Organizational, Effectiveness, Efficiency Review

of the Emergency Medical Services System

for the City of Spokane

Final Report

A report from:

The Abaris Group
Walnut Creek, CA

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Executive Summary

The City of Spokane operates a full-service, competent and state-of-the-art fire department and despite several budget cuts has maintained the ability to deliver EMS at the advanced life support level from fire apparatus while providing other critical emergency response services, including fire suppression, hazardous materials response, technical rescue, confined space rescue, and water rescue. Except for fire suppression and EMS, these other emergency response services are being provided by utilizing firefighters from engines or ladders that cross-staff specialized response units located in some fire stations. The contracted private ambulance transport service is also providing competent patient care and transportation at a high level of clinical sophistication. Compared to national standards the City's fire department and the contracted private ambulance service have created and operated an EMS system that meets or exceeds the national standards and guidelines for EMS system performance. While the City has entertained more involvement in the ambulance transportation system, no action has been taken on this topic to date. The City retained The Abaris Group to evaluate the current EMS service delivery and performance and to review transport options previously submitted to City elected officials, as well as review the feasibility of a fire department transport program.

There are 29 recommendations for the City to consider that would potentially enhance the service delivery of EMS in the City of Spokane. They include the following:

1. *Consider changing the current response-time standard for Code responses to eight-minutes and 59 seconds (8:59), 90 percent of the time.*

2. *Consider changing the current response-time standard for No-Code responses from twenty-minutes (20:00) to fifteen-minutes (15:00), 90 percent of the time.*

3. *Allow AMR to respond Code to C-level incidents.*

4. *Allow AMR to cancel the responding SFD unit enroute when AMR arrives first and determines SFD is not required.*

5. *Limit the number of times AMR can redirect an enroute ambulance to another higher priority incident to only one time per call.*

6. *Dispatch AMR on A-level responses at the same time SFD is dispatched.*

7. *Consider allowing AMR to staff some ambulances at the BLS level to respond to A-level incidents.*

8. *Require AMR to re-supply disposable medical supplies used by SFD on patients that are transported.*

9. *Consider eliminating the requirement prohibiting AMR from charging the ALS base rate when a SFD paramedic accompanies the*

patient to the hospital subject to CMS policies.

10. *Consider renegotiating the AMR contract base rates to allow AMR to cover additional costs, if any, resulting from decreased response-times, responding to A-level incidents and re-supplying SFD medical supplies.*

11. *Implement a program where SFD dispatch personnel can ride on fire apparatus and SFD fire personnel spend time in the CCB observing the dispatch process.*

12. *Implement a Medical Dispatch Review Committee to enhance the current SFD quality improvement process for reviewing compliance with MPDS by SFD dispatch personnel.*

13. *Consider the implementation of an immediate dispatch policy once the location of the emergency is known.*

14. *Consider changing the current dispatch criteria for C-level responses to the closest SFD unit only.*

15. *Consider implementing the Omega response option for MPDS to reduce the number of SFD A-level responses.*

16. *Develop a comprehensive and ongoing public education program promoting the appropriate use of 9-1-1 to reduce A-level responses.*

17. *Develop a protocol that would allow SFD EMS units on-scene at an A-level incident to become available for another EMS call prior to the arrival of AMR.*

18. *Increase the number of ALS capable response units by assigning only one paramedic to each fire apparatus.*

19. *Consider upgrading all SFD fire apparatus to provide ALS level service.*

20. *Identify specific intersections that delay emergency responses and prioritize them for the installation of emergency traffic pre-emption devices.*

21. *Provide basic EMS equipment on all first-response apparatus, including traction splints, glucose monitors and any other piece of equipment or tool that SFD EMTs are trained and authorized to use.*

22. *Consider moving from a four-shift system to a three-shift system for emergency response personnel.*

23. *Consider purchasing five transport capable medic units and place them in fire stations that have ladder trucks and pumper/ladders and*

cross-staff these units with firefighter/paramedics for EMS responses.

24. *Establish an independent ambulance oversight committee or board to review and monitor the performance of AMR and compliance with the ambulance contract.*

25. *SFD should hire an EMS clerical support person.*

26. *Implement a formal comprehensive CQI program to review patient care by assigning an additional staff person to this function.*

27. *Develop a comprehensive, ongoing EMS training program that exceeds the minimum requirements for certification.*

28. *Enhance EMS field supervision using existing on-duty battalion chiefs and EMS staff.*

29. *Consider the implementation of a preferential hiring process for new firefighters that are currently certified as paramedics or conduct a lateral hiring process for firefighter/paramedics.*

Background and Project Overview

The City of Spokane Fire Department (SFD) has provided some form of emergency medical services (EMS) response to the Spokane community and visitors since the early 1950s when firefighters provided medical assistance with an oxygen-powered inhalator. In the 1970s, SFD had a single ambulance and provided limited ambulance transport services at no charge. In the late 1970s, the first firefighter paramedics were trained and SFD started to provide first-response advanced life support (ALS) level services. The ambulance was replaced in the 1980s with two quick response type vehicles called medic squads which were two person non-transport vehicles. Over the next few years additional medic squads, staffed by firefighter paramedics, were placed into service delivering ALS care. Due to funding issues and a lack of staffing, the medic squads were phased out in the late 1980s and early 1990s. EMS delivery was then provided at both the basic life support (BLS) and ALS care levels from fire apparatus, both fire engines and ladder trucks, by cross-trained/multi-role firefighters certified as either Emergency Medical Technicians (EMT) or Paramedics.

Today SFD provides EMS first-response services on 11 engines, 2 pumper ladders, 3 ladder trucks and 1 rescue truck from 14 fire stations. Eight of these fire apparatus are staffed with Firefighter Paramedics providing ALS care and the other nine units are staffed with Firefighter EMTs that provide BLS care. ALS transport services are provided by American Medical Response (AMR) through an exclusive performance contract with the City of Spokane. Prior to the contract with AMR, there were at least three ambulance service providers in and around the City of Spokane. Because of performance issues with these ambulance service providers, including uncoordinated ambulance dispatch, different levels of care, varying ambulance fees for transport, and other issues, the City of Spokane developed a request for bid's (RFB) document for an exclusive 9-1-1 ambulance transport provider. After a competitive bid process, AMR was awarded the Spokane contract and became the exclusive provider for 9-1-1 ambulance transportation in 1998. The current AMR contract expires in 2013.

SFD's delivery of EMS has evolved over the past 50 years to the current system because of continuous decreases in emergency personnel staffing due to City budget cuts. During the past 25 years, the number of SFD fire stations has declined from 17 to 14 stations; the number of staffed first-response fire/EMS apparatus has decreased from 29 to 17 units; and, the number of on-duty daily emergency response personnel has been reduced from 83 to 58 per day. These reductions have occurred over several years and may still occur today due to the economic environment in Spokane.

In spite of these reductions, SFD functions as a full-service fire department and has maintained the ability to deliver EMS at the ALS level from fire apparatus while providing other critical emergency response services, including fire suppression, hazardous materials response, technical rescue, confined space rescue, and water rescue. Except for fire suppression and EMS, these other emergency response services are being provided by utilizing firefighters from engines or ladders that cross-staff specialized response units located in some fire stations. Cross-staffing occurs whenever a specific type of technical type rescue incident or a hazardous materials incident occurs requiring specialized apparatus and thus the firefighters will leave the engine or ladder in the fire station

and respond in the specialized technical rescue unit or hazardous materials response unit. This can be an efficient practice and is common in some departments throughout the country.

The current EMS delivery system in Spokane has been a topic of discussion by firefighters, the firefighter's bargaining group, some residents, and elected officials for many years. The issue of whether or not the SFD should be providing ambulance transportation services has also been a topic of interest to these same groups. The SFD administration has studied this issue and developed transport options that were presented to the City Council for their consideration in the past. The intense interest in how EMS is delivered in the City of Spokane, as well as the desire to enhance EMS delivery, resulted in the City seeking requests for proposals (RFP) from EMS consulting firms to conduct an organizational, effectiveness, efficiency review of the Spokane EMS system. Through a competitive bid process, The Abaris Group was selected to conduct this review.

The City's RFP listed seven objectives to be accomplished by the EMS consulting firm selected. These objectives are:

- Evaluate EMS System Delivery Process
- Analyze Ambulance Response Performance
- Analyze First Responder Response Performance
- Analyze Financial and Operating Projections for Fire Department Based Transport
- Review EMS System Management, Oversight and Support
- Development and Review Project Report
- Final Report Presentation

Project Approach and Methodology

The Abaris Group's approach to this project included the review of greater than 100 documents related to Spokane's EMS system; three multi-day onsite visits; interviewing over 30 EMS stakeholders and citizens; conducting six town-hall meetings, four of which were for SFD personnel and two for the general public; and, an extensive web-based search for relevant information that would provide additional insight on Spokane's EMS system. SFD provided to The Abaris Group several reports and spreadsheets with EMS data, as well as any other documents requested for this study. Information regarding AMR's Spokane operations were obtained through the SFD or obtained directly from the AMR Spokane General Manager. The town hall meetings afforded SFD personnel and the general public the opportunity to express their concerns and provide suggestions for enhancing EMS delivery in Spokane.

National EMS and fire standards were reviewed as well as EMS and fire publications. Standards reviewed included the National Fire Protection Association (NFPA) Standard 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2010 Edition* and NFPA Standard 450:

Guide for Emergency Medical Services and Systems, 2009 Edition. NFPA standards are widely adopted because of the significant fire industry input and that they are developed using an open, consensus-based process. In addition to the NFPA standards, appropriate Washington State fire and EMS standards, statutes, and regulations were also reviewed. Several publications have been referenced for this study including; the International Association of Fire Fighters' (IAFF) *Emergency Medical Services: A Guidebook for Fire-Based Systems, 4th Edition* and the American Ambulance Association's (AAA) *Community Guide to Ensure High-Performance Emergency Ambulance Service, 2004 Edition.* These two publications represent the perspective of EMS delivery from both the public and private sector.

The notes from personal interviews, personal observations, documents and standards, SFD documents, and the input from the town-hall meetings were reviewed and analyzed. The analysis focused on gaining an understanding of the Spokane EMS system, determining strengths and weaknesses of the system, determining system costs, and other relevant EMS attributes. This information was used in creating The Abaris Group's conclusions for the Spokane EMS delivery system, reviewing the fire department's EMS role and formulating realistic recommendations for Spokane officials to consider in an effort to enhance EMS delivery in the City of Spokane.

EMS Systems in the United States

The Emergency Medical Services Act of 1973 defined EMS as a system that provides for the arrangement of personnel, facilities, and equipment for the effective and coordinated delivery of health care services under emergency conditions. Such a system is administered by a public or non-profit entity with the authority and resources to provide effective administration of the system.[1] An EMS system includes human resources; medical direction; legislation and regulation; education systems; public education; prevention; public access; communication systems; clinical care; information systems (data collection); and, evaluation. There are certain components of an EMS system that are considered critical to the overall functioning of the EMS system; they include timely responses, adequate staffing, appropriate deployment of equipment, transportation, and system review.[2]

EMS delivery in the United States is primarily local in nature. Public policy officials decide how their EMS systems will be structured and how they adapt to changes in the environment. They determine the organization of the delivery system, the structure of EMS response-times, the development of finance mechanisms, and the management of other system components. Because of this local control, EMS systems across the country are extremely variable and fragmented. The current design of EMS systems in the U.S. promotes local self-determination and tailors EMS systems to the needs and expectations of local residents.[3]
In general, EMS systems have been designed to meet the needs of the local community balancing the cost to the community for the level of service, including the level of care desired, BLS or ALS; response-time performance requirements for first-response and

[1] Boyd,D., "Emergency Medical Services System Development: A National Initiative," *IEEE Transactions on Vehicular Technology;* November 1976
[2] International Association of Fire Fighters. Emergency Medical Services: A Guide Book for Fire-Based Systems. 4th Edition
[3] Institute of Medicine of the National Academies. Future of Emergency Care: Emergency Medical Services at the Crossroads. 2007

ambulance transportation, medical oversight, and, system evaluation.

Spokane EMS Delivery Process

The current EMS delivery system in the City of Spokane can be categorized as a public/private partnership, a common EMS delivery model in the United States. There are several variations of this model across the country but generally a public fire agency provides BLS or ALS first-response and a private ambulance service provides emergency medical transportation services. In Spokane, SFD provides first-response EMS delivery at both the BLS and ALS care level from fire apparatus and AMR, a private ambulance service, provides emergency medical transportation services. The system in Spokane is multi-tiered with non-transport and transport vehicles and personnel with both BLS and ALS capabilities responding to an established dispatch plan for EMS incidents.

A separate county agency, Spokane County 9-1-1, is the designated primary public safety answering point (PSAP) for the City of Spokane. In 2008, the PSAP received 374,004 phone calls through the 9-1-1 system. These calls are routed to the appropriate public safety agency dispatch center and the appropriate public and private resources are dispatched. In Spokane, Spokane County 9-1-1, Spokane Police Department dispatch, Spokane Sherriff's dispatch, and the SFD dispatch operate out of the Combined Communications Building (CCB). The Spokane Fire Department dispatches through a contract arrangement, for the majority of the public fire/EMS agencies in Spokane County. Each agency has space within the CCB allocated to them in order to perform the dispatch function for their agency. The SFD dispatch personnel provide fire and EMS dispatching services for 14 fire and EMS agencies in Spokane County through a contract arrangement. The agencies that use the services of SFD dispatch for fire and EMS dispatching services contribute to the SFD dispatch budget on a cost-per-call basis. During 2008, there were a total 52,719 fire and EMS calls dispatched by the SFD dispatch center The City of Spokane is the largest user of these dispatch services accounting for 55 percent of all dispatches. The second highest user of SFD's dispatch services is Spokane Valley with 22 percent of all dispatches. The total budget for the SFD dispatch function, including maintenance and operations cost for the facility, is approximately $3,016,000, with the City paying approximately $1,048,000 or 35 percent of those costs. The cost-per-call dispatched by SFD for the participating fire/EMS agencies is $77.50. The SFD's cost-per-call dispatched is $38.95.

SFD dispatch personnel are trained to the standards of the Washington State Criminal Justice Training Commission's Telecommunicator program. They are also trained and certified as Emergency Medical Dispatchers (EMD) through the National Academies of Emergency Dispatch (NAED). Personnel are assigned to one of four 24-hour shifts, the same schedule worked by emergency response personnel. There is a minimum of three personnel on-duty at all times consisting of a primary call-taker, radio dispatcher, and a supervisor. There is also a 12-hour "power shift" that starts at 8:00 am and ends at 8:00 pm bringing the on-duty staffing to four personnel. The SFD dispatch center has a captain that serves as the Communications Manager and is responsible for the management of the SFD dispatch center. A lieutenant is responsible for training of dispatch personnel and quality assurance.
SFD uses the computerized version of the NAED's Medical Priority Dispatch System (MPDS), called ProQA, to categorize EMS

calls by level of service needed, BLS or ALS, and the response mode; lights-and-sirens (Code) or no lights-and-sirens (No Code). Together, the level of service needed and the response mode, make up the "dispatch determinants" for EMS incidents. Spokane. Dispatch personnel also provide pre-arrival medical instructions to callers prior to the arrival of EMS responders. The use of these standards is consistent with the best practice for 9-1-1 EMS dispatch in the country.

The Spokane MPDS program has been modified to accommodate the local EMS system design. The NAED does allow for modifications to the dispatch determinants and provides guidelines for any modifications. These minor modifications consist of upgrading the responses for certain types of calls based on input from the EMS system medical director and the SFD medical advisor. There is a MPDS Committee of the Spokane County EMS and Trauma Care Council, the EMS regulatory agency in Spokane, that reviews the dispatch determinants, makes modifications and approves them for use. The committee consists of the SFD EMS Chief, SFD Medical Advisor, SFD Quality Improvement Officer, SFD Communications Manager, and the Medical Program Director for Spokane County EMS. The dispatch determinants for EMS incidents in Spokane are as follows:

- ALPHA-level ("A"): BLS non-emergency
  - Closest SFD BLS Unit – No Code
  - No AMR response

- BRAVO-level ("B"): BLS emergency
  - Closest SFD BLS Unit – Code
  - AMR ALS – No Code

- CHARLIE-level ("C"): ALS emergency
  - Closest SFD ALS Unit – Code, if a SFD BLS Unit is closer than the ALS Unit, it also responds Code
  - AMR ALS – No Code

- DELTA-level ("D"): ALS emergency
  - Closest SFD ALS Unit – Code, if a SFD BLS Unit is closer than the ALS Unit, it also responds Code
  - AMR ALS – Code

- ECHO-level ("E"): ALS emergency (cardiac and respiratory arrest incidents)
  - Closest SFD BLS Unit– Code, if a SFD BLS Unit is closer than the ALS Unit, it also responds Code
  - AMR ALS – Code

The NAED MPDS also has an additional category offered in their system referred to as the "OMEGA-Level" that does not result in an EMS unit responding; instead it refers the patient to alternative care options. The intent of the Omega protocol is to allow

referrals for very low acuity incidents out of the EMS system to an alternate response; not, a non-response, but to another, better avenue of care. These could include information or advice lines (poison control, "ask a nurse", rape crisis lines, mental health help lines, etc.), doctors, clinics, community services that assist immobilized or elderly patients and so on. In Spokane, OMEGA-level incidents are responded to as an "A" level calls and there are no alternative referrals.

All SFD incidents are classified by type and given a designated number and letter. EMS incidents are referred to as 31 or 46 type calls. Based on the information obtained from the 9-1-1 caller by SFD dispatch personnel using the MPDS ProQA system, these 31 or 46 type EMS calls are further categorized as either an A-B-C-D-E level response. The designated EMS codes for each type and a description for each are listed in Table A below.

Table A

EMS Incident Type	Description
31A – Alpha Response	Used for lift assist, check welfare, third-party calls unknown if there are injuries. Generally BLS unit responds no code without an ambulance.
31B – Bravo Response	Used for non-life threatening emergencies. Generally BLS unit code with ambulance no code.
31C – Charlie Response	Used for possible life threatening emergencies as defined by ProQA. Both BLS and ALS units code with an ambulance no code (unless closer than fire apparatus).
31D – Delta Response	Used for life threatening emergencies as defined by ProQA. All units respond code.
31E – Echo Response	Used for cardiac or respiratory arrest. All units respond code.
31F – EMS Multiple Alarm	Used when first alarm response is determined to be inadequate by incident commander.
31T – Ambulance Transport Only	Used for Dr.'s appointments, scheduled transport without complications, problems with tubes, etc.
46A – MVA/Alpha Response*	Used for MVA when it is unknown if there is injury, check/advise on car, rollover with no patient information, non-injury MVA with small amount of fluids leaking. Generally the BLS unit responds no code without an ambulance.
46B – MVA/Bravo Response	Used for MVA with confirmed minor or non-life threatening injuries. The BLS unit responds code with a no code ambulance.
46C – MVA/Charlie Response	Used for MVA with confirmed possible life threatening injuries as defined by ProQA. Both BLS and ALS units respond code with a no code ambulance (unless the ambulance is closer than the fire apparatus.
46D – MVA/Delta Response	Used for MVA with confirmed life threatening injuries as defined by ProQA. All units respond code.
46F – MVA/Multiple Alarm	Used when first alarm response is determined to be inadequate by the incident commander.

**MVA – motor vehicle accident*

For 2008, EMS incidents by MPDS response category are listed below in Table B.

Table B

MPDS Category	Dispatched	Percentage
ALPHA	4,897	20
BRAVO	8,721	36
CHARLIE	5,218	21
DELTA	5,409	22
ECHO	214	<1
Totals:	24,459	100

The multi-tiered 9-1-1 emergency response to EMS incidents in Spokane consists of SFD providing emergency medical first-response services on fire apparatus responding at both the BLS and ALS level and AMR responding at the ALS level for ground emergency medical transportation services. SFD responds from 14 fire stations strategically located throughout the City of Spokane with 17 response apparatus. SFD provides BLS level from six fire stations and ALS level care from eight fire stations. Deployment to emergency incidents is static meaning that SFD responds primarily from fixed locations – fire stations. AMR uses a dynamic deployment system consisting of ambulances being located in areas where based on historical data EMS incidents occur. This dynamic deployment strategy is called system status management (SSM) and is sometimes used by private ambulance providers. SSM attempts to match resources to expected demand. It has been determined that demand for EMS services is fairly predictable based on time of day, day of week, month of year, and location within the service area. When these patterns are known and tracked, staffing and placement of ambulances can be matched to typical demand for services. When successfully implemented, SSM results in maximal performance for the investment.

The EMS system in Spokane has implemented response-time performance objectives and standards for arriving at EMS incident scenes for both SFD first-response units and AMR ambulances. The response-time interval is from the time SFD Dispatch receives a request for services and the time the first arriving SFD unit arrives at the scene. SFD has adopted a response-time objective of eight minutes and thirty seconds (8:30) for the arrival of the first fire department unit at life-threatening EMS incidents, 90 percent of the time. They also have adopted a response-time objective of eight minutes and thirty seconds (8:30) for the arrival of the first SFD ALS unit at life-threatening EMS incidents, 90 percent of the time. Their actual performance in meeting these objectives for the past three-years is listed below in Tables C and D.

Table C

Percentage of Time First SFD ALS Unit Arrives On-Scene in 8:30, 90% of the Time		
2006	2007	2008
92.4%	91.5%	94.4%

Table D

Percentage of Time First SFD Unit Arrives On-Scene in 8:30, 90% of the Time		
2006	2007	2008
97.5%	96.3%	94.8%

SFD meets and exceeds these response-time objectives with the first SFD unit arriving on-scene 90 percent of the time in seven minutes and 17 seconds (7:17) for all EMS incidents and the first ALS unit arriving on-scene 90 percent of the time in seven minutes and 23 seconds (7:23) to all EMS incidents requiring ALS care.

The response-time requirements for AMR are mandated in their contract with the City. AMR is required to respond to Code (red-lights and siren) incidents in ten-minutes or less 90 percent of the time and for No-Code incidents, 20-minutes or less 90 percent of the time. They currently meet the Code response requirement 93 percent of the time and the No Code requirement 97 percent of the time. AMR's response-times are monitored by the SFD and they are financially penalized for all late responses.

As stated previously, SFD provides first-response EMS services from 14 fire stations using a combination of BLS and ALS staffed fire apparatus consisting of engines, ladders, pumper-ladders and a special rescue apparatus. SFD fire apparatus are staffed with three or four firefighters. All ladder trucks and pumper/ladders have four personnel assigned to them and one engine has four personnel assigned. The remaining engines have three personnel assigned to them and the rescue unit has two personnel assigned. Eight of SFD's fire stations have ALS response units assigned to them with two Firefighter/Paramedics assigned to each ALS unit. The remaining six fire stations have BLS response units staffed by Firefighter/EMT personnel.
The distribution of apparatus, personnel and level of EMS care is listed in Table E.

Table E

Fire Station	Address	Units	EMS Capabilities	Staffing
Station 1	44 W. Riverside Ave.	Engine 1	ALS	3
		Ladder 1	BLS	4
		Rescue 1	BLS	2
Station 2	1001 E. North Foothills Dr.	Ladder 2	BLS	4
Station 3	1713 W. Indiana Ave.	Engine 3	ALS	4
Station 4	1515 W. First Ave.	Engine 4	ALS	3
		Ladder 4	BLS	4
Station 7	1901 E. First Ave.	Engine 7	ALS	3
Station 8	1608 N. Rebecca St.	Engine 8	BLS	3
Station 9	1722 S. Bernard St.	Engine 9	BLS	3
Station 11	3214 S. Perry St.	Pumper/Ladder 11	ALS	4
Station 13	1118 W. Wellesley Ave.	Pumper/Ladder 13	ALS	4
Station 14	1807 S. Ray St.	Engine 14	BLS	3
Station 15	2120 E. Wellesley Ave.	Engine 15	ALS	3
Station 16	5225 N. Assembly St.	Engine 16	BLS	3
Station 17	5121 W. Lowell Rd.	Engine 17	BLS	3
Station 18	120 E. Lincoln St.	Engine 18	ALS	3

It is SFD's policy to send the closest unit to the scene of all EMS incidents. SFD ALS response units are dispatched to all C, D and E-level EMS incidents in the City of Spokane. During 2008 there were 10,651 such incidents representing approximately 44 percent of all EMS incidents. In addition to responding to all ALS (C-D-E) incidents, these ALS units also respond to BLS incidents if they are the closest available unit to the incident location. There are many ALS EMS incidents that result in two SFD units responding to the same EMS incident – the closest BLS unit backed up by the closest ALS unit. In these instances there will be two fire apparatus and six to eight SFD personnel on-scene. On B-C-D-E level calls, AMR also responds with two personnel, usually a Paramedic and an EMT or EMT-Intermediate (EMT-I), bringing the potential for eight to ten EMS personnel on-scene of a single EMS incident.

The SFD responded to 28,673 incidents in 2008 of which 24,459 or 85 percent were EMS incidents. Emergency incidents have increased approximately 10 percent each year since 2003. This increase is directly related to EMS incidents as the number of fire related incidents has remained fairly stable averaging about 4,300 per year.

Table F below lists the EMS incidents for 2008 by unit and type of call.

Table F

Unit	Level of Care	Total Incidents	EMS Incidents	Call Types								
				31-A	31-B	31-C	31-D	31-E	46-A	46-B	46-C	46-D
Engine 1	ALS	2,516	1,981 (79%)	37	57	860	764	22	148	58	3	32
Ladder 1	BLS	1,443	961 (67%)	274	533	61	58	20	3	2	1	9
Rescue 1	BLS	1,465	910 (62%)	272	540	42	37	1	10	5	0	3
Ladder 2	BLS	1,885	1,515 (80%)	203	564	296	296	17	72	42	0	25
Engine 3	ALS	3,172	2,703 (85%)	292	834	663	653	32	126	57	5	41
Engine 4	ALS	2,358	1,791 (76%)	87	207	642	608	27	131	61	4	24
Ladder 4	BLS	1,969	1,562 (79%)	490	915	57	56	17	11	9	2	5
Engine 7	ALS	2,051	1,675 (82%)	156	506	362	433	22	124	55	1	16
Engine 8	BLS	956	706 (74%)	96	243	133	159	7	43	16	1	8
Engine 9	BLS	940	561 (60%)	118	243	149	143	6	24	10	0	3
Pumper/Ladder 11	ALS	1,799	1,577 (88%)	184	430	446	448	18	26	14	1	10
Pumper/Ladder 13	ALS	2,490	2,116 (85%)	248	478	530	624	32	113	69	2	20
Engine 14	BLS	1,331	1,060 (80%)	141	345	247	220	13	55	29	2	8
Engine 15	ALS	2,840	2,450 (86%)	230	667	649	671	38	109	50	2	34
Engine 16	BLS	1,250	1,048 (84%)	103	380	232	264	10	29	22	2	6
Engine 17	BLS	574	432 (75%)	54	142	90	122	6	13	5	0	0
Engine 18	ALS	2,480	2,180 (88%)	239	640	553	558	28	89	54	0	33

Of the 24,459 EMS incidents in 2008, there were 13,135 (53.4 percent) incidents resulting in patients being transported to Spokane hospitals or other medical facilities. There are three primary receiving hospitals in Spokane: Deaconess Medical Center, Holy Family Hospital, and Sacred Heart Medical Center. Sacred Heart Medical Center is the City's Level II trauma center. Twenty-four percent of the patients were transported to Deaconess Medical Center, 32 percent were transported to Holy Family Hospital, and 44 percent were transported to Sacred Heart Medical Center. AMR data indicates that they responded to 20,278 EMS incidents in the City of Spokane, they were cancelled enroute 1,710 times and transported a total of 14,769 (72.8 percent) patients.[4]

[4] The differences between the transport totals between the SFD and AMR data are related to how the transports are reported. Of the 13,135 transports reported by SFD, the City does not count each total individual patient when multiple patients are transported from a single EMS incident.

Funding for EMS delivery in Spokane is provided through a variety of sources. The SFD budget for 2009 is $42,528,087 of which $31,472,743 is from the City's general funds, licenses, permits, etc; the CCB fund is $3,007,999, with an additional $183,475 for maintenance and operating costs for the CCB; and, the City has an EMS levy adding $7,358,132 to the budget for EMS first-response ALS services. The EMS levy expires in 2010 and the City will seek voter approval to continue the EMS levy for an additional six years. The EMS fund makes up 17 percent of SFD's budget.

In addition to these funding sources, the contract between AMR and the City requires monthly payments from AMR of $27,211 for contract administration totaling $326,532 annually. AMR is also assessed liquidated damages for late ambulance responses outside of the required response-time standard. For 2008, the average amount assessed was $10,520 per month generating an approximate $126,240 annually. Therefore the most recent year of revenue derived from the AMR contract was approximately $452,772.

AMR has a user fee for ambulance transportation that is regulated by the City through the AMR contract. AMR charges a base fee for BLS and ALS, mileage, and oxygen. The current ambulance transport fees are as follows:

BLS Base - $401.19
ALS Base - $553.37
Mileage - $18.45
Oxygen - $46.12

AMR is prohibited, by contract, from charging the ALS base rate when a SFD firefighter/paramedic rides in the back of the ambulance with a patient that SFD initiates ALS care for. AMR is only allowed to charge the BLS rate for that service. AMR has higher base rates outside of the City limits. For Spokane Valley the base rate is $844.37, in the west portion of the county the rate is $909.09, and all other parts of the county are charged an $865.00 base rate. The majority of AMR's transports are within the City of Spokane. For comparison purposes, Table G below lists ambulance base rates for other jurisdictions that have more than 15,000 transports and maintain a contract with a governing body.

Table G

Area	Base ALS Rate	Base BLS Rate	Mileage
Seattle	N/A	$694.92	$14.45
Spokane County	$844.37	$699.18	$17.57
Clark County, WA	$871.77	$871.77	$12.04
Multnomah County, OR	$891.52	$891.52	$20.40
Spokane – West Plains	$900.09	$710.30	$17.57
Clackamas County, OR	$1,065.96	$637.84	$15.72
Tacoma	$1,170.90	$836.92	$19.12

The Washington State Legislature has approved laws governing EMS operations in the state. The Revised Code of Washington (RCW) and the Washington Administrative Code (WAC) are the sources for statutes and regulations that govern EMS operations in Spokane. EMS legislation in the RCW is primarily contained in Title 70, Chapter 70.168 titled Statewide Trauma Care System and in Title 18, Chapter 18.73 titled Emergency Medical Care and Transportation Services. EMS regulations are found in the WAC under Title 246, Chapter 246-976. The City of Spokane has enacted EMS legislation in the Spokane Municipal Code, including Title 04, Chapter 04.20 – Emergency Medical Services Advisory Board; Title 07, Chapter 07.08, Section 07.08.113 – Emergency Medical Services Fund and, Title 10, Chapter 10.47 – Emergency Medical Transport.

Regulation of EMS is provided by the Washington State Department of Health (DOH), Office of Emergency Medical Services and Trauma System (OEMSTS) that uses a regional system to coordinate EMS activities. Spokane's EMS system falls under the East Region EMS and Trauma Care Council. EMS is also regulated at the County level through the Spokane County EMS and Trauma Care Council.

Evaluation of the Spokane EMS Delivery Process

The delivery of EMS in Spokane is the responsibility of the City of Spokane. The primary providers of EMS are SFD for first-response BLS and ALS services and AMR for ALS ground ambulance transportation services. Spokane has a comprehensive EMS system that includes the national EMS components of human resources; medical direction; legislation and regulation; education systems; public education; prevention; public access; communications systems; clinical care; information systems (data collection); and, evaluation. The critical components of timely response, adequate staffing, appropriate deployment of equipment, transportation, and system review are also in place.

The NFPA Standard 1710 used (*Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2010 Edition* and NFPA Standard 450: *Guide for Emergency Medical Services and Systems, 2009 Edition)* are appropriate standards to apply to the Spokane EMS system. Using these standards, EMS system publications and The Abaris Group's knowledge of current EMS system design in the U.S., the EMS delivery process in Spokane is acceptable for meeting the needs of the community for first-response EMS, ambulance transportation, and receiving medical facilities. However, there is room for improvement in the design of the Spokane EMS system and EMS delivery based on this evaluation.

The following sections will examine each component of a comprehensive EMS system as well as apply the appropriate standards.

Human Resources – This component includes adequate personnel to provide EMS, personnel management structures and monitoring personnel performance. SFD has adequate personnel to provide first-response EMS and AMR has adequate personnel to provide ambulance ground transportation. The receiving facilities also appear to be appropriately staffed to accept EMS system

patients. These organizations also have the appropriate personnel management structures in place. SFD and AMR meet the requirements of NFPA 450, Chapter 12 – *Human Resources.*

The issue of adequate and appropriately trained personnel to deliver EMS is of concern in Spokane. SFD's daily on-duty emergency staffing of fire apparatus historically used to provide EMS has been declining for several years. Most fire apparatus are staffed with three personnel. The NFPA 1710 Standard requires fire apparatus to be staffed with four personnel, and in some cases five people. The number of firefighter paramedics available to provide first-response ALS is also inadequate. SFD currently provides ALS services from 8 of the 14 fire stations with BLS services being provided by the remaining six fire stations. SFD compensates for this by sending an ALS unit from another fire station when ALS level care is required based on the initial dispatch. This practice results in two SFD apparatus, the closest BLS and the closest ALS unit and 6 to 8 personnel on-scene of some ALS incidents. This practice also depletes the number of available SFD first-response units that are the closest unit to an EMS incident because the closest unit is no longer available in the fire station. When simultaneous requests for EMS are received, there is a domino effect with fire apparatus from the next closest station or the third closest station having to respond to an EMS incident from a farther location. This can result in increased response-times for the first arriving fire apparatus or first arriving SFD ALS unit.

Since the City of Spokane uses fire apparatus with cross-trained/multi-role firefighters to provide first-response EMS delivery, the response to EMS incidents by SFD when there are fires or other emergency incidents (hazardous materials, technical rescues, etc.) is diminished. A single working fire can deplete available resources for EMS responses by 50 percent. If the fire requires additional resources, i.e. 2nd or 3rd alarm fires, SFD is severely limited in responding to EMS incidents. When these types of incidents occur, AMR becomes the primary provider of EMS delivery in Spokane since SFD has committed their units to non-EMS incidents. In 2008, SFD responded to 4,412 non-EMS incidents with 56 of those incidents classified as working fires. Although this only represents 0.20 percent of all SFD incidents, there were at least 56 times in 2008 where SFD's available fire apparatus for EMS responses was depleted by at least 50 percent and this number does not include many other fire incidents that involved longer than routine commitment of SFD resources.

There are no national standards for the number of paramedics that an EMS system needs. There have been ongoing studies and debates on this issue with some believing that fewer paramedics in a local EMS system enhances their skill levels because of a higher number of ALS patient contacts and ALS skill usage. There are others that believe a paramedic should be assigned to every first-response unit and that the public deserves this level of service. 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.

The number of available SFD firefighter paramedics in the City to provide ALS has varied over the years. Currently, SFD recruits paramedics internally. Firefighters interested in becoming a paramedic are screened and if approved, attend the Spokane Community College Paramedic Training Program. SFD has hired some paramedics directly as new employees once in the past to increase the number of SFD ALS personnel, but those employees have been laid-off due to budget cuts in 2005. Currently SFD has 52 certified

paramedics to staff fire apparatus, averaging 13 paramedics on each of the four shifts. There are two paramedics assigned to each of the eight SFD ALS units leaving each shift short by three paramedics. SFD has 10 – 12 firefighters currently attending the paramedic training program. These students are assigned to SFD ALS units on a daily basis to fulfill the two paramedics per unit policy.

AMR's administrative offices and vehicle service center are located at 915 W. Sharp Avenue in Spokane. The AMR operation in Spokane consists of 166 full and part-time employees which include four management employees; four field supervisors; one communications supervisor; one clinical education specialist; nine dispatchers; 79 EMTs; 65 paramedics; one office staff member; and, two mechanics. Many of these employees have been with the company for several years, some with more than 20 years of service. The turnover of employees at AMR has averaged 5.28 percent for the past three-years and was 7.65 percent in 2008. The EMS field personnel are well trained and competent. The employees work a variety of shifts based on the number of ambulances that need to be in-service at specific times of the day. The annual wages for EMTs range from $29,411 for a first-year employee, to $44,574 for a 20-year employee. Paramedic wages range from $37,374 first-year employee, to $56,642 for a 20-year paramedic.

AMR's staffing is not as much of a concern since their contract with the City requires AMR to meet response-time performance standards and staffing requirements for responding to EMS incidents in Spokane or face financial penalties, including the possibility of having their contract with the City cancelled for non-compliance. Although AMR was fined on average approximately $10,000 per month in 2008 for individual response performance, they met their response-time requirements for Code responses 93 percent of the time and 97 percent of the time for No-Code responses. AMR has large pool of paramedics to recruit from because of their national presence. Turnover of personnel at AMR's Spokane operation has averaged a modest 5.28 percent per year over the past three years. AMR has many employees that have been providers in the Spokane system for several years.

Medical Direction – This component consists of having physicians involved in the medical oversight of the EMS system. Effective medical oversight includes monitoring patient medical treatment through on-line and off-line medical direction, protocol development, clinical quality assurance and improvement and the understanding of emergency operations, and field observations. The Spokane EMS delivery system has very good medical direction with a single medical authority structure in place and input provided by Spokane County EMS and Trauma Care Council. There is a dedicated system Medical Program Director that is actively involved with the EMS system in Spokane including protocol development, regulations, emergency medical dispatching and quality improvement.

SFD has a contract (20 hour per week) EMS medical director who has been in this role for several years. SFD's Medical Director provides education and training to SFD paramedics, reviews patient care activities of the system as well as individual SFD paramedic performance, conducts limited EMS research, and participates in quality improvement activities. SFD's Medical Director also reviews the emergency medical dispatch criteria used by the Department. AMR also has a medical director that participates in these areas for AMR's Spokane operation. The EMS system in Spokane meets the requirements set forth in NFPA 450, Chapter 7 – *Medical Oversight.*

Legislation and Regulation – It appears that SFD and AMR comply with all the State, regional, and local EMS statutes, laws, and regulations. SFD actively participates with both the East Region and Spokane County EMS and Trauma Councils and the SFD EMS Division Chief is a member of both of these organizations. AMR has membership on the Spokane County EMS and Trauma Care Council and actively participates. The EMS system in Spokane complies with the provisions of NFPA 450, Chapter 4 – *System Regulation and Policy*.

Education Systems – The initial and ongoing training and education provided to EMS personnel is essential for the success of any EMS system. Initial training includes programs for EMT and paramedic levels of care. EMS education is regulated by the Washington DOH OEMSTS and they specify the number of hours and type of training required for EMS personnel to maintain their certification. The initial training for paramedics is provided by the Spokane Community College with continuing education provided by several organizations including the SFD, AMR and local hospitals. There are shared training opportunities between SFD and AMR for ALS level education. EMT level continuing education is provided in-house by each agency. EMTs from SFD and AMR personnel do not train together.

SFD has a Lieutenant, EMS Training Officer, assigned to the Training Division for the purpose of coordinating and providing EMS continuing education, primarily EMT or BLS level training. The SFD Medical Director provides ALS training to SFD paramedics. OEMSTS developed an ongoing training and evaluation program (OTEP) that allows EMS agencies to provide continuing education in-house including the evaluation of EMS skills. EMS re-certification in Washington is required every three years. EMTs receive a minimum of 30 hours over a three-year period and paramedics are required to have 150 hours of continuing education over a three-year period.

SFD has a comprehensive training schedule that includes mandatory training for firefighting, hazardous materials, drivers/operators, and other specialty training. EMS training is provided to meet at least the minimum requirements for recertification of EMS personnel. NFPA 450, Chapter 13 – *Operations* addresses EMS training, SFD is in compliance with those requirements.

Public Education – There are two reasons that EMS public education is important. First, there are opportunities to localize and target specific problem areas such as lack of use of seat belts or drowning. Second, the general public can be provided information regarding the local EMS systems capabilities and practices.[5] There does not appear to be a comprehensive coordinated public education program within the Spokane EMS system. There are individual agencies that provide public education specific to their agency such as seat belt use and driving under the influence (DUI) awareness campaigns. The East Region EMS and Trauma Care Council has an Injury Prevention and Public Education (IPPE) committee that provides public information for firearm safety and helmet safety. SFD does not have an EMS public education program but provides some public education through their website and

[5] Brennan J. and Krohmer, J. Principles of EMS Systems. American College of Emergency Physicians. 2006

offers CPR training to the general public.

Prevention – Prevention and public education are interrelated and can be accomplished simultaneously. There is not a comprehensive coordinated prevention program within the Spokane EMS system. There are individual agencies that provide some prevention messages but there is not a focused prevention program. The IPPE committee provides prevention information for falls and suicide prevention. The Spokane EMS system does not meet the components of NFPA 450, Chapter 9 – *Public Information, Education, and Relations (PIER)* for education or prevention issues as described.

Public Access – Access to the EMS system begins with a call to the 9-1-1 communications center. Details have been provided earlier in this report. NFPA 450, Chapter 10 – *Communications* addresses public access. The Spokane EMS system is in compliance with those provisions.

Communications Systems – Communications is critical to all emergency service functions and activities. The CCB in Spokane is a state-of-the-art facility that provides excellent telecommunication services. There is interoperability between the various emergency service agencies, including AMR. SFD and AMR have linked their computer-automatic dispatch (CAD) systems and can transmit information back and forth. There are some SFD personnel who when interviewed during this study were critical of the current CAD used by SFD. Some critics feel the current CAD is old and subject to failure. They also like some of the features of the Spokane Police Department CAD. These concerns were not verified and SFD feels the CAD meets the needs of the EMS system. AMR incorporates the use of a global positioning system (GPS) and automatic vehicle locator (AVL) software with its CAD as well. Interviews with both the Communications Supervisor and the Information Technologies staff person expressed their satisfaction with the current CAD and that is has been reliable. The EMS dispatch system in Spokane also complies with NFPA 450, Chapter 10 – *Communications.*

Clinical Care – Details of the City's and region's clinical care oversight process were provided earlier in this report. Some of SFD's firefighter/EMTs expressed concerns that they are not able to provide patient care at the level they were trained because of the Department's policy of not providing certain EMS equipment, such as traction splints, KED splints, and glucose test kits on BLS response units. These EMTs felt their only role was to take vital signs. Some of the SFD paramedics also said that some of the Department's EMTs will immediately relinquish patient care duties to ALS personnel even though only BLS care is needed.

The level of clinical sophistication for ALS care is very good. They use a protocol driven process for patient care; use several advanced airway techniques, including the use of endotracheal intubation and continuous positive airway pressure (CPAP); and use innovative equipment and treatment techniques such as pulse oximeters, 12 lead ECG, and provide intra-osseous infusions and synchronized cardioversion.

AMR has a comprehensive quality improvement (CQI) program in place and maintains a high level of clinical care through consistent monitoring of the system and personnel. They utilize a paramedic and an EMT to provide patient care with the EMT

attending the patient if BLS care is appropriate and if ALS care is needed, the paramedic attends the patient. This process results in the AMR EMTs getting more exposure to patients and providing patient care than the SFD EMTs.

Information Systems (data collection and analysis) – EMS system data analysis helps the system evolve and assists management to make decisions. The Spokane EMS system collects and analyzes EMS system data and changes to the EMS system are made based on the data. SFD EMS information is obtained from several sources including computer input patient care records, CAD data, and other sources. SFD develops several reports and spreadsheets that are reviewed and analyzed by fire administration. The consultant for this study was provided several spreadsheets containing EMS data collected by SFD. The SFD data collection and information management system is excellent and the data available from the system can be extremely valuable if used effectively.

The mere fact that data is collected and the Department can monitor its performance, effectiveness, and efficiency is irrelevant if the information is not shared with everyone in the organization. There are several reports that SFD can produce that could be made available to the rank and file members of SFD that is not currently provided. Examples would include the publishing of the response-time reports, including turnout-times for all units by shift, patient procedure reports, incident volume reports; transport and ride-in reports, as well others.

AMR has similar information systems in place and can provide the same level of reporting of data as SFD. The Spokane County EMS and Trauma Care Councils also has information systems in place that provide data on the EMS system's performance. They utilize computer technology to track hospital resources in the region through a web-based tool called RAMSES, an acronym for Resources Available for Medical and Surgical Emergency Services. The EMS system performance in Spokane is also evaluated through data collection by the County through their Quality Improvement Committee including cardiac arrest survival statistics and advanced airway procedures.

Evaluation – System review and continuous evaluation of an EMS system is one of the critical components of an EMS system. Coupled with the data from the EMS system's data collection and information systems, the EMS system's performance, effectiveness, and efficiency may be assessed. Based on these assessments appropriate adjustments can be made to enhance the system. EMS CQI programs are designed to evaluate aspects of the EMS system including individual performance and system performance.

The Spokane EMS system is evaluated on a regular on-going basis by the EMS response agencies through their quality improvement programs, the Spokane County EMS and Trauma Care Council, and the occasional outside study or review. SFD does not have a formal written CQI program in place. The quality improvement activities performed by SFD are mainly done in order to comply with the EMS regulatory agencies requirements.

Overall, the EMS delivery process in the City of Spokane is effective, efficient and meets the needs of the citizens and visitors. The system has evolved over the years because of the economic conditions in Spokane. The number of resources and the manner in

which EMS is delivered has changed over the years. Instead of two-person medic squads, SFD uses fire apparatus staffed with three or four firefighters certified as EMTs or paramedics. The system has response-time reliability with SFD arriving at the scene in seven minutes and seventeen seconds (7:17) for all (100 percent) EMS incidents and the first SFD ALS unit arriving on-scene 93 percent of the time in seven minutes and 23-seconds (7:23) to all EMS incidents requiring ALS care. AMR is on scene in 10 minutes or less 90 percent of the time for Code responses and 97 percent of the time or less for No-Code responses. By design, the system is set up to limit the number of incidents that are responded to with lights-and-sirens. The use of MPDS and responding No Code for A-level calls, as well as limiting the Code responses by AMR reduces the chances of emergency vehicles being involved in a vehicle collision. Emergency vehicle collisions are one of the leading causes of liability claims for EMS system.

The deployment methods used by SFD and AMR are matched to the level of care required and appropriate as to the location of SFD fire stations and AMR's posting of ambulances. Posting refers to fixed locations in the community where ambulances are sent to await a call. AMR has 17 posts in and around the city. The locations are determined through computer analysis of historic call volume for EMS incidents. The EMS personnel from the two agencies work well together and patient care is appropriately provided. There are quick transport times to the area hospitals and appropriate medical facilities to treat patients after they arrive.

Both AMR and SFD are delivering quality EMS for a modest cost. It costs approximately $1,483 for each emergency incident SFD responds to. This cost was derived from dividing the entire SFD budget by the number of emergency responses in 2008.The cost per capita for SFD is $208. The marginal cost per EMS call for SFD is $300 and the cost per capita for EMS is $36 annually.

The maximum paid by a homeowner is $0.50 per 1,000 dollars of assessed value for the EMS levy. The median home price in Spokane is $97,000[6] resulting in a cost of approximately $40.00 per household. The EMS levy provides the funds for the EMS budget and has allowed SFD to provide ALS first-response EMS services. The cost for ambulance transportation in Spokane is very low compared to the cost in other parts of Washington and in other U.S. cities. Currently ambulance base rates in many parts of Washington are in the $800 and higher range. Parts of Spokane County, outside the city limits, already pay as much as $909.00 for ambulance transportation. City residents who are transported from outside the City will pay these higher rates for ambulance transportation as well.

Input regarding the EMS system in Spokane from some residents and many SFD personnel is that the EMS system in the city is broken, too costly, inefficient, and needs to be redesigned. One reason stated during interviews and town-hall meetings in support of this view is the SFD's practice of sending fire apparatus, especially ladders or pumper/ladders, to EMS incidents, sometimes two units, and the perception that this is costly, wasteful and redundant. Increased maintenance and operating costs for fire apparatus is another reason cited. However, the general public does not seem to understand the system's design, a multi-tiered response system with a public/private partnership which is common in many communities in the west. This lack of understanding has resulted in

[6] U.S. Census Bureau

criticism of the system and the occasionally questioning of the SFD's role in EMS.

There are individuals that would like to see the SFD provide the entire EMS delivery function by providing emergency ambulance transportation services in addition to first-response services. This question has been raised on and off since 1998. One of the more vocal groups in support of a fire-based transport service is IAFF Local 29, the bargaining unit for SFD. The reasons conveyed to The Abaris Group from both IAFF Local 29 officials and rank-and-file firefighters for having SFD initiate ambulance services were varied. Some members were concerned about continuity-of-care issues (this becomes a concern whenever patient care is transferred from one paramedic to another) and felt SFD EMTS and paramedics would provide a better service, in terms of quality, than AMR currently provides. Others wanted to take on the transport function to gain additional support from the community and city elected officials. The general idea is that by providing the critical service of ambulance transportation in addition to firefighting activities, the general public and the City Council would be less apt to layoff firefighters during times of economic downturn. There are some that feel the SFD would generate significant revenue that would come back to the City, instead of revenue and profits going to AMR's shareholders.

Some SFD personnel and members of the public support the idea of SFD providing ambulance transportation because they do not like AMR as a company. Some provided their rationale for their distrust of AMR as related to a recent ambulance overbilling concern in Spokane. In 2005, it was discovered that AMR had been overbilling EMS patients transported in the city in violation of a clause in the AMR/Spokane ambulance contract. In the contract, AMR was not allowed to charge the ALS base rate of $494 when SFD paramedics accompanied a patient, needing ALS level care, to the hospital by riding in the back of the ambulance. In those cases when the SFD paramedic rides in with the patient, AMR was supposed to bill the patient at the BLS rate of $358.00 for the ambulance trip. AMR contends that the overbillings were the result of mistakes made by one of its regional billing centers located outside Spokane, not familiar with the Spokane contract clause. The billing errors were discovered by members of SFD who brought their concerns to fire administration. These members felt that fire administration was not concerned and brought the issue to the attention of the IAFF Local 29 officials, who in turn brought it to the Spokane City Council's attention. There was extensive media coverage regarding the overbilling issue. There were also accusations that the fire administration and AMR were working together and that the fire chief was defending AMR. In the end, the Mayor fined AMR approximately $80,000 for the billing errors and AMR agreed to refund the overpayments. Individuals, in and outside of the SFD felt the penalties were not sufficient and AMR should have been more severely penalized. AMR has had overbilling issues in other of its operations nationwide and these were also mentioned as additional reasons for their distrust. A class-action law suit has been filed because of this overbilling.

There are some that feel that their corporate entity, for-profit status and its large presence in the U.S. ambulance market is not compatible with the City of Spokane's needs. Some resent the fact that AMR has an exclusive contract with the City for ambulance transportation and feel the City should allow more competition.

The private sector can usually provide ambulance transportation services more economically than the public sector can when comparing costs to deliver the service. The primary reasons for this include: that the private sector usually pays lower wages to

EMS personnel; uses dynamic deployment dispatch strategies (SSM, GPS/AVL) thus flexes coverage based on demand; and the larger national ambulance services, such as AMR, has the advantage of other economies of scale.

If ambulance services are not currently being provided by local government, the primary reasons local government takes on this responsibility is: when the current ambulance service is not performing adequately, including long ambulance response times or inability to meet required response-time standards; poor quality of patient care; or excessive ambulance fees. By all measures and from input from this study, AMR is currently providing quality ambulance services, meeting response-time requirements, and has very low ambulance fees.

Overall, the EMS delivery system in Spokane is meeting the needs of the community and visitors experiencing medical or trauma emergencies. The cost to provide these services and the cost for ambulance transportation is very reasonable with high quality clinical care being provided.

Strengths and Weaknesses – Spokane EMS Delivery Process

Based on the review of documents, reports, industry standards and study observations, The Abaris Group identified specific strengths and weaknesses related to the Spokane EMS delivery process. These are listed below

Strengths

- EMS system is designed well and incorporates the EMS system design components identified nationally
- Tiered system of response
- Good medical oversight and direction by active participating physicians
- State-of-the-art clinical care
- Competent EMS personnel and oversight process
- Good working relationship between SFD and AMR field level personnel
- Significant number of state-of-the-art receiving hospitals
- Medical Priority Dispatch System.
- Ambulance performance contract
- Mandated ambulance response times
- SFD/AMR costs of providing EMS services is low
- Very reasonable ambulance fees
- Good data collection capabilities
- Compliance with state laws and regulations
- Good support for EMS from SFD administration

Weaknesses

- Perceived inadequate number of SFD paramedic personnel to meet SFD paramedic staffing goals
- SFD practice of frequently sending more than one unit to ALS responses
- The use of ladder trucks and pumper/ladders as primary EMS response units with high response volumes (Ladder trucks are used by the U.S. fire service to respond to EMS incidents, but usually as the second or third out unit. Six Washington fire departments were contacted and verified they only use ladder trucks as secondary response units with the exception of Central Pierce that does have a ladder truck that is the primary EMS response unit in the downtown area, but it responds to less than 1,000 incidents per year. SFD ladder and pumper/ladder apparatus responds to 1,443 to 2,490 incidents per year. The cities contacted include: Tacoma, Central Pierce, Evert, Eastside Fire and Vancouver.)

Ambulance Response Performance

In the American Ambulance Association's (AAA) *Community Guide to Ensure High-Performance Emergency Ambulance Service*, the AAA defines a high-performance community emergency ambulance service as one that assures the public of clinical excellence, response-time reliability, economic efficiency, and customer satisfaction - simultaneously. Together these are called the "essential performance results of a high-performance emergency ambulance service". The AAA lists five "hallmarks" to ensure high-performance emergency ambulance service.

Hallmark 1 – *Hold the emergency ambulance service accountable*. With effective emergency ambulance service design and performance-based contracting, ambulance services should achieve high performance in communities of various sizes and demographics.

Hallmark 2 – *Establish an independent oversight entity*. Independent oversight promotes performance accountability by giving the overseeing entity the authority and tools to improve services or safely replace a non-performing provider. The independent oversight entity is responsible for monitoring and routinely reporting the provider's performance and compliance in clinical excellence, response-time reliability, economic efficiency, and customer satisfaction.

Hallmark 3 – *Account for all service costs*. An effective emergency ambulance service accounts for all its costs – direct, indirect, and shared. These costs include labor, medical communications center, buildings, vehicles, equipment, supplies, liability exposure, administrative overhead, and independent oversight costs. User fees should be used as the primary source of funding for the costs of emergency ambulance service.

Hallmark 4 – *Require system features that ensure economic efficiency*. Since the volume and location of medical emergencies varies by hour of day and day of week, ambulance deployment should be based on geographically deploying the right number of ambulances

according to historical call demand and redeploying as events occur. The EMS system design should allow the ambulance provider to offer inter-facility ambulance transports to maximize economies of scale. Economic efficiency can also be accomplished with a multi-jurisdictional system serving regional medical trade areas.

Hallmark 5 – *Ensure long-term high performance service*. Contractually required performance standards should be established through effective competition for service rights. Properly structured competition promotes the greatest quality for the optimum cost. This usually involves a competitive procurement process for interested ambulance service providers. By applying an effective competitive process, local officials can create a level playing field for all potential providers and ensure that the best and most cost-effective service for the community is obtained.[7]

AMR is the exclusive provider of 9-1-1 emergency ground transportation in Spokane and meets all of the AAA's listed requirements for a high-performance emergency ambulance service provider. They provide clinical excellence, response-time reliability, economic efficiency, and customer satisfaction.

The five hallmarks for ensuring a high-performance emergency ambulance service have been addressed by the City Spokane and AMR through the structure of the EMS system designed for Spokane. They are held accountable through a performance-based contract that requires AMR to meet or exceed specific performance standards and financial benchmarks. AMR has response-time standards of ten-minutes or less for Code responses, 90 percent of the time. They are currently meeting this standard 93 percent of the time. For No-Code responses, AMR must be on-scene in 20 minutes or less, 90 percent of the time. AMR currently meets this standard 97 percent of the time. The AMR contract also has provisions for liquidated damages (penalties and fines) for response-times that are longer than the required response-time standard. The contract has several other provisions that ensure accountability in the areas of clinical excellence, response-time reliability, economic efficiency, and customer satisfaction. Although there is no independent oversight entity in Spokane for the ambulance contract, AMR's performance is monitored by the SFD EMS Division Chief who also administers the AMR contract. AMR, as a corporation, does extremely well at accounting for all their costs. The Spokane operation is funded entirely by user fees and there are no subsidies provided by the City to AMR. The EMS system design in Spokane does have required features that promote economic efficiencies. AMR is the sole provider of emergency ambulance services in the City and the primary provider outside of the city limits. They also provide inter-facility transports in the area. AMR uses a dynamic deployment process to determine the number of ambulance needed by hour of day and day of week based on historical EMS call data.

The City of Spokane conducted a request for bids (RFB) ambulance process in the mid 1980s and Spokane Ambulance (eventually purchased by AMR) was selected as the exclusive ambulance provider through a competitive process. Prior to this contract being awarded, there were other ambulance service providers in Spokane. Ambulance services were not regulated at that time by the City

[7] American Ambulance Association. Community Guide to Ensure High-Performance Emergency Ambulance Service. 2004

and there were many performance issues that led to conducting the RFB for a single ambulance provider. While Spokane had the foresight at the time in seeking a single provider contract, it is now a common practice for cities or regions choosing to contract with a single ambulance provider for 9-1-1 ambulance services to achieve the goals for the communities they serve. The current contact between AMR and the City of Spokane is a performance-type contract. The contract contains provisions for response-time criteria, performance standards, training requirements, and several standard ambulance contract clauses. The City is reimbursed by AMR for contract administration, some dispatch services, a portion of the cost for the SFD CAD, radio communications, and other support related functions. These and other features of the ambulance contract assure cost effectiveness and accountability.

One basic measurement of efficiency in EMS is the unit hour utilization (UHU) ratio. This measurement has become one standard for determining effective deployment strategies, response patterns, unit and system productivity, and even scheduling practices. A unit hour is defined as a "fully equipped and staffed ambulance on a response or waiting for a response for one hour." Unit hour utilization is the measurement that results from dividing the utilization (calls) by the number of unit hours produced in a given time period.[8]

AMR provides 1,763 weekly unit hours in Spokane which is an average of 252 unit hour per day resulting in an average of 10.5 ambulances in-service per day. Depending on the hour of the day, AMR staffs between six and fourteen ambulances using peak staffing methodology. Peak staffing is simply putting more ambulances in service based on the predicted number of EMS incidents throughout the day. The UHU ratio is 0.42, meaning that AMR ambulances are on a call or transporting 42 percent of the time. This indicates that the AMR operation is efficient. The average time on each incident is 44 minutes which includes the time dispatched until the time they are available for another call. AMR responded to 33,823 incidents in 2008 countywide. Sixty-percent or 20,278 of these responses were in the City of Spokane by AMR.

AMR operates its own Communications Center for dispatching ambulances. The Center is an Accredited Center of Excellence (ACE) for emergency medical dispatch awarded by the NAEMD. The NAEMD accreditation standards are based on 20 points that are self-assessed and documented followed up by a site assessment completed by NAEMD evaluators. The AMR CAD system is integrated with the CCB CAD and when a 911 EMS call comes into the CCB the information is electronically transferred to AMR's CAD.

AMR units are dispatched to EMS incidents based on their SSM plan. This plan is developed using a computer software program that analyzes the historical EMS call volume in Spokane in terms of locations and times of the day. As stated previously, AMR uses a dynamic deployment system where ambulances are moved to pre-designated locations, called Posts, based on where EMS incidents occur at a particular time of the day. There are 17 posts in Spokane used by AMR and when there are 17 ambulances available to respond to EMS calls, the system is at Level 17. Ambulances are also posted at these locations based on the number of

[8] National Association of EMS Physicians. Prehospital Systems and Medical Oversight. 2002

ambulances available in the system. For example, if there are only two ambulances available for responding to calls, Level 2, one is sent to Post 17 at 5633 N. Lidgerwood Street and the other ambulance is sent to Post 12 at 300 Freya Street. AMR vehicles are equipped with automatic vehicle locators (AVL) integrated with its CAD system. These AVL units use a global positioning system (GPS) that allows AMR's CAD system to locate the closest ambulance to a specific EMS call.

When AMR receives a request for service from SFD they are provided the EMS incident type and dispatch code, A-B-C-D or E, and either respond Code or No Code. AMR does not respond initially to A-level incidents. After the SFD unit arrives on an A-level incident, if transportation is required, AMR is requested to respond. AMR responds No Code to B and C-level incidents within a 20-minute response-time requirement. They respond Code to all D and E-level calls with a 10-minute response-time requirement. SFD personnel on-scene of an EMS incident can upgrade No Code AMR responses to Code if warranted by the patient condition. If AMR arrives prior to SFD, they can reduce the response by SFD from Code to No Code if the patient's condition allows. AMR is not allowed to cancel responding SFD units.

The response-time standards imposed on AMR meet the requirements for an emergency ambulance response (WAC 246-976-390, (11)a). The Commission on Accreditation of Ambulance Services (CAAS) is an independent organization that has established a series of standards for the ambulance service industry. The response-time standard set by CAAS for emergency ambulance response is eight-minutes and 59 seconds (8:59) or less, 90 percent of the time. EMS response-time standards are based on research conducted by the American Heart Association (AHA) on sudden cardiac arrest survivability and the American College of Surgeons for trauma survivability. The AHA recommends that CPR be started immediately on sudden cardiac arrest victims, BLS level care and an automatic external defibrillator (AED) arrive within four-minutes and ALS level care be provided in eight-minutes in order to assure the highest possible chance of surviving a sudden cardiac arrest event. Survival is directly linked to the amount of time between the onset of sudden cardiac arrest and defibrillation. If no-bystander CPR is provided, the chance of survival is reduced by seven to ten percent with every minute of delay until defibrillation. The response-time for trauma patients is based on the *golden hour* concept that when definitive care is delayed greater than 60 minutes, the victim of traumatic injury has only a 15 percent survival rate. Definitive care refers to treatment in a hospital.

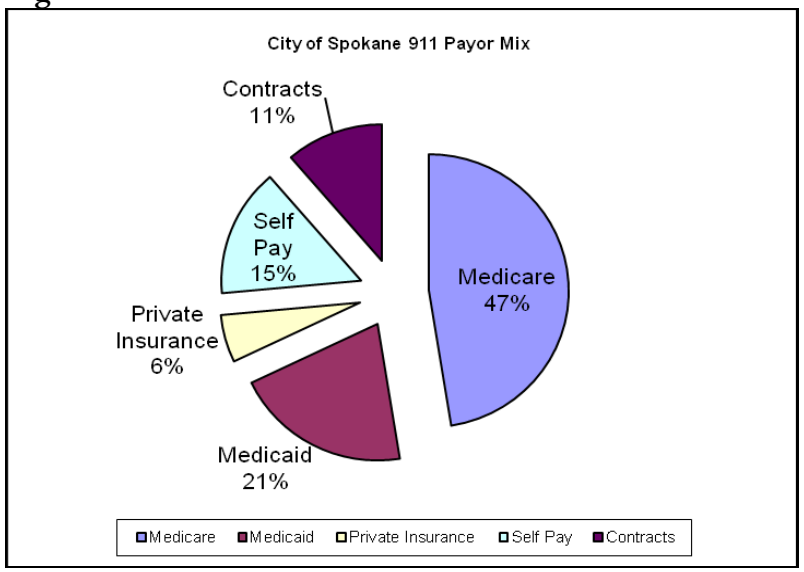
SFD personnel usually are on-scene before AMR and initiate patient care appropriate to the situation encountered. AMR paramedics and EMTs work well together with SFD personnel in the interest of providing quality pre-hospital patient care. There is a formal reporting on-scene protocol defined in the AMR contract. SFD paramedics are primarily responsible for patient care until the patient is turned over to the AMR personnel. SFD uses their equipment and supplies to treat the patient, including oxygen delivery devices, bandages, I.V.s, splints, and backboards. The equipment and supplies used by SFD and AMR are generally standardized. AMR and the SFD do not exchange supplies or equipment between them, meaning that if SFD uses supplies or equipment when treating a patient; AMR does not resupply or give SFD their splints or backboards. In essence, SFD is subsidizing AMR with medical supplies since SFD does not charge for them. AMR has an all inclusive base rate for BLS and ALS which includes the use of equipment and supplies.
To ensure high-quality medical treatment and address problems that may arise, AMR has field supervisors on-duty 24 hours every

day. These field supervisors can respond to EMS incidents and provide assistance or guidance to AMR personnel as well as serve as a resource to resolve conflicts or other issues in the field. AMR also ensures quality patient care through its in-house CQI program.

AMR has user fees approved by the City of Spokane, which includes a base rate for BLS and ALS, loaded mileage, and oxygen administration. The current rates allow AMR to charge $553.37 for ALS, $401.19 for BLS, $18.45 per mile, and $46.12 for oxygen administration. These are some of the lowest rates in the country. The City of Spokane, through its ambulance performance contract with AMR has assured the community of high-quality ambulance services at a bargain rate. Outside the city limits AMR has an ALS base rate ranging from $844.00 to $909.00.

The actual amount AMR collected from transporting 9-1-1 patients is approximately 42 percent. Ambulance bills are paid either through private medical insurance, Medicare, Medicaid, or by the patient themselves. Usually private insurance policies pay the full amount of an ambulance bill. Medicare and Medicaid only pay a portion of the bill and the amount paid by the patient can vary between nothing and the full amount. The payer mix in Spokane is illustrated in Figure 1 below.

Figure 1



Source: City and AMR data for 2008

There is a higher than usual number of Medicare and Medicaid EMS patient mix in Spokane which is explained by the population's age and demographics. In most cities, the Medicare and Medicaid payers range from 30 to 40 percent. The number of community members with private medical insurance is also very low when compared to other cities that have approximately double the

percentage of private medical insurance patients. This could affect the financial performance of this delivery system.

Overall the ambulance response performance in Spokane is very good. Ambulance response-times are being met consistently, AMR personnel are adequately trained and have the necessary tools to perform patient care, the quality of clinical care provided is very good, and the ambulance rates are extremely reasonable.

First Responder Response Performance

SFD is the primary provider of EMS first-response services in the City of Spokane with 85 percent of its 28,673 total emergency incidents being for EMS. A description of the SFD first-response system has been provided in the previous sections of this report. Overall, first-response EMS delivery currently provided by SFD is effective, extremely efficient and meets the needs of the citizens and visitors in the City of Spokane.

The design and structure of the EMS first-response system is a result of SFD budget cuts and personnel layoffs over several years. SFD has had to do more with fewer resources and has been able to deliver and maintain a high level of EMS. The fact that they are able to maintain a full service fire department with the current level of resources allocated is commendable. It is a common practice in the U.S. to dispatch fire apparatus staffed with firefighter EMTs or paramedics as first-responders. The public/private multi-tiered EMS delivery system in place in Spokane is also a common model for EMS delivery.

Self imposed response-time performance goals are being met consistently but these goals do not meet the NFPA 1710 Standard of BLS on-scene in 240 seconds and ALS on-scene in 480 seconds, 90 percent of the time, for travel times. Longer response times for EMS incidents occur when the closest fire apparatus is not immediately available. This happens when the closest unit is already handling another emergency incident or is out of the fire station for training or other non-emergency activities. In the event of a working fire incident, 50 percent of SFD's fire apparatus may not be available to respond to EMS incidents and the units that are available to respond have longer response-times because of the travel distance. There were at least 56 times in 2008 when available fire apparatus to respond to EMS incidents was reduced by 50 percent because of working fires.

The amount of time it takes for fire personnel to get on the fire apparatus after they have been notified of an emergency incident and start to travel to the incident, known as *turnout time* is longer than it should be. The accepted turnout time standard for fire departments is 60 seconds for EMS incidents and 90 seconds for fire incidents. SFD does monitor and produces a turnout time report that indicates all of the SFD response units exceed the recommended standard for turnout times. This factor of long turnout times was also addressed in the 2008 Spokane Fire Department Annual Report indicating a Department turnout time of 134 seconds, 90 percent of the time.

The only potential risks to the future dispatch and response-time performance in Spokane is if the financial condition in Spokane continues to result in budget cuts and personnel layoffs. Resources, both financial and personnel, are already at the minimum level needed to provide EMS delivery services. Any further cuts to funding or staffing will result in decreased EMS delivery services and longer response-times.

The practice of using ladder trucks and pumper/ladders as "primary" EMS response units is not a common practice used by most fire departments. These types of fire apparatus are used for EMS responses, but not to the extent that they are used in Spokane. Usually these types of fire apparatus are secondary and tertiary response units and used when the primary response units are not available. SFD ladder trucks and pumper/ladders responses range from 1,443 to 2,490 emergency incidents annually. The consultant was not able to analyze the impact on these fire apparatus from the standpoint of increased maintenance costs and increased out of service time because SFD does keep computerized records for apparatus maintenance. One of the criticisms of the Spokane EMS system is excess wear and tear on fire apparatus.

The practice of responding the closest BLS unit and then the closest ALS unit if ALS level care is required is redundant when taking into consideration that AMR is also responding. The result is that SFD units are no longer available to respond the closest unit because the closest unit is not available. This also results in additional response units being taken out of their primary response area.

SFD staffing of paramedics consists of two firefighter/paramedics assigned to each of the eight ALS response units. The actual time that there are two firefighter/paramedics on these units is about 60 percent of the time. SFD has 52 fully certified firefighter/paramedics and approximately 10 – 12 in the process of becoming paramedics. To continue the two paramedics per unit policy for the existing eight ALS response units, SFD needs a minimum of 64 paramedics. In reality they staff with a minimum of one paramedic and use one of the 10 – 12 paramedic students as the second paramedic. Firefighter/paramedics receive additional compensation of 13 percent of a senior firefighter. There are financial incentives in the IAFF Local 29 contract to encourage firefighters to obtain paramedic certification. At one point the Department hired certified paramedics and trained them as firefighters. Most those paramedics were laid off in 2005 because of budget cuts.

SFD firefighter/paramedics have the option to accompany patients that required ALS level care to the hospital in the back the AMR ambulance. When they do accompany the patient AMR is prohibited from charging the patient the ALS base rate for the transport. In 1999, SFD paramedics rode-in with the patient 59 percent of the time. In 2009, they only rode-in 25 percent of the time. SFD paramedics stated to the consultant that they only ride-in if the patient needs the additional care they can provide. They do not ride-in to reduce the ambulance bill to the patient.

Strengths and Weaknesses – First Responder Response Performance

Strengths

- Dedication of emergency response staff and administrative staff
- Spokane Combined Communications Building
- Use of Medical Priority Dispatch and pre-arrival medical instructions
- Tiered EMS response system
- ALS level patient care
- Strategically located fire stations
- Dispatching the closest fire apparatus to EMS incidents
- Cross-staffing specialized apparatus
- Active part-time Medical Advisor
- SFD involvement and membership with EMS regulatory agency councils

Weaknesses

- Poor public knowledge and misuse of the 9-1-1 system
- Lack of awareness on the part of firefighters of the MPDS processes
- SFD response-times not meeting the NFPA 1710 Standard
- SFD apparatus staffing does not meet to NFPA 1710 Standard
- SFD has longer than necessary turnout times
- Very few emergency traffic preemption devices installed throughout the City
- Several needless EMS responses
- Routinely dispatching two fire apparatus to ALS EMS incidents
- SFD available emergency response staff
- Lack of adequate on-duty firefighter/paramedics
- Not providing ALS from all fire stations
- Not allowing AMR to cancel responding SFD units
- Lack of adequate EMS field supervision
- Lack of a comprehensive on-going CQI program
- No on-scene medical resupply process
- Lack of specific basic EMS equipment on BLS response apparatus, i.e. traction splints, glucose monitors

Recommendations – First Responder Response Performance

1. ***Implement a program where SFD dispatch personnel can ride on fire apparatus and SFD fire personnel spend time in the CCB observing the dispatch process.*** This will allow each of these disciplines to understand the others work processes. Firefighters have criticized the dispatch process but do not fully understand the process. There were many comments that the calls they are sent to were not appropriately categorized.

2. ***Implement a Medical Dispatch Review Committee to enhance the current SFD quality improvement process for reviewing compliance with MPDS by SFD dispatch personnel.*** Currently 10 percent of all EMS incidents are reviewed for compliance to the MPDS by the SFD dispatch shift supervisors. This process can be enhanced by including firefighter/paramedic personnel and representatives from the agencies that SFD dispatches for. In addition, a formal dispatch feedback process should be implemented in order to respond to questions regarding the categorization of specific EMS incidents.

3. ***Consider the implementation of an immediate dispatch policy once the location of the emergency is known.*** This recommendation can decrease response times to EMS incidents by making up for time lost in caller interrogation to determine the dispatch determinant, i.e. A – E-level, and firefighter turnout time. The closest SFD unit can be determined as soon as the location of the emergency is known and immediately dispatched to the scene and updated by the SFD dispatcher as additional information is obtained from the 9-1-1 caller.

4. ***Consider changing the current dispatch criteria for C-level responses to the closest SFD unit only.*** This change will reduce the number of times two SFD fire apparatus are sent to the same EMS incident. In conjunction with having AMR respond Code to C-level incidents, ALS care if needed, will be on-scene in a timely manner and ALS care can be provided by AMR paramedics. SFD would continue to send a second ALS unit to D and E-level incidents if the closest unit is at the BLS level.
5. ***Consider implementing the Omega response option for MPDS to reduce the number of SFD A-level responses.*** The Department should explore options with the Medical Program Director, AMR, local hospitals, and other medical facilities or programs to provide alternatives to specific A-level incidents. There are several options available including the use of triage nurse programs, taxi cab vouchers, expanding the roles of Car 50 and the CARES program, as well as an AMR ambulance only response. A committee with representation from SFD, AMR, Medical Directors, hospital personnel, public health, Car 50, CARES, and others should be established to develop these alternatives that are safe and do not increase liability from not responding.

6. ***Develop a comprehensive and ongoing public education program promoting the appropriate use of 9-1-1 to reduce A-level responses.*** In conjunction with AMR and the Spokane CCB an ongoing public awareness campaign using print,

radio, and television media can provide information to the public on when to call 9-1-1 and when not to call. These types of programs have been successful in reducing needless 9-1-1 calls.

7. ***Develop a protocol that would allow SFD EMS units on-scene at an A-level incident to become available for another EMS call prior to the arrival of AMR.*** Currently, SFD units can be on-scene of a non-emergency incident for up to 20 minutes waiting for AMR to arrive to provide ambulance transportation. If the condition of a patient warrants the SFD unit to go available or leave the scene for another EMS incident, the on-scene paramedic should be able to make that decision. Appropriate documentation and instructions should be provided to the patient to call back 9-1-1 if their condition worsens. This practice will allow SFD units to increase their availability for additional EMS incidents that they be closer to.

8. ***Increase the number of ALS capable response unit by assigning only one paramedic to each ALS fire apparatus.*** The current policy of assigning two paramedics to an ALS unit limits the number of ALS units the Department could staff. By assigning one paramedic to an ALS unit, SFD could add ALS capabilities to five more apparatus, bringing the total number of SFD ALS units to 13 utilizing the existing 52 firefighter/paramedics. See the maps in Appendix A illustrating the current level of ALS coverage and the expanded ALS coverage map in Appendix B, as well as the frequency of EMS incidents in Appendix C.

9. ***Consider upgrading all SFD fire apparatus to provide ALS level service.*** This recommendation would require current firefighters to obtain paramedic certification. With the current shift structure, to upgrade all SFD fire apparatus to ALS would require at least 68 certified paramedics and does not account for replacements needed for leave usage.

10. ***Identify specific intersections that delay emergency responses and prioritize them for the installation of emergency traffic preemption devices.*** Currently there are just few of these devices installed at intersections in Spokane. The additional installation of these devices can enhance SFD response times to emergency incidents.

11. ***Provide basic EMS equipment on all first-response apparatus, including traction splints, glucose monitors and any other piece of equipment or tool that SFD EMTs are trained and authorized to use.*** SFD does not provide the full complement of basic EMS equipment on all fire apparatus. BLS response units should be equipped with all the equipment SFD EMT personnel are authorized to use. Some of the SFD EMTs expressed that they were only expected to take vital signs and paramedic personnel provide treatment and intervention. By not equipping SFD BLS units with this equipment this perception is perpetuated.

12. ***Consider moving from a four-shift system to a three-shift system for emergency response personnel.*** Under the current four-shift system employed by SFD, firefighters work an average of 46.15 hours a week. There are several variations of three-shift systems with varying numbers of average hours worked. This issue was extensively addressed in a study

conducted by another consulting firm in 2007. That study looked at the three-shift system from the perspective of reducing costs. The Abaris Group is recommending that SFD consider implementing a three-shift system to enhance service delivery by increasing the daily staffing and upgrading all SFD fire apparatus to ALS. Implementing a 56 hour average work week will increase daily staffing from 58 to 77 personnel resulting in all SFD fire apparatus staffed with four persons, upgrade all SFD fire apparatus to the ALS level of care, and provide 9 relief personnel per shift. This recommendation must be negotiated with Local 29 and will result in additional pay for fire personnel working 9.85 more hours per week.

13. ***Consider purchasing five transport capable medic units and place them in fire stations that have ladder trucks and pumper/ladders and cross-staff these units with firefighter/paramedics for EMS responses.*** SFD currently cross-staffs for hazardous materials responses and specialized rescue responses. By assigning medic units to the stations with ladder trucks and pumper/ladders that are currently staffed with four persons, when an EMS incident occurs near these stations, the firefighter/paramedic and another firefighter/EMT can respond in the medic unit. This practice will leave two firefighters in the fire station that can respond in the ladder or pumper/ladder to additional emergency incidents. Ladder trucks and pumper/ladders would become secondary EMS response units. The cost of purchasing transport capable vehicles is not much more than the cost of non-transport capable vehicles. By providing transport capable units, SFD can enhance the current ambulance transport system during multi-casualty incidents or disaster situations. SFD should also consider transporting when in the best interest of the patient when AMR is delayed or unable to respond, for scene safety reasons, or when emergency service personnel need to be transported. Transport capable units will also allow SFD personnel to move patients off the ground to the back of an ambulance during the winter or when it is raining. They can also be used to rehab firefighters at fire incidents. Should SFD be successful in moving to three-shift system, four of these medic units could be staffed with the nine relief personnel and only one medic unit would need to be cross-staffed with personnel from a ladder company. It is important to note that the ladder company cannot perform fire suppression activities with only two firefighters and would have to team up with the other two firefighters on a transport capable medic unit to function as a company.

Strengths and Weaknesses – Ambulance Response Performance

Based on the review of documents, reports, industry standards and personal observations, The Abaris Group identified specific strengths and weaknesses related to ambulance response performance. These are listed below:

AMR has the following strengths for its ambulance delivery system:

- Provides a high-quality ambulance transportation service with well trained and competent medical staff
- Accountable through the ambulance performance contract with the City of Spokane
- AMR and SFD medics work well together as a team
- Has a good working relationship with the area Emergency Department personnel
- Has a state of the art, ACE communications center providing ambulance dispatching services
- Uses contemporary computer technology (e.g. GPS) for their deployment plan
- Consistently meets response-time requirements
- Has reasonable ambulance fees
- Has low turnover of personnel
- Provides field supervision of its personnel
- Quality CQI program in place
- Provides inter-facility transfers to maximize franchise leverage

Weaknesses

- Payer mix in Spokane includes a high percentage of Medicaid and Self Pay patients and low percentage of patients with private medical insurance
- Collects approximately 42 percent of ambulance fees
- On rare occasions has limited ambulances available during unexpected high-demand periods
- Occasional delayed inter-facility transfer times during high-demand periods
- Poor public perception and distrust because of the overbilling incidents in 2005

Recommendations – Ambulance Response Performance

Although overall AMR provides good service, there are a few recommendations that may enhance the delivery of ambulance services in Spokane. Some of these recommendations may result in the need to renegotiate the current ambulance performance contract between the City and AMR and could result in an increase in the ambulance base rates within the City of Spokane.

1. ***Consider changing the current response-time standard for Code responses to eight-minutes and fifty-nine seconds (8:59).*** This is in line with the response-time requirements in the CAAS standard as well as enhancing patient care and reducing transport times from the initial onset of the EMS incident.

2. ***Consider changing the current response-time standard for No Code responses from twenty-minutes (20:00) to fifteen-minutes (15:00).*** This would decrease the amount of time a SFD unit remains on-scene awaiting the arrival of an ambulance as well as get an ambulance on scene faster.

3. ***Allow AMR to respond Code to C-level incidents.*** This would allow AMR to arrive quicker at potentially life-threatening incidents and assist SFD personnel with patient care. Currently many times AMR is upgraded from No Code to Code after SFD is on-scene. This change will result in AMR responding Code to approximately 5,300 calls a year. In treating critical care patients or multiple patients, having AMR on-scene quicker will enhance patient care.

4. ***Allow AMR to cancel the responding SFD unit enroute when AMR arrives first and determines SFD is not required.*** The current policy of not allowing AMR to cancel SFD units results in SFD not being available for another EMS incident. It also suggests that AMR is not capable of providing patient care without SFD personnel.

5. ***Limit the number of times AMR can redirect an enroute ambulance to another higher priority incident to only one time.*** Currently a responding AMR ambulance may be diverted from a No Code incident to a Code incident if they are the closest ambulance. This has resulted in longer response-times to No Code incidents and SFD personnel being on-scene for longer periods of time than necessary.

6. ***Dispatch AMR on A-level responses at the same time SFD is dispatched.*** The fact that AMR does not respond to A-level calls on the initial dispatch results in SFD units being on-scene longer for lower level EMS incidents than necessary when ambulance transportation is needed. In 2008 there were 4,897 A-level incidents with 12 percent of those incidents resulting in a patient being transported. By having AMR respond to all A-level incidents there would be an average of 13 additional AMR responses per day, approximately two calls per hour. There may be the need for AMR to add additional ambulances to their deployment plan in response to these additional calls.

7. ***Consider allowing AMR to staff some ambulances at the BLS level to respond to A-level incidents.*** By allowing AMR to staff at the BLS level to respond to A-level calls, and possibly B-level calls, ALS level ambulances will be more readily available for higher level EMS incidents. These BLS units can also provide inter-facility transfers if ALS level care is not required. The cost for AMR to staff BLS ambulances will be less than the cost to staff at the ALS level. This also opens the door to SFD possibly not responding to A-level calls at all and having AMR solely responding to A-level incidents keeping SFD units available for higher level EMS incidents.

8. ***Require AMR to resupply disposable medical supplies used by SFD on patients that are transported.*** Resupplying disposable medical supplies is a common practice in public/private EMS systems and is not a violation of the Medicare anti-kickback provisions. Since AMR has moved to an all inclusive base rate for BLS and ALS, the cost of patient supplies is included in the ambulance base rate. Before the implementation of an all inclusive billing system, medical supplies were itemized on the ambulance bill. This is no longer the practice because medical supplies are included in the ambulance base rate. SFD will realize a cost savings in the current medical supplies budget of approximately $100,000.

9. ***Consider eliminating the requirement prohibiting AMR from charging the ALS base rate when a SFD paramedic accompanies the patient to the hospital.*** The intent of this requirement by the City is to reduce the cost of ambulance transportation to Spokane citizens when SFD paramedics ride in the back of the ambulance with the patient when they are transported to a hospital. The SFD lists this as a benefit of the EMS levy. In reality SFD paramedics accompanied the patient to the hospital only 25 percent of the time, or twice a day in 2008, down from a high of 59 percent in 1998. SFD paramedics stated to The Abaris Group that they only accompanied the patient to the hospital if they warranted additional ALS level care not able to be provided by AMR personnel. Reducing the cost to the patient was not viewed as part of the criteria for riding in with patients. In addition to this, with the payor mix in Spokane consisting of 62 percent Medicare or Medicaid, the full ALS ambulance bill is not paid. Regardless of the total of the ambulance bill, Medicare and Medicaid will only pay a flat fee far below the total bill. The 15 percent of those patients without insurance that are transported, approximately 200 of them in 2008, are the only ones that might realize this savings of $152.18 when SFD paramedics accompany them to the hospital. Allowing AMR to bill for ALS can offset additional enhancements to the ambulance delivery service as a result of the recommendations in this report.

10. ***Consider renegotiating the AMR contract base rates to allow AMR to cover additional costs, <u>if any</u>, resulting from decreased response-times, responding to A-level incidents and resupplying SFD medical supplies.*** The current AMR base rates are calculated on the current EMS delivery system and contract requirements. In any redesign of the ambulance response system, some enhancements to the system may increase operating expenses. AMR will have to calculate what the additional costs would be, taking into consideration that if allowed to staff some units at the BLS level there would be additional savings that could offset the costs for the additional A-level calls, decreased response-times, and additional medical supplies provided to SFD.

Financial and Operating Projections for FD Based Transport

Overview

As stated previously in this report, the discussion of whether the SFD should provide ambulance transportation has occurred since 1998. There are individuals within SFD, IAFF Local 29 officials, and some members of the Spokane City Council that desire that the SFD to provide ambulance transportation. It is interesting that in the late 1970s, SFD did have one ambulance and occasionally provided ambulance transportation at no charge to the patient. As recently as 2007, fire administrative staff provided three SFD transport options that were presented to the Spokane City Council for their consideration.

The overall concept was that SFD would increase ALS services in three additional fire stations so that ALS services would be provided from ten fire stations, instead of, at the time of this 2007 analysis, seven fire stations. SFD would only provide transportation for 9-1-1 incidents beginning at the expiration of the AMR contract in November 2008. They would provide five full time ALS first-response units and five full time ambulances at fire stations 1, 11, 13, 15 and 18. In that same proposal, another five ambulances would be located at fire stations 2, 4, 7, 9, and 16 and cross-staffed with exiting first-response fire apparatus personnel in those stations.

The availability of SFD ambulances for patient transport would depend on whether or not they were already committed to another EMS incident which was a potential weakness in the models presented. Response deployment would continue as multi-tiered system with fire-apparatus providing first-response services and SFD ambulances providing transportation. Staff spreadsheets were provided at that time attempting to identify additional personnel expenditures, overtime costs, accounting and billing services costs, contingency funds, and the capital expenditures related to start-up costs (e.g. ambulances and equipment). Revenue projections from ambulance transport fees and anticipated collection rate were also calculated using the International Association of Fire Firefighters Medicare revenue calculator. A total of three options were developed and analyzed based on expenditures and revenues projected over a three-year period for each option. Table H below summarizes the 2007 SFD analysis for each option.

Table H – Fire-Based Ambulance Transport Models

Option	New Hire	2009 Exp	2009 Rev	2009 P/L	2010 Exp	2010 Rev	2010 P/L	2011 Exp	2011 Rev	2011 P/L
1	50	5,224,991	1,960,359	(3,264,632)	4,932,367	3,148,811	(1,783,556)	5,844,567	3,445,219	(2,399,349)
2	26	3,493,024	1,960,359	(1,532,664)	2,927,077	3,148,811	221,734	3,406,215	3,445,219	39,004
3	38	4,338,507	1,960,359	(2,378,148)	3,931,297	3,148,811	(782,486)	4,627,045	3,445,219	(1,181,826)

In 2009, the SFD EMS Division Chief, using current AMR data, re-evaluated three options for a SFD transport service. The Abaris Group reviewed the data and adjusted the data which is included in Appendix D.

The Abaris Group Preliminary Findings

The Abaris Group reviewed all of the cost and revenue assumptions for the proposed SFD ambulance delivery models. Under the three models proposed only one (Model 2) appeared to have the potential to off-set costs with ambulance revenue. Additional commentary about the models and assumptions used by the City:

- The cost assumptions are summarized and it is not clearly evident what the total underlying assumptions that were used are. Having said that, the assumptions appear reasonable with the exceptions of "contingencies" in the amount of $50,000 per year which will likely need to grow to $100,000 to $150,000 per year at least initially.
- The growth in the number of EMS responses and transports should taper to a near "no-growth" rate in the near future reflecting the City's no-growth projections.
- The revenue assumptions also appear reasonable for the number of transports used. It is assumed that the SFD ambulance delivery system (similar to the current AMR system) would transport all eligible patients to an ED and if that is the case the 2007 estimates for transports and thus opportunity to bill for service would be under estimated in the proforma by approximately 1,465 transports per year (using the total ambulance transports of 13,135 actual ambulance transports that occurred in 2008). If this revenue were included, this would add approximately $408,000 to the net revenue assumptions of the proforma.
- Also, a 54 percent collection rate was used which is very high for the payer mix of the City which may be more reflective of the low AMR charge levels that a sustainable long-term assumption for collections.
- Other variable adjustments to the fee system could also add an additional approximately $125,000 to the net revenue picture for the proformas using such tools as charge increases, first-responder fees and membership fees ("subscriptions").
- Start-up costs have not been fully disclosed in the proformas and could have an impact on the short-term success of the program.
- Not much has been added to the assumptions for oversight (e.g. program supervision, medical direction and overhead which further could impact the proformas' success.
- The assumption used for the cost to bill and collect ambulance transports appears adequate but the City must assume that they would use an outside expert billing entity for this function to maximize collections.

The most significant concern regarding the City's proposal is the proposed deployment method which is reflected in their proforma. AMR currently deploys 1,760 unit hours per week (the number of hours a single ambulance is on duty) for the entire county (including non 9-1-1 calls) but they deliver these hours on a dynamic basis. That is, AMR deploys ambulance hours by hour of the day and day of the week to match demand and thus there is considerable variability in the total number of ambulances on duty at any given time. This is done to assure there are sufficient ambulances deployed to meet "peak" demand. The City's proposal, however, offers up to ten ambulances deployed per day (five confirmed and five mixed first response/ambulance units) or 1,680 unit hours (City alone) per week to service the 9-1-1 EMS requests. The concern is that this number of ambulance unit hours is below AMR's current unit hours and also could be significantly impacted by other first responder responses further eroding the proposed fire ambulance availability. Finally, the SFD proposal would provide "static" ambulance unit hours and thus not guarantee peak-load

availability. This static unit-hour approach would likely lead to an erosion of response times if the new SFD approach were used.

It should be noted that in other high-performance fire/private EMS delivery systems with fire ALS first response that it has become common to lower ambulance response times due to the resultant of quicker ALS response times through first-in engines. This adjustment was not evaluated by The Abaris Group in this proposal as it was not cited or proposed in the City's proposal. There is also considerable opportunity with other "revenue-sharing" proposals a topic that is not part of the primary scope of this study. Revenue sharing is common in a number of metro fire/private EMS delivery systems in the West. These opportunities should be fully explored.

More details on underlying assumptions should be provided with more study on more precise revenue, cost and "what-if" scenarios as well as adjustments to performance standards that may be warranted from this study's recommendations as well as the City's previous proposals. It may be that the City could achieve all and more than its goals from a cost and performance standpoint through this report's recommendations and through a more vigorous assessment of revenue sharing options.

As EMS systems evolve over time, it is appropriate to review the EMS system design and make improvements to enhance patient care. There are several fire-based ambulance services throughout the United States with several types of transport configurations. These include BLS only transport, ALS only transport, or a combination of both. In addition there are a variety of ways first-responder services are provided by fire-based ambulances services including BLS with Automatic External Defibrillators or full ALS first-response service.

The 2009 updated information provided by the SFD EMS Division Chief did not demonstrate that it would be in the best interest of the City and the City's residents to have SFD assume the role of ambulance transportation. Appendix D clearly shows that if SFD provided ambulance transportation, the rates would have to be increased significantly in order to cover costs. The Abaris Group recommends that the current transport provider continue to provide ambulance transportation.

EMS System Management, Oversight and Support

The SFD Fire Chief through the SFD EMS Division Chief has the overall responsibility for EMS management, oversight and support. The EMS Division Chief performs the day-to-day administrative and management duties and activities required for the SFD EMS system. The EMS Division Chief is a member of both the Spokane County EMS & Trauma Council and the East Region EMS & Trauma Care Council. This individual is responsible for financial management of the EMS budget and EMS levy funds, oversight of the AMR contract, including response-time compliance, collecting and analyzing EMS related data, and ensuring that SFD is in compliance with Washington state laws, regulations and rules, as well as in compliance with the requirements of the two EMS regulatory agencies.

The EMS Division Chief has assistance with these functions and activities from the EMS Training Officer, EMS QA staff person, and the SFD Medical Advisor. The EMS Training Officer has primary responsibility for conducting EMS continuing education at the BLS level for SFD EMT personnel. The SFD Medical Advisor is a contract employee working approximately 20 hour a week. The Medical Advisor has primary responsibility to provide EMS continuing education at the ALS level to SFD paramedics and conduct some quality improvement activities. There is some cross-over of training provided by both of these individuals that is relevant to both BLS and ALS personnel, but generally the training is separated.
There is no formal written CQI program within the SFD. The EMS QA staff person is primarily responsible for the overall SFD QI program. The individual assigned to this position includes several other duties and there is limited time to perform QI EMS-related activities. Most of the SFD QI activities consist of compliance with the EMS regulatory agencies and their QI requirements or special requests. The SFD Medical Advisor also conducts some QI activities and reviews individual EMS provider performance. The Department does review and evaluates targeted aspects of patient care such as advanced airway procedures and cardiac arrest survival. SFD administration has expressed concerns about not being able to review the quality of patient care on a regular continuous basis. They are not adequately able to review patient care reports for trends and adherence to EMS protocols. There is also no clerical support for the EMS Division or any of the EMS staff members. In addition to these primary EMS administrative staff members, SFD has identified the amount of time spent on administering the AMR contract.

Table I below shows the percentage of time certain SFD staff positions spend on issues related to the AMR contract.

Table I

SFD Position	Percent of Time
Fire Chief	1.25%
Assistant Fire Chief	0.6%
Deputy Fire Chief	2.0%
Accountant II	5.0%
IMS Manager/Programmer	1.0%
Desktop Support	10.0%
GIS Support	2.5%
Network Support	2.5%
Special Events Coordinator	0.6%
Internal Tax Auditor	0.6%
EMS Division Chief	15.0%
Quality Improvement Officer	5.0%
SFD Medical Director	2.5%
Battalion Chiefs (8)	2.0%
Captains (17)	<0.5%
Lieutenants (51)	<0.5%
Fire CCB Manager	2.5%
Dispatch Training Supervisor	1.0%
Fire CCB Shift Supervisors (4)	<0.5%
Fire CCB Dispatchers (13.75)	<0.5%

Appropriate oversight of the AMR contract has been questioned in the past because of overbilling by AMR discovered in 2005. There was a fair amount of criticism of the oversight process. As mentioned in the previous section on ambulance performance, one of the hallmarks to ensure high-performance emergency ambulance service is the establishment of an independent oversight entity. Under this model, the responsibility for monitoring the performance of AMR and their compliance to the contract would not be vested in a single individual.

The current SFD financial projections used in planning for future EMS expenditures and revenues appears to be adequate. There is some concern that the expenditures are going to exceed the future revenues from the EMS levy. In reviewing the 2008 EMS line item budget, there are several items that would be more appropriately charged to the general fund. If the SFD stopped providing EMS first-response services, it is doubtful that all of the line-item costs would be eliminated. Some of the identified costs in the EMS budget support the delivery of overall emergency response services. For example, SFD would probably not eliminate the 28 firefighter positions, 10 fire lieutenants and the personnel benefits and associated costs. To eliminate these positions, the daily on-

duty emergency staffing of 58 personnel would be reduced to approximately 48 personnel.

SFD uses full-costing methodology for determining its cost to provide EMS, (marginal costing was used for the transport options) when a marginal cost approach would be more accurate to determine the actual cost of EMS delivery. Marginal costs of providing EMS services are only those expenses that are above and beyond other routine fire department operation costs.[9] Marginal costing methodology is commonly used by fire departments to determine the cost of EMS delivery.

The current SFD EMS training program is designed strictly to meet the minimum requirements for EMT and paramedic recertification. The training is structured around the number of hours needed in specific medical subject categories as determined by the Washington DOH. Firefighter/paramedics occasionally train with AMR personnel but other EMTs currently do not. Some of the EMTs expressed to the consultant that they are not comfortable with their level of expertise and patient care abilities and would like to see the Department provide additional EMS training.

There is very little supervision of daily EMS field activities in the SFD first-responder system. AMR does utilize full-time EMS supervisors. Although SFD does have fire battalion chiefs assigned to each shift as supervisors and incident commanders, they rarely respond to EMS incidents, unless they are multi-casualty incidents or incidents requiring multiple fire apparatus. SFD's administration has had discussions with the current group of battalion chiefs but has not implemented any policies or provided additional training for them regarding EMS supervision. A few of the battalion chiefs related to the consultant that they were not comfortable with providing supervision for EMS incidents. There are certain EMS incidents that the current on-duty battalion chiefs should and could respond to. When these chief officers arrive on the scene of an EMS incident, they are demonstrating support for the SFD EMS mission. By not responding to EMS incidents routinely, they are giving the perception that EMS is not important.

SFD recruits paramedics from within its own ranks. Firefighters volunteer to attend paramedic training through an application and screening process. Paramedic training is provided through the Spokane Community College and is a four-quarter program beginning in the fall and continues through the summer quarter. Through its contract with IAFF Local 29, SFD provides financial incentives for firefighters that attend paramedic training. Department approved paramedic students receive $250 for three of the quarters of school and an additional $250 when they complete their internship for a total of $1,000. They receive an additional $1,000 after they are certified to perform as a paramedic for SFD. Certified paramedics get 13 percent of senior firefighters pay added to their salary base for performing the duties of a paramedic.

It is a common practice for fire departments to recruit paramedics from within. Many fire departments will hire paramedic certified personnel and train them to become firefighters. This done either through a direct recruitment process for specific paramedic

[9] International Association of Fire Fighters. Emergency Medical Services: A Guide Book for Fire-Based Systems. 4th Edition

positions or by giving preference to applicants for firefighter positions if they are certified paramedics. There was only one time that SFD hired paramedic certified personnel to bolster the number of paramedics. Unfortunately, they were laid-off in 20005 because of budget cuts and reductions of SFD personnel.

It was reported to the consultant that some firefighters become paramedics in order to get a permanent assignment to specific fire apparatus. Currently, permanent positions are held by the most senior members of SFD. For less senior firefighters, becoming a paramedic is a way to obtain a permanent assignment. This practice has resulted in some animosity towards paramedics getting permanent assignments over senior non-paramedic firefighters.

The issue of hospital diversion does not appear to be of major concern currently. In Spokane EMS patients are transported to the hospital of their choice or are transported to the closest hospital. Trauma patients that meet the criteria to be transported to a designated Trauma Center are transported to Sacred Heart Medical Center, a level II trauma facility. EMS officials in Spokane should monitor this issue and implement a no diversion policy for ambulances. No diversion policies have been successfully implemented in many EMS systems. This policy should also address ambulance off-load times. In some EMS systems ambulance personnel must wait for the patient to be moved from the ambulance stretcher to a hospital stretcher because of a hospitals lack of adequate staff or emergency department beds, sometimes for hours, this not the case in Spokane.

Recommendations – EMS System Management, Oversight and Support

1. ***Establish an independent ambulance oversight committee or board to review and monitor the performance of AMR and compliance with the ambulance contract.*** There are several models of ambulance oversight committees or boards that review the performance and contract compliance of an ambulance provider. The establishment of this committee should eliminate criticism of the current oversight process. Committee members should include representatives from the City Finance Department; SFD EMS Chief; SFD Medical Advisor; Spokane County EMS & Trauma Care Council; Hospital Emergency Department; and a SFD firefighter/paramedic. Some of these types of committees also have a citizen representative that has either a medical or financial background. The AMR general manager and AMR staff should attend the committee meetings and any issues with response-time compliance, patient care and satisfaction, billing issues, and other performance or contract issues should be presented and discussed. Meetings of the committee should occur monthly and be open to the public.

2. ***SFD should hire an EMS clerical support person.*** The amount of clerical work and basic administrative processes associated with an EMS system requires a clerical support position. Currently, SFD EMS administrative staff performs these functions that take time away from other EMS activities they should be performing. From a cost-benefit view, it is not effective to have the EMS Division Chief making photocopies or performing other clerical duties.

3. ***Implement a formal comprehensive CQI program to review patient care by assigning an additional staff person to this function.*** An additional paramedic or registered nurse level person should be assigned to develop, implement and manage a formal written CQI program. In addition to the SFD Medical Advisor and the CQI staff person, the program design should include firefighter/EMTs and firefighter/paramedics as part of a SFD CQI committee. CQI activities should include a review of patient care records, collection and analysis of system and individual EMS provider data, a peer review component, and a mechanism to provide feedback to individual EMS providers that includes a non-punitive process for improving performance. There are model CQI programs currently used by fire departments that could be used by SFD. The CQI process currently used by AMR should also be considered. The National Highway Traffic Safety Administration (NHTSA) publication, *A leadership Guide to Quality Improvement for Emergency Medical Services* is a resource that can be considered. The IAFF EMS Division also has developed EMS system performance indicators and measurements that should also be reviewed prior to the development of a comprehensive CQI program. In addition to these resources there are several publications on CQI that can be obtained and used to guide program development.

4. ***Develop a comprehensive, ongoing EMS training program that exceeds the minimum requirements for certification.*** A comprehensive EMS training program should include training opportunities for SFD EMS personnel with AMR, the hospitals, and other continuing medical education and training programs. SFD should survey firefighters and conduct an EMS training needs assessment process to determine the specific training that should be implemented. Additional EMS training programs can enhance the confidence and competence of SFD EMS responders, especially EMT personnel.

5. ***Enhance EMS field supervision using existing on-duty battalion chiefs and EMS staff.*** SFD administration and the fire battalion chiefs should agree to and implement a policy for battalion chiefs to provide some EMS field supervision. The appropriate training and types of incidents they would respond to needs to be determined.

   In addition to having fire battalion chiefs supervising EMS incidents, SFD can initiate a system where current EMS administrative staff members, including the EMS Division Chief, EMS QA Lieutenant, EMS Training Officer, SFD Medical Advisor, and the additional CQI program manager, provide EMS field supervision on a rotating basis. These staff members can either do ride-alongs with specific SFD EMS units or respond in a separate emergency response vehicle. They would provide EMS field supervision when necessary as well as observe patient care provided by SFD EMS personnel. This type of EMS field supervision would require the development of standard operation procedures and standardized evaluation processes. Ideally, if the SFD was able to financially support EMS field supervisory positions, a full-time EMS supervisor would be assigned to each of the shifts.

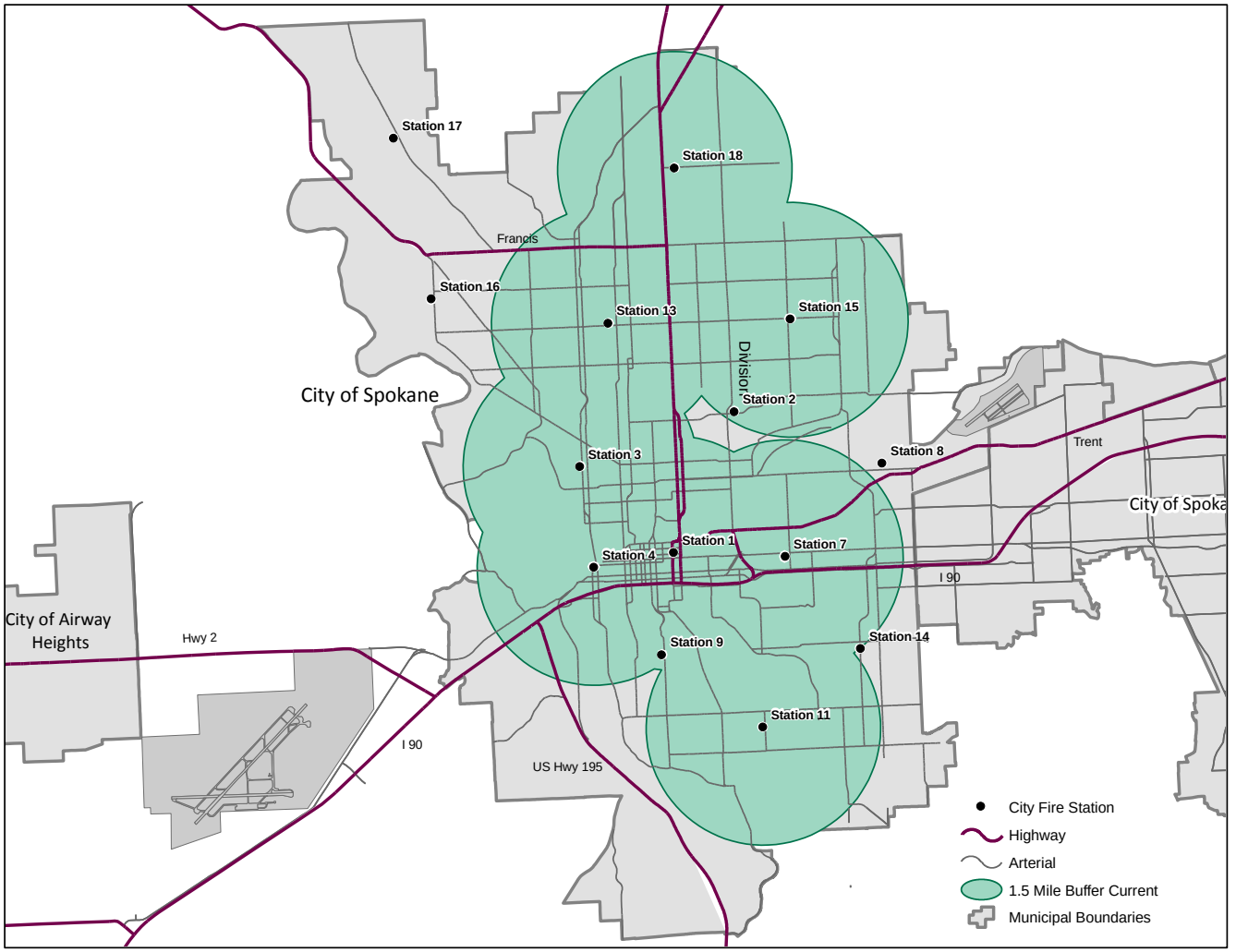
6. ***Consider the implementation of a preferential hiring process for new firefighters that are currently certified as paramedics or conduct a lateral hiring process for firefighter/paramedics.*** This recommendation would allow SFD to increase the number of firefighter/paramedics to staff ALS response units.

Spokane EMS Recommendations Matrix			
Ambulance Response Performance		**Potential Direct Cost ***	**Estimated Timeframe**
1.	*Consider changing the current response-time standard for Code responses to eight-minutes and 59 seconds (8:59), 90 percent of the time.*	*Potential AMR Rate Increase*	*90 days*
2.	*Consider changing the current response-time standard for No-Code responses to 15-minutes (15:00), 90 percent of the time.*	*Potential AMR Rate Increase*	*90 days*
3.	*Allow AMR to respond Code to C-level incidents.*	*None*	*90 days*
4.	*Allow AMR to cancel the responding SFD unit enroute when AMR arrives first and determines SFD is not required*	*None*	*120 days*
5.	*Limit the number of times AMR can redirect an enroute ambulance to another higher priority incident to only one time per call.*	*None*	*90 days*
6.	*Dispatch AMR on A-level responses at the same time SFD is dispatched.*	*Potential AMR Rate Increase*	*90 days*
7.	*Consider allowing AMR to staff some ambulances at the BLS level to respond to A-level incidents.*	*None*	*90 days*
8.	*Require AMR to re-supply disposable medical supplies used by SFD on patients that are transported.*	*None*	*90 days*
9.	*Consider eliminating the requirement prohibiting AMR from charging the ALS base rate when a SFD paramedic accompanies the patient to the hospital subject to CMS policies.*	*None*	*90 days*
10.	*Consider renegotiating the AMR contract base rates to allow AMR to cover additional costs, if any, resulting from decreased response-times, responding to A-level incidents and re-supplying SFD medical supplies.*	*Potential AMR Rate Increase*	*90 days*
First Responder Response Performance			
11.	*Implement a program where SFD dispatch personnel can ride on fire apparatus and SFD fire personnel spend time in the CCB observing the dispatch process.*	*Potential OT costs, depending on staffing*	*90 days*
12.	*Implement a Medical Dispatch Review Committee to enhance the current SFD quality improvement process for reviewing compliance with MPDS by SFD dispatch personnel.*	*$50,000/year*	*120 days*
13.	*Consider the implementation of an immediate dispatch policy once the location of the emergency is known.*	*None*	*90 days*

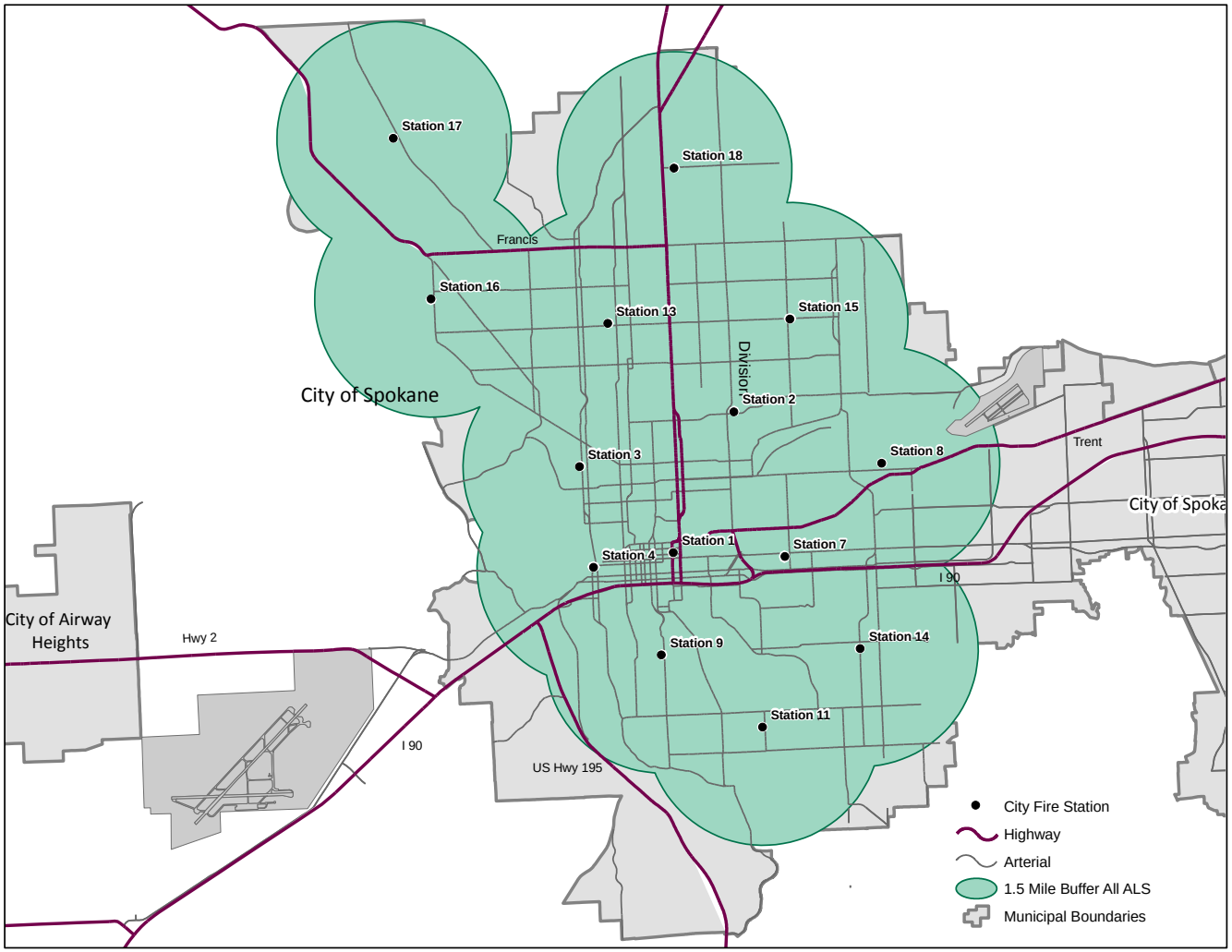
Spokane EMS Recommendations Matrix			
First Responder Response Performance (Cont)		**Potential Direct Cost ***	**Estimated Timeframe**
14.	*Consider changing the current dispatch criteria for C-level responses to the closest SFD unit only.*	*None*	*120 days*
15.	*Consider implementing the Omega response option for MPDS to reduce the number of SFD A-level responses.*	*None*	*120 days*
16.	*Develop a comprehensive and ongoing public education program promoting the appropriate use of 9-1-1 to reduce A-level responses.*	*$65,000/year*	*365 days*
17.	*Develop a protocol that would allow SFD EMS units on-scene at an A-level incident to become available for another EMS call prior to the arrival of AMR.*	*None*	*90 days*
18.	*Increase the number of ALS capable response units by assigning only one paramedic to each fire apparatus.*	*None*	*90 days*
19.	*Consider upgrading all SFD fire apparatus to provide ALS level service.*	*None (could likely be accomplished through 18 above)*	*90 days*
20.	*Identify specific intersections that delay emergency responses and prioritize them for the installation of emergency traffic pre-emption devices.*	*$12,000/intersection*	*365 days*
21.	*Provide basic EMS equipment on all first-response apparatus, including traction splints, glucose monitors and any other piece of equipment or tool that SFD EMTs are trained and authorized to use.*	*$50,000*	*120 days*
22.	*Consider moving from a four-shift system to a three-shift system for emergency response personnel.*	*Unknown – Negotiable with IAFF Local 29*	*365 days*
23.	*Consider purchasing five transport capable medic units and place them in fire stations that have ladder trucks and pumper/ladders and cross-staff these units with firefighter/paramedics for EMS responses.*	*$750,000 ($150,000/vehicle)*	*365 days*

Spokane EMS Recommendations Matrix			
EMS System Management, Oversight and Support		**Potential Direct Cost ***	**Estimated Timeframe**
24.	*Establish an independent ambulance oversight committee or board to review and monitor the performance of AMR and compliance with the ambulance contract.*	*Minimal, administrative costs*	*120 days*
25.	*SFD should hire an EMS clerical support person.*	*$60,000 with benefits*	*120 days*
26.	*Implement a formal comprehensive CQI program to review patient care by assigning an additional staff person to this function.*	*$85,000 with benefits*	*120 days*
27.	*Develop a comprehensive, ongoing EMS training program that exceeds the minimum requirements for certification.*	*Minimal*	*120 days*
28.	*Enhance EMS field supervision using existing on-duty battalion chiefs and EMS staff.*	*None*	*120 days*
29.	*Consider the implementation of a preferential hiring process for new firefighters that are currently certified as paramedics or conduct a lateral hiring process for firefighter/paramedics.*	*None*	*120 days*

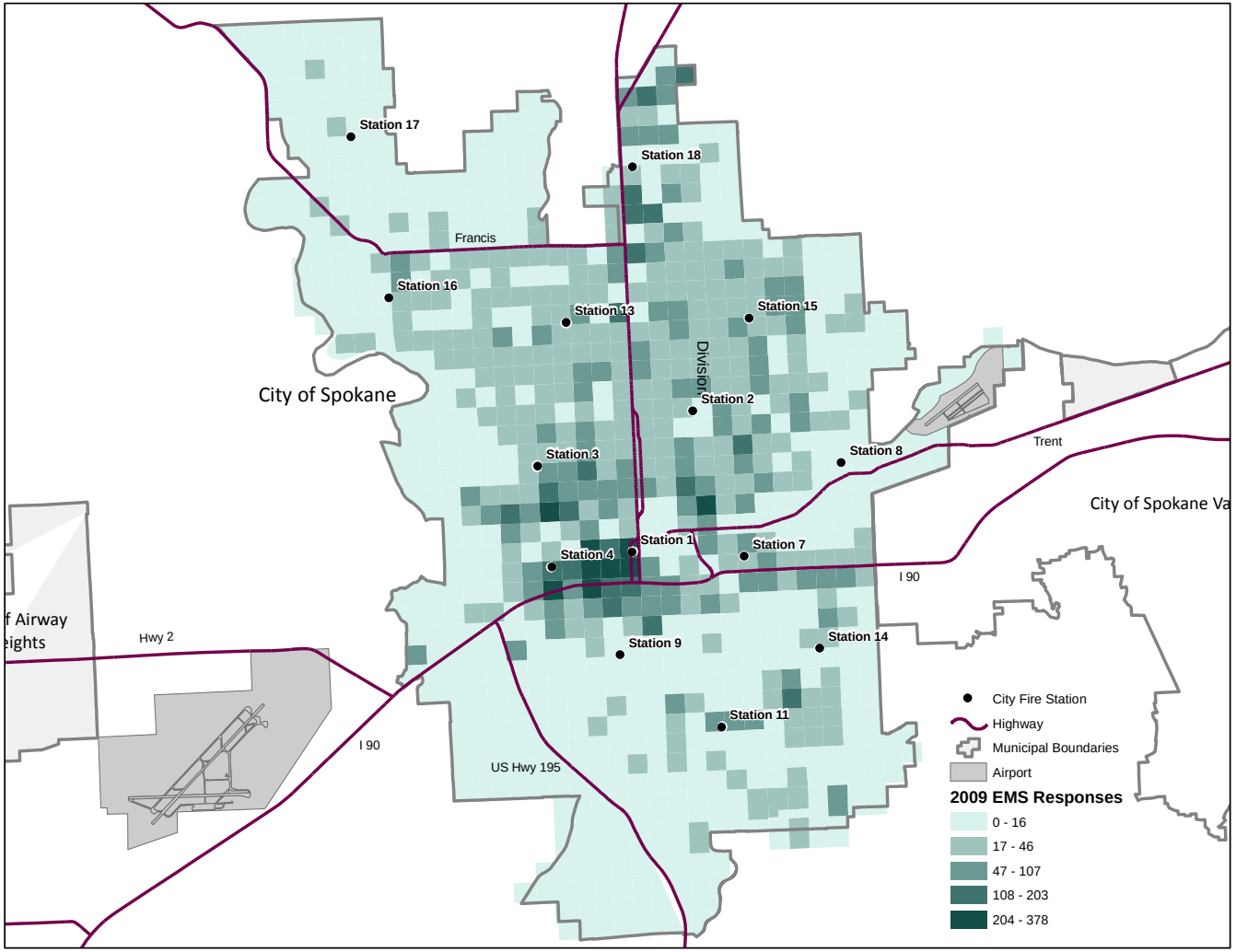
Appendix A – Current ALS Coverage – 8 ALS Units (1.5 Mile Radius)



Appendix B – Expanded ALS Coverage – 14 ALS Units (1.5 Mile Radius)



Appendix C – 2009 EMS Response Frequency Distribution



Appendix D – 2009 Spokane EMS Transport Options A - C

City of Spokane EMS Transport Options - 2009
Option A:
8 ALS stations to 10 ALS stations (76 new FFs, 4 new supervisors and 2 new civilians).
8 full time ALS response ambulances.
9-1-1 transport only.
Option B:
8 ALS stations to 10 ALS stations (49 new FFs hired, and 2 new civilians and 24 FFs moved off apparatus + 3 existing relief personnel).
8 full time ALS response ambulances.
9-1-1 transport only.
Move from 4-person to 3-person engines.
Option C:
8 ALS stations to 10 ALS stations same as Option A except: 63 new FFs hired, 2 civilians, 12 FF moved off apparatus + 1 existing relief per
8 full time ALS response ambulances.
9-1-1 transport only.
4-person ladders would remain.

City of Spokane - EMS Transport - Option A - 2009 City Fire EMS Transport						
Year	2010	2011	2012	2013	2014	*Notes:*
Change	-	3.5%	2.5%	2.5%	2.5%	
Volume	15,629	16,176	16,580	16,995	17,419	*1*
Revenue						
Change	-	5.0%	5.0%	5.0%	5.0%	
Average charge	$ 632.26	$ 663.87	$ 697.07	$ 731.92	$ 768.52	*2*
Average collection	$ 316.13	$ 331.94	$ 348.53	$ 365.96	$ 384.26	*3*
Gross net revenue	$ 4,940,796	$ 5,187,836	$ 5,447,227	$ 5,719,589	$ 6,005,568	
Personnel Costs						
Change	-	19.0%	15.0%	15.0%	15.0%	*4*
Ambulance staff + supervisor	$ 6,263,867	$ 7,454,002	$ 8,572,102	$ 9,857,917	$ 11,336,605	*5*
Accounting support	$ 82,600	$ 98,294	$ 113,038	$ 129,994	$ 149,493	*6*
Ambulance mechanic	$ 84,555	$ 100,620	$ 115,714	$ 133,071	$ 153,031	*6*
Overtime	$ 125,000	$ 125,000	$ 125,000	$ 125,000	$ 125,000	*6*
Other costs						
Change	-	5.0%	5.0%	5.0%	5.0%	*7*
Billing costs ($10/claim)	156,290	169,848	174,090	178,442	182,903	*8*
Additional FF equipment (SCBA, etc) purchase & replacement	$ 370,700	$ 129,755	$ 136,243	$ 143,055	$ 150,208	*9*
Ambulance & supervisor unit purchase/replacement	$ 2,320,000	$ 393,000	$ 412,650	$ 433,283	$ 454,947	*10*
Contingency	$ 50,000	$ 52,500	$ 55,125	$ 57,881	$ 60,775	*11*
Total Costs	$ 9,403,012	$ 8,470,519	$ 9,648,836	$ 11,000,761	$ 12,552,186	*12*
Net (Revenue - Costs)	$ (4,462,216)	$ (3,282,684)	$ (4,201,609)	$ (5,281,173)	$ (6,546,618)	*13*

Notes:

1. Only modest growth for EMS transports is expected.

2. Assumes current charge, and COLA adjustments. No rate increases were included other than COLA.

3. Collection rate per AMR discussions and City estimates adjusted by The Abaris Group's for predicted actual.

4. Percentage "change" from City estimates and The Abaris Group's extrapolation for yrs 3 and beyond. .

5. Assumes 68 new FFs, 8 FF for relief, PM premium pay and promotions of Lts and Capts to FF/PP roles per City's estimates.

6. Per City estimates.

7. COLA estimate.

8. Industry standard.

9. Per City estimates. Replacement every 3 years.

10. Purchase of 12 ambulances plus amb. Equipment then allocation for ambulance replacement of 2 per year. Supervisor's unit budgeted for a 3-year replacement plus COLA.

11. Per City estimate.

12. Capital costs (vehicles and equipment) are included but not amortized for this performa.

13. Actual cash flow may vary based on A/R timing which may require some financing thus costs which are not allocated for this performa.

All personnel costs include benefits per City estimates. There is no allocation for overhead in this proforma.

City of Spokane - EMS Transport - Option B - 2009 City Fire EMS Transport						
Year	2010	2011	2012	2013	2014	*Notes:*
Change	-	3.5%	2.5%	2.5%	2.5%	
Volume	15,629	16,176	16,580	16,995	17,419	*1*
Revenue						
Change	-	5.0%	5.0%	5.0%	5.0%	
Average charge	$ 632.26	$ 663.87	$ 697.07	$ 731.92	$ 768.52	*2*
Average collection	$ 316.13	$ 331.94	$ 348.53	$ 365.96	$ 384.26	*3*
Gross net revenue	$ 4,940,796	$ 5,187,836	$ 5,447,227	$ 5,719,589	$ 6,005,568	
Personnel Costs						
Change	-	19.0%	15.0%	15.0%	15.0%	*4*
Ambulance staff + supervisor	$ 4,369,612	$ 5,199,838	$ 5,979,814	$ 6,876,786	$ 7,908,304	*5*
Accounting support	$ 82,600	$ 98,294	$ 113,038	$ 129,994	$ 149,493	*6*
Ambulance mechanic	$ 84,555	$ 100,620	$ 115,714	$ 133,071	$ 153,031	*6*
Overtime	$ 125,000	$ 125,000	$ 125,000	$ 125,000	$ 125,000	*6*
Other costs						
Change	-	5.0%	5.0%	5.0%	5.0%	*7*
Billing costs ($10/claim)	156,290	169,848	174,090	178,442	182,903	*8*
Additional FF equipment (SCBA, etc) purchase & replacement	$ 173,000	$ 60,549	$ 63,577	$ 66,756	$ 70,093	*9*
Ambulance & supervisor unit purchase/replacement	$ 2,320,000	$ 393,000	$ 412,650	$ 433,283	$ 454,947	*10*
Contingency	$ 50,000	$ 52,500	$ 55,125	$ 57,881	$ 60,775	*11*
Total Costs	$ 7,311,057	$ 6,147,150	$ 6,983,882	$ 7,943,331	$ 9,043,771	*12*
Net (Revenue - Costs)	$ (2,370,261)	$ (959,314)	$ (1,536,655)	$ (2,223,742)	$ (3,038,203)	*13*

Notes:

1. Only modest growth for EMS transports is expected.

2. Assumes current charge, and COLA adjustments. No rate increases were included other than COLA.

3. Collection rate per AMR discussions and City estimates adjusted by The Abaris Group's for predicted actual.

4. Percentage "change" from City estimates and The Abaris Group's extrapolation for yrs 3 and beyond. .

5. Assumes 49 new FFs, 3 FF for relief, 24 existing FFs moved from apparatus, PM premium pay and promotions of Lts and Capts to FF/PP roles per City's estimates.

6. Per City estimates.

7. COLA estimate.

8. Industry standard.

9. Per City estimates. Replacement every 3 years.

10. Purchase of 12 ambulances plus amb. Equipment then allocation for ambulance replacement of 2 per year. Supervisor's unit budgeted for a 3-year replacement plus COLA.

11. Per City estimate.

12. Capital costs (vehicles and equipment) are included but not amortized for this performa.

13. Actual cash flow may vary based on A/R timing which may require some financing thus costs which are not allocated for this performa.

All personnel costs include benefits per City estimates. There is no allocation for overhead in this proforma.

City of Spokane - EMS Transport - Option C - 2009 City Fire EMS Transport						
Year	2010	2011	2012	2013	2014	*Notes:*
Change	-	3.5%	2.5%	2.5%	2.5%	
Volume	15,629	16,176	16,580	16,995	17,419	*1*
Revenue						
Change	-	5.0%	5.0%	5.0%	5.0%	
Average charge	$ 632.26	$ 663.87	$ 697.07	$ 731.92	$ 768.52	*2*
Average collection	$ 316.13	$ 331.94	$ 348.53	$ 365.96	$ 384.26	*3*
Gross net revenue	$ 4,940,796	$ 5,187,836	$ 5,447,227	$ 5,719,589	$ 6,005,568	
Personnel Costs						
Change	-	19.0%	15.0%	15.0%	15.0%	*4*
Ambulance staff + supervisor	$ 5,347,152	$ 6,363,111	$ 7,317,578	$ 8,415,214	$ 9,677,496	*5*
Accounting support	$ 82,600	$ 98,294	$ 113,038	$ 129,994	$ 149,493	*6*
Ambulance mechanic	$ 84,555	$ 100,620	$ 115,714	$ 133,071	$ 153,031	*6*
Overtime	$ 125,000	$ 125,000	$ 125,000	$ 125,000	$ 125,000	*6*
Other costs						
Change	-	5.0%	5.0%	5.0%	5.0%	*7*
Billing costs ($10/claim)	156,290	169,848	174,090	178,442	182,903	*8*
Additional FF equipment (SCBA, etc) purchase & replacement	$ 215,600	$ 75,459	$ 79,232	$ 83,194	$ 87,354	*9*
Ambulance & supervisor unit purchase/replacement	$ 2,320,000	$ 393,000	$ 412,650	$ 433,283	$ 454,947	*10*
Contingency	$ 50,000	$ 52,500	$ 55,125	$ 57,881	$ 60,775	*11*
Total Costs	$ 8,331,197	$ 7,325,333	$ 8,337,301	$ 9,498,197	$10,830,224	*12*
Net (Revenue - Costs)	$ (3,390,401)	$ (2,137,497)	$ (2,890,074)	$ (3,778,608)	$ (4,824,656)	*13*

Notes:

1. Only modest growth for EMS transports is expected.

2. Assumes current charge, and COLA adjustments. No rate increases were included other than COLA.

3. Collection rate per AMR discussions and City estimates adjusted by The Abaris Group's for predicted actual.

4. Percentage "change" from City estimates and The Abaris Group's extrapolation for yrs 3 and beyond. .

5. Assumes 63 new FFs, 1 current FF for relief, 12 personal moved from existing apparatus, PM premium pay and promotions of Lts and Capts to FF/PP roles per City's estimates.

6. Per City estimates.

7. COLA estimate.

8. Industry standard.

9. Per City estimates. Replacement every 3 years.

10. Purchase of 12 ambulances plus amb. Equipment then allocation for ambulance replacement of 2 per year. Supervisor's unit budgeted for a 3-year replacement plus COLA.

11. Per City estimate.

12. Capital costs (vehicles and equipment) are included but not amortized for this performa.

13. Actual cash flow may vary based on A/R timing which may require some financing thus costs which are not allocated for this performa.

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