currently unsafe situation, safe.

- No Priority 1 issues or recommendations were identified.

Priority 2 – Legal or Financial Exposure

The recommendation resolves a situation that is creating, or is likely to create, the opportunity for legal action against the entity or its officials. It also may be a situation that could subject the entity to a significant expense.

- The City should seek to recover a portion of its first responder costs resulting from efficiencies implemented through its deployment plan from the transport provider agency.....40

Priority 3 – Corrects a Service Delivery Issue

The recommendation addresses a service delivery situation that, while it doesn't create an immediate safety risk to personnel or the public does affect the District's ability to deliver service in accordance with its standards of performance. For example, adding a response unit to compensate for a growing response workload or delivering training needed to allow personnel to deal effectively with emergency responses already being encountered.

Priority 4 – Enhances the Delivery of a Service

The recommendation improves the delivery of a particular service. For example, relocating a fire station to improve response times to a particular part of town or adding a piece of equipment that will improve the delivery of a service.

Priority 5 – A Good Thing To Do

The recommendation doesn't fit within any of the above priorities, but is still worth doing and can enhance the District's morale or efficiency.

- No Priority 5 issues or recommendations were identified.

Conclusion

It is common for those in emergency services to tout themselves or their organization in terms such as *a pride-driven organization that is at their best every day*, and *the best by test*, or more simply, *the best*. The true marks of quality of the best organizations, however, are those that work continuously for measurable improvement in organizational performance. By undertaking this study, the leadership of Boise Fire Department has begun the task of organizational and system evaluation that is necessary to plan for and reach the goal of truly being the best.

ESCI in no way intends to suggest that Boise Fire Department or Ada County Paramedics are not already operating at a high level. In fact, ESCI is pleased to report that all available evidence shows that both organizations consistently provide excellent service to the citizens of the City of Boise. However, in keeping with the notion of continuous improvement wherein an unending loop of performance, measurement, and evaluation leads to system enhancements that would otherwise be impossible, ESCI offers recommendations to assist the City in implementing strategies that will best benefit the public.

The ESCI project team began collecting information concerning the EMS system in the City of Boise in June, 2010. The team members recognize that the report contains an extremely large quantity of information and ESCI would like to thank the elected officials of the City of Boise as well as the staff of Boise Fire Department and Ada County Paramedics for their tireless efforts in bringing this project to fruition. ESCI would also like to thank the various individuals and external organizations for their input, opinions, and candid conversations throughout this process. It is ESCI's sincere hope that the information contained in this report is utilized to its fullest extent and that the emergency services provided to the citizens of Boise and the surrounding areas are improved by its implementation.

Appendix A

SAMPLE AMBULANCE TRANSPORT AGREEMENT

THIS AMBULANCE TRANSPORT AGREEMENT ("Agreement") is entered into this ____ day of _____, 2009, by and between the City of Lenexa, Kansas ("City") and the Board of County Commissioners of Johnson County, Kansas ("County") as the governing board of Johnson County Emergency Medical Services ("Med-Act") (collectively referred to herein as the "Parties").

WHEREAS, City and Med-Act both currently operate an ambulance service and emergency medical service, as defined by Kansas law; and WHEREAS, City desires to utilize Med-Act's ambulance service as the primary ambulance transport provider within the City; and

WHEREAS, City will continue to operate and maintain an emergency medical service and provide emergency medical services within the City; and

WHEREAS, the parties are authorized by K.S.A. 12-2908 and 65-6113 to enter into this Agreement.

NOW, THEREFORE, in consideration of the promises, covenants, and agreements herein made and contained, the sufficiency of which is hereby acknowledged, City and Med-Act agree as follows:

I. Purpose

The purpose of this Agreement is to define the obligations and responsibilities of the Parties hereto with respect to the operating parameters for emergency medical services and ambulance transport services in the City of Lenexa. Pursuant to the authority granted in K.S.A. 65-6113, the City hereby contracts with Med-Act for the purpose of furnishing primary ambulance transport services within the City.

II. Powers and Duties

The City, through the Lenexa Fire Department ("LFD"), will provide emergency medical services within the City in a non-transport role, while Med-Act will provide emergency medical services as the transport agency. Each agency recognizes the other's integral role as emergency medical service ("EMS") providers.

III. Term and Termination

This Agreement shall become effective January 1, 2010. The initial term of this Agreement shall be for three years, followed by automatic renewal for successive three-year terms unless and until terminated as provided herein. Either Party may elect to terminate this Agreement for convenience at any time by providing a minimum of two hundred seventy (270) days written notice to the other Party. Either Party may, upon ninety (90) days written notice to the other Party identifying specifically the basis for such notice, terminate this Agreement for breach of any material term or obligation, provided that the other Party has failed to correct or cure said breach within the ninety (90) day period.

IV. Response times

Both Parties agree that quick response times are essential to a successful outcome of an emergency incident and agree to optimize response times with available resources. Both Parties are accountable to elected bodies for response time performance. The Parties agree to report response time performance to each other upon the request of either Party. Both agree to adopt the following response time targets to requests for service.

- Parties agree to work towards integration of turn out time standards over the initial three year term of this Agreement. Parties agree that the goal for this integrated turn-out time standard will be ninety (90) seconds for 90% of incidents.
- The travel time standard for first arriving LFD unit is six (6) minutes for 80% of incidents.
- The travel time standard for Med-Act transport units is eight (8) minutes for 80% of incidents.
- LFD and Med-Act both agree to manage their resources and responses to extra-jurisdictional calls in a manner which does not jeopardize their ability to render reliable response time performance for incidents within the City as required hereunder.

V. Operations

Both Parties will work collaboratively in the best interests of the patients. LFD retains responsibility for incident command, as appropriate for the incident. Med-Act assumes responsibility for medical authority when LFD transfers patient care to Med-Act. Unified command shall be used as appropriate. A joint post-incident analysis will be conducted upon the request of either Party.

VI. Medical Advising

The medical adviser of each Party, appointed pursuant to K.S.A. 65-6126, will work cooperatively to promote the highest quality medical care and a consistent standard of care. In the event of a change in medical advisers, the Parties will discuss a possible unified medical adviser.

VII. Medical Supplies and Equipment

Med-Act agrees to replace, at its sole cost, all of LFD's disposable medical supplies and oxygen that is used in patient care, joint training, or that have expired. Further, Med-Act agrees to provide to LFD, upon written request, non-disposable medical supplies, and LFD agrees to be responsible for, at its sole cost, all non-disposable medical supplies so provided by Med-Act hereunder, at Med-Act's actual purchase cost. In the event Med-Act desires that LFD change or upgrade any durable medical equipment used by LFD, in order to provide a more consistent standard of care, the Parties agree to negotiate for potential joint procurement of said durable medical equipment.

For purposes of this Section, disposable medical supplies may include things such as IV solutions, medications, bandages, and disposable splints; non-disposable medical supplies may include things such as trauma kits and oxygen regulators; and durable medical equipment may include backboards, suction units, and defibrillators.

VIII. Facilities

The Parties agree to enter into a facilities use agreement for housing of Med-Act ambulances, equipment and personnel at mutually acceptable locations within the City, which will be executed as a separate document.

IX. Fees

Med-Act agrees to include a separately identified $100 LFD Advanced Life Support (ALS) Responder fee ("LFD ALS fee") within each patient bill issued by Med-Act ("Med-Act bill") for each incident in Lenexa where LFD is on scene and that results in an ambulance transport. Amounts collected from the LFD ALS fee, less any applicable collections commission, shall be paid to the City by the County on a monthly basis. When a Med-Act bill is deemed uncollectable, Med-Act agrees to pay the City its proportionate share of any partial payments collected or received on said Med-Act bill, if applicable. Med-Act agrees to share its billing and collection data with the City, upon written request. The LFD ALS fee may be adjusted upon 60 days advance written request of the City and upon action of the Lenexa City Council. Med-Act shall have authority to negotiate and/or waive the LFD ALS fee consistent with its ordinary business practices.

X. Special events

Med-Act agrees to provide dedicated EMS resources at special events sponsored by the City at no cost. The level of resources appropriate for each event will be as agreed upon between the Parties. If a transport ambulance is deemed necessary at a special event, it shall not depart the event except to transport a patient from the event to a medical facility, in which case another ambulance shall be immediately dispatched to standby at the special event. The foregoing shall not apply in circumstances giving rise to a Mass Casualty Incident (MCI), which shall be subject to proper MCI protocols.

XI. Conflict resolution

The Parties hereto will attempt to settle any claim or controversy arising from this Agreement through consultation and negotiation in good faith and a spirit of mutual cooperation. The Chiefs of the LFD and Med-Act will develop a process to resolve conflicts related to the provision of EMS within the City. Additionally, LFD Shift Battalion Chiefs and Med-Act Shift Battalion Chiefs will meet monthly to discuss incident and employee performance concerns. In the event these practices fail to resolve a dispute, the Parties agree to submit their dispute to the County Manager and City Administrator for resolution. Further, no dispute will be submitted to mediation or arbitration without both Parties' express written consent. Nothing in this Section shall be deemed to waive any rights of either Party to take such additional steps as it deems necessary to protect its interests.

XII. Partnership initiatives

The LFD and Med-Act will work collaboratively on joint training activities and EMS System committees, such as the Protocol Sub-Committee and the Clinical Standards and Practices Committee.

XIII. Compliance with Laws; Ethics

Both Parties shall fully comply with all laws, standards, rules and regulations established by the State, the County, and the Emergency Medical Services Board. Each Party shall at all times conduct its business and perform its responsibilities under this Agreement in accordance with ethical business and medical practices. Each Party further agrees to follow and comply with all Medicare, Medicaid, and other applicable regulations regarding appropriate billing information, and to provide services hereunder in compliance with all applicable federal, state, and local laws, ordinances rules and regulations. Further, all ambulances shall at all times be staffed and equipped in accordance with the rules and regulations promulgated by the Emergency Medical Services Board pursuant to K.S.A. 65-6110, and amendments thereto.

XIV. Permits

Med-Act shall at all times maintain a valid permit to operate an ambulance service as required by K.S.A. 65-6127, and shall be responsible for all associated costs.

XV. Indemnity

For purposes of this Agreement, to the extent permitted by law, and subject to the immunity and maximum liability provisions of the Kansas Tort Claims Act, the Parties hereto agree to indemnify and hold harmless the other Party, its employees and agents from and against any and all claims, losses, or damages of any nature, where said claims, losses, or damages are caused or incurred in whole or in part as a result of the negligence or other actionable fault of the other Party hereto. This obligation shall not include amounts attributable to the fault or negligence of any third party for whom neither Party is responsible.

XVI. Limitation of Liability

In no event will either Party be liable to the other or to any third parties for any indirect, special, incidental, consequential or exemplary damages relating to or arising from this Agreement, or otherwise relating to the performance by either Party of its obligations under this Agreement, including, without limitation, damages based on loss of revenues, profits, business interruptions or business opportunities, whether or not either Party had or should have had any knowledge, actual or constructive, that such damages might be incurred.

XVII. Insurance

During the performance of this Agreement, each Party agrees to maintain insurance coverage of the types and minimum liability limits as set forth below, and to furnish the other with a Certificate of Insurance verifying such coverage. The certificate holder on the Certificate of Insurance shall be as follows:

City of Lenexa, Kansas Board of County Commissioners
Fire Station No. 1 Johnson County, Kansas
9620 Pflumm Road c/o Risk Management
Lenexa, KS 66215 Johnson County Administration Building
111 South Cherry Street, Suite 2400
Olathe, KS 66061-3441

Prior to any Party's reduction in coverage or limits, or cancellation, such Party will give to the other thirty (30) days advanced written notice by certified mail to the stated address of the certificate holder.

a) Commercial General Liability insurance on an occurrence basis in amounts no less than $500,000 bodily injury and property damage per occurrence, including personal and advertising injury; $500,000 general aggregate.
b) Automobile Liability insurance in an amount no less than $500,000 bodily injury and property damage combined single limit, including all owned, hired, and non-owned autos.
c) Workers' Compensation and Employers' Liability, protecting against all claims under applicable state Workers' Compensation laws. Both Parties shall also be protected against claims for injury, disease or death of employees which, for any reason may not fall within the provisions of a Workers' Compensation law. The policy liability limits shall not be less than Statutory (Workers' Compensation); $100,000 / $500,000 / $100,000 (Employers Liability).

The Parties will only accept coverage from an insurance carrier who carries a Best's policyholder rating ofA-:VIII or better; or is a company mutually agreed upon by the Parties.

XVIII. Nondiscrimination in Employment
Each Party shall comply with the provisions of the Kansas Act Against Discrimination, K.S.A. 44-1030 and, in so doing: (i) shall not discriminate against any person in the performance of work under this Agreement because of race, religion, color, sex, disability, national origin or ancestry; (ii) in all solicitations or advertisements for employees, include the phrase "equal opportunity employer" or a similar phrase; and (iii) include the provisions of K.S.A. 44-1030 in every subcontract or purchase order so that such provisions will be binding upon such subcontractor or vendor.

XIX. Independent Contractor
Each Party is an independent contractor and as such is not an agent or employee of the other Party.

XX. Subcontracting of Service
Neither Party shall subcontract or assign any of the services to be performed under this Agreement without the prior written consent of the other Party.

XXI. Waiver of Breach

The waiver by any Party hereto of a breach of any of the provisions of this Agreement shall not operate or be construed as a waiver of any subsequent breach by either Party.

XXII. Governing Law

This Agreement shall be governed by and construed solely in accordance with the laws of the State of Kansas.

XXIII. Severability

Should any provision of this Agreement be determined to be void, invalid, unenforceable or illegal for whatever reason, such provision(s) shall be null and void; provided, however, that the remaining provisions of this Agreement shall be unaffected thereby and shall continue to be valid and enforceable.

XXIV. Modifications/Amendments

The provisions of this Agreement encompass the entire agreement between the Parties hereto. No modification, addition, or deletion to this Agreement shall be effective unless placed in writing and signed by the Parties hereto.

XXV. No Third Party Beneficiaries

The provisions of this Agreement are intended to be for the sole benefit of the Parties and their respective successors and assigns. None of the provisions of this Agreement are intended to be, nor shall they be construed to be, for the benefit of any third party.

XXVI. Miscellaneous

The language used in this Agreement shall be deemed to be the language chosen by both Parties to express their mutual intent, and no rule of strict construction against either Party shall apply to any term or condition of this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives on the date and year first above written.

THE CITY OF LENEXA, KANSAS

_____
Michael A. Boehm
Mayor

ATTEST:

_____
David F. Bryant, III
City Clerk

APPROVED AS TO FORM:

_____
Marcia L. Knight
Assistant City Attorney

BOARD OF COUNTY COMMISSIONERS
OF JOHNSON COUNTY, KANSAS

_____

Annabeth Surbaugh

Chairman

ATTEST:

_____

Casey Joe Carl

Clerk of the Board

APPROVED AS TO FORM:

_____

Nicholas Saldan

Deputy County Counselor

Emergency Services
Consulting International

Corporate Offices
25200 SW Parkway Avenue, Suite 3
Wilsonville, Oregon 97070
Ph: 800.757.3724

Southwestern Region Office
8866 St. Anthony Court
Elk Grove, California 95624
Ph: 916.689.5363

Eastern Region Office
249 Normandy Road
Mooresville, North Carolina 28117
Ph: 704.660.8027

National Capital Region Office
4025 Fair Ridge Drive
Fairfax, Virginia 22033
Ph: 703.273.0911