

EMS

Structured For Quality

**Best Practices in Designing, Managing and
Contracting for Emergency Ambulance Service**



EMS Structured for Quality:

Best Practices in Designing, Managing and Contracting for Emergency Ambulance Service

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Dedication

This Guide, EMS Structured for Quality: Best Practices in Designing, Managing and Contracting for Emergency Ambulance Service, is dedicated to all those committed to excellence in emergency ambulance service... to the individual leaders of local government or other agencies who are responsible for the health and safety of their citizens as they contract for emergency prehospital care and transport services, to the health-care professionals and concerned citizens who provide input, to the ambulance service providers who day in and day out provide care to patients in need. To all of you, the authors of this Guide say thank you for embracing an even higher level of care, service and accountability in your community.

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TABLE OF CONTENTS

MESSAGE	6
To Those Who Contract for Emergency Ambulance Service.....	6
MESSAGE	7
To Emergency Ambulance Service Providers	7
PREFACE	8
New Features of This Guide	8
CHAPTER 1	10
Best Practices in Contracting for Emergency Ambulance Services	10
.....	10
<i>System Design from the Patient’s Point of View</i>	10
<i>What is High-Performance Emergency Ambulance Service?</i>	11
<i>Hallmarks to Ensure High-Performance Emergency Ambulance Service</i> ...	11
<i>Evaluating and Improving Current Performance</i>	12
<i>Hallmark 1 — Hold the Emergency Ambulance Service Accountable</i>	12
<i>Hallmark 2 — Establish an Independent Oversight Entity</i>	12
<i>Hallmark 3 — Account for All Service Costs</i>	12
<i>Hallmark 4 — Require System Features That Ensure Economic Efficiency</i>	13
<i>Hallmark 5 — Ensure Long-Term High Performance Service</i>	13
<i>Effective System Design Does Work</i>	13
CHAPTER 2	14
Public Policy Options: Selecting the System Design.....	14
<i>Structural Attributes of System Design</i>	14
<i>Public Policy Options Matrix</i>	15
<i>Geographic Scope</i>	16
<i>Standard Setting and Enforcement</i>	20
<i>Guidelines Versus Standards</i>	23
<i>Division of Functions</i>	23
<i>Production Strategies</i>	25
<i>Service-Area Allocation</i>	27
<i>Consequences of Chronic Failure to Perform</i>	28
<i>Business Structure and Financing Strategy</i>	29
<i>Management Level Required</i>	31
<i>Why Sound EMS System Design?</i>	32

CHAPTER 3	35
From the Patient's Point of View: Achieving Essential Performance Results	35
<i>Clinical Excellence</i>	35
<i>Continuous Pursuit of Clinical Excellence</i>	36
<i>Response-Time Reliability</i>	42
<i>Economic Efficiency</i>	49
<i>Customer Satisfaction</i>	50
<i>System Design Characteristics that Maximize Performance Results</i>	52
<i>System Design Component</i>	56
<i>Characteristics</i>	56
<i>The Costs and Benefits of Quality</i>	57
 CHAPTER 4	 59
Emergency Ambulance Service Contract: Establishing the Legal Framework	59
<i>Relationship to the Business Structure</i>	59
<i>Elements of the Legal Framework</i>	59
<i>Anti-Trust Issues</i>	60
<i>Local Ambulance Service Ordinance</i>	61
<i>Interlocal Agreements</i>	61
<i>Emergency Ambulance Service Contract</i>	61
 CHAPTER 5	 63
Contracting Safely: Creating an RFP with Accountability	63
<i>Planning the Procurement Process</i>	63
<i>Developing the Request for Proposal Document (RFP)</i>	69
<i>Establishing System Safeguards</i>	72
 CHAPTER 6	 76
Focus on Efficiency: Developing the Financing Strategy	76
<i>Emergency Ambulance Service Costs</i>	76
<i>Emergency Ambulance Service Revenues</i>	85
<i>Developing the Financing Strategy</i>	89
 CHAPTER 7	 95
The Provider's Perspective: Ensuring Fair Competition	95
<i>A Sufficiently Desirable Offering</i>	96
<i>Concerns of Incumbent Providers</i>	98
<i>When Local Government Providers Compete</i>	99
<i>Prevent Violations of Federal Anti-kickback Laws</i>	101
<i>Human Resource Issues</i>	103
 APPENDIX A	 105

National Resources	105
<i>American Ambulance Association</i>	105
<i>Ambulance Service Management Certificate Program</i>	105
<i>Commission on Accreditation of Ambulance Services</i>	105
<i>Commission on Accreditation of Medical Transport Systems</i>	105
<i>EMS Agenda for the Future</i>	106
<i>Institutes of Medicine—The Future of Emergency Care in the U.S. Health System</i>	106
<i>National Academy of Emergency Dispatch</i>	106
<i>National Association of EMS Physicians</i>	107
<i>National Association of State EMS Officials</i>	107
APPENDIX B	108
Community Tax Support/Ambulance Fee Tradeoff Analysis.....	108
<i>Sample Provider</i>	108
APPENDIX C	116
Emergency Ambulance Service Financial Model	116
APPENDIX D	117
Acknowledgements.....	117
APPENDIX E.....	118
About the Authors	118
APPENDIX F.....	120
Abbreviations	120
APPENDIX G	122
Table of Figures	122
<i>Figure</i>	122
<i>Title</i>	122
<i>Page</i>	122
APPENDIX H	123
Glossary.....	123

MESSAGE

To Those Who Contract for Emergency Ambulance Service

Of all the services that you are responsible for purchasing for your community, prehospital emergency ambulance service is one of the most critical ... because of how deeply it touches the lives of almost everyone who relies upon you, and because it is one of the most complex to understand, oversee, and hold accountable.

This *Guide—EMS Structured for Quality: Best Practices in Designing, Managing and Contracting for Emergency Ambulance Service*—is written for those who want to achieve the balance between quality and cost factors, while earning the satisfaction of patients, taxpayers, elected officials, ambulance service managers, employees, and other customers.

Fortunately, balance *can* be achieved if the overall emergency ambulance service system design holds the service providers accountable to achieve, simultaneously, the following four Essential Performance Results:

- Clinical Excellence
- Response-Time Reliability
- Economic Efficiency
- Customer Satisfaction

This is what is considered a high performance emergency ambulance system.

As a contracting entity, you can incorporate into your system design and contracting practices the following Hallmarks for achieving a high performance system:

Hallmark 1—Hold the emergency ambulance service accountable.

Hallmark 2—Establish an independent oversight entity.

Hallmark 3—Account for all service costs.

Hallmark 4—Require system features that ensure economic efficiency.

Hallmark 5—Ensure long-term high performance service.

In the immediate future there will be incredible new challenges for contractors for ambulance services—the baby boomers are aging and will need more services, budget challenges are impacting ambulance services (with rising costs for fuel, professional labor, technology improvement, etc.), Medicare and Medicaid reimbursement is below cost, and so on. If you are not prepared or at least making steps, your service is at risk of becoming sub-par in quality or service—costing you more or creating great liability for you.

You have taken the first step by subscribing to this *Guide* and using the aids in our *Online Tool Kit* to achieve an even higher level of care, service and accountability in your community.

The Authors

MESSAGE

To Emergency Ambulance Service Providers

The pressures on emergency ambulance service providers are intense ... and getting more so everyday. If one of those pressures is to validate the quality of your performance and accountability to a contracting entity, elected officials, your community or the media, colleagues in your medical community, and/or your patients ... then this *Guide—EMS Structured for Quality: Best Practices in Designing, Managing and Contracting for Emergency Ambulance Service*—is for you.

This is also the definitive guide regarding how to “raise the bar” for the level of ambulance service in your community, to achieve the balance between quality and cost factors. Fortunately, balance *can* be achieved if the overall emergency ambulance service system design holds the service providers accountable to achieve, simultaneously, the following four Essential Performance Results:

- Clinical Excellence
- Response-Time Reliability
- Economic Efficiency
- Customer Satisfaction

This is what is considered a high performance emergency ambulance system.

As an ambulance service provider, you can further the quality of your system design and work with contracting entities or evaluators to ensure that the following Hallmarks for achieving a high performance system are incorporated:

Hallmark 1—Hold the emergency ambulance service accountable.

Hallmark 2—Establish an independent oversight entity.

Hallmark 3—Account for all service costs.

Hallmark 4—Require system features that ensure economic efficiency.

Hallmark 5—Ensure long-term high performance service.

In the immediate future there will be incredible new challenges for contractors for ambulance services—the baby boomers are aging and will need more services, budget challenges are impacting ambulance services (with rising costs for fuel, professional labor, technology improvement, etc.), Medicare and Medicaid reimbursement is below cost, and so on. If you are not prepared or at least making steps, your service is at risk of becoming sub-par in quality or service—costing more to operate or creating great liability for you. If contracting entities do not perceive you as performing well, you may also face the risk of being replaced. No matter what size or structure you are, this *Guide* can help you make progress in becoming—and being seen as—a high performance system.

You have taken a great step by subscribing to this *Guide* and using the aids in our *Online Tool Kit* to achieve an even higher level of care, service and accountability in your community.

The Authors

PREFACE

New Features of This Guide

For the past fifteen years, the American Ambulance Association has been the leader in publishing practical information for ambulance providers, contracting officials and community leaders regarding the delivery of emergency ambulance services.

This *Guide—EMS Structured for Quality: Best Practices in Designing, Managing and Contracting for Emergency Ambulance Service*—is the latest in a series of publications by the AAA on this topic, including, *Community Guide to Ensure High-Performance Emergency Ambulance Service (2004)*; *Emergency Medical Services System Cost Template (1995)*; and *Contracting for Emergency Ambulance Services: A Guide to Effective System Design (1994)*.

Since publishing the 2004 edition of this *Guide*, independent data continues to support our strong belief that **emergency ambulance service, first and foremost, is the practice of medicine in the out-of-hospital environment**. The *Guide*'s key principles—the Hallmarks and the Essential Performance Results—are validated by numerous independent sources which support or confirm the conclusions drawn in the *Guide*'s 2004 edition:

- The *Guide*'s clinical framework and factors of quality patient care presented in *Chapter 3—From the Patient's Point of View: Achieving Essential Performance Results* are substantiated by the 2005 Guidelines from the American Heart Association for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care.
- The *Guide*'s focus on accountability in its *Hallmarks for Ensuring High-Performance Emergency Ambulance Service* is one of the central themes contained in the prestigious Institutes of Medicine (IOM) recommendations published in 2007 for a coordinated, regionalized, and accountable emergency care system.
- The *Guide*'s key financial principles, including the methods for ensuring the accuracy of the financial analysis, presented in *Chapter 6—Focus on Efficiency: Developing the Financing Strategy*, are validated by a federal Government Accountability Office (GAO) report on ambulance providers' costs published in May 2007.
- Researchers used the *Guide*'s methodologies to refine the cost framework for the *EMS Cost Analysis Project*, published in March 2007 in the *Annals of Emergency Medicine*.
- The *Guide* was one of the first publications to address the policy issues associated with the high cost of readiness for ambulance services. Subsequently, the EMS cost analysis project researchers, Centers for Medicare and Medicaid Services (CMS) officials, the IOM Committee, and GAO analysts have all added to the growing body of evidence that cost of readiness is a critical factor in the financing strategy of emergency ambulance service.
- The *Guide* is part of the curriculum at the University of Maryland, Baltimore County, bachelors of science degree in Emergency Health Services which provides education for future EMS professionals.

The original *Guide* published in 1994 was the only publication of its kind at the time. While many concepts in this new edition are familiar to readers of the AAA's previous publications, we have made significant updates including new references to our original text that reflect the new research, government reports, independent studies, and expert panel recommendations that have been published since 2004. The authors have added the following new features to this 2008 edition:

- An update of all references with *new publications, data and resources* including *internet addresses* providing a gateway to additional information (throughout the *Guide*).
- A new section on *technological advancements and performance management processes* (page 40).
- *New clinical references* for emergency ambulance service response times (page 44) and public-access automatic external defibrillation programs (page 48).

- A description of the unique characteristics that *maximize performance results in small towns and rural communities* (starting on page 55).
- Comprehensive *new cost and revenue comparison data* published by the federal government and industry studies (throughout Chapter 6).
- A comprehensive definition of *cost of readiness* with additional justifications for addressing the issue during rate setting and rate regulation processes (starting on page 78).
- A reorganized chapter which assists contracting entities in *assuring fair competition* when the decision is made to issue a Request for Proposals (Chapter 7).
- The *latest analysis of the federal anti-kickback regulations* and their impact on providers and contracting entities (starting on page 102).
- *Independent justification of the integrity of the financial analysis* including the need for systems of full cost accounting within non-government services to assure that data are reliable (pages 93-96).
- When you subscribe you have unlimited access to the *EMS Structured for Quality Tool Kit* for the length of your subscription. Here are all the resources you receive:
 - The searchable, downloadable, printable guidebook that is the keynote of *EMS Structured for Quality: Best Practices in Designing, Managing and Contracting for Emergency Ambulance Service*.
 - The interactive financial model that can be downloaded and used for situation analysis for fee setting, cost analyses, reimbursement modeling and determination of deficit or surplus.
 - Quick Start Guides for the guidebook, financial model and the resources that are likely of most interest.
 - Access to webinars, technical support staff, and other educational opportunities provided by the AAA that support the subscribers
 - And more resources and tools being added... continuously

Based on the evidence that supports the principles of this *Guide*, community leaders are urged to take action to improve their emergency ambulance services systems to benefit their communities and patients. If you have questions or feedback regarding this *Guide* or the *Online Tool Kit*, send us an e-mail at info@emergencyambulancequality.com.



**Best Practices in Contracting for
Emergency Ambulance Service**

CHAPTER 1

Best Practices in Contracting for Emergency Ambulance Services

Imagine an emergency ambulance service provider in your community that *ensures* response-time performance, *ensures* highly trained and courteous medical professionals, *ensures* that the finest medical technology is always available, and *ensures* that it will operate cost efficiently. Imagine an emergency ambulance service that backs up these commitments with the assurance that the community can replace the provider if it fails to perform. Stop imagining. These emergency ambulance services are operating today in systems designed specifically to achieve these results.

The Essential Performance Results detailed in Chapter 3 are the outcome of an effective high-performance emergency ambulance service. Chapter 1 provides an overview of the design features, or Hallmarks, that are integral to ensuring these results.

System Design from the Patient’s Point of View

The community’s emergency ambulance service functions as a key component of the Emergency Medical Services (EMS) system. The principles of this *Guide* are based on the following definition of the EMS system:

*The emergency medical service system consists of those organizations, individuals, facilities and equipment whose participation is required to ensure timely and medically appropriate responses to each request for out-of-hospital care and medical transportation.*¹

Most EMS system definitions have been developed from the viewpoint of the system itself, or from the viewpoint of the system’s service providers. By defining emergency ambulance services *from the patient’s point of view*, however, performance results ensure that the patient is served first—before any other interests. This allows the different provider models and their results to be compared objectively as to how they best serve the patient, rather than how they best serve the provider.

In the next few years, emergency medical service systems will likely experience a dramatic growth in the number of patients seeking emergency care. According to new data, as the leading edge of baby boomers are entering their 60s, there is a potential for a doubling of elder visits to the emergency department by the year 2013.² These trends are likely to also result in a dramatic increase in requests for emergency ambulance service through community 9-1-1 response systems. With an expected increasing demand for services, communities are best served by a high-performance emergency ambulance service.

¹ Overton J, Stout J. System design. In: Kuehl AE, editor. Prehospital systems and medical oversight. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 114-131.

² Berger E. The graying of America: The impact of aging baby boomers on emergency departments. *Annals of Emergency Medicine*. Dallas, TX: American College of Emergency Physicians; 2008 March. p 288-290.

What is High-Performance Emergency Ambulance Service?

High-performance emergency ambulance service is the delivery of clinical excellence, response-time reliability, economic efficiency, and customer satisfaction—simultaneously. For a system to be considered high performance, it must measure its performance using nationally accepted high-performance standards, and it must continually compare itself to other high-performance emergency ambulance services using independent expert evaluation. An in-depth discussion of high-performance emergency ambulance service and specific benchmark criteria occurs throughout this *Guide*. This *Guide* also describes the essential components of system design which include performance requirements, independent oversight, business structure, legal framework, and financing strategy.

Hallmarks to Ensure High-Performance Emergency Ambulance Service

The Hallmarks to Ensure High-Performance Emergency Ambulance Service are integral to achieving quality care and economic efficiency. The Hallmarks ensure the highest levels of medical and financial accountability, provide for independent oversight of the service, provide mechanisms to ensure performance, and offer public safeguards to quickly replace any provider that chronically fails to achieve established performance requirements (medically or fiscally).

Figure 1: 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 can achieve high performance in communities of various sizes and demographics. A high-performance emergency ambulance service achieves clinical excellence, response-time reliability, economic efficiency, and customer satisfaction—simultaneously. The designated emergency ambulance provider should be required to meet or exceed specified levels of performance in each of these four operational areas. Without accountability, there are no assurances.

Hallmark 2 — Establish an independent oversight entity. Independent oversight promotes performance accountability by giving the overseeing entity the authority and the tools to improve service or safely replace a non-performing provider. Independent oversight is accomplished by creating a true arm’s-length relationship between an overseeing entity and the provider organization. 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. The oversight entity also requires periodic independent expert audits of the service’s performance against other high-performance services.

Hallmark 3 — Account for all service costs. An effective emergency ambulance service accounts for all its costs—direct, indirect, and shared. Whatever the provider type, whether privately owned, hospital-based, part of a public agency, or staffed by volunteers, cost calculations should include labor, medical communications center, buildings, vehicles, equipment, supplies, liability exposure, administrative overhead, and independent oversight costs. Medically necessary emergency ambulance service is a covered benefit of virtually all commercial and government insurance programs. User fees should be used as the primary source of funding for the costs of emergency ambulance service. Where user fees are a source of revenue, the associated costs and impact of uncompensated care should also be identified and accounted for within the system.

Hallmark 4 — Require system features that ensure economic efficiency. The volume and location of medical emergencies vary by hour of day and day of week. To reflect this reality, ambulance deployment should be based on geographically deploying the right number of ambulances according to historical call demand and redeploying as events occur. In contrast, “fixed-

base” or “static” deployment, in which shift schedules and unit locations are fixed, is generally discouraged and should not occur other than in remote, low-volume locations. To optimize efficiency, the system design should allow the emergency ambulance service provider to offer interfacility ambulance transports as appropriate to maximize economies of scale. Whenever possible, the creation of multi-jurisdictional systems that serve regional medical trade areas should be considered. These practices promote productivity and eliminate wasted resources.

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 can be achieved in one of two ways: 1) benchmarking the clinical and financial performance standards of the current service against other recognized high-performance emergency ambulance services, or 2) a competitive procurement process. Subsequent to either process, emergency ambulance service providers can earn service-right extensions by meeting or exceeding the established performance standards. By applying an effective competitive process, local officials can create a level playing field for all potential providers and ensure that the best service for the community is obtained. Tying the first four Hallmarks together with an effective competitive process ensures long-term high performance service.

Evaluating and Improving Current Performance

The following list of questions will assist community leaders to determine whether their community achieves the Hallmarks to Ensure High-Performance Emergency Ambulance Service. Periodically, each community should also use an EMS system design expert to compare its emergency ambulance service to other high-performance emergency ambulance services that are recognized as being clinically and financially successful.

Hallmark 1 — Hold the Emergency Ambulance Service Accountable

- Does the EMS system routinely measure and report the Essential Performance Results?
- Does the EMS system set, monitor, and achieve appropriate response times?
- Does the EMS system continuously obtain and report customer feedback?
- Do medical protocols reflect current standards of practice and the best technologies available?

Hallmark 2 — Establish an Independent Oversight Entity

- Is the oversight entity independent?
- How does the EMS system monitor and improve quality?
- Does the EMS system use nationally accepted processes for medical dispatch?
- Does the EMS system require the provider to obtain and maintain national accreditation by independent organizations?
- Do physicians play a leadership role in clinical and quality management?

Hallmark 3 — Account for All Service Costs

- Are all costs for all components identified and included in the ambulance service budget?
- Does the EMS system have adequate funding to accomplish its mission?
- Is the cost of readiness fully funded?
- Is the infrastructure properly capitalized?
- Are upgrades in technology, medicine, training, vehicles, and so on, routinely contemplated and implemented, providing the best quality *without* crisis procurements, rate hikes, or tax increases?
- How much community tax support does the system require for emergency ambulance service?
- Can community tax support be reduced without affecting quality care or response times?
- Is community tax support needed to adequately fund ambulance services provided to the uninsured?
- Do accounting practices meet generally accepted accounting principles?
- Is the accounts receivable process effective and performing optimally?

Hallmark 4 — Require System Features That Ensure Economic Efficiency

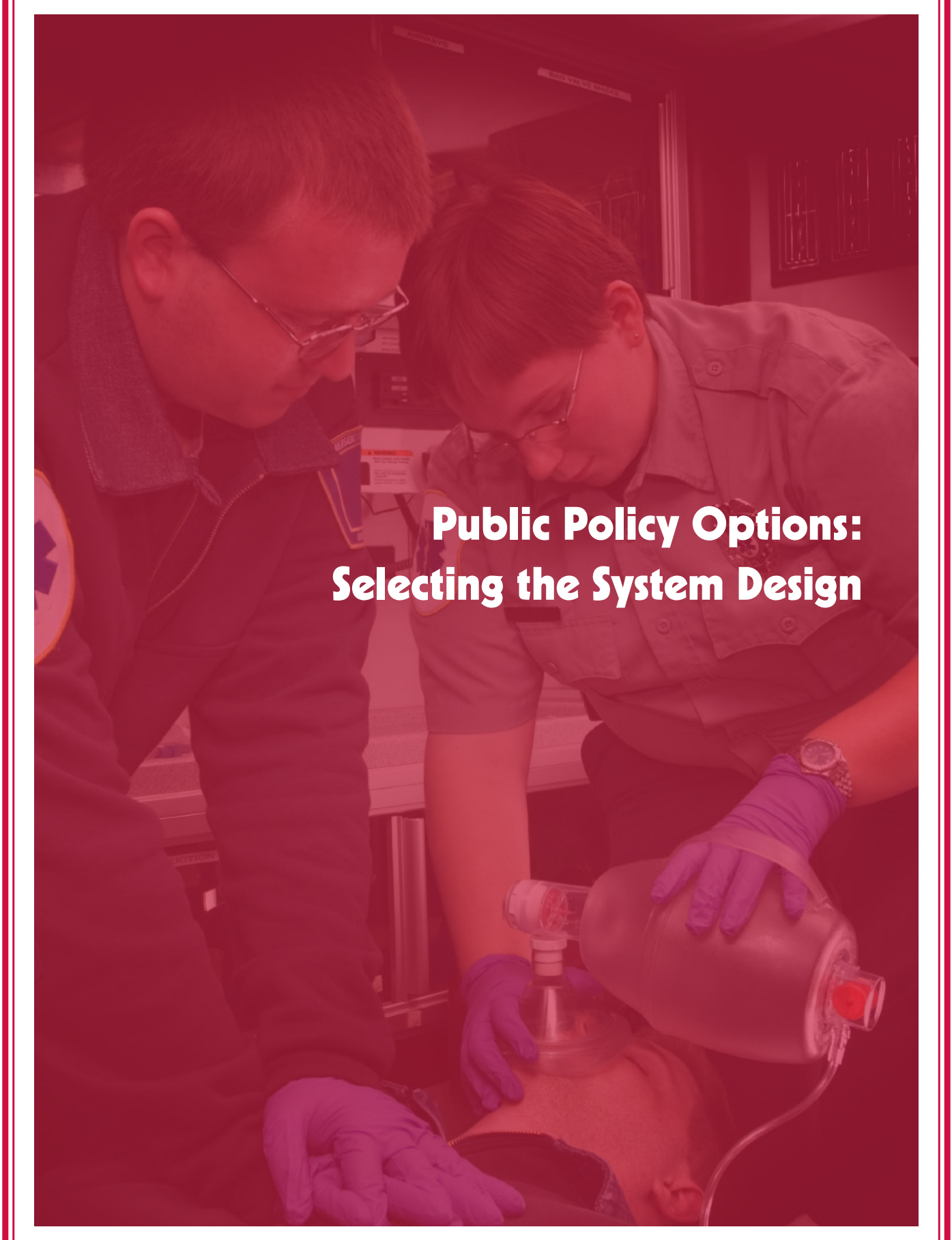
- Are operational resources used effectively and efficiently?
- Are resources duplicated unnecessarily?
- Does the EMS system use resources comparable to that of other systems of similar size and quality?
- Do providers use peak-load staffing, flexible deployment, and event-driven redeployment?
- Is the limited supply of paramedic personnel utilized and distributed effectively through the system?
- Are systems in place to minimize risks?

Hallmark 5 — Ensure Long-Term High Performance Service

- Is the organization dedicated to ongoing quality improvement processes?
- Is the organization receptive to change without every change costing something more?
- Is there a commitment to performance-based contracting?
- Is there a benchmarking mechanism to determine whether competition for the service area is necessary?
- Can the service be replaced? Can it be replaced safely?

Effective System Design Does Work

The clinical and economic impact of emergency ambulance service is determined by the policy constraints under which the ambulance service operates. Highly efficient and effective EMS systems not only allow their emergency ambulance service provider to attain high performance, they *mandate* the Essential Performance Results and strive to achieve all the Hallmarks. Communities that enjoy high-performance emergency ambulance service are not geographically or demographically unique. They just have great leadership combined with proven system design features.

The image shows two individuals in a laboratory or clinical setting. On the left, a man with glasses and a dark jacket is looking down. On the right, a woman in a light-colored uniform shirt and glasses is pouring liquid from a large, clear plastic jug into a smaller container. She is wearing purple gloves. The background shows laboratory equipment and a window with bars. The entire image is overlaid with a semi-transparent red color and framed by a white border.

**Public Policy Options:
Selecting the System Design**

CHAPTER 2

Public Policy Options: Selecting the System Design

To ensure effective emergency ambulance service, community leaders must understand the likely consequences of each policy decision and act in the best interest of patients and the community. Decisions may be clouded by special-interest concerns, lack of information, or pressure to implement quick fixes, many times without evaluating the short- and long-term consequences of those decisions.

It is critical for public policy makers to make informed choices among emergency ambulance service design options and contracting methods, and make sure that the Essential Performance Results fit within the overall EMS system design. In fact, how the results fit within the system design is the most powerful factor influencing an EMS system's ability to convert available dollars into clinical excellence, response-time reliability, economic efficiency, and customer satisfaction. A well-designed emergency ambulance service contract properly addresses the underlying legal, organizational, financing, business oversight, and medical oversight structure of the ambulance provider organization within the EMS system.

This chapter reviews the structural attributes of the emergency ambulance service within the EMS system design and describes the public policy options that community leaders should review and select if they are to achieve high-performance emergency ambulance service.

Structural Attributes of System Design

Every EMS system design includes the following major structural attributes related to emergency ambulance service:³

- 1. Geographic Scope.** The geographic scope of the primary service area (9-1-1 medical response area) and its affect on economies of scale.
- 2. Standard Setting and Enforcement.** The process by which performance standards are established, monitored, and enforced.
- 3. Division of Functions.** The way in which functional responsibilities are divided among organizations participating in the EMS system.
- 4. Production Strategies.** The decision to use either specialized production strategies or flexible production strategies.
- 5. Service-Area Allocation.** The method used to select organizations to participate in the system.
- 6. Consequences of Chronic Failure to Perform.** The ability to replace a poorly performing organization with a new provider.

³ Overton J, Stout J. System design. In: Kuehl AE, editor. Prehospital systems and medical oversight. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 114-131.

7. Business Structure and Financing Strategy. The structure of the functional relationship between the service provider and the independent oversight entity, and the sources and levels of funding.

8. Management Level Required. The level of management required to extract the emergency ambulance service’s maximum potential.

Public Policy Options Matrix

Figure 2 presents a condensed list of the public policy options which are reviewed in this chapter. The decision-making process for each of the system’s structural attributes will determine if the chosen system design can result in meeting the Hallmarks. The contracted high-performance model is the system design which successfully meets or exceeds all of the Hallmarks and is highlighted in bold in Figure 2 below.

Figure 2: Public Policy Options Matrix					
Structural Attributes of System Design	Business Structure Models				
	<i>Laissez Faire</i>	<i>In-House</i>	<i>Level-of-Effort</i>	<i>Contracted Performance-based</i>	<i>Contracted High-Performance</i>
Service-Area Definition	Mono-jurisdictional	Mono-jurisdictional	Mono- or multi-jurisdictional	Mono- or multi-jurisdictional	Mono- or multi-jurisdictional
Market Segments	Emergency or interfacility	Emergency only	Emergency only	Emergency or both	Exclusive market
Independent Oversight	Not required	Not required	Not required	Not required	Required
Medical Oversight	Provider-based or external regulations	Provider-based or external regulations	Provider-based or external regulations	Provider-based or external regulations	External, independent, authoritative, full scope
Accreditation	Not required	Not required	Not required	May be required	May be required
Pre-Arrival Instructions and Call Prioritization	Not required	May be required	Not required	May be required	Provider-based medical dispatch
Co-Response Service	Not required	Often the same organization	May be required	May be required	AED, public safety/public health integration, accountable
Receiving Facility Interface	Provider dependent	May be required	May be required	May be required	Policies established, integrated, accountable
Service Level	BLS/ALS	BLS/ALS	BLS/ALS	BLS/ALS	All ALS
Staffing Level	Static staffing	Static staffing	Static staffing	Static or peak-load staffing	Peak-load staffing
Deployment Method	Fixed or flexible, not necessarily closest unit	Usually fixed	No incentive to match deployment to demand	Probably flexible	Flexible, event- and demand-driven

(Figure 2 continued)	<i>Laissez Faire</i>	<i>In-House</i>	<i>Level-of-Effort</i>	<i>Contracted Performance-based</i>	<i>Contracted High-Performance</i>
<i>Form of Competition</i>	Open competition	No competition	Competition for interfacility	Competition for contract	<i>Competition for entire service area with contract</i>
<i>Consequences of Failure to Perform</i>	None, but provider may lose market share and risk failure	None	Provider may be replaced	Provider will be replaced	<i>Provider will be replaced</i>
<i>Financing Strategy</i>	No transparency or accountability	Often not all service costs accounted for	May have transparency and accountability	Transparency and accountability required	<i>Transparency and accountability required</i>
<i>Management Level Required</i>	Not required	Not required	Not required	Required	<i>Required</i>

The rest of this chapter describes the options that are available to community leaders in each of the structural categories and briefly outlines the types of decisions that should be made when determining the design of the emergency ambulance service function.

Unless otherwise noted, this discussion will focus on ambulance services provided to the public, including both emergency and interfacility service generated through calls to seven-digit and 9-1-1 telephone exchanges, rather than on the EMS system as a whole.

Geographic Scope

The first system design decision is to define the system's geographic scope for both regulatory and contractual purposes. In a number of communities, especially metropolitan areas, public issues such as commercial development, growth planning, transportation, and provision of community services have expanded beyond the scope of a single neighborhood or town to encompass numerous cities, an entire countywide area, or even multiple counties. Multi-county and regional approaches to public issues are becoming more widespread, even in rural areas, including health services.

The regionalization of emergency care is not new. Regional trauma centers were first designated in the 1980s, and recent evidence demonstrates reduced morbidity and mortality for cardiac and stroke patients with a regional approach.⁴ The objective of regionalization is to simultaneously improve outcomes and reduce cost by eliminating duplication of services in a medical trade area based on patient flow patterns.

The regional configuration of EMS can demonstrate similar results. Because EMS is the entry point for health care for many citizens, the effective and efficient triage, treatment, transport of patients requiring emergency care to the most appropriate receiving facility will improve outcomes and reduce costs.⁵

⁴ Institutes of Medicine [IOM]. Hospital-based emergency care at the breaking point. Washington DC: The National Academies Press; 2007. p 87.

⁵ Institutes of Medicine [IOM]. Emergency medical services at the crossroads. Washington DC: The National Academies Press; 2007. p 77.

Service-Area Definition

In defining service-area issues, the following considerations deserve careful attention:

Patient-Flow Patterns. The location of trauma centers, hospitals, and other health-care facilities (such as managed-care facilities) may not coincide with a community's geopolitical boundaries. Recognizing that ambulance services frequently transport patients to and from health care facilities in surrounding areas, patient flow patterns are an important factor in determining the system's geographic scope.

Economies of Scale. The economies of scale that exist for ambulance services are determined by specific factors within the service area, and not by jurisdictional boundaries. Establishing a contracted service area purely on jurisdictional boundaries and ignoring economies of scale may hinder the system's and the provider's ability to deliver the desired clinical and financial performance.

Buying Power. Dividing a service area into small difficult-to-serve areas (e.g., areas with low call volume and/or low call density) reduces the possibility that the providers in those areas will achieve the economies of scale available when serving larger areas. Conversely, some urban communities are large enough to support more than one provider, each serving a specified zone. Thus, the impact of buying power depends on local factors that determine economies of scale.

Alternatives Available to Neighboring Jurisdictions. A high-performance emergency ambulance service located in a neighboring community presents an excellent opportunity to consider the benefits of a multi-jurisdictional emergency ambulance service area. For example, when Oklahoma City, OK was considering ways to improve its emergency ambulance system, it made perfect sense to take advantage of the economies of scale and buying power already available to the financially stable and well-managed emergency ambulance system in the neighboring city of Tulsa, OK. The result was the Emergency Medical Services Authority—a high performance emergency ambulance service serving both Tulsa and Oklahoma City under one performance-based contract.

Disaster Response and Mutual-Aid Capabilities. All emergency ambulance services are subject to stresses caused by extraordinary events or disasters that overwhelm existing resources. When determining the geographic scope of an ambulance service area, system designers should consider the ability of neighboring communities to provide disaster response and mutual aid, as well as the ability of the local providers to provide disaster response and mutual aid to the neighboring communities. Other considerations are the unique local resources and geographic factors, such as reciprocity of personnel, available access routes, travel patterns and times between geographic locations, and the reserve capacities of potential mutual-aid partners.

Jurisdictional Issues

Service-area definition determines which communities will be part of the system design. For example, will the system serve only one city and be a *mono-jurisdictional* system, or will two or more communities join to ensure that efficient and effective emergency ambulance services are available on a *multi-jurisdictional* basis? Following is a discussion of each option:

Mono-Jurisdictional

In a mono-jurisdictional system, the system and the primary service area are limited to an individual municipality. Advantages of a mono-jurisdictional system include limited need for cooperation with other communities; the local government's ability to manage its own ambulance service; and ease of designing, supervising, and funding the system with whatever community tax support is needed.

Disadvantages of mono-jurisdictional systems include insufficient call volume to create economies of scale; failure to recognize medical trade areas, thus requiring extensive out-of-service-area transport; failure to recognize geopolitical boundaries, thus complicating dispatch to the incident of the closest unit; and poor economic performance.

Multi-Jurisdictional

In the multi-jurisdictional system, ambulances may transport patients to and from health care facilities throughout a medical trade area. As such, the movement and deployment of ambulances often are based on this larger service area and are not restricted to single cities.

Ambulance services provide a classic example of a service with a high potential for economies of scale. The principle advantage of a multi-jurisdictional system is the ability to spread the fixed costs of emergency ambulance service across a larger volume of transports, reducing the cost per transport. For details, see Chapter 6.

Other advantages of a multi-jurisdictional system include enhanced communication, refined treatment and transport protocols, pooled resources available for infrastructure development, reliable dispatching of nearest-available unit, event-driven deployment, and improved response time performance. The result may be fewer hospital diversions, lower costs, and increased efficiencies.⁶ In a multi-jurisdictional system, two or more bodies of local government may form an interlocal cooperation agreement. For a description of the use of interlocal agreements in ambulance contracting, see Chapter 4.

The biggest challenge to creating a multi-jurisdictional system is that it requires interlocal cooperation between two or more units of government. This results in the loss of absolute control within a municipality.

Market Segment Determination

The second decision for community leaders is to determine which market segments will be incorporated into the system design. This is an important strategic decision, especially in communities that have limited financial resources or an inability to generate the economies of scale required to achieve the Essential Performance Results—clinical excellence, response-time reliability, economic efficiency, and customer satisfaction.

Most communities have two ambulance market segments, each with various clinical service levels:

- ***Emergency.*** Ambulance service requests received via 9-1-1 Public Safety Answering Points (PSAPs). Services can be provided at the Basic Life Support (BLS) or Advanced Life Support (ALS) level, or both.
- ***Interfacility.*** Ambulance service requests via seven-digit telephone numbers requested by health care facilities. Services can be emergency or routine and can be provided at the BLS, ALS, or Specialty Care Transport (SCT)/Critical Care Transport (CCT) level.

Options that are available to community leaders for the design of the emergency ambulance service component include:

- Open market
- Limited market
- Exclusive market

Open Market

Under the open market option, community leaders require that providers be licensed, but they do not award market-segment rights for either emergency or interfacility responses. Competition occurs for 9- 1-1 calls, with distribution based on call rotation or patient choice. In addition, patients may call for emergency help using seven-digit phone numbers based on the marketing efforts of individual organizations. These are *dangerous* practices because there is no systematic process for sending the closest, most appropriate ambulance to each response. In addition, although illegal in many states and ill advised, there are still a few communities in which no ambulance license is required and community leaders exercise no control over the ambulance service.

⁶ Institutes of Medicine [IOM]. Hospital-based emergency care at the breaking point. Washington DC: The National Academies Press; 2007. p 91-93.

Features of open markets include:

- Accountability standards may be set through the licensing process.
- Minimum or no effort is required from oversight agencies.
- Highly variable rates for contract service (with HMOs, etc.) form the basis for competition.
- Uncontrolled competition may continue, and consumers may be forced to decide what service to call at the time of an emergency.
- Quality generally stagnates at the minimum standard or below.
- The system often under serves economically disadvantaged neighborhoods.

Limited Market

Under the limited market option, sometimes referred to as an Emergency Operating Area (EOA) or exclusive emergency ambulance franchise, a contract, statute, Certificate of Need (CON), or some other legal instrument typically is used to award service-area rights for emergency ambulance responses only. Limited rights may be awarded for emergency ambulance service within a community, and the service area may be based geographically in a large urban or multi-jurisdictional area. The designated emergency ambulance service provider also may provide interfacility service, although other ambulance providers may compete for the interfacility market segment. In most cases, the emergency ambulance provider will have a significant advantage when competing in the interfacility market and subsequently may maintain many or all of the characteristics of an exclusive market.

Features of limited markets include:

- Establishes minimum standards, with higher standards determined as part of contract negotiations and system design features.
- Development of performance measurement leading to key indicators which are essential for accountability.⁷
- Eliminates competition at the time of the emergency call.
- Provides for increased efficiency and stability.
- Collects measurable data on a regular basis to monitor and benchmark EMS system performance.
- Segmented customer base reduces economies of scale.
- Requires competitive or other market-segment award process.
- Requires supervision to ensure standards are met.
- Often requires displacement or consolidation of incumbent emergency ambulance provider organizations.

Exclusive Market

Under the exclusive market option, emergency and interfacility ambulance services are consolidated in the service area with market rights awarded to a single provider. This approach maximizes the potential for economies of scale by spreading the fixed costs over a larger call-volume base and can be particularly efficient when serving a multi-jurisdictional service area.

Features of exclusive markets include:

- Creates the environment for high efficiency.
- Establishes and monitors uniform set of standards, along with accountability measures.
- Results in a similar emphasis being placed on clinical care and response times for both emergency and interfacility patients.
- Provides for service-area stability when combined with reasonable performance security measures.
- Eliminates competition at the time of the emergency.
- Requires a market-segment award process.
- Often requires displacement or consolidation of incumbent provider organizations.
- Requires significant independent oversight to ensure that performance standards are being met.

⁷ Institutes of Medicine [IOM]. Emergency medical services at the crossroads. Washington DC: The National Academies Press; 2007. p 86.

Since the limited and exclusive market options result in government pre-emption of open competition, qualified legal counsel is required to ensure compliance with federal anti-trust laws (see Chapters 4 and 5 for more information).

Standard Setting and Enforcement

The following actions are required to establish, monitor, and enforce performance standards in the EMS system:

- Establish an independent oversight entity
- Establish external medical oversight
- Evaluate the costs and benefits of quality
- Determine essential performance results
- Consider other national standards

One of the key discussions in this section is the inter-relationship, yet significant difference, between the objectives achieved by the independent oversight entity and those achieved by accreditation from one or more independent national organization. The objectives achieved by each entity are different and are not interchangeable.

Establish an Independent Oversight Entity

It is the responsibility of the independent oversight entity to establish, monitor, and enforce the EMS system's performance standards. Once the oversight entity is established, all providers within the EMS system are accountable to this oversight body. The entity establishes a mechanism for objective, periodic (e.g., monthly) reporting with verification that actual performance results meet or exceed established service requirements. Identification of minor performance problems may result in financial penalties until corrective action is taken. Chronic substandard performance may result in loss of service-area rights. To lose these rights, the provider typically must be unable to achieve certain standards over a number of consecutive months, or as otherwise determined by the ambulance service contract. To be effective, the independent oversight entity should consist of an unaffiliated and objective group of people selected for their expertise in specific professional disciplines required in the development and oversight of the emergency ambulance service. Community representation on the independent oversight entity should include leaders from areas such as the following:

- Legal
- Accounting
- Business
- Medicine
- Patient advocacy
- Hospital and/or health care
- Local government (elected official)

Establish External Medical Oversight

High-performance emergency ambulance service systems are driven by *externally* imposed and enforced clinical and response-time standards. The characteristics of effective medical oversight are as follows:⁸

External, Not Internal. The provider organization whose work in the EMS system is subject to medical oversight does not hire or compensate the EMS system medical director. Instead, the system medical director's authority is independent from and superior to that of the participating organizations. Without this independence, it may be difficult or impossible for the medical director to fill the sometimes critical role of helping to resolve issues among participating organizations. When evaluating the current EMS system, it is important to ask: "Does the medical director serve at the pleasure of one or more of the organizations whose medical performance he or she oversees?" Many provider organizations also retain

⁸ Overton J, Stout J. System design. In: Kuehl AE, editor. Prehospital systems and medical oversight. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 114-131.

their own medical director to provide internal oversight of clinical performance, continuing education, and related services. Internal medical oversight often has beneficial effects on a provider organization's clinical performance. However, internal medical oversight should *augment, not replace*, independent external medical oversight.

Authoritative, Not Advisory. On matters affecting the quality of patient care, the medical director directs; he or she does not advise. All of the patient care delivered in EMS systems is subject to the authority of the medical director. Subject to reasonable due-process constraints, the medical director is empowered to establish and enforce the system's standard of care.

Full Scope of Authority. Medical oversight covers all the organizations and individuals participating in the EMS system, including all co-responder organizations. In essence, the scope of authority is system wide and extends to cover all *output* components of the EMS system (all organizations playing a role in the system). In the case of multi-jurisdictional systems, this authority is legally recognized by all jurisdictions served.

Establishing an expert, objective, and informed external medical director is a critical component of the independent oversight Hallmark. EMS systems can finance external medical control using a number of options. These include user fees, community tax support, grants/donations, acute-care hospital support, and regional or state support.

Evaluate the Costs and Benefits of Quality

Improved response times, rapid cardiac defibrillation, closest-unit dispatch, and use of pre-arrival instructions are just a few examples of the clinical improvements achieved over the years that have contributed to the enhanced level of quality for today's emergency ambulance services. However, there is a cost associated with each new enhancement. Indeed, there is a financial consideration for each level of clinical care chosen by the EMS system, and these cost/quality factors deserve thorough analysis. The system design should carefully establish public policy and ambulance service standards to ensure a balance between quality and cost.

Some of the challenges associated with EMS system redesign and change disappear when the simple five-step process for completing a cost-benefit analysis outlined in Chapter 3 is adopted and used by every participant in the EMS system. Using this process, community leaders can be certain that the dollars they spend are used for real improvements in their systems and that those improvements make a demonstrable difference to customers and improve patient outcome. By conducting a cost/benefit analysis on all issues with the potential to affect patient outcome, community leaders will be assured the process has a high degree of accountability. This analysis then can be presented to the public and to those entities responsible for paying for each component of the EMS system.⁹

Determine Performance Requirements

The independent oversight entity's primary function is to hold the emergency ambulance provider accountable for achieving performance requirements that are outcome-focused. Results should not be process-oriented or "level-of-effort." Level-of-effort refers to a rate and level of activity measured only in terms of resources consumed over a specific period of time—not the results of that resource usage. While more research needs to be conducted on the impact of various EMS system designs on patient outcome, the process used by the independent oversight entity and the external medical director to determine performance results should be based on scientific evidence, whenever possible.

The Institute of Medicine's (IOM) landmark report, *Emergency Medical Services at the Crossroads*, recommended that the US Department of Health and Human Services (DHHS) convene a panel of EMS experts to develop evidenced-based indicators of emergency and trauma care system performance.¹⁰

⁹ Taigman, M. We need one on every ambulance! *Ambulance Industry Journal*. McLean, VA: American Ambulance Association; 1993 Jul/Aug. p 16.

¹⁰ Institutes of Medicine [IOM]. *Emergency medical services at the crossroads*. Washington DC: The National Academies Press; 2007. p 115.

Additionally, the Federal Interagency Committee on Emergency Medical Services (FICEMS) statutorily authorized in 2006 and accountable to the US Congress acted on this recommendation in June 2007. The Technical Working Group of FICEMS recommended that FICEMS support a comprehensive national EMS assessment that “will assist in developing a shared national vision, establishing benchmarks and performance metrics and providing the basis for a gap analysis.”¹¹

For example, while clinical research indicates that patient outcomes are improved when cardiac arrest patients receive defibrillation within 4 minutes and ALS-level care within 8 minutes; it is operationally impossible and financially infeasible to achieve this standard 100 percent of the time for all 9-1-1 requests for service.¹² Recognizing this, many high performance systems have set a practical standard of 90 percent compliance for all 9-1-1 calls.¹³

Consider Other National Standards

A variety of national standard-setting bodies affects how emergency ambulance services are provided. The following is a look at the most relevant of these organizations and how their standards may be included in the system design to ensure improvement or maintenance of effective emergency ambulance service performance.

Accreditation

It is becoming increasingly common for cities and counties to require that their emergency ambulance service provider achieve accreditation. Accreditation by a recognized, independent national organization verifies at a specific point in time that the provider executes management processes and performs operational functions that are consistent with national standards. Substandard implementation or documentation generally results in loss of accreditation status until corrective action is taken. The accreditation process is generally repeated once every three to five years.

Achieving national accreditation does not mean that the provider is not held accountable to independent and objective monitoring of ambulance performance results by a local oversight entity. In fact, national accreditation should be accomplished *in addition to* performance monitoring by the local entity.

One of the most recognized forms of accreditation is through the Commission on the Accreditation of Ambulance Services (CAAS), an independent body that sets nationally recognized standards of organizational excellence. The CAAS accreditation process consists of a comprehensive self-assessment and an intensive independent on-site review of the emergency ambulance service provider. Organizations that pass both these steps receive an initial three-year accreditation. This accreditation reassures local officials and the medical community that the service has passed a rigorous review of key functions, including patient-care practices, operating procedures, administrative policies, record keeping, quality improvement monitoring, and financial practices.

The American Ambulance Association supports the requirement for CAAS accreditation, at a minimum, as a condition of awarding future market rights to existing or new ambulance-provider organizations.

The National Academy of Emergency Dispatch (NAED) offers accreditation of medical communication centers. The provision of response prioritization and pre-arrival medical instructions, delivered by certified emergency medical dispatchers, has become an essential component of a high-performance emergency ambulance service.

¹¹ Federal Interagency Committee on Emergency Medical Services (US)[FICEMS]. Technical Working Group Report. Washington DC: NHTSA; June, 2007. p 1.

¹² Eisenberg MS, Bergner L, Hallstrom A. Out-of-hospital cardiac arrest: improved survival with paramedic services. *Lancet* 1980:812-815.

¹³ Overton J. High performance and EMS: market study 2006. Richmond, VA: Coalition of Advanced Emergency Medical Systems; 2006, p 18.

The Commission on Accreditation of Medical Transport Systems (CAMTS) also offers a program of voluntary evaluation of compliance with accreditation standards for fixed and rotary wing services as well as ground interfacility services providing critical care transports.

Information on the CAAS, NAED and CAMTS accreditation processes may be found in Appendix A.

Regulatory Agencies

While the external medical director and independent oversight entity establish and administer the system's standard of care, state and federal agencies often set additional mandates in areas such as training and licensing, occupational safety, vehicle specifications, and equipment regulations. These agencies include the state EMS offices, the National Highway Traffic Safety Administration (NHTSA), the Occupational Safety and Health Administration (OSHA), the Federal Drug Administration (FDA), the Centers for Medicare and Medicaid Services (CMS), and the Federal Emergency Management Agency (FEMA). Two examples of these mandates can be found in the Health Insurance Portability and Accountability Act (HIPAA) regulations on privacy and security and the FEMA National Incident Management System (NIMS) mandates to train every first responder in NIMS and the Incident Command System (ICS). The operational requirements and associated costs of complying with such regulations should be anticipated.

Other Organizations

A variety of other organizations also establish EMS guidelines and standards. These organizations include entities such as the American Society of Testing and Materials (ASTM), the National Fire Protection Association (NFPA), and the American Heart Association (AHA).

It is in the best interest of patients and the local community to implement and enforce only those guidelines or standards that are outcome-focused, performance-based, and have met the cost/benefit analysis test. Whenever possible, scientific evidence should support guidelines or standards. EMS system designers should carefully consider the advantages and disadvantages of guidelines that rely heavily on level-of-effort approaches and are not necessarily science-based. See box for a definition of guidelines versus standards.

Guidelines Versus Standards

There is a tendency to confuse standards and guidelines. The key distinction between the two is simple: Guidelines are intended to be recommendations of preferred practices. Standards are intended to be an exact description of how a set of practices should be implemented. Voluntary standards do not have the force of law unless some entity with the necessary authority decides to adopt the voluntary standard as law.

Division of Functions

Figure 3 describes eight service elements that are necessary if the EMS system is to deliver medically appropriate responses to all requests for emergency ambulance service:¹⁴

Figure 3: EMS System Service Elements

1. Prevention and Early Recognition
2. Bystander Action and System Access
3. 9-1-1 Call-Taking
4. Co-Response Dispatch and Co-Response Services
5. EMS Telephone Inquiry and Pre-Arrival Instructions
6. Ambulance Dispatch and Ambulance Services
7. Receiving-Facility Interface (Hospital)
8. Medical Oversight

¹⁴ Overton J, Stout J. System design. In: Kuehl AE, editor. Prehospital systems and medical oversight. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 114-131.

As described in Chapter 3, the emergency ambulance service provider is directly responsible for or involved in four of these essential service functions: prevention and early recognition, bystander action and system access, EMS telephone inquiry and pre-arrival instructions, and ambulance dispatch and ambulance services. Three of the functions—9-1-1 call-taking, co-response dispatch and services, and receiving-facility interface—often are provided by other organizations in the EMS system and have unique public policy considerations. While detailed discussion of the operational requirements of each of these functions is beyond the scope of this *Guide*, each function is critical to building an effective EMS system, and all participants in the EMS system should be held accountable for achieving established performance results. The policy considerations behind the interface of these functions with emergency ambulance service are described briefly in this section and in detail in Chapter 3.

9-1-1 Call-Taking

The emergency ambulance service should either supply or otherwise control all resources and equipment that affect its ability to comply with contractual standards and ordinance requirements. It is in the best interest of the community to require that the emergency ambulance service supply its own medical communications (dispatch) center, thus giving it the responsibility for all decisions related to ambulance-unit deployment and resource allocation. This allows the independent oversight entity to hold the provider accountable for response times and other contractual performance requirements. High-performance ambulance providers also should require that pre-arrival instructions are provided to callers so that care is provided to the patient as early as possible. Due to lower call volume density, it may be more cost effective for there to be regional coordination of the dispatch function in rural areas with provisions implemented to assure the ambulance provider is in control of all decisions related to ambulance-unit deployment and resource allocation.

In many cities and counties, the 9-1-1 call-taking function is performed at a centralized 9-1-1 center, referred to as a Public Safety Answering Point, or PSAP. The call then is referred to the ambulance provider's medical communications center, which dispatches the ambulance. If this is the case, the following issues should be addressed when designing the communications component of the EMS system to ensure that high-performance standards are met:

- How emergency calls are prioritized to ensure accurate emergency response.
- How pre-arrival instructions are given. Preferably, the ambulance provider's medical communications center personnel deliver pre-arrival instructions to the caller. This provides continuity between the dispatcher and the field staff providing the care in the field.
- How initial patient information is transferred to the ambulance provider and how the PSAP is set up to document and record information. A complete, accurate, documented record of every patient call is important for legal, risk, continuous quality improvement, and reimbursement purposes.

Co-Response Dispatch and Services

Patients are best served by well-integrated teams performing various public safety and public health functions at the scene of a serious illness or injury. For example, research indicates that there is an increase in patient survival from cardiac arrest when the patient is treated with early bystander CPR and then an Automatic External Defibrillator (AED) within a clinically meaningful time. CPR plus defibrillation within 3 to 5 minutes can result in survival rates as high as 75% and for each minute of delay, that percentage may reduce the chance of survival by approximately 10%.¹⁵ This treatment can be given by bystanders or by personnel from co-responder agencies, such as EMS personnel, fire fighters, law enforcement officers, public health workers, forestry rangers, snow ski patrols, beach lifeguards, harbor patrol members, and security guards. (For more information on achieving clinically meaningful defibrillation response times by broadly distributing community-based and public safety-based AEDs, refer to Chapter 3.)

¹⁵ Handley AJ, et al. Guidelines for Resuscitation 2005. European Resuscitation Council. 2005, p 57-58

When looking at this component of the EMS system, community leaders should work with the medical director or other medical oversight entity to define the role of co-responders, looking at the benefits to be gained and the associated costs. Roles in which public safety co-responders may be considered include the following:

- **Public Safety Function.** Public safety agencies perform various on-scene roles such as extrication, rescue, hazard control, fire suppression, scene security, and traffic control and accident investigation. Accident and disaster scenes may involve other agencies, such as public utility companies, the water department, and the public works department. Community tax support funds the public safety component.
- **Public Health Function.** Co-responders may be used to provide assistance within the EMS system, although they are typically not eligible for fee-for-service health-care dollars and are funded by community tax support. Additionally, biological, chemical, radiological, and nuclear attacks or accidents pose a unique public health threat and require specialized training, procedures, equipment, and response. Local and state public health departments and specialized response teams will be in charge of these scenes. Community, state, and federal tax support funds the public health component.

Receiving-Facility (Hospital) Interface

The EMS system is responsible for the patient from the time the 9-1-1 PSAP (or another emergency access number) receives the call to the time the receiving hospital's emergency department accepts the patient. Subject to the oversight of the external medical director, policies related to the receiving facility interface include the following:

- **Patient Transfer Protocols.** Protocols determining the process of transferring patient care to hospital personnel, including a standard stating that the hospital receiving facility will accept responsibility for the patient and release the ambulance personnel within 15 minutes of the ambulance arrival at the hospital.
- **Program Integration.** Protocols such as equipment exchange and medical supply restocking, disaster drills, bioterrorism response and transport protocols and involvement of other physicians in the service.
- **Ambulance Diversion Protocols.** Resolving issues outside the control of the emergency ambulance provider, such as extended hospital turn-around times and hospital emergency department diversions. Due to financial pressures on hospitals, increasing demand for services, overcrowding, and boarding of patients, emergency departments are increasingly diverting ambulances to other facilities.

It is projected that the problem of diversion will continue to grow. According to the recent findings of the Institute of Medicine, "this has become a commonplace event." The IOM estimated that in 2003, an average of one ambulance was diverted every minute in the United States or 501,000 ambulances that year. The next year, another study found that 70 percent of urban hospitals, and half of all hospitals, reported diversion.¹⁶

Production Strategies

Ambulance services can be provided at different clinical levels, depending on the medical condition of the patient at the time of the call for service. Emergency Medical Technicians (EMTs) trained to deliver basic-level care, such as Cardiopulmonary Resuscitation (CPR), first aid, and oxygen administration, provide BLS care and transportation. Paramedics (EMT-Ps) trained to perform advanced level assessment, monitoring and care such as cardiac defibrillation, advanced airway management, and administration of medications provide ALS care and transportation. Specialty Care Transport (SCT), also referred to as Critical Care Transport (CCT), is an interfacility transport of a critically ill or injured patient and requires services at a level beyond the scope of a typically trained paramedic. Qualified personnel provide service levels in accordance with local and state laws.

¹⁶ Institutes of Medicine [IOM]. Hospital-based Emergency Care at the Breaking Point. Washington DC: The National Academies Press; 2007. p 4.

For the EMS system to serve patients, it is necessary to develop a clear understanding of their medical needs. Researchers in one 9-1-1 service area studied requests for both emergency medical assistance and interfacility medical transportation. The study revealed that on some non-emergency and interfacility calls, the patient required ALS care at the scene or en route to the desired health care facility, even though the initial call for assistance was made at the BLS level.¹⁷ In systems in which there are two distinct levels of service—ALS and BLS—these patients may not have received the help they needed immediately.

While many emergency ambulance services respond to calls based on the assumption that they are responsible only for medical calls received via the 9-1-1 system, in truth, requests for medical assistance can arrive via a number of routes. The above referenced study found that approximately 12 percent of ambulance requests placed via seven-digit numbers required providers with ALS skills. Based on the results of this study and statistics reported by other emergency ambulance services, the most effective emergency ambulance services are prepared to serve the clinical needs of all patients, whether emergency or interfacility. In building the emergency ambulance service component of the EMS system from the patient's point of view, the needs of patients are the priority.

The selection of production strategies (the resource allocation practices employed by the community's ambulance providers) should be selected to meet the patients' medical needs. System designers know they have selected the right production strategies when the emergency ambulance system simultaneously achieves quality care and economic efficiency. The production strategies that optimize performance results (i.e., quality care and economic efficiency) are as follows:

- **Single Provider of Emergency Ambulance Service.** A single provider of emergency ambulance services avoids duplication of resources and provides the environment for closest-unit dispatch.
- **All Emergency Ambulances Are ALS.** All emergency ambulance units are staffed and equipped at the ALS level.^{18 19}
- **Peak-Load Staffing.** Ambulance crew shifts are scheduled to match the demand for service by hour of day and day of week. For example, more ambulances are staffed and on duty during “peak” periods of demand than during “off-peak” periods of demand. Since call volume generally peaks during the day and drops at night, there may be twice the number of units on duty during the day than at night. Ambulance shifts are of varying lengths, such as 8, 10, or 12 hours; generally, there are few, if any, 24-hour shifts.²⁰
- **Event-Driven Deployment.** Using the latest Computer Aided Dispatch (CAD) technology and System Status Management (SSM) practices, ambulance units are positioned and repositioned throughout the service area at strategic locations according to geographic demand, and at strategic times of the day and week according to volume demand.²¹
- **Flexibility in Performing Interfacility Transports.** To optimize operational capacity, the emergency ambulance provider uses ALS ambulances to provide interfacility ambulance transport services. When coupled with advanced resource-deployment techniques, this practice can result in rapid response times and significant economic efficiencies.²² This “flexible production” concept is discussed in detail in Chapter 3.

¹⁷ Wilson B, Gratton MC, Overton J, Watson WA. Unexpected ALS procedures on non-emergency calls: the value of a single-tier system. *Prehospital and Disaster Medicine*; 1992 Oct-Dec;7:380-382.

¹⁸ Overton J, Stout J. System design. In: Kuehl AE, editor. *Prehospital systems and medical oversight*. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 114-131.

¹⁹ Wilson B, Gratton MC, Overton J, Watson WA. Unexpected ALS procedures on non-emergency calls: the value of a single-tier system. *Prehospital and Disaster Medicine*; 1992 Oct-Dec;7:380-382.

²⁰ Stout J. Peak-load staffing: what's fair for personnel and patients? *Journal of Emergency Medical Services*. San Diego, CA: Elsevier Public Safety; 1989 Aug:73-76.

²¹ Stout J. System status management: the fact is, it's everywhere. *Journal of Emergency Medical Services*. San Diego, CA: Elsevier Public Safety; 1989 Apr:65-71.

²² Overton J, Stout J. System design. In: Kuehl AE, editor. *Prehospital systems and medical oversight*. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 114-131.

Factors to consider when determining the most appropriate production strategies include the service area's geographic size and population, regulatory issues, funding, available labor pool, and the number and distribution of receiving facilities. These factors and the production strategies are reviewed further in Chapter 3.

Service-Area Allocation

Form of Competition

Competition and the threat of competition are fundamental concepts of capitalism. Few Americans question that retail competition contributes to lower prices, improved quality, and greater diversity in the delivery of most goods and services. At the same time, one of the greatest controversies faced by community leaders considering contracting for emergency ambulance services is the issue of competition and how it will be employed.

This section describes the three basic forms of competition for emergency ambulance services:

- No competition
- Competition *within* the service area
- Competition *for* the service area

No Competition

In some communities, there is no competition for portions or all of the ambulance service area. In such a structure, the community selects a provider without any competition or any real threat of competition in the future. When quality or economic efficiency of a provider are not prerequisites for retaining the service area, there is no incentive to maintain quality or efficiency, and both wane.

Organizations that lack competition or the real threat of competition, can stagnate, stop innovating, grow inefficient, and become over-confident in the fact that the provider organization has a perpetual right to serve a specific area. The advantages of a no-competition policy are enjoyed primarily by the incumbent provider organization.

There are some models in which the effects of competition appear to be absent, but actually exist through various forms of regulation. These models generally employ some form of regulatory oversight through certificate-of-need processes, licensing, rate regulation, service-area comparisons, or some combination of the above. In addition, even without competition, a performance-based contract that includes the ability to terminate the provider for non-performance ensures the effect of competition.

Competition within the Service Area

This form of competition allows emergency ambulance providers to compete for business within the same service area. In this “retail-type” approach, emergency ambulance providers market their services directly to consumers, and consumers are forced to shop for the provider that best meets their personal needs relative to price, quality, and availability.

While, in general, retail competition lowers prices, raises quality, and results in a greater diversity of goods and services in other industries, it is not the most efficient form of competition for emergency ambulance services. This is because the conditions necessary for an effective retail transaction do not exist in emergency ambulance service. For a retail transaction to be effective, the following basic economic features must exist:

- ***There must be a choice of suppliers.*** The public is rarely in the position to shop when an emergency ambulance is needed, even if there is a choice of emergency ambulance suppliers.
- ***The user must have a stake in quality.*** Patients clearly have a stake in the quality of emergency ambulance services they receive, but since they rarely use the service, they typically are poor judges of quality.

- ***The user must have a stake in cost.*** Many patients have neither health insurance nor the ability to pay for emergency ambulance services, and therefore have no stake in the cost of service. For patients with health insurance, most policies cover ambulance service, and almost all patients believe their insurance will cover the cost of services.
- ***The user must have a chance to compare.*** In an emergency, there is no time for the public to comparison shop, for obvious reasons.
- ***The user must be qualified to compare.*** In service areas where patients have the ability to choose between providers of varying degrees of clinical sophistication (e.g., ALS-level emergency providers and BLS-level emergency providers), they frequently may select the wrong service because they do not understand which service level they need.
- ***The user must buy often enough to become a skillful buyer.*** Repeated experience in purchasing a commodity or service is necessary in becoming an informed consumer. Most people order an emergency ambulance infrequently and are therefore not proficient or skilled in their purchase. In comparison, although many people buy five or more houses in their lifetime, they tend to rely on the expertise of a real estate agent, escrow company, appraisal firms, attorney, and advice from friends and family. Frequently, public policy allows retail competition, or competition *within* the service area, for the interfacility market segment, while some other form of competition governs the emergency market segment within the same service area. There are examples of high-quality services in both emergency and interfacility segments of these hybrid systems, but the efficiency of the system does not reach the same potential as in systems with organized service-area allocation and competition *for all* the service area.

For these reasons, and most importantly, because the practice compromises patient care, retail competition *within* the emergency ambulance market segment is *dangerous* and not recommended.

Competition for the Service Area

In more advanced designs of the emergency ambulance service function, competition for the provision of emergency ambulance service *within* the service area has been replaced by competition *for* the service area. In this approach, competition is held between provider organizations interested in and qualified to serve the area. Community leaders, often assisted by expert ambulance service buyers, review presentations, commitments, and qualifications of potential providers, and award service area rights to the best organization(s).

In this approach, street-level, call-for-call competition is replaced by sophisticated competition for the rights to the service area—emergency, interfacility, or both. This form of competition often results in a single provider for the entire service area, maximizes efficiency, and achieves the best combination of price and quality.

For service-area competition to remain effective once service-area rights are allocated, day-to-day competition is replaced by the threat of competition. Proven performance is a prerequisite to retaining service-area rights, and periodic or triggered competition poses the threat of replacement and, hence, the effect of competition. Managing a competitive procurement process is described in detail in Chapter 5.

Consequences of Chronic Failure to Perform

Prudent EMS system designers consider the possibility that the emergency ambulance provider may fail to meet performance requirements. One of the Hallmarks of high-performance emergency ambulance service is the ability to hold the provider accountable, up to and including termination of service-area rights. The ability to ultimately terminate a non-performing provider ensures the community that its provider will meet the specified performance levels or that it will be able to select another provider that will meet those levels. Accordingly, a well-designed EMS system incorporates a variety of performance security measures to minimize the potential for failure and sustain uninterrupted service should a change be needed.

As discussed throughout this *Guide*, high-performance emergency ambulance service providers are contractually held accountable for specific performance standards. This accountability is most often

achieved through a system of escalating penalty steps that, if not corrected, ultimately result in finding the provider in breach of contract and terminating the relationship. In some arrangements, this incentive process works in both directions and the provider is rewarded for exceeding performance requirements.

It is important to establish a short, but meaningful, set of interim penalty steps that escalate in severity until there is a declaration of a “breach” in the contract. These incremental penalties serve several purposes. They align the incentives of the provider and independent oversight entity to ensure that the established performance standards are achieved. They provide a fair process for quickly placing the provider on notice of a lapse in performance-standard achievement, without unnecessarily threatening the stability of an otherwise compliant emergency ambulance service. Finally, they reward or penalize the provider objectively for exceeding or failing to meet pre-established performance standards. Response-time penalties often are included in the initial Request for Proposals (RFP) document and emergency ambulance service contract. Chapter 5 provides examples of commonly used response time penalties and other performance penalties and rewards.

In some communities, penalty fees have been absorbed into the independent oversight entity’s general fund. This practice creates an inappropriate incentive for the entity to levy and collect penalties and *is strongly discouraged*. In communities where this practice has been in place for several years, the financial incentives can become so misaligned that the independent oversight entity and the ambulance provider come to accept a consistent level of penalty proceeds as a stable source of funding for the entity. This practice, in effect, institutionalizes substandard performance. It is therefore recommended that performance-standard penalties be contributed to purposes other than to the direct departmental benefit of the independent oversight entity. For example, these funds may be contributed to health promotion and injury prevention programs.

Business Structure and Financing Strategy

Business Structure Models

In designing the business structure for the emergency ambulance service, administrators should carefully consider the expectations the business relationship will create for the providers. A well designed EMS system identifies the needs of patients and the community. It then creates an incentive for ambulance service that aligns the provider’s survival and growth desires with the patients’ needs. Well-designed business structure models ensure clearly defined performance expectations and give the independent oversight entity the ability to terminate the provider’s contract and service-area rights if expectations are not met.

The business structure models available to policy makers include:

- Laissez faire
- In-house
- Contracted level-of-effort
- Contracted performance-based
- Contracted high-performance

When considering the merits of each of these structures, determine whether it is possible for the emergency ambulance service to achieve each of the Essential Performance Results and the Hallmarks.

Laissez-Faire Model

The loose translation of the term “laissez faire” is to let something take its own course. Since many systems are not designed using specific business structure, the natural incentives of the individual organizations involved are allowed to determine performance, thus ensuring a laissez-faire model. Public access to essential ambulance provider infrastructure (communications systems, vehicles, equipment, etc.) is necessary to ensure uninterrupted operations in the case of provider failure or termination. This is not

guaranteed in a laissez-faire relationship, and there is no means of terminating a poorly performing provider. While it is possible that some of the goals of high-performance emergency ambulance service could be met in the laissez-faire model, no one would be able to verify that outside of the provider organization.

In general, the laissez-faire model fails to achieve any of the Hallmarks.

In-House Model

In the nation's largest 200 cities, approximately 42 percent of emergency ambulance services are performed by government providers (i.e., fire department, third-service and public safety providers).²³ In these communities, the local public safety agency provides the ambulance service and usually oversees its own internal operation. In some communities, a separate government-operated department (referred to as a "third service") provides the emergency ambulance service within the city or county.

In-house providers generally do not provide routine interfacility transportation. Most in-house providers are funded by community tax support and serve mono-jurisdictional service areas. Government accounting practices make it difficult to determine the full cost of an in-house ambulance service separately from other services provided.²⁴

In-house operations often do not use peak-load staffing or event-driven deployment techniques, both of which are foundations for achieving high performance and economic efficiency in the provision of emergency ambulance service.

Reporting to a government department head or elected body *does not* meet the Hallmark of independent oversight. While public access to essential infrastructure necessary to ensure uninterrupted service (communications systems, vehicles, equipment, etc.) would seem to be guaranteed in an in-house operation, there is no practical means of terminating a poorly performing government operation. In such cases, the community is forced to continue to reinvest in an inefficient or poorly performing operation. Without a change in the business structure, there is little chance that deteriorating service quality or efficiency will improve significantly.

In general, the in-house model fails to achieve the Hallmarks.

Contracted Level-of-Effort Model

In the contracted level-of-effort model, a contract or some other mechanism specifies the number of ambulances and resource levels in return for conveyance of service-area rights. However, the provider is not expected to meet specific performance standards, as long as it has the mandated number of vehicles and resources available to the system. A franchise may be awarded on a limited or exclusive basis through sole-source negotiations with existing providers or through an open procurement process. Business incentives may be aligned with the interests of patients, and the contract may require medical oversight. Service-area allocation may be based on the extent of the local medical trade area, allowing the system to take advantage of economies of scale and to potentially eliminate the duplication of distribution networks of multiple providers.

Due to the fundamental design of the level-of effort model, EMS administrators have no way to mandate the recording of Essential Performance Results and, as such, there are no measures in place to evaluate whether the Hallmarks are met.

²³ Williams D. 2007 JEMS 200 city survey. Journal of Emergency Medical Services. San Diego, CA: Elsevier Public Safety; 2008 Feb; 48-65.

²⁴ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 4.

Contracted Performance-Based Model

In the contracted performance-based model, the provider is expected to meet one or more specific performance standards to retain market rights. A franchise may be awarded on a limited or exclusive basis through sole-source negotiations with existing providers or through an open procurement process. Business incentives may be aligned with the interests of patients, and the contract may require medical oversight. Service-area allocation may be based on the extent of the local medical trade area, allowing the system to take advantage of economies of scale and to potentially eliminate the duplication of distribution networks of multiple providers.

If the performance-based model does not qualify as a high-performance model, it is because one or more of the essential elements of high-performance emergency ambulance service are not contractually required in the business structure. Under this model, some of the Hallmarks may be achieved.

Contracted High-Performance Model

The contracted high-performance model creates a business relationship that tightly aligns the interests of a contracted ambulance provider with public needs. An independent oversight entity is responsible for performance standards, medical oversight, financial oversight, rate regulation, licensing, and market allocation. In addition, it may be responsible for ambulance fees and collections, as well as ownership of certain long-term infrastructure items such as ambulance vehicles and the medical communications center. A single ambulance provider is competitively selected and given clearly defined responsibility for operations management of the ambulance delivery system.

All costs are accounted for in this model. Economic efficiency is obtained initially through the competitive procurement process and maintained throughout the contract term as the provider meets or exceeds specific performance requirements.

The contracted high-performance model ensures the presence of the Essential Performance Results and, as such, achieves all the Hallmarks.

Financing Strategy

Emergency ambulance service embodies a unique blend of health care, public safety, public health, and transportation services. Therefore, several potential revenue sources are available to most EMS systems. Community leaders should explore these options as a way of financing the infrastructure development, oversight, and ongoing operation of the emergency ambulance service for the community.

The dominant sources of emergency ambulance revenues are community tax support (subsidy) and user fees charged to patients. The proportionate relationship between community tax support and the revenues generated from patient charges is a public policy decision. The process of determining the desired mix between these two funding sources is called the Community Tax Support/Ambulance Fee Tradeoff Analysis. Quite simply, the higher the level of community tax support, the lower the amount needed from ambulance-fee revenues. Conversely, the more ambulance-fee revenues received, the lower the amount of tax support needed. Details on how to conduct the Community Tax Support/Ambulance Fee Tradeoff Analysis, and the data required, are provided in Chapter 6.

Management Level Required

High-performance emergency ambulance service is a complex health care enterprise, a fact that is often underestimated. High-performance systems require and tend to attract high-quality managers who enjoy the challenge of achieving performance results. This outcome is positive for patients and the community. Local government officials who make the effort to address the public policy options discussed in this chapter will want to make sure the leaders of the provider organization have the experience and skills to ensure success.

High-performance ambulance services require superior management skills in many areas, including resource allocation, deployment, quality practices, labor relations, compliance, and reimbursement management. Thorough evaluation of an existing or prospective provider's key personnel and management expertise is an integral part of any provider-selection process.

The nation's leading ambulance management training course is the American Ambulance Association's Ambulance Service Management (ASM) program. The curriculum provides an overview of the skills necessary to manage complex ambulance services. Additional information about the ASM curriculum can be found in Appendix A.

Why Sound EMS System Design?

When performance is measured from the patient's perspective, its definition includes anything that impacts or potentially impacts clinical excellence, response-time reliability, economic efficiency, and customer satisfaction. Using this all-encompassing definition, system design takes on increased importance. In fact, of all the forces influencing an emergency ambulance service's ability to convert dollars into these Essential Performance Results, system design is by far the most powerful.²⁵

It is common practice for administrators to choose only those system design structures with which they happen to be familiar. Alternatively, they accept the current system design while under pressure from special interests within the community that have an obvious stake in maintaining the status quo. Poorly informed selection of system design options is one of the reasons so many emergency ambulance services are saddled with increasing demand for services and a decreasing source of tax revenues and user fees to support those services. Ultimately, the public and patients lose. Fortunately, highly visible and successful emergency ambulance services are breaking this trend.²⁶

Limitations of EMS System Design

System design refers to the process of selecting and implementing public policies that create the emergency ambulance service's underlying framework, including performance requirements, independent oversight, business structure, legal framework, and financing strategy. While system design is critically important, it is not all-powerful. The following are its limitations:²⁷

- Talented and motivated personnel and managers can produce good results from a bad system design, but not for extended periods.
- Incompetence can produce poor results from even the best system design.
- Talented personnel and managers tend to be attracted to system designs that are more likely to nurture and showcase their individual talents.
- Good system design makes excellence possible and superior performance probable, but guarantees neither.
- Bad system design makes excellence impossible and inferior service probable.

Sound system design cannot guarantee clinical excellence, response-time reliability, economic efficiency, and customer satisfaction will be achieved, but poor system design can make consistent life-saving performance extremely unlikely, even impossible. Fortunately, a growing number of today's successful emergency ambulance services are products of an informed selection of structural features that, taken together, create an opportunity to deliver the best possible chance of survival from unexpected illness and injury. The continuing track records of these high-performance emergency ambulance services are defining the future of EMS.²⁸

²⁵ Overton J, Stout J. System design. In: Kuehl AE, editor. Prehospital systems and medical oversight. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 114-131.

²⁶ Fitch J. Consultant report: comprehensive market review. Platte City, MO: Fitch & Associates, LLC; 2002 May. p 1-37.

²⁷ Overton J, Stout J. System design. In: Kuehl AE, editor. Prehospital systems and medical oversight. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 114-131.

²⁸ Fitch J. Consultant report: comprehensive market review. Platte City, MO: Fitch & Associates, LLC; 2002 May. p 1-37.

Effects of Flawed EMS System Design

A flawed system design can have many negative effects on the delivery of EMS in the community, both operationally and financially. System designers should recognize and be able to correct the following examples of common system design flaws:

Unequal service based on socioeconomic. Uncompensated care is a real concern for emergency ambulance services that rely primarily on user fees to fund operations, especially if they cover a number of economically disadvantaged neighborhoods with higher rates of uninsured residents. An AAA study found that uninsured patients make up an average of 14 percent of ambulance transports and ambulance services experience a charity care burden that is about double that of US hospitals and physicians.²⁹ Given that emergency ambulance services should provide equal service to all emergency patients regardless of the patient's presumed ability to pay, an overabundance of uninsured patients can create hardship for the provider. Unless there are specific requirements and funding for the service, this can result in unequal service.

Unequal response-time performance. A poorly designed EMS system can mistakenly encourage better response-time performance in certain neighborhoods, while allowing poor response times in other areas. Unequal response-time performance occurs most often in systems in which *average* response-time measurement is the standard. Systems in which *fractile* response time measurements are used are better protected against unequal response-time performance. For a discussion of average versus fractile response time standards, see Chapter 3.

Failure to send the closest available ambulance. A system that dispatches multiple emergency ambulance providers on a rotating basis without regard to location of the call, or that splits the service area geographically without appropriate mutual-aid arrangements, is both expensive to run and dangerous for patients. Advanced CAD systems that include global positioning technology to find the closest available units to the call, ensure that ambulances are dispatched according to their exact real-time location, delivering a faster response to the patient.

No incentive to grow. Flawed system designs lack the flexibility to take advantage of opportunities to grow by increasing transport volume and associated revenue. For example, effective systems incorporate design elements that facilitate the acquisition of new service areas or new services by allowing providers to include interfacility transports, provide communications services, or operate outside the medical trade area.

Failure to charge patients the full cost of service. Medically necessary ambulance services are a covered benefit by all major commercial and government insurance plans. Some system designs fail to charge, or through rate regulation, prohibit ambulance fees that cover the full cost of ambulance service. While this may result in ambulance fees that appear low, the financial burden carried by taxpayers is often hidden. Sound system design ensures ambulance fee charges that cover the full cost of service and offers flexible payment plans to the uninsured.

Failure to recognize the cost of uncompensated care. As of this printing, approximately 45 million Americans (approximately 15 percent of the population) have no form of health insurance coverage and an additional 29 million Americans are underinsured lacking sufficient coverage for essential medical care.³⁰ Nationwide EMS systems respond to thousands of requests for service from people who access emergency care because they are unable or unwilling to access the health-care system through more

²⁹ Hogan C. AAA 2006 Ambulance Cost Study. McLean, VA: American Ambulance Association; 2007 Jan. p 51.

³⁰ Institutes of Medicine [IOM]. Hospital-based Emergency Care at the Breaking Point. Washington DC: The National Academies Press; 2007. p 42.

appropriate means.³¹ An AAA study found that uninsured patients make up an average of 14 percent of ambulance transports and ambulance providers experience a charity care burden that is about double that of US hospitals and physicians.³² Sound system designs assure that funding from the state or local government is available to offset the cost of uncompensated care.

Level-of-effort restrictions. A system that specifies a required number of ambulance units as opposed to requiring specific response-time standards is unlikely to achieve high performance. This and other level-of-effort restrictions prevent systems from improving performance and economic efficiency. Sound system designs specify the required performance, not the level-of-effort required.

Failure to integrate ambulance services into emergency preparedness programs.

Ambulance providers play a vital role in the community's disaster-response programs. Interfacility ambulance providers, in particular, may have the largest local fleet of patient transport-capable vehicles. Local officials are urged to include all emergency and interfacility ambulance providers in their emergency preparedness and response plans, and funding programs. The Emergency Management Assistance Compact model intrastate legislation states "...emergencies transcend political jurisdictional boundaries and... intergovernmental coordination is essential for the protection of lives and property and for the best use of available assets both public and private."³³ For example, in 2005, the AAA collaborated with FEMA to deploy 500 ambulances and 1500 EMTs and paramedics from 150 member ambulance services to provide medical care to the Gulf communities ravaged by Hurricanes Katrina and Rita.³⁴

³¹ McCaig LF, Burt CW. National hospital ambulatory medical care survey: 2002 emergency department summary. Advance Data from Vital and Health Statistics; No. 340. Hyattsville, MD: National Center for Health Statistics, Centers for Disease Control and Prevention; 2004 Mar 18. p 2.

³² Hogan C. AAA 2006 Ambulance Cost Study. McLean, VA: American Ambulance Association; 2007 Jan. p 51.

³³ Emergency Management Assistance Compact. Model intrastate mutual aid legislation. Lexington, KY: National Emergency Management Association; www.emacweb.org.

³⁴ American Ambulance Association. Report on the national ambulance services response to Hurricanes Katrina and Rita. McLean, VA: American Ambulance Association; 2006. p 6.



**From the Patient's Point of View:
Achieving Essential Performance Results**

CHAPTER 3

From the Patient's Point of View: Achieving Essential Performance Results

Achievement of the following four Essential Performance Results will ensure a high-performance emergency ambulance service:

- Clinical excellence
- Response-time reliability
- Economic efficiency
- Customer satisfaction

When achieved together in balance, these four elements result in optimal patient care.

The process of rigorous Continuous Quality Improvement (CQI) is a necessary function within the emergency ambulance service to achieve and maintain high-performance results. To be successful, the provider organization should achieve continued improvements over time in service excellence and cost effectiveness, in comparison to its own performance and to the performance of other emergency ambulance services of similar size and demographics.

A commitment to the Essential Performance Results in their entirety is key to achieving a balance between quality, performance, cost, and patient satisfaction. Even a poorly structured, badly managed system can achieve reasonably good performance in one or two areas, creating an appearance of competence when viewed from a favorable angle. The consequences of such distortion harm the patient, the taxpayer, or both. For example, even an unskilled manager can limit spending by allowing clinical quality or response-time reliability to deteriorate. Similarly, given enough money, even the worst management team can provide a good, but not necessarily excellent, service.

High-performance emergency ambulance service providers have proven track records in *simultaneously* generating clinical excellence, response-time reliability, economic efficiency, and customer satisfaction. Meeting that challenge qualifies any system, and its personnel, as truly *high performance*.

This chapter describes the measurable outcomes of each component of the four Essential Performance Results.

Clinical Excellence

In every EMS system, out-of-hospital care should be provided as an extension of the medical director's license—the setting of standards and the measurement of quality is his or her responsibility. In high performance emergency ambulance service design, the independent oversight entity assigns the standard setting responsibility to a board-certified emergency physician who reports either to the independent oversight entity or to a separate medical advisory board. This arrangement ensures an arms-length relationship between the function of medical oversight and the provision of services.

Although the local medical director and the independent oversight entity establish and oversee the system's standard of care, additional mandates often are set at the state and federal levels in areas such as training and licensing, occupational safety, vehicle specifications, and equipment regulations.

In advanced EMS system designs, the medical director's practice of out-of-hospital medicine begins the moment a call is received for medical assistance and continues to the moment the patient comes under the care of a receiving facility. This practice includes the combined activities of medical communications center personnel, co-responders, ambulance crews, and other physicians providing medical oversight. Considerable authority is granted to the EMS system medical director by local ordinance, state statute, and contract. It includes oversight of all individuals, organizations, facilities, and equipment required to generate a medically appropriate, planned, and fully coordinated response to each request for emergency care and medical transportation.

Since the EMS system is accountable for the entire patient care continuum, from the time the request for service is received until the time the patient is transferred to the receiving hospital, the scope of medical oversight includes:

- Medical protocols and service-level requirements for co-responder services.
- Medical protocols and service-level requirements for ambulance services.
- Protocols governing use of air ambulance services (scene flights only).
- Certification, continuing education, and training for medical dispatchers, co-responders, ambulance personnel, and other involved physicians.
- Telephone access (9-1-1 and other) systems.
- Citizen CPR training, Public Access Defibrillator (PAD) programs, health and safety education programs, and illness and injury prevention activities.
- Triage, hospital destination, ambulance diversion, and alternate destination policies.
- Priority dispatch protocols and pre-arrival instructions.
- CQI program.
- Medical research and patient outcome studies.

Continuous Pursuit of Clinical Excellence

Figure 4 presents the six quality aims defined by the IOM for health care. Health care should be safe, effective, patient-centered, timely, efficient, equitable.³⁵

Figure 4: Six Quality Aims for Health Care

Health care should be:

Safe—avoiding injuries to patients from the care that is intended to help them.

Effective—providing services based on scientific knowledge to all who could benefit and refrain from providing services to those not likely to benefit.

Patient-centered—providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.

Timely—reducing waits and sometimes harmful delays for both those who receive and those who give care.

Efficient—avoiding waste, including waste of equipment, supplies, ideas and energy.

Equitable—providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.

³⁵ Institutes of Medicine [IOM]. Crossing the quality chasm: A new health system for the 21st century. Washington DC: The National Academies Press; 2001. p 5-6.

For the emergency ambulance service system design, the quality of patient care delivered by the emergency ambulance provider is determined by the factors in Figure 5.

Figure 5: Factors of Quality Patient Care

- Medical Protocols
- EMS Telephone Inquiry and Pre-Arrival Instructions
- Level of Staffing
- Personnel Training and Certification Programs
- Clinical Performance Measures
- Continuous Quality Improvement Programs
- Technological Advancements
- Co-Responder Program Integration
- Work Environment for EMS Personnel
- Community Education Programs

Medical Protocols

According to legislation, regulations, and protocols that define a medical incident and designate the appropriate level of response, the entire patient-care sequence is governed by planned protocols, beginning with the initial call for help and continuing through transport to the nearest appropriate facility.³⁶ Medical protocols translate the current state of medical science on how to care and treat patients into practical application for EMS personnel who act as physician extenders. Protocols give specific direction to EMS personnel and facilitate the process for physicians to manage patient care in the field. No aspect of the patient care scenario is left to chance.

EMS Telephone Inquiry and Pre-Arrival Instructions

High-performance emergency ambulance service providers should have in place certified Emergency Medical Dispatchers (EMDs) capable of providing life-saving pre-arrival instructions to callers.

Certified EMDs provide telephone instructions on how to check vital signs, open the patient's airway, start CPR, stop bleeding, and perform other types of first aid before the ambulance arrives. They also dispatch the appropriate response to medical emergencies, promoting optimum and medically appropriate use of resources while avoiding unnecessary duplicate responses. When the incident requires a co-response for public safety reasons, such as heavy rescue, extrication, or traffic control, the EMDs notify the proper agencies. Using pre-established protocols, the EMDs also determine when the patient's condition warrants the dispatch of a co-responder equipped with an AED.

In advanced systems, the independent oversight entity periodically evaluates the medical communications center to ensure response-time accuracy, compliance to medical dispatch protocols, timely alert and dispatch of co-responders, and proper issuance of pre-arrival instructions.

Level of Staffing

The minimum staffing for an emergency ambulance is one paramedic and one EMT. There is no research demonstrating that a higher level of staffing improves patient outcomes. If a community wishes to increase staffing levels to two paramedics, two paramedics and an EMT, a paramedic and a nurse, or some other staffing combination, this policy becomes a cost decision for the community. In addition, in any given EMS system, there are only a certain number of patients requiring advanced-level skills. To maintain skill levels, health-care workers must use these skills regularly. If an EMS system utilizes additional paramedics to

³⁶ Roush WR, McDowell RM, Pons PT. Emergency medical services systems. In: Roush WR, editor. Principles of EMS systems. Dallas, TX: ACEP; 1994. p 11-24.

deliver care to an unchanging volume of patients, there is a danger of degradation in clinical- and invasive-skill proficiency.

A recent survey of emergency medical services in the nation's 50 largest cities compared paramedic ratios per 100,000 population in cities that measure cardiac arrest (i.e., patients in ventricular fibrillation heart rhythm) survival ratios. The survey results indicated lower patient survival rates in cities with higher paramedic ratios (i.e., more paramedics per 100,000) than cities with lower paramedic ratios.³⁷ Other research has also shown positive correlation between more cases treated per paramedic and an increase in survival rates.³⁸

Personnel Training and Certification Programs

Personnel training programs should impart a patient-first ethic and include a comprehensive continuing education program. Beyond meeting EMT and paramedic re-certification needs, continuing education ensures quality patient care through ongoing skills and knowledge evaluation, patient safety training, driver training, and customer care. In addition to basic certification programs, some systems may include more specific certifications, such as Pediatric Advanced Life Support (PALS), Basic Trauma Life Support (BTLS), Prehospital Trauma Life Support (PHTLS), Advanced Cardiac Life Support (ACLS), Prehospital Emergency Pediatric Program (PEPP), and other programs, such as the National Registry of EMTs exam. They may also wish to look at specialized training, including incident command, medical response to terrorism, weapons of mass destruction, wilderness medicine, SWAT (Special Weapons and Tactics), and hazardous materials. Training and certification requirements will vary from state to state.

All training programs should address changing needs in medical treatment and skills needed to handle technological advances. Research is continually being conducted on drugs and treatments that shorten patient hospitalization and reduce patient mortality. Quality emergency ambulance services are able to respond to the critical and emerging needs of patients because of their ability to quickly adapt and train personnel in the evolving requirements.

Clinical Performance Measures

To maintain quality, emergency ambulance services should continuously measure current performance against their baseline performance and against that of other high-performance emergency ambulance services. The following are examples of general clinical performance measures. Specific measures should be developed in collaboration with the system's medical director, the independent oversight entity, and the local medical community:³⁹

- ***Cardiac Arrest Survival.*** The percentage of patients experiencing cardiac arrest who return to spontaneous circulation before arrival to or at the emergency department.
- ***Critical Invasive Skill Success.*** The success ratio (i.e., number of successes divided by number of attempts) for skills such as endotracheal intubation, intravenous line (IV) insertion, cricothyrotomy, and needle thoracotomy.
- ***Correct Protocol Utilization.*** The success ratio (i.e., number of protocols successfully implemented divided by the total number of patients) for correct usage of medical protocols based on a review of patient documentation records.
- ***Clinical Impression Accuracy.*** The success ratio (i.e., number of accurate clinical impressions divided by the number of patients seen) documented by emergency department physicians confirming the accuracy of the initial clinical impression documented by emergency ambulance personnel.

³⁷ Davis R. Fewer paramedics better? Many lives are lost across USA because emergency services fail. McLean, VA: USA TODAY; 2003 Jul 28.

³⁸ Sayre MR, et al. Cardiac arrest survival rates depend on paramedic experience. In Academic Emergency Medicine. Lansing, MI: Society for Academic Emergency Medicine; Vol. 13, Number 5, Supplement 1, May 2006. p S55-S56.

³⁹ Pointer J. Evaluation of system components. In: Swore RA, editor. Quality management in prehospital care. St. Louis, MO: Mosby Lifeline; 1993. p 36-48.

- ***Correct Usage of BLS Interventions.*** The success ratio (i.e., number of patients receiving proper BLS interventions divided by the total number of patients receiving BLS services only) for correct usage of BLS interventions, such as spinal immobilization and oxygen administration, based on a review of patient documentation records.
- ***Refusal of Treatment.*** Percent of patients refusing medical treatment against the advice of on-scene EMS personnel.
- ***Outcome Improvement of Key Clinical Presentations.*** The percentage of patients experiencing improvement in outcome or symptom relief following treatment, such as rise in blood-sugar levels and improved mental status of hypoglycemia patients, improved peak flow in patients experiencing difficulty breathing, chest pain reduction in cardiac patients, and general pain reduction in trauma patients.

Continuous Quality Improvement Programs

A high-performance emergency ambulance service must implement a consistent CQI program to ensure that every segment of the organization delivers quality service. Methods of ensuring quality may include standardized and advanced recruitment and hiring criteria, customized new-employee orientation programs, medical chart reviews, work aids, evaluation of clinical performance measures, interaction with patients or their families, interaction with personnel peers and partners, interaction with the medical facilities and their personnel, field evaluation of clinical service, and customer surveys.

The CQI program should be:

- Conducted by the system as a whole and by each component individually.
- Patient-outcome focused as the critical performance measure of system output (most important is the outcome of the patient care).
- Integrated with local medical oversight, and all related health provider agencies, including public health services.
- Process driven, leading to organizational changes and educational initiatives to improve performance.

Technological Advancements and Performance Management Processes

Advances in medical care bring about continual changes in technology, equipment requirements and performance management processes. Quality emergency ambulance providers should have in place excellent equipment procurement, testing, preventive maintenance and replacement programs. These providers must also meet all federal regulatory compliance requirements for medical equipment. A system design that allocates clinical upgrade funding and capital budgeting for technology changes will be assured of its ability to stay current with treatment and equipment advances. Today's most advanced emergency ambulance systems leverage the latest technologies and new management processes to dramatically improve system response times and safety, while simultaneously increasing system efficiency and reducing costs. Examples of the latest emerging technologies and management processes are presented below.

Advanced mapping technologies. Advanced computer aided-dispatch software programs integrate data from ambulance-based global positioning systems (GPS) which measure average speed on routes of travel. The system then predicts an eight (8) minute response time coverage zone for each ambulance in a fluid "amoeba-like" color display. Sophisticated mapping technologies provide automated unit and routing recommendations to mobile data terminals placed inside ambulances. In difficult situations, communications center specialists track and advise responding units of alternate routes and provide exact directions to further reduce response times.

Electronic patient care charts. Data from electronic patient care charts are analyzed to identify clinical skills accuracy, protocol compliance and for other operations purposes to search for dispatch, field and clinical improvement opportunities. Reciprocal agreements allow hospitals and emergency providers to share patient demographic, insurance, and billing information (HIPAA compliant) which improves billing accuracy for both entities.

Driver performance systems. On-board driver monitoring systems provide immediate performance feedback to the EMT or paramedic driver and capture vehicle data on an ongoing bases and when accidents occur. Ambulance-mounted video monitors allow replay of events leading up to accidents providing evidence of responsible party assisting in resolving false claims. These systems improve safety during emergency responses for both the ambulance personnel and the community at large.

Ambulance restocking systems. A concept in ambulance restocking and cleaning, known as “speed loading,” utilizes ambulance and stock standardization coupled with lean manufacturing techniques to create a system that is highly efficient, reliable and cost effective. Pre-packaged medical supplies are placed in sealed bins (i.e., the “speed loader”) which are then placed inside sealed interior and exterior cabinets. A carefully designed process flow assures that the individuals restocking the ambulance have all the necessary materials within arms reach in order to place the supplies in standardized locations. Consequently, the emergency crew only walks around and inside the ambulance once. Ambulance-restocking times are reduced from nearly one hour (for both pre- and post-shift activities) to less than 10 minutes while also assuring improved medical equipment and supply reliability.

Advanced management reporting systems. *Key performance indicators* (KPI) are used to measure key data indices in areas including operations status, response times, sentinel events, clinical data and financial reports, among others. Today’s advanced software and hardware systems allow enormous volumes of data to be gathered and organized into actionable operational intelligence for performance improvement. Real time updates from these communication center systems are routinely streamed to the cell phones and personal computers of managers, keeping them abreast of performance at multiple levels. As part of the after action review process, key managers and supervisors meet briefly on a daily basis to review the previous day’s performance, including the processes, practices and people driving the measured performance through what is termed “root cause analysis.” Using the KPI data and root cause failure analysis as a foundation, managers identify the source cause of system failures (response time, financial, clinical, etc). Once failure source trends are identified, managers proactively address the problems at their source through process re-engineering, leveraging technology and performing timely feedback.

Advanced management communication systems. Advances in internet, email, wireless and other technologies make communications more available and affordable than ever before. They also improve organizational communications, information archiving and actionable operational intelligence. Known as the new “organizational dashboard,” a centralized shared repository of KPI and organizational information is created over the internet with access available to authorized users. While traditional dashboards only provide data, advanced systems include operational awareness communications, sentinel event reporting, shared scheduling and calendars, centralized employee data, meeting minutes, shift reports and KPI data. A centralized information source on one combined online system allows organizations to improve efficiency and eliminate waste. Further, it allows more rapid responses to customers and issues (internal and external), provides improved situational awareness and improves communications throughout the organization.

Co-Responder Program Integration

For victims of cardiac arrest, considered to be the most time-critical patient in the EMS system, the American Heart Association recommends that each community have systems in place to ensure a strong “chain of survival.” This chain is defined as early access to the 9-1-1 system, early CPR, early defibrillation, and early advanced cardiac life support.⁴⁰ According to these guidelines, what best serves the patient is a well-integrated team that serves with the emergency ambulance service as co-responders in the first critical minutes of an acute medical event.

Local public safety agencies perform various on scene roles such as extrication, rescue, hazardous materials control, fire suppression, traffic management, accident investigation, and crime-scene control. Some emergency scenes involve public utility companies and other local or state government departments such as

⁴⁰ Cummins RO, Ornato JO, Theis WH, Pepe PE. Improving survival from sudden cardiac arrest-the "chain of survival" concept. *Circulation*. Dallas, TX: American Heart Association; 1991;83:1832-1847.

the water department, environmental protection agency, and so on. A system that focuses on integrating co-responders will include the provision of a number of different programs ensuring the ability of all system participants to work together. These programs include joint participation in independent medical oversight, continuing education, the exchange of equipment and supplies, disaster drills, and a variety of other programs specific to the community.

The following are different types of co-response for medical emergencies:

- **Citizen-Based First Aid.** Pre-arrival instructions from EMD-trained dispatchers turn callers into co-responders who can perform CPR and first aid before the ambulance arrives. Citizen CPR programs are another useful initiative that increases the number of lay people trained in CPR.
- **Public Access Defibrillation (PAD) Programs.** Performed by trained lay people with access to automatic defibrillators, PAD programs ensure the availability of AEDs in public places such as airplanes, airports, businesses, sports stadiums, public buildings, and other places where large numbers of people gather.
- **Public Safety-Based AED Programs.** At a minimum, all public safety personnel, including police officers, firefighters, lifeguards, forest rangers and harbor patrols should be trained to provide quick and high quality CPR and also equipped to use AEDs. In a recent landmark study, the combination of Basic Life Support, rapid response, and effective CPR are the factors that optimize survival.⁴¹ Public safety personnel may also receive the EMT certification.

Work Environment for EMS Personnel

Personnel job satisfaction is an important measure of an ambulance service's quality focus. EMTs and paramedics should be provided with competitive wages and benefits, as well as working conditions that are supportive of responsible patient care. In top-quality organizations, field personnel often are the most ardent supporters of the pursuit of quality. Personnel who seek opportunities for advancement or new challenges will form the nucleus of a high quality team. Following are some issues of importance to personnel:

- Competitive wages and benefits
- Safe work environment
- Involvement in CQI processes
- Culturally diverse workforce
- Opportunities for career advancement

The University of California San Francisco is conducting a comprehensive study of EMS workforce issues called the EMS Workforce for the 21st Century Project. Their final report, *National EMS Workforce Assessment*, is expected to be published in the summer of 2008.⁴² The goal of the project is to provide guidance to the national EMS community in ensuring a viable EMS workforce in the future. The report will provide policy recommendations regarding the supply, demand and needs of the EMS workforce as well as an overview of current workforce planning issues.

Community Education Programs

An informed public needs to know how and when to request an ambulance. High-quality emergency ambulance service providers emphasize the proper use of 9-1-1 to call for help. Similarly, responsible providers deliver community education on topics such as CPR, first aid, safety awareness and accident prevention, health and wellness promotion, and what to do until the ambulance arrives.

⁴¹ Stiell I, et al, OPALS Study Group. Modifiable factors associated with improved cardiac arrest survival in a multicenter basic life support/defibrillation system: OPALS Study Phase I Results. *Annals of Emergency Medicine*. Irving, TX: ACEP. January 1999, 33:1, p 44.

⁴² Additional information available at <http://futurehealth.ucsf.edu/emsworkforce/>.

Response-Time Reliability

The most serious and time-critical medical emergency to which an ambulance service responds is a cardiac arrest. In cardiac arrest, a patient's heart stops beating and blood stops circulating oxygen through the body. If circulation is not restored in a matter of minutes, this lack of oxygen will damage the brain irreversibly, and survival is impossible. In fact, every minute of untreated ventricular fibrillation, or cardiac arrest, leads to a reduction in survival of up to 10 percent.⁴³

Researchers have studied the survival of cardiac arrest patients treated by the EMS system. Both the European Resuscitation Council⁴⁴ and the American Heart Association⁴⁵ recommend responses under 5 minutes with the immediate initiation of CPR and subsequent defibrillation for a successful outcome.

But cardiac arrest is not the only time dependent emergency. The severely injured patient needs rapid response and transport to a trauma center where immediate surgery can be performed. In addition, patients suffering a heart attack, stroke, the sudden onset of asthma, or an overdose need advanced treatments from a paramedic to minimize harm.

These types of findings have produced local EMS system response-time standards. For example, the Commission on Accreditation of Ambulance Services (CAAS) recommends an 8-minute and 59-second response-time standard, 90 percent of the time, for life-threatening emergencies.⁴⁶ Response time is determined as the interval between the time the patient's location, callback number, and patient problem type are known, and the time the ambulance crew arrives on scene. Response times for suburban and rural areas can differ based on the needs and the configuration of each EMS system and as approved by the local medical director.

Prior to the introduction of computer-aided dispatch, response-time stamps were recorded in minutes rather than seconds. An 8-minute response-time guideline would include everything from 8:00 to 8:59 minutes. As technology evolved, it became easier to hold services accountable to specific response time standards to the second.

Depending on total call volume, call-volume density, and other geographic factors, frontier regions, rural communities, and some suburban areas may find it financially impossible to achieve the same ALS response-time standard as that in urban areas. This does not mean, however, that they cannot otherwise achieve high performance. These communities have either established longer response-time standards, developed multi-jurisdictional systems, created air ambulance or helicopter services, established paramedic intercept services or paramedic "fly-cars" that rendezvous with BLS ambulances, or created a combination of these elements to get as close as possible to the 8-minute ALS standard.

As community leaders consider the appropriate response-time standard for their communities, each increment in improved response-time performance carries an increased cost that varies depending on size of the population served, total call volume, call volume density, and other geographic factors. Again, these quality and cost factors should be carefully analyzed.

⁴³ Advanced Life Support Working Party of the European Resuscitation Council. Guidelines for adult advanced cardiac life support. *Resuscitation*. Elsevier; 1992; 24:111-121.

⁴⁴ Ibid.

⁴⁵ American Heart Association, 2005 Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. Dallas, TX: American Heart Association; Vo. 112, Issue 24, December 2005.

⁴⁶ Standards Revision Committee. 201.05.02 response time standards. In: CAAS Standards, Version 2.5 (version 2.4). Glenview, IL: Commission on Accreditation of Ambulance Services; 2005. p 10

Defining Response-Time Performance

For the purposes of this discussion, response time is defined as:

The interval between the moment when the provider first gained enough information to initiate a response, and the time a properly equipped and staffed unit arrives at the scene.

To ensure the appropriate system response, times should be captured and recorded at each of the stages in Figure 6, and in the intervals between the discrete events measured.⁴⁷ This allows the independent oversight entity to measure system performance effectively from the patient's point of view.

While the data sets allow intervals to be measured from the time the incident actually occurred, in a performance-based contract, the provider should only be held accountable for factors within its control. As such, response times should be determined from the time the system's providers (i.e., emergency ambulance service and co-responder) receive sufficient information to initiate the response. For the ambulance service, this is defined as the interval between the moment that the callback number, location, and chief complaint are first made known to the medical communications (dispatch) center, and the moment the first ambulance arrives at the call location.

In systems where the call comes into a government 9-1-1 or PSAP center, and not the emergency ambulance provider's communications center, interfaces between the 9-1-1 CAD system and that of the provider should be in place to automate the rapid transfer of the call information. Even though the 9-1-1 complaint taker or ambulance dispatcher may gather additional information and give pre-arrival instructions once the unit is dispatched, the response-time clock should start as soon as the emergency ambulance provider has acquired sufficient information to initiate a response.

The response-time clock should not be started, and response time *should not* be measured as the following:

- The time from unit alert to arrival at the scene.
- The time from completion of the *full* telephone inquiry to arrival at the scene.
- The time the co-response or ambulance leaves the base location to arrival at the scene.⁴⁸

In addition, the response-time clock for ALS units should not be stopped by the arrival of a BLS unit, and the clock for ambulance response should not be stopped by the arrival of a co-response unit.

Response times are the most easily documented and evaluated of all parameters of emergency ambulance service performance and have gained wide public recognition as a key measure of quality and service. High-performance emergency ambulance services have developed advanced technology that accurately measures response times, including Computer Aided Dispatch (CAD) systems, Automatic Vehicle Location (AVL) systems and expert management techniques. The same technology is available for the measurement of co-responder response times.

Another advancement implemented by high-performance emergency ambulance services, and included in the proposed data sets, is the requirement by some EMS system medical directors that ALS providers record and report response time to "patient side," in addition to the time the ambulance arrives at the call address. This measurement gives a greater degree of response-time accuracy, since another minute or two may pass from the time of the unit's arrival on scene until the ambulance personnel can actually arrive at the tenth floor of a high-rise building and start caring for the patient. While high-performance ambulance services have the sophistication to report these times, they should not be held accountable for this interval due to the various environmental factors outside their control. However, the data gathered can be extremely useful in the overall CQI program to help maximize clinical excellence and make EMS system improvements.

⁴⁷ National Emergency Medical Service Information System Project. EMS data set version 2.05. Washington DC: National Highway Traffic Safety Administration; 2004 Mar 1. p 14-17.

⁴⁸ Technical Committee on Fire and Emergency Service Organization and Deployment-Career. NFPA 1710: the standard for the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by career fire departments 2001 ed. Quincy, MA: National Fire Protection Association; 2001. p 1710-6.

Figure 6: Response-Time Events

Every response to an emergency request for service proceeds in the following sequence of events:

- Incident or onset date/time: The date/time the injury occurred or the date/time symptoms or problem started.
- PSAP call date/time: The date/time the phone rings (9-1-1 call to a PSAP or other designated entity) requesting EMS services.
- Dispatch notified date/time: The date/time dispatch was notified by the 9-1-1 call taker (if a separate entity).
- Unit notified and dispatched date/time: The date/time the responding unit was notified by dispatch.
- Unit en route date/time: The date/time the unit responded; that is, the time the vehicle started moving.
- Unit arrived on scene date/time: The date/time the responding unit arrived on scene; that is, the time the vehicle stopped moving.
- Arrived at patient date/time: The date/time the responding unit arrived at the patient's side.
- Transfer patient care date/time: The date/time the patient was transferred from this EMS agency to another for care.
- Unit left scene date/time: The date/time the responding unit left the scene (started moving).
- Patient arrived at destination date/time: The date/time the responding unit arrived with the patient at the destination or transfer point.
- Unit back in service date/time: The date/time the responding unit was back in service and available for response (finished the call, but not necessarily back at home location).
- Unit cancelled date/time: The date/time if unit's call was cancelled.
- Unit back at home location date/time: The date/time the responding unit was back in their service area. (Note: For high performance emergency ambulance services, the term "home location" refers to the provider's service area as assigned by the provider's system status management protocols.)

Measuring Response Times

It has been a common practice in the past to report response times by using *averages*. This is an easy-to-understand methodology that calculates response times by adding all applicable response times together and then dividing the total number of minutes by the total number of responses to come up with an average. Measuring and reporting average response times is inadvisable because one-half of the patients may receive the required response time, while the bottom half do not. Given what has been learned about the need for an eight-minute response to maximize survivability from cardiac arrest, an average eight-minute response, by definition, means that one-half, or more, of the service's patients are not reached within that critical time.

The use of average response times also can raise concerns about ambulance deployment practices. If a predetermined average response-time goal has been set either by the service or local leaders, the placement of the ambulances may be centered to respond to a geographic area that can be easily reached in that time or that has a higher-than-normal call volume, potentially leaving the rest of the service area unprotected.

Many suburban and rural areas may set longer response-time goals because of fewer requests for service and higher cost per transport. The use of averages in these areas can be a cause for even greater concern than in urban areas, as just one short response time can be used to offset several longer ones, with the result being resident or patient complaints about the inequity of the service.

Fractile Response-Time Measurement

High-performance emergency ambulance services use a different methodology to measure response times to ensure service equality to all patients: *fractile distribution* reported at the 90th percentile. This methodology places each response within the minute it is achieved and stacks the minutes in ascending order to establish a fractile response-time distribution. The point at which the fractile response time crosses the 90th percentile measures the point of the service's response-time reliability.

Figure 7: Sample Response-Time Report

Minutes	Number of Responses	Cumulative Percentage	Frequency of Occurrence
0	62	2.4%	2.4%
1	60	4.7%	2.3%
2	221	13.2%	8.5%
3	348	26.5%	13.4%
4	489	45.3%	18.8%
5	467	63.3%	17.9%
6	374	77.6%	14.4%
7	270	88.0%	10.4%
8	188	95.2%	7.2%
9	52	97.2%	2.0%
10	28	98.3%	1.1%
11	21	99.1%	0.8%
12	11	99.5%	0.4%
13	6	99.7%	0.2%
14	2	99.8%	0.1%
15	5	100.0%	0.2%
Total 2604			

Figure 7 provides an example of a report commonly used to measure response-time reliability. This report, from the Richmond, Virginia emergency ambulance service shows that the system achieved response time reliability of eight minutes or less, 95.2 percent of the time, for the month shown. It is also important to note that the 50th percentile is achieved between the fourth and the fifth minute.

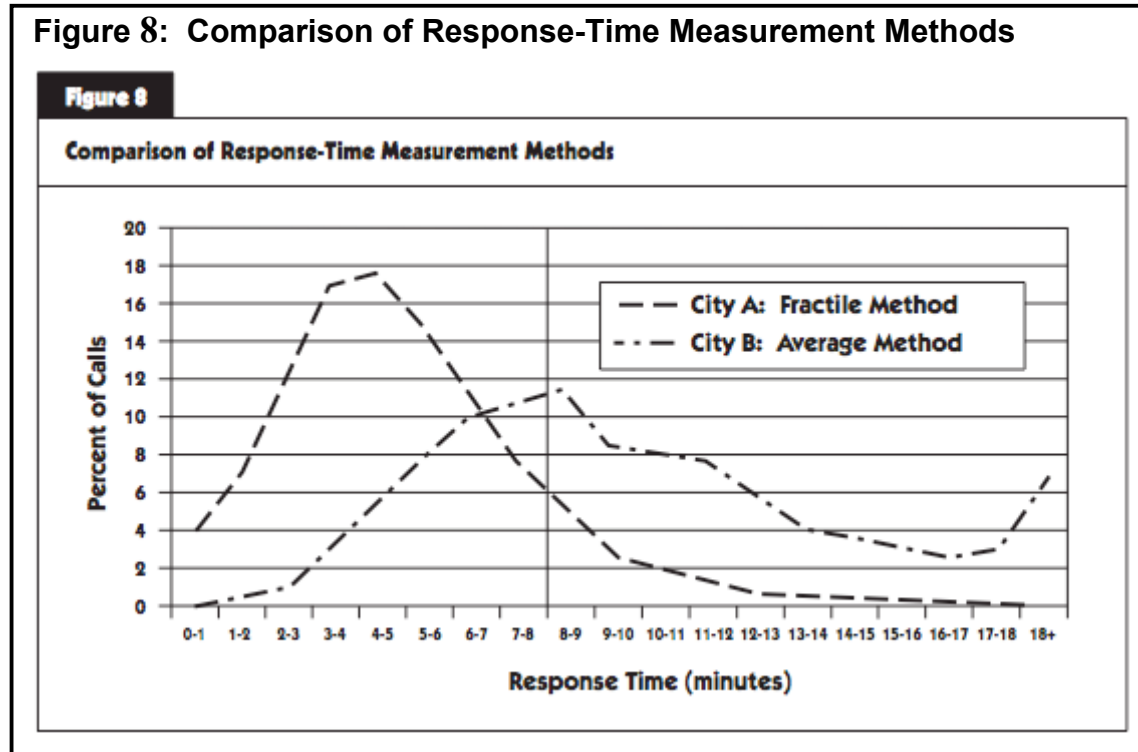
The predetermined response-time standard is established for different high-performance ambulance services based on the service area’s demographic and geographic factors, combined with a realistic funding level. In many urban settings, the time standard is set within 8 minutes and is based on cardiac research. In suburban, where call volume may be less because the population may be younger and healthier, or geographically scattered, 12 or 15 minutes may be used as the response-time requirement depending on the financial resources available.

While the best standard would require a response within the established response time 100 percent of the time, this is not reasonable or economically affordable. Consequently, a 90 percent requirement typically is used. The fractile method also assures equality of service to all area residents. To achieve 90 percent reliability, different deployment patterns and management techniques should be used. Times of calls, road systems, shape of service areas, traffic patterns, and population fluctuations should all be considered on a regular basis to ensure that reliability is achievable on a regular basis and within the service’s operating budget.

Continually attaining meaningful response-time reliability is a complex undertaking. It is important that the service’s management team understands the requirements set by the independent oversight entity and is committed to achieving long-term performance.

The graph in Figure 8 presents the actual results of response-time statistics from two cities, both requiring an 8-minute (7:59) or less ambulance response time to life-threatening emergencies. City B used the average method, while City A used the fractile method (90th percentile).

These results reveal the dramatic difference in response-time reliability between emergency ambulance providers using fractile versus average measurement methods. As the vertical line at the 8-minute point indicates, more patients received paramedic care in 8 minutes or less where response times are measured on a fractile basis (City A) than where response times are measured in averages (City B).⁴⁹



Monitoring and Reporting Response-Time Compliance

The following are important considerations when determining how to measure and report EMS response-time compliance:

- **Response times should be monitored and reported on a monthly basis.** In most systems, this period provides adequate volume for reporting to be meaningful and is a short enough time to provide timely recognition and correction of response-time performance.
- **Responses in low volume areas should be aggregated.** In rural or other low-volume areas that do not generate a minimum number of responses per month (e.g., 100 responses), additional month(s) responses should be aggregated until there are at least 100 responses to be measured. Once this volume has been achieved, the aggregate responses can be reported in the subsequent month's report and the response count reset to zero. An alternative approach is to establish a longer reporting period based on historical data, such as quarterly rather than monthly, during which there are consistently a minimum of 100 responses.
- **Response-time performance is based on complete responses.** All responses that result in an ambulance arriving at the location to which they were requested should be measured.
- **First-arriving ambulance stops the response time clock.** In a multiple-ambulance response to a single incident, the first-arriving ambulance stops the response-time clock. Only a fully staffed, transport-capable ALS ambulance can stop the ambulance response-time clock.

⁴⁹ Overton J, Stout J. System design. In: Kuehl AE, editor. Prehospital systems and medical oversight. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002.

- **Response-time performance is reported separately for each EMS system component.** Response times are established for each component of the EMS system, such as the co-response provider and the emergency ambulance service provider, and are monitored and reported separately to the independent oversight entity.

Establishing Exemptions to Response-Time Requirements

When calculating response-time performance, the ambulance provider should include all responses to requests for emergency service received via 9-1-1 or a seven-digit telephone number. The dispatchers are required to enter three essential data items: callback number, nature of request, and location of caller. The service’s CAD system also should record “time call received” automatically. No other method of manual calculation or mechanical time stamping is as accurate as the electronic stamp provided by a sophisticated CAD system.

Ambulance services should be exempt from the response-time requirement for certain predetermined types of calls or periods of time as specified in the performance-based contract. Determined by the administrator of the independent oversight entity, these exemptions may include:

- Periods of severe weather conditions.
- Extraordinary events causing system overload (e.g., a predetermined number of emergency calls simultaneously in progress as specified by the contract).
- A declared disaster.

Other circumstances outside the provider’s reasonable control cause EMS-system overload and longer ambulance response times. These include periods when hospital emergency departments are on “ambulance divert” status or when hospital staffing shortages or patient overcrowding cause extended ambulance turn-around times in the emergency department.⁵⁰ The challenge to EMS when hospitals are on diversion is immediate. Hospital diversions increase the transport time for the patient, which correspondingly decreases the time the ambulance is available to respond to the next emergency. Even adding a minute or two to the time the ambulance is out of service produces a negative impact on the system which directly leads to increased response times and decreased system efficiencies. As will be discussed in Chapter 5, even a slight decrease in the unit hour utilization can cause an exponential increase in cost per transport.

The local EMS regulatory agency and independent oversight entity should take action to correct these system-wide problems before they reach crisis levels and negatively affect patient care. Response-time exemptions should also be considered if these system design flaws persist without correction, especially when they are outside the ambulance provider’s reasonable control.

Response-time performance should be monitored externally, and requests for exemptions to the response-time standard should be submitted to the administrator and/or medical director of the independent oversight entity. Other causes for late responses, such as traffic congestion or vehicle failure, are not considered exemptions.

Achieving Clinically Meaningful Defibrillation Response Times

Medical innovations continue to offer new equipment and system design options for delivering a clinically meaningful EMS response to the most time-critical medical emergency—the cardiac arrest. In the past, paramedics were the only prehospital personnel qualified to deliver defibrillation due to the training required to determine certain heart rhythms and monitor the effects. Now, with the development, affordability, and broad availability of AEDs that instruct the operator when to shock a patient, a wide range of community co-responders can provide the needed “electrical jumpstart” to ventricular fibrillation, or cardiac arrest, in a cost effective and clinically effective way.

⁵⁰ General Accounting Office (US) [GAO]. Hospital emergency departments: crowded conditions vary among hospitals and communities. Washington, DC: U.S. General Accounting Office; 2003 Mar 2. GAO-03-460. p 3.

Numerous studies have found early defibrillation increases patient survivability.⁵¹ Based on these clinical data, the following system design enhancements will improve patient outcomes and pass the cost benefit test:

- **Public Access Defibrillation (PAD) Programs.** The PAD program, mentioned earlier in this chapter, places AEDs in public places, such as airplanes, airports, sport stadiums, businesses, public buildings, and other areas where large numbers of people gather.
- **Public Safety-Based AED.** Co-responder agencies, such as police officers, firefighters, lifeguards, forest rangers, and harbor patrols are equipped and trained to use AEDs.⁵² A new certification, Emergency Medical Technician-Defibrillation (EMT-D), is also an option for public safety personnel.

In systems where public safety responders serve at the BLS level, the issue of upgrading personnel to the ALS level is a public policy option. The scientific evidence clearly indicates that advanced-life-support interventions did not improve the rate of survival in an EMS system that optimized quick response and defibrillation.⁵³ Rather, improved CPR and public safety-based AED programs are the priority to save lives.^{54 55} The decision to upgrade co-responders to the ALS level in urban/suburban communities with clinically meaningful ambulance response times may not provide additional clinical benefit and may not pass the cost-benefit test. Therefore, implementing CPR, PAD, and AED programs may be a more effective use of public dollars than upgrading co-responders to the ALS level.

In the latter part of the 1990s, some EMS systems implemented ALS co-response and extended the ALS ambulance response-time requirements. Recent research in the emergency care of heart attack, stroke, and trauma patients, however, indicates that patients are better served when the ambulance transport from the scene occurs as soon as possible, ensuring that the patient arrives at the emergency department for definitive care as soon as possible.⁵⁶ According to American Heart Association guidelines, short scene times are desired for the reduction of mortality in cases of a heart attack, or acute myocardial infarction and stroke.⁵⁷ This is a case in which it is essential that EMS practices be based on clinical outcomes and the needs of the patient, as research clearly demonstrates the advanced procedures that must be performed in the hospital's coronary care unit are the only ones that can save the valuable cells in the heart muscle from dying during an acute event. In Proceedings published by the National Heart, Lung, and Blood Institute, rapid response and transport to a tertiary care center, which might not be the closest hospital, is the best course of action for the definitive care of these patients.⁵⁸

⁵¹ Part 4: the automated external defibrillator: key link in the chain of survival. Resuscitation. Elsevier; 2000;46:73-91.

⁵² Mosesso V, Newman M, Ornato J, Paris P. Law enforcement agency defibrillation (LEA-D): proceedings of the national center for early defibrillation police AED issues forum. Resuscitation. Elsevier; 2002;54:15-26.

⁵³ Stiell I, et al. The Ontario Prehospital Advanced Life Support (OPALS) Study: Advanced cardiac life support in out-of-hospital cardiac arrest. Waltham, MA: New England Journal of Medicine; August 12, 2004, p 647-656.

⁵⁴ Katz AA, Cassara M, Houser C. First responders. In: Kuehl AE, editor. Prehospital systems and medical oversight. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 236- 244.

⁵⁵ Stiell I, et al. The Ontario Prehospital Advanced Life Support (OPALS) Study: Advanced cardiac life support in out-of-hospital cardiac arrest. Waltham, MA: New England Journal of Medicine; August 12, 2004, p 647-656.

⁵⁶ National Institute of Health (US) [NIH]. National heart attack alert program: staffing and equipping emergency medical services systems-rapid identification and treatment of acute myocardial infarction. Washington, DC: National Institute of Health; 1993.

⁵⁷ Albers MJ, et al. Recommendations for the establishment of primary stroke centers. Chicago, IL: JAMA 2000;283:3102-3109.

⁵⁸ LaRosa JH, et al. Proceedings of the National Heart, Lung, and Blood Institute Symposium on Rapid Identification and Treatment of Acute Myocardial Infarction. Washington DC: National Heart, Lung, and Blood Institute; September 1991. p 60, p 73.

Economic Efficiency

Of all EMS system components, the emergency ambulance service component is a significant investment. With its variety of delivery methods and provider types, community leaders face a challenging array of emergency ambulance service options, each with unique costs. The following sections briefly introduce the concepts of cost and productivity measurement. These topics are discussed in detail in Chapter 6.

Performance Tools Ensuring Economic Efficiency

Specific tools used by high-performance emergency ambulance services to maximize operational efficiency include:

- Flexible production strategy
- Event-driven deployment
- Peak-load staffing
- Performance-based contracting

Flexible Production Strategy

High-performance emergency ambulance services are encouraged to include the transportation of interfacility patients between hospitals, nursing homes, and other diagnostic centers into their deployment system. This method of deploying ambulance resources, called the *flexible production strategy*, properly aligns ambulance resources and medical reimbursement policies to benefit a more diverse base of consumers, resulting in a lower overall cost to the patient, taxpayer, and insurer. The flexible production strategy benefits taxpayers and users for the following reasons:

- There are more ambulance unit hours available to respond to emergency requests for the same or fewer dollars.
- A broader mix of patients (insured and uninsured) is charged for services, spreading the cost of maintaining an ambulance distribution network over a larger group of transports.
- Higher ambulance productivity levels are achieved, resulting in lower cost per transport, lower user fees, and reduced or eliminated community tax support.
- Savings resulting from the flexible production strategy can be invested in a variety of emergency ambulance service improvements.

Many high-performance emergency ambulance services have converted voluntarily to all-ALS, full service fleets, recognizing that gains in efficiency far outweigh the minimal additional cost of staffing and equipping the entire fleet at the ALS level.⁵⁹ These services employ a single fleet of ALS units capable of handling any type of service request, rather than operating specialized ambulance fleets with different service levels. Using advanced ambulance deployment practices, the all-ALS (otherwise known as “single-tier”) system guarantees that every patient, regardless of the urgency of the call determined by the medical communications center, receives the highest level of care. In turn, the system benefits from productivity levels that are significantly higher than those relying on the specialized (two-tier) production strategy.

The value of the flexible ambulance production strategy was shown in a study involving 13 EMS systems—urban, suburban, and rural.⁶⁰ The purpose of the study was to determine the cost savings, if any, of the flexible production strategy when compared with the specialized production strategy. Savings were documented in all systems operating with a flexible production strategy, within a range of 4.9 percent to 19.8 percent, and a median of 12.9 percent. The study concluded that substantial savings could be realized from implementing the ambulance flexible production strategy, with the percentage of savings determined by operational, demographic, and local regulatory factors.

Event-Driven Deployment

⁵⁹ American Ambulance Association. Annual membership survey. McLean, VA: American Ambulance Association; 2008.

⁶⁰ Overton J, Stout J. System design. In: Kuehl AE, editor. Prehospital systems and medical oversight. 3d ed. Dubuque, IA: Kendall/Hunt Publishing Company; 2002. p 114-131.

EMS demand changes in a cyclical manner on an hourly and daily basis, following the movement of people across jurisdictional boundaries and their broadly changing patterns of behavior, such as commuting to another community during the day and returning home at night. In fact, the patterns of demand for EMS closely resemble those for law enforcement, which is reflected in the desired shift patterns for both types of services. For example, urban police departments do not use 24-hour shifts, and high-performance ambulance services in urban areas use few, if any, 24-hour shifts.

Managers of high-performance emergency ambulance services study and learn the cyclical patterns of *volume demand* and *geographic demand* in their service area, as well as changes in traffic congestion patterns, performing this analysis meticulously for each hour of the day and each day of the week (for a total of 168 hours for each week).⁶¹ They then design and refine ambulance deployment and redeployment strategies to match the patients' predicted need for service. These volume-demand and geographic-demand analyses result in a *system status plan* (SSP) as a different deployment schedule (based on volume and geographic demand analysis) for every hour of every day.

Combined with the latest CAD technology, this *system status management* (SSM) method of managing ambulance resources has been employed and refined by the most clinically advanced ambulance services for more than two decades.⁶² SSM is an important tool that maximizes successful patient outcomes.⁶³

Peak-Load Staffing

Effective emergency ambulance service providers carefully match ambulance resource supply with predictable demand and traffic pattern fluctuations, using the analyses described above. Using peak-load staffing, ambulances are scheduled to match the demand for service. For example, more ambulances are staffed and on duty during "peak" periods of demand than during "off-peak" periods of demand. Because call volume generally peaks during the day and drops at night, there may be as many as twice the number of units on duty during the day than at night. To achieve this, ambulance shifts are of varying lengths, such as 8, 10, or 12 hours with staggering start times; generally, there are few, if any, 24-hour shifts.

Performance-Based Contracting

A performance-based contract requires the emergency ambulance service to meet or exceed specific performance standards and financial benchmarks to retain market rights. One of the key features of a performance-based contract is a competitive or benchmarking process which assures that the community receives the best value—the highest quality service at the lowest cost to taxpayers and users. Service-area allocation often allows the provider to take advantage of economies of scale and to potentially eliminate the duplication of distribution networks of multiple providers.

Customer Satisfaction

The goal of all high-performance emergency ambulance providers is to serve their communities. Therefore, they should have in place mechanisms by which they can receive customer input and determine whether they are meeting expectations. Customers of the ambulance service provider and the EMS system include but are not limited to the following groups:

- Patients
- Public
- Participants in the oversight structure

Customer satisfaction is achieved when the expectations of the customer groups are met. Customer satisfaction can also be enhanced by offering value-added services which improve the overall EMS system.

⁶¹ Demand fluctuations are tracked to about one or two standard deviations from the mean to achieve the 90 percent standard of response-time reliability.

⁶² Stout J. System status management: the strategy of ambulance placement. *Journal of Emergency Medical Services*. San Diego, CA: Elsevier Public Safety; 1983 May:22-32.

⁶³ Stout J. System status management: the fact is, it's everywhere. *Journal of Emergency Medical Services*. San Diego, CA: Elsevier Public Safety; 1989 Apr:65-71.

Patients

The patient is the focus of all the service's resources. Beyond clinical excellence, he or she should receive courteous service, protection of privacy rights, and choice of health-care facilities when medically appropriate. As consumers, patients pay for services rendered through their health insurance coverage; through out-of-pocket payments for co-pays, deductibles, and uninsured amounts; and as taxpayers. As such, the high-performance ambulance provider should have in place mechanisms to determine the patient's perception of the quality and cost of services delivered. There are various methods to measure customer satisfaction. It is recommended that the ambulance service consistently use a professionally developed survey tool to determine customer satisfaction, so that it can benchmark against previous performance.

Public

As bystanders, the public participates with the emergency ambulance service as a co-responder by delivering first aid, CPR, and PAD when needed. Members of the public often activate the EMS response by dialing 9-1-1 and, at the direction of the EMD in the medical communications center, may provide pre-arrival care. Whether the public's expectations of the emergency ambulance service are being met is determined through feedback to government officials, to the service provider, to community advisory boards, and through focus group surveys.

Participants in the Oversight Structure

In an effective independent oversight structure, the ambulance provider and independent oversight entity evaluate performance results on a regular basis. Through this process, the ambulance provider should receive continuous feedback regarding the oversight entity's overall satisfaction with the provider's performance.

Value-Added Services

There are a number of value-added services that an emergency ambulance service provider may be requested to deliver or may propose for the improvement of the EMS system. These value-added services are not inherently the responsibility of the emergency ambulance service provider and are therefore beyond the scope of this *Guide*. However, they may effectively and efficiently meet the needs of customers in the community in areas such as health care, public health, and public safety. This is a new and exciting area of EMS that is being explored by a broad range of national organizations including the federal Office of Emergency Medical Services at the National Highway Traffic Safety Administration which has published the *EMS Agenda for the Future* (see Appendix A).⁶⁴

In 1997, the American Ambulance Association published *Expanded Scope of Ambulance Services—A Resource Guide* which surveyed and explored the many issues related to the EMS-based programs that provide alternative community health services.⁶⁵ Subsequently, in 1998, programs in Idaho and Orange County, North Carolina—both of which include a treat and refer with no transport component—gained notice nationally.⁶⁶ In the ensuing years, other programs were initiated around the country to deal with the growing issue of emergency department over-crowding, diversion, and EMS system utilization. The IOM report, *Emergency Medical Services at the Crossroads*, recommended that the Centers for Medicare and Medicaid Services (CMS) convene an ad-hoc working group of EMS experts to evaluate EMS reimbursement including such issues as treat and refer without transport.⁶⁷ The Federal Interagency Committee on EMS (FICEMS) has also been strengthened by Congress to bring all federal agencies and non-federal EMS stakeholders together to work on EMS issues. With the IOM recommendation and the role of the FICEMS, there has never been a better time to explore these issues.

⁶⁴ National Highway Traffic Safety Administration (US) [NHTSA]. EMS agenda for the future. Washington, DC: National Highway Traffic Safety Administration; 1996 Aug. DOT HS 808 441. p 9-12.

⁶⁵ American Ambulance Association. Expanded scope of ambulance service. McLean, VA: American Ambulance Association; 1997.

⁶⁶ Garza M. EMS Insider. San Diego, CA: Elsevier Public Safety; 1998 Feb 25 (2), p 1, 3, 8

⁶⁷ Institutes of Medicine [IOM]. Emergency medical services at the crossroads. Washington DC: The National Academies Press; 2007. p 116.

When evaluating value-added services, administrators should consider the following:

1. Are there opportunities for the ambulance service to integrate with the broader health-care community?

For example, can the service:

- Partner with other health-care agencies to ensure patients are getting the right care at the right time in the most appropriate setting?
- Keep non-urgent, medically-safe patients out of overburdened and costly emergency departments?
- Work with managed-care organizations and insurance plans to help ensure that patients who access the 9-1-1 system stay in the organization's network when medically safe and operationally possible?
- Support public health initiatives such as safety helmets, domestic violence reporting, high incident crash location identification, immunization, and flu shot clinics?

2. Can emergency ambulance service providers contribute to community education initiatives that accomplish the following:

- Ensure appropriate usage of the 9-1-1 system?
- Promote CPR and first aid training?
- Promote PAD programs?

3. Can the emergency ambulance service medical communication center be used to:

- Employ medical dispatch call-screening and triage protocols to better match the needs of the patient with available health-care resources, including non-EMS services, creating more effective and efficient emergency ambulance service delivery?
- Provide medical-alarm monitoring services to the elderly and disabled?
- Maintain databases of individuals on home-based power-dependent medical devices to evacuate or otherwise provide extra protection in times of emergencies?

4. Can the emergency ambulance service provide special event coverage that:

- Enhances clinical care and resource coordination at special events?
- Improves emergency ambulance service response and productivity?
- Provides an opportunity to inform and educate the public about emergency ambulance services?
- Provides another source of revenue?

System Design Characteristics that Maximize Performance Results

Based on the public policy discussion presented in this *Guide*, Figure 9 illustrates the characteristics that maximize performance results. The chart provides an example of how the *Guides'* key concepts are applied to the essential components of system design (i.e., performance requirements, independent oversight, business structure, legal framework and financing strategy) and to the essential performance results (i.e., clinical excellence, response-time reliability, economic efficiency and customer satisfaction)—all based upon the principles established by the *Hallmarks* presented in Chapter 1. This chart reflects the complexity of emergency ambulance service system design in urban communities and is one example of how characteristics must be carefully chosen to meet each individual community's unique needs and resources.

Figure 9: System Design Characteristics that Maximize Performance Results – Urban Communities

<i>System Design Component</i>	<i>Characteristics</i>
<i>Performance Requirements</i>	<p>Externally-monitored 8:59 minute/90 percent response time requirement</p> <p>All ALS with paramedic/EMT crew configuration</p> <p>Evidence-based protocols for co-responders, ground and air ambulance</p> <p>Use of advanced pharmacology, equipment and technology</p> <p>Funds set-aside to implement advances in medical care and technology</p> <p>Superior preventive maintenance programs for vehicles, equipment and software</p> <p>Use of electronic health care data systems</p> <p>Peak-load staffing and event-driven deployment with system status management</p> <p>Fully integrated with local, regional and state disaster response plans</p> <p>Nationally accredited</p> <p>Feedback mechanisms measure customer satisfaction</p>
<i>Independent Oversight</i>	<p>Business-based independent oversight entity with system-wide responsibility and enforcement authority</p> <p>Full- funded independent medical oversight, physician-controlled with system-wide responsibility</p> <p>Clinical standards and continuous quality improvement process for both co-responder and ambulance provider</p> <p>Benchmark system performance results</p>
<i>Business Structure</i>	<p>Single provider of emergency and non-emergency ambulance service serving multi-jurisdictional area</p> <p>Maximize economies of scale with urban and suburban neighbors where possible</p> <p>Accredited ambulance service-based medical communications center with priority dispatch interrogation and pre-arrival instructions</p> <p>Public safety-based co-responders implement AED program</p> <p>Co-responders use priority dispatch protocols, nearest-unit dispatch</p> <p>Co-responders response times required & externally reviewed</p>
<i>Legal Framework</i>	<p>Formal state legislative action authorizing local government market-rights preemption under federal antitrust state-action immunity provisions</p> <p>Interlocal agreements; facilitating multi-jurisdictional systems</p> <p>Local (city or county) ambulance service ordinance authorizing market-right allocation and independent oversight entity</p> <p>Performance-based ambulance service contract with triggered procurement process</p>
<i>Financing Strategy</i>	<p>Limited use of community tax support</p> <p>User fees are primary revenue source</p> <p>Rate regulation optimizes user fee recovery, accounts for cost of readiness and uncompensated care</p> <p>Common schedule for each jurisdiction to select community tax support and ambulance fee levels</p>

Maximizing Performance Results in Small Towns & Rural Communities

The principles of this *Guide* can also be adapted by community leaders in emergency ambulance system design for small towns and rural communities. However, there are unique challenges for rural communities that are important factors in the overall system design.

Challenges

Compared to urban locales, rural communities are characterized by large geographic coverage areas, lower population density, lower call volumes and longer travel distances.⁶⁸ For example, the average length of urban transports of Medicare beneficiaries is 7 miles, while rural averages 13 miles and super-rural averages 20 miles.⁶⁹ In addition, rural residents experience higher rates of injury and death from trauma and generally have less access to essential health care services.⁷⁰

Only 20% of Americans live in rural areas, however, 60% of all trauma related deaths occur in rural areas. Nearly 85% of US residents can reach a level one or two trauma center within an hour, but only 24% of rural residents have access within that time frame.⁷¹

While rural providers generally have lower cost per unit hour than their urban counterparts for a variety of reasons (lower wages, rent and other costs);⁷² their cost of readiness is an even greater component of total cost.⁷³ In rural service areas, four or more unit hours may be produced for every one hour used to treat and transport patients. Numerous government and industry reports have confirmed higher cost per transport for providers serving rural areas because fixed costs are spread across a lower volume of transports—including three GAO reports,^{74,75,76} and reports from the American Ambulance Association⁷⁷ and the Project Hope Center for Health Affairs.⁷⁸ For this reason, three GAO reports have recommended increasing base rate payments for transports from rural service areas to account for this higher cost of readiness.

⁶⁸ Additional information available from the National Rural EMS & Trauma Technical Assistance Center at <http://ruralhealth.hrsa.gov/ruralems/> sponsored by the US HHS, Health Resources and Services Administration (HRSA), Office of Rural Health Policy.

⁶⁹ General Accounting Office (US) [GAO]. Ambulance services: Medicare payments can be better targeted to trips in less densely populated rural areas. Washington, DC: U.S. General Accounting Office; 2003 Sep. GAO-03-986. p 10.

⁷⁰ Institutes of Medicine [IOM]. Emergency medical services at the crossroads. Washington DC: The National Academies Press; 2007. p 62-66.

⁷¹ Morris T. Emergency medical services in rural America. Denver, CO: National Conference of State Legislatures; June 2007. p 2.

⁷² Hogan C. AAA 2006 ambulance cost study. McLean, VA: American Ambulance Association; 2007 Jan. p 48.

⁷³ General Accounting Office (US) [GAO]. Ambulance services: Medicare payments can be better targeted to trips in less densely populated rural areas. Washington, DC: U.S. General Accounting Office; 2003 Sep. GAO-03-986. p 19.

⁷⁴ Government Accountability Office (US) [GAO]. Rural ambulances: Medicare fee schedule payments could be better targeted. Washington DC: U.S. Government Accountability Office; 2000 Jul. GAO/HEHS-00-115.

⁷⁵ Government Accountability Office (US) [GAO]. Rural payments can be better targeted to trips in less densely populated rural areas. Washington DC: U.S. Government Accountability Office; 2003 Sep. GAO-03-986.

⁷⁶ Government Accountability Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. Government Accountability Office; 2007 May. GAO-07-383. p 19.

⁷⁷ Hogan C. AAA 2006 ambulance cost study. McLean, VA: American Ambulance Association, 2007 Jan. p 33.

⁷⁸ Mohr P, Cheng M, Mueller C, Good C. Establishing a fair Medicare reimbursement for low-volume rural ambulance providers. Bethesda, MD: Project Hope Center for Health Affairs; 2001 July.

Rural providers also face tremendous challenges recruiting and retaining both paid and volunteer personnel.⁷⁹ In 2004, two-fifths of ambulance providers relied substantially on volunteer staff.⁸⁰ One study estimated that nearly three-quarters of low-volume rural providers operate with predominantly volunteer staff.⁸¹

Revenue sources for providers serving rural areas are diverse and include user fees, community tax support, charitable donations, state and federal grants and subscription programs. However, while funding resources in rural areas are severely limited, community expectations for service levels and response times are often based on urban standards.

Rural Ambulance Providers

Rural areas are served by a diverse group of providers including private, non-profit, government, and hospital-based services. There are also a growing number of urban and suburban-based providers with rural satellite operations. Across the country, a large number of providers serve rural areas each performing a very small number of transports. For example, about half of ambulance providers serve predominately rural and super-rural areas, while performing less than one quarter of all Medicare transports.⁸² Of the approximately 9,000 ambulance providers that bill Medicare, three-quarters are rural (6,750).⁸³ EMS systems, especially in rural areas, have evolved over time and as a result there is enormous variability in the design of EMS systems across states, regions and local areas.

Definition of Rural

The federal Office of Rural Health Policy (ORHP) uses the Rural/Urban Commuting Areas (RUCA) system as a rational, data-driven method to accurately target resources intended for rural populations. The RUCA system is a density-based system that classifies areas with similar population density characteristics. Every census tract in the U.S. is assigned to one of ten RUCA levels. Currently, ORHP considers all RUCA levels four through ten (4 to 10) to be rural. Further, ORHP has designated 132 large area census tracts with RUCA levels two and three (2 and 3) as rural. To identify rural transports for the Medicare ambulance fee schedule, CMS has adopted the RUCA system in place of the former Goldsmith Modification for the designation of rural areas within metropolitan counties. Within the RUCA system, small towns are designated rural and consist of populations from 2,500 to 10,000.⁸⁴

Rural areas have a great opportunity to benefit from the IOM Committee's vision for an emergency and trauma care system recommendations with the goals of improved coordination, expanded regionalization, and increased transparency and accountability.⁸⁵ Figure 10 describes how community leaders can incorporate the *Guide's* key concepts to maximize performance results with the inherent challenges and limited resources in small towns and rural areas.

⁷⁹ Additional information available from the National Association of State EMS Officials at <http://www.nasemsd.org>.

⁸⁰ General Accounting Office (US) [GAO]. Ambulance services: Medicare payments can be better targeted to trips in less densely populated rural areas. Washington, DC: U.S. General Accounting Office; 2003 Sep. GAO-03-986. p 10.

⁸¹ Mohr P, Cheng M, Mueller C. Establishing a fair Medicare reimbursement for low-volume rural ambulance providers. Bethesda, MD: Project Hope Center for Health Affairs; 2001 Jul. p 3.

⁸² General Accounting Office (US) [GAO]. Ambulance services: Medicare payments can be better targeted to trips in less densely populated rural areas. Washington, DC: U.S. General Accounting Office; 2003 Sep. GAO-03-986. p 10.

⁸³ General Accounting Office (US) [GAO]. Ambulance services: Medicare payments can be better targeted to trips in less densely populated rural areas. Washington, DC: U.S. General Accounting Office; 2003 Sep. GAO-03-986. p 36.

⁸⁴ Additional information about RUCA can be obtained at <http://depts.washington.edu/uwruca/>.

⁸⁵ McGinnis K. Rural and frontier EMS agenda for the future. Kansas City, MO: National Rural Health Association; 2004.

Figure 10: System Design Characteristics that Maximize Performance Results – Small Towns & Rural Communities

<i>System Design Component</i>	<i>Characteristics</i>
<i>Performance Requirements</i>	<p>24-hour geographic coverage with response time zones All ALS with paramedic/EMT crew configuration Creative strategies to recruit and retain personnel Maximize use of distance learning opportunities for personnel training Cross-train personnel with other aspects of public health or health care Use of technology and telemedicine opportunities Public education about system expectations with focus on injury prevention Explore expanded role or scope of practice by ambulance personnel and organizations Fully integrate with local, regional and state disaster response plans Feedback mechanisms measure customer satisfaction</p>
<i>Independent Oversight</i>	<p>Independent oversight entity engaged in regional planning and full integration with overall health care system Collaboration with local, regional and state public health, public safety, academic and community resources Encourage partnerships/joint ventures to eliminate duplication, maximize quality and reduce cost Independent medical oversight over system-wide regional networks Cooperation with regional quality improvement programs Benchmark system performance results</p>
<i>Business Structure</i>	<p>Single provider of emergency and non-emergency ambulance service serves multi-jurisdictional area Maximize economies of scale with urban, suburban and rural neighbors where possible Regional medical communications center electronically integrated with public-safety answering points with priority dispatch interrogation and pre-arrival instructions Public safety-based co-responders implement AED program</p>
<i>Legal Framework</i>	<p>Formal state legislative action authorizing local government market-rights preemption under federal antitrust state-action immunity provisions Interlocal agreements - facilitating multi-jurisdictional systems Local (city or county) ambulance service ordinance authorizing market-right allocation and independent oversight entity Performance-based ambulance service contract with triggered procurement process</p>
<i>Financing Strategy</i>	<p>Rate regulation optimizes user fee recovery, accounts for higher cost of readiness, uncompensated care and full labor cost Diverse revenue sources with access to grants, donations, community tax support and subscription program Consider preparedness-based funding model</p>

The Costs and Benefits of Quality

Effective EMS administrators establish public policy and emergency ambulance service performance standards based on sound scientific evidence while ensuring a balance between quality and cost. When defining performance standards in the emergency ambulance service contract, input should be sought from organizations and individuals within the EMS system. These include local community groups, public safety agencies, hospitals, managed-care organizations, emergency-physician groups, ambulance providers, government agencies, the public, and others. Their input will be of great value in establishing policies that meet the public's needs and expectations.

Health-care providers are currently under extreme pressure from insurers and government regulators to justify the costs and the benefits of medical services and treatments. Before establishing and upgrading staffing levels, response-time requirements, telecommunications technology, medical protocols, equipment and other standards, community leaders should conduct an analysis to identify the cost and expected outcome associated with each upgrade. Proposals to enhance services need to be judged for their clinical outcomes, not their perceived benefit.

Conducting a Cost-Benefit Analysis

The following five-step process for determining the costs and benefits of adding new system design features, equipment, drugs, and protocols to the EMS system is adapted from a presentation by Dr. Joseph P. Ornate, an internationally known emergency cardiac researcher at Virginia Commonwealth University Health System, Richmond, VA:

- **Step 1** — Is there a theoretical basis for the proposed change? Explain how the proposed change would help customers, patients, and the EMS system. Often these explanations rely on medical science and an understanding of systems theory.
- **Step 2** — Is there scientific research available to support this change? Evaluate the scientific literature. It is important to have a qualified individual review the research to determine its importance and validity.
- **Step 3** — Is the proposed change clinically important? Verify that the research shows clinical improvement for patients and that the clinical improvement is relevant in the out-of-hospital setting.
- **Step 4** — Is it practical, teachable, affordable and safe? A detailed evaluation of the EMS system's needs and resources should include the following issues: costs of implementation; enhancements to system efficiency; direct cost savings; and realistic plan for implementation, including training, system integration, safety, and impact on field personnel. Ensure that this is the best use of available funds.
- **Step 5** — Make the change. If the intended change stands up to scrutiny under the preceding four steps, make the change and carefully monitor its impact on patients, customers, and the system.

Much of the frustration associated with system redesign and change disappears when this simple five-step process is adopted and used by every participant in the EMS system. In fact, many manufacturers have adopted this procedure and provide copies of the scientific literature related to their products. In addition, personnel who have an idea for a new medication, piece of equipment, or protocol know what process they have to complete to obtain approval. Managers, in turn, will be more certain the dollars they spend are going toward improvements in their organizations that make a demonstrable improvement in the system.

By conducting a cost/benefit analysis on all potential changes or upgrades to the EMS system, community leaders will know they have in place a defined process with a high degree of accountability that can be presented to the public and to those entities responsible for paying for each component of the EMS system.⁸⁶ The ambulance service contract should provide an allowance or adjustment to pay for system upgrades that have passed the cost/benefit test and are not included in the initial performance specifications.

⁸⁶ Taigman, M. We need one on every ambulance! *Ambulance Industry Journal*. McLean, VA: American Ambulance Association; 1993 Jul/Aug, p 16.

Determining Clinical Standards

Public expectations, customer input, medical outcome research, and financial considerations all influence the clinical standards for an emergency ambulance service. The EMS system's medical director is responsible for determining the level of service delivered by each functional component of the EMS system. Increasingly, the policies of the federal Medicare and Medicaid programs, as well as those of commercial insurers, also are impacting emergency ambulance services. While medical directors determine protocols for ambulance and co-response levels of service based on medical considerations and local needs, these standards may not match the reimbursement policies mandated by government and private insurers. For example, local medical protocols may prescribe that a patient requires medical treatment and transport based on symptoms. Insurance-claim reviewers, however, may deem that same treatment and transport not medically necessary. These types of factors should be carefully considered when evaluating a new service or protocol.

The image shows the interior of an ambulance, viewed from the side. Two EMTs are visible, one in the foreground and one in the background, both wearing blue uniforms and white gloves. They are attending to a patient lying on a stretcher. The patient is covered with a white blanket and has a blue oxygen mask over their face. The ambulance interior is dimly lit, with several circular lights visible on the ceiling. The overall color scheme is dominated by a deep red or maroon hue, which is also the color of the text overlay. The text is centered and reads:

**Emergency Ambulance Service Contract:
Establishing the Legal Framework**

CHAPTER 4

Emergency Ambulance Service Contract: Establishing the Legal Framework

A sound legal framework forms the basis of a well-designed high-performance emergency ambulance service contract. The legal framework of the EMS system and the emergency ambulance service consists of one or more statutes, ordinances, contracts, regulations, franchise agreements, trust indentures or other legal instruments. The following are just a few of the crucial matters controlled by the system's legal framework:

- How service area rights and responsibilities are allocated among participating organizations.
- How clinical service levels, response times, and other standards are established, revised, and enforced.
- Whether and how funding policies are established.
- Whether and how the system's geographic boundaries may be altered to include additional jurisdictions or delete jurisdictions currently served.

The underlying legal framework of every system is unique. Each has to be adapted to accommodate applicable state statutes, local government charters, business aspects of the system's design, local preferences, and other factors unique to each community.

Relationship to the Business Structure

The ambulance service business structure and the legal framework within which it is authorized to operate are closely related and share many of the same structural elements. For example, the rate-control provisions of an ambulance service ordinance or statute are key elements of both the legal and business structures.

Every ambulance service contract's legal framework should be tailored to meet local needs and preferences. Generally, ambulance service contracts that have the potential to deliver high performance fall into one of two business structure models: contracted performance-based and contracted high-performance. In a contracted performance-based model, the organization operating the ambulance service is compensated by third-party payers, private-pay patients, community tax support, and other sources. In contrast, the organization that operates in the contracted high-performance model is a management subcontractor to a governmental or independent oversight entity. In this business structure, either the governmental entity or the ambulance service provider may sell the services and directly control ambulance fee collections.

Elements of the Legal Framework

The specific legal instruments required for various systems differ according to three critically important sources of design constraint: applicable law (constitutional and statutory), local government charters or equivalent instruments limiting or defining government powers or methods, and the system design and business structure. Key legal instruments include the following:

- ***State Enabling Legislation*** – passes state action anti-trust immunity onto the local government entity for purposes of service-area allocation.
- ***State Regulations*** – facilitates licensing of ambulance services and establishes minimum standards for ambulance service operations.
- ***Precedent-Setting Court Decisions*** – applicable court rulings relating to legal framework and business structure.
- ***Local Ambulance Service Ordinance*** – city or county ordinances establishing the EMS system design, market-rights allocation, and an independent oversight entity.
- ***Interlocal Agreements*** – facilitates multi-jurisdictional systems when the emergency ambulance service will cover more than one governmental locale.
- ***Emergency Ambulance Service Contract*** – between the contracting entity and the emergency ambulance service provider establishing business structure, performance requirements, provider payments, clinical standards and medical control, and any local standards higher than the state standard.
- ***Associated Agreements*** – including related contracts required for operation, such as three-way equipment leases and the medical director contract.

Anti-Trust Issues

For local governments to assign exclusive market rights to an ambulance service provider, state law must authorize local governments to allocate service-area rights free from anti-trust encumbrances. Most legal challenges to system redesign come from displaced local firms or unsuccessful bidders in a competitive process. The most commonly threatened cause of action rests on anti-trust law, e.g., an allegation that an award of service-area rights by local government or the enforcement of those rights against others violates anti-trust law. Related claims often include allegations that actions by local government resulted in the displacement of an incumbent firm and violate constitutional prohibitions against the “taking” of property without due process of law or fair compensation.

Cases that have been decided by federal appellate courts provide comfort on these issues. See *Gold Cross Ambulance v Kansas City, MO*, 705 F2d 1005 (8th Cir 1983); *Ambulance Service of Reno v Nevada Ambulance Service*, 819 F2d 910 (9th Cir 1987); and an unpublished 5th Circuit decision, *Central Ambulance v Fort Worth, Texas* (5th Cir 1986). These cases held that, where state statutory authority explicitly or by implication allows local government to provide for or arrange ambulance services through a single agency, the local government taking the action is immune from anti-trust claims in regard to taking that action—i.e., *state action exemption*. Additionally, *Gold Cross Ambulance* specifically rejected all constitutional claims (i.e., claims based on the right to due process and/or prohibitions against “taking”) raised by the plaintiff, a displaced competitor.

In addition to the state action exemption, the Local Government Anti-trust Act of 1984 provides immunity for local government agencies, and those acting for or on their behalf, from the treble-damages provisions of the anti-trust laws, even where the state action exemption does not apply. However, since injunctive relief is still an available remedy, blanket immunity must be established under the *Gold Cross Ambulance* holding and the cases following *Gold Cross Ambulance*. Each state’s laws determine whether such immunity exists.

Even though local government is immune from the treble-damages provisions of anti-trust law, private firms cooperating with local government are not immune. Thus, unless the authority of local government to allocate service-area rights is settled reasonably, local government should be prepared to address the issue of limited indemnification of the chosen provider. For example, indemnification should be limited to causes of action by third parties. This may result from the provider’s compliance with the procurement policies of local government. Absent such assurance (where the law is unclear), the best-qualified providers may understandably shy away from the procurement.

Additionally, if such state legislation exists, there will be related state regulation establishing the process and criterion for service-area allocation at the local governmental level. These regulations need to be understood and adhered to by all parties.

Local Ambulance Service Ordinance

The local ambulance service ordinance establishes a number of key components of the ambulance service system, including the following:

- It should establish an independent physician medical director and create and periodically update the patient care standards and protocols that govern system performance.
- It can regulate ambulance-service rate structures and community tax support levels; within a portion or all of its jurisdictions, the local government entity(s) may choose to augment ambulance fees with community tax support, or require full funding of ambulance service costs from ambulance fees with no community tax support.
- It creates an independent oversight entity that establishes and oversees the provider's compliance with the performance, clinical, and business requirements of the emergency ambulance service contract.
- It can also allow or prohibit the existence of specialized interfacility ambulance transport providers (e.g., neonatal transports, special events, etc.).

Interlocal Agreements

In a multi-jurisdictional system, the ambulance service interlocal agreement enables local governments to pool their purchasing power to achieve economies of scale and to secure ambulance service for the residents of multiple jurisdictions. Special features of the agreement allow other jurisdictions to add their purchasing power to the group purchasing arrangement to provide higher quality ambulance service at lower cost throughout the contracted service area.

There is great value in multiple jurisdictions cooperating to provide improved and efficient service coverage to rural and suburban areas. A multi-jurisdictional system can be accomplished using multiple contracts or a master contract with interlocal agreements. Since participating jurisdictions share in the consequences of certain decisions such as bidder selection, provider compensation, changes in the system standard of care, infrastructure development, and similar matters of collective concern, authority for deciding these matters *cannot* be reserved for individual decision-making by each jurisdiction. The power to decide these kinds of issues should be delegated to a multi-jurisdictional agency—the independent oversight entity.

It is recommended that each jurisdiction participating in an interlocal agreement retain the right to choose separately from a uniform schedule of community tax support/ambulance fee options. For example, one participating jurisdiction may prefer zero community tax support and higher user fees, while another may choose to offset a portion of its user fees through local tax support. Other local governments may enjoy the benefits of regional participation, with or without community tax support, by negotiating a separate contract with the ambulance service provider, incorporating the clinical standards and compensation provisions of the contract. All these financing strategies can coexist peacefully within the same multi-jurisdictional system.

Emergency Ambulance Service Contract

The emergency ambulance service contract exists between the independent oversight entity and the emergency ambulance service provider and requires specific levels of clinical performance, response-time reliability, economic efficiency, and customer satisfaction. The contract should be written such that both the contracting entity and the emergency ambulance service provider are obligated to provide clinical excellence for the residents of the community(s) they serve. Both entities are responsible for cost-

containment and presenting a professional and courteous image. The contract should also demonstrate the contracting entity's expectation that the provider will be operationally and financially successful. Under the contract, the relationship between the contracting entity and the provider should be outlined so that it is generally one of cooperation, not conflict, achieving the best possible alignment of the community interest with the provider's expertise.

Finally, the contract should allow the provider to use its best expert and professional judgment in deciding on the methods to be employed to achieve and maintain the level of performance required by the contract. This encourages innovation, efficiency, and superior levels of performance.

Several other agreements may be required to secure related components of the emergency ambulance service. These may include the medical director contract and three-way lease arrangements for capital equipment.



**Contracting Safely:
Creating an RFP with Accountability**

CHAPTER 5

Contracting Safely: Creating an RFP with Accountability

An effective procurement process, combined with sound system design, is essential for achieving high-performance emergency ambulance service. Government should be an educated buyer of emergency ambulance services and use advanced contracting tools to ensure that the community receives the highest quality, most reliable and cost-effective delivery of emergency ambulance service, and that the best organization is selected to operate the service. To facilitate this process, and to become an educated buyer of these services, the community is strongly encouraged to retain an experienced EMS consultant with expertise in EMS system design and emergency ambulance service procurement.

There are risks involved in a flawed procurement process. First, inadequate accountability can lead to poor patient care, costly service, and loss of system credibility. Failure to properly apply the elements of competitive contracting can result in expensive litigation. Finally, failure to require the appropriate method and level of performance security leaves the community open to unnecessary liability exposure and provides the community with no protection against interruption of service due to breach of contract.

A significant advantage of performance-based contracting is the ability of local government to terminate a contract should the provider fail to perform as contractually agreed. This powerful incentive to perform does not exist in level-of-effort contracts or in-house provided services because the retention of service-area rights is not tied to pre-established performance or economic requirements. Before an independent oversight entity can safely contract with any ambulance service provider, it should be prepared to safely terminate that contract.

Not all problems encountered during the term of an ambulance service agreement become a factor in a major breach of contract. On the contrary, the implementation of Continuous Quality Improvement (CQI) processes requires a constant monitoring of the service to identify weak or problem areas and to formulate solutions prior to major breaches. Additionally, the independent oversight entity has a stake in ensuring its provider's success by designing provisions for infrastructure development, clinical and technological advancements, monitoring and enforcement, and conflict resolution (see Chapter 7).

Planning the Procurement Process

A professionally managed procurement process is the essential element in achieving a sound contract. Well-written Request for Credentials (RFC) and Request for Proposals (RFP) documents not only address reasonable credentialing and performance expectations, but also establish guidelines describing how the contract will be implemented. Methods detailed in this section will help provide for a successful procurement process and a mutually beneficial, long-term contractual relationship.

The crucial first step in any procurement process is to analyze the current emergency ambulance service's performance. This analysis will determine whether revisions to the performance criteria are desired and affordable, and whether changes in the legal framework or business structure are necessary. The

contracting entity should establish the system design before the process of contracting for emergency ambulance service begins.

Important questions to answer during this phase include:

- What is the status of the current provider or providers?
- Have the Essential Performance Results been addressed?
- Have the Hallmarks been addressed?
- How does the current provider benchmark against other providers?
- Is a competitive procurement process required?

By addressing these questions, the independent oversight entity or the government body overseeing the process can determine whether to move forward and the best approach to use.

When one or more of the Essential Performance Results or Hallmarks fail to meet expectations, or are absent, the following procurement options should be considered carefully:

- Sole-source negotiate a performance-based contract with existing provider(s) and fine tune existing performance.
- Sole-source negotiate a performance-based contract with existing provider(s), with the stipulation that there will be a future competitive procurement process to retain service-area rights via service-area comparisons or open competitive process.
- Closed, competitive procurement process involving only existing provider(s), with the stipulation that there will be a future competitive procurement process to retain service-area rights via service-area comparisons or open competitive process.
- Open, competitive procurement process.

Determining if a Procurement Process is Warranted

When making the decision about whether to proceed with a procurement process, assuming all the Essential Performance Results and Hallmarks are met, it is important to determine whether such a step will be beneficial. For example, if the community currently has an experienced provider with good to excellent performance, it may be just as effective and less costly to negotiate a contract or contract extension.

Community leaders should consider the following alternatives when making the decision to participate in a procurement process:

- Benchmarking
- Earned extension
- Periodic competition
- Triggered competition
- No term

Benchmarking

Benchmarking provides a rational and fair alternative to competition. The process allows the independent oversight entity to evaluate the incumbent provider by assessing certain performance indicators within specific parameters. The performance indicators are measured every four to five years against consistent comparables from other high-quality, efficient systems to determine the value and quality of the service that the incumbent provider is delivering to the community.

In some communities, incumbent providers may have achieved some or all of the essential performance results through their own internal requirements. Other incumbent providers may have been prohibited historically from making advancements due to local constraints. Consider these factors when benchmarking an incumbent provider's performance and determining whether a procurement process is warranted. Figure 11 lists examples of frequently measured performance indicators as they relate to the five Hallmarks.⁸⁷

⁸⁷ Fitch J. Consultant report: comprehensive market review. Platte City, MO: Fitch & Associates, LLC; 2002 May. p 5-6.

If the benchmarking process indicates that the potential cost savings or improvements in service do not justify the potential fiscal, operational, or clinical risk of the procurement process, local government may choose to negotiate a contract extension.

Earned Extensions

Often termed as an “opportunity for extension,” a provider can earn renewal extensions at different periods during the contract term by meeting criteria specified in the original ambulance contract. Following are examples of these specified criteria:

- Clinical and response-time performance meet or exceed requirements.
- Substantial compliance with the applicable federal and state requirements; local laws, rules and regulations; and the performance obligations of the agreement.
- Exceptional performance characterized by the provider meeting or exceeding all the commitments in its winning proposal and/or contract.
- An agreement by the provider that any renewal pricing will not exceed a predetermined percent increase.
- Exceptional customer and community services.

An earned extension may be awarded after a specified time during the term of the contract. For example, in a five-year contract, the provider can be awarded an earned extension after the second and fourth contract years, with the extensions added on to the end of the contract. In this example, should the provider earn two one-year extensions, the service would be able to operate for seven years under contract.

Periodic Competition

Periodic competition requires a competitive procurement process at the completion of a specific term, regardless of the provider’s performance. This approach may subject the community to an unnecessarily long and complex process that can result in neither better quality nor value for its residents. Some stable high-performance systems have found that benchmarking is a better alternative to this approach.

Triggered Competition

In contracts with triggered competition, an event or previously agreed-on condition stimulates competition. For example, triggered competition in a well-designed system may occur in the event of provider failure or if the provider is unable to contain price increases. Triggered competition may be combined with other forms of competition as a contingency option.

No Term

Many communities have no specific term or policy related to competition. In this case, the provider is not exposed to competition or even the threat of competition. This policy does not achieve the Hallmarks and is strongly discouraged.

Figure 11: Benchmarking Characteristics

Hallmark 1 — Hold the emergency ambulance service accountable.

- Provides ALS to all requests for service
- Medical communications center accreditation
- Response-time reliability achieved
- Fractile compliance for emergency and interfacility responses
- Response-time measurement from patient's perspective

Hallmark 2 — Establish an independent oversight entity.

- Employs evaluation tool of pre-arrival instructions
- EMD-certified dispatchers
- Clinical capability and training of ambulance personnel beyond state standard
- Sophisticated quality improvement processes in place
- Sophisticated pharmacological agents available
- Sophisticated ALS procedures and equipment available

Hallmark 3 — Account for all service costs.

- Prepares audited financial statements
- Provides for full-cost accounting
- Benchmarks cost per transport, cost per unit hour, and total system cost per capita against other providers

Hallmark 4 — Require system features that ensure economic efficiency.

- Vehicle safety achieved
- Employee safety achieved
- Effective management of accounts receivable
- No or low community tax support

Hallmark 5 — Ensure long-term high performance service.

- Offers community value-added services
- Produces positive customer satisfaction surveys results

Establishing a Realistic Time Line

The amount of time required to conduct a competitive procurement process varies depending on a number of factors. Figure 12 provides a sample timeline and outlines the steps necessary to conduct a successful competitive procurement process.

Figure 12: Sample Timeline for Model Emergency Ambulance Service Procurement Process

Months	Step
24	Review system design alternatives, identify options, and establish policy
12	Make the decision to initiate a competitive process; verify and obtain necessary authority
12	Develop the RFC and RFP documents
10	Advertise and issue RFC and RFP documents
9	Conduct pre-procurement process conference
8	Credentials due
7	Review credentials and announce eligible providers
5	Proposals due; review may include: <ul style="list-style-type: none">• written materials and references• oral interviews or presentations• site visits
4	Selection committee announces recommendation
4	Final contract negotiations
3	Contract execution
0	System start-up

Attracting Qualified Providers

Attracting qualified providers is extremely important in the procurement process. The process should result in the selection of a qualified ambulance service provider that will deliver the best service at the optimum price to the community. It should not be the objective of the independent oversight entity to develop criteria that favor unqualified providers or impede the financial success of the selected provider. However, if there are to be changes to the system standard of care or certain other standards, it is *pro-competitive* to resolve system design and legal barriers first, and then allow a transition period for incumbent providers to gain a track record of performance. Dedicated local providers should not be penalized unfairly due to changes in public policy or an increase in performance standards.

The goal of the competitive procurement process is to attract multiple, qualified providers that are willing to submit a response to the community's requirements as specified by the RFP. It is not the goal to create a process that includes such stringent or impractical requirements that no provider wishes to contract with the community. Although it is embarrassing to issue an RFP and receive no proposals, this has occurred, typically when communities develop poor specifications or otherwise demonstrate that they do not understand or do not know how to structure an objective procurement process. In the end, flawed procurements can be expensive for both communities and potential providers.

Each provider has the right to expect that the community knows what it wants to purchase before issuing the invitation to submit proposals. Before entering into a competitive procurement process, community leaders should consider carefully the complexities of conducting an emergency ambulance service procurement. It is recommended that local officials use independent ambulance service procurement experts.

Pre-Qualifying Potential Bidders: Request for Credentials (RFC)

When properly employed, credentialing is an important and powerful tool in the procurement of a new provider or in the evaluation of an existing provider.

Developing a credentialing process and evaluating responses is an excellent experience for the independent oversight entity. This process allows for an initial assessment, narrows the range of choices, and eliminates unqualified proposals before the important selection of a provider is made.

The procurement documents (both the RFC and RFP) specify the minimum qualifications of prospective providers in several key areas. They also formalize what the community perceives as its problems and states the priorities and criteria important to that community.

Once received by the procurement committee, the credentials are evaluated using the provider's analogous track record in the areas it currently serves to gain an understanding of its existing clinical capabilities and business practices. The RFC should require documentation that describes the provider's analogous track record in the key areas listed in Figure 13.

Each of the RFC evaluation criterion is given a point weighted according to the community's priorities. The evaluation process is based on an objective review of each criterion as compared with the minimums set forth in the RFC document. The evaluation score determines whether the provider is qualified to continue in the procurement process and is allowed to submit a proposal. Those providers scoring below a pre-established minimum score are not allowed to submit a proposal.

Figure 13: Sample Credentials Evaluation Criteria

1. Response-Time Performance
2. Clinical Performance
3. Medical Communications Center Operations
4. Customer Service
5. Effective Risk Management, and Vehicle and Equipment Maintenance
6. Community Service
7. Accounts Receivable Management
8. Qualifications of Key Personnel, and Management Bench Strength
9. Financial Strength

Organizing the Selection Process

To ensure a fair selection process, take the following steps before evaluating any RFCs and RFPs:

- ***Step 1.*** Retain an experienced EMS consultant with a successful track record in EMS system design and emergency ambulance service procurement.
- ***Step 2.*** Determine the primary competitive procurement variable: quality or price.
- ***Step 3.*** Establish the following reviewer standards and responsibilities (rules of engagement):
 - Outline time commitments for participation.
 - Require reviewers to read RFPs and proposals and allow sufficient time for review.
 - Eliminate any conflict of interest by requiring reviewers to sign conflict-of-interest disclosure statements.
 - Do not allow lobbying of reviewers.
 - Reimburse reviewers for expenses and consider paying an honorarium for the extensive amount of time required, especially for a first-time procurement process.
 - Establish rules of engagement regarding scoring; these are imperative to ensure fair evaluation of each proposal.

- **Step 4.** Create a neutral procurement review committee containing the following recommended representatives:
 - Accountant
 - Two EMS medical directors (one medical director from the EMS system, if available, and one from another community)
 - Two executives from another community’s independent oversight entity
 - Two community representatives
 - Legal counsel and the EMS system design and procurement consultant as non-voting advisers
- **Step 5.** Clearly state the proposal evaluation process:
 - Number of points to be awarded for each criteria, including how criteria will be weighted and totaled.
 - The lead consultant or procurement coordinator facilitates discussion of each proposal —this discussion ensures that the reviewers benefit from the unique expertise of each reviewer.
 - Determine when and how oral presentations will be made.

Eliminating Cavalier Proposals

One of the greatest threats to a successful procurement process for both the community and the provider is a proposal that contains unrealistic commitments, or what is termed a “cavalier” proposal. When this occurs, qualified providers that submitted realistic proposals meeting the RFP requirements may be passed over in favor of the proposal that is too good to be true. A provider that misunderstood the requirements, was inexperienced or overestimated its ability may have submitted the proposal innocently. The procurement selection committee that does not recognize the unrealistic commitment and accepts a commitment that far exceeds the other proposals compounds the mistake and places the community and providers at risk.

The following serves as an example of a cavalier proposal:

A community issues an RFP for emergency ambulance services and requires a response time of 10 minutes or less, with 90 percent reliability. A provider that has never dealt with fractile response times proposes to exceed the community’s requirement by committing to a response time of five minutes or less with 90 percent reliability. The provider believes it is committing to an average rather than a fractile response time. The procurement committee is impressed by any provider that could commit to such a stringent fractile response time. The cavalier proposal wins the competition, and the misunderstanding is not discovered until after the contract is signed. Since a five-minute fractile commitment requires significantly more resources than a five-minute average commitment, the provider fails in less than one year of starting service, and the community is forced into another procurement process, overshadowed by the potential risk of an interruption in its emergency ambulance service.

With a cavalier proposal, nobody wins. Neither the expectations of the community nor the provider are met. To prevent cavalier proposals, the community should implement an effective credentialing process and a careful proposal evaluation process.

Developing the Request for Proposal Document (RFP)

The RFP document establishes the framework for specifying the minimum performance specifications for the emergency ambulance service contract. The provisions of each RFP should be tailored exclusively to the specific business structure, legal framework, and financing strategy being employed. No attempt should be made to insert specific provisions from other RFPs. “Cutting and pasting” provisions from other RFPs without expert evaluation of how they relate to the community in question is a dangerous practice.

The development of the RFP document is the single most important element in defining the emergency ambulance service contract. It should be created simultaneously with the RFC document and released at the same time. Experts in EMS system design and emergency ambulance service procurement should

develop these documents. Numerous examples of failed procurements have resulted from poorly written RFC and RFP documents that inappropriately and dangerously mix system design and emergency ambulance contract features.

Competitive Procurement Variable

The RFP document should clearly establish the competitive procurement variable: *price* or *quality of service*. It is difficult, if not impossible, to objectively evaluate competitive proposals submitted with both quality-of-service and price variables. Many successful emergency ambulance service procurements have fixed the price (ambulance fees and community tax support amount) at a predetermined level and then compared quality-of-service proposals.

Where quality of service is the competitive variable, additional commitments offered by the winning provider serve to enhance and further define the contract performance specifications. The RFP specifies the minimum levels of performance required by the provider for response-time and clinical performance. Providers should commit to meet the minimum requirements specified in the RFP and may make additional commitments, which are reviewed and awarded points.

For a true comparison, it is necessary to fix certain contract assumptions to allow competition to be isolated to a single procurement variable. To illustrate why this is necessary, consider the following example: Provider A presents an offer of average-quality service at a medium cost, while Provider B presents an offer of above-average service at above-medium cost. In such a process, unless the community has previously stated that quality of care will be given more or less weight than cost, the selection process becomes more a matter of preference than objective, structured competition.

Structure of the RFP Document

A procurement process with a quality variable will include commitments to meet or exceed the minimum requirements as established in the RFP for the following categories:

- Clinical and response-time performance
- Medical communications center operations
- Quality of equipment and maintenance
- Cultural diversity
- Customer service
- Community education and information program
- Fair accounts receivable practices
- Cost control and risk management
- Key management personnel
- Treatment of incumbent workforce

While all these requirements are commonly found in performance-based ambulance contracts, specific competitive criteria may vary depending on system design, business structure, and financing strategy.

Types of Contracts

The RFP document becomes the foundation of the contract between an independent oversight entity and an emergency ambulance provider. In the contract, the community agrees to grant market rights and retain the services of the ambulance provider, and the provider agrees to accept the work. The following are two basic forms of emergency ambulance contracts:

- Level-of-effort
- Performance-based

Level-of-Effort Contract

In a level-of-effort contract, community leaders agree to grant the provider the opportunity to serve a certain area or region and the provider commits to a specific level of effort or a specific amount of resources. The promise of effort is the basis of the provider's consideration in exchange for the ability to serve the area.

To illustrate, a contract requiring a specific number of on-duty ambulances establishes a level-of-effort for the provider. In this case, the provider meets the requirement for the number of on-duty ambulances, but the number required may be insufficient to meet the demand for emergency ambulance service requests or achieve desired response-time performance. The emergency ambulance provider has met its contractual obligation, even if it is not meeting the patient's needs. Therein exists the greatest problem with level-of-effort contracts for ambulance services—it requires that the *buyer* have expertise in the delivery of emergency ambulance services.

Performance-Based Contract

In a performance-based contract, the consideration offered by the emergency ambulance provider is a specific commitment of performance or results in exchange for the opportunity and privilege of serving the area or region. In a performance-based contract, it is the results, not the methods by which the provider achieves those results that are specified and measured.

The most common performance criteria used in emergency ambulance contracts are clinical sophistication, medical communications center performance, and response-time reliability. Frequently, economic penalties are established for minor breaches of performance, and serious economic penalties and termination of the opportunity to serve the area or region are established in the event of major breaches in the agreement.

A common mistake is to attempt to combine level-of-effort contract provisions with those of a performance-based contract. For example, a flawed contract of this type may require both a certain number of ambulances stationed at mandated locations (level-of-effort) *and* a specific response-time performance (performance-based). This results in conflict and confusion and creates the conditions for inefficiency. The provider may eventually fail because ambulance deployment is based on artificial constraints instead of historical and evolving demand patterns.

Compensation Provisions

Well-designed EMS systems ensure the financial stability of the system and its provider(s) by planning proper methods for compensating the provider. In some business structure models, the provider collects fees from patients and manages the accounts receivable. If this is the case, the RFP should require effective accounts receivable management practices and reasonable collection policies. Additional requirements may include automated billing systems, customer service programs, assistance in billing the patient's insurance company, and experience in dealing with Medicare and Medicaid programs.

In certain contracted high-performance emergency ambulance service models, the independent oversight entity retains the responsibility for billing and collections. The oversight entity then pays a monthly management fee to the provider, based on the predetermined amount authorized in the RFP or the amount set forth in the contract. Monthly payments are for the provision of overall system management and operation and are not tied to a specific number of emergency transports, procedures performed, or medical supplies used. The monthly payment also may reflect standby services and other special contractual provisions. In addition, compensation may include service area rights and other elements of value to the provider, such as the use of equipment and facilities, including:

- Central ambulance operations facility
- Medical communications center
- Post-location facilities
- Dispatch communications equipment and maintenance services
- Medical communications system
- CAD hardware and software
- Telephone dispatch systems
- Medical quality control and medical director services
- Use of a licensed trade name
- Revenues from outside work

Establishing System Safeguards

The RFP and the subsequent emergency ambulance service contract must contain provisions designed to ensure uninterrupted emergency ambulance service in the event of major contract default. The independent oversight entity must be prepared to continue uninterrupted service should the provider be unable to fulfill its obligations. This includes having a plan and structure in place to finance and immediately assume responsibility for the provision of emergency ambulance services, including its infrastructure, and to potentially initiate a new procurement process.

Performance Penalties and Rewards

Financial penalties represent a form of performance security and can be imposed for minor contract infractions. For instance, when a provider fails to meet mandated response times, it must pay a per-minute penalty to the independent oversight entity. Over the years, high-performance emergency ambulance service contracts have incorporated performance penalties and rewards to encourage consistently superior performance. The most common penalties and rewards occur in the response-time area, with the provider being penalized for emergency responses that are beyond the community's established response-time criteria. The penalties are levied on a per-minute basis, or part thereof, up to a maximum penalty amount.

Figure 14 provides a guide for developing penalty minimum and maximum amounts. Developed by the Coalition of Advanced Emergency Medical Systems (CAEMS),⁸⁸ these statistics represent the mean levels of per-minute response-time penalty and the average maximum penalty for high-performance emergency ambulance service systems. These statistics provide the range used by some of the country's highest performing emergency ambulance services.

Figure 14: Life-Threatening Emergency Response-time Penalties
High-performance EMS Systems

<i>System</i>	<i>Per Minute</i>	<i>Maximum</i>
Ft. Wayne, IN	\$10	\$100
Oklahoma City, OK	\$10	\$250
Pinellas County, FL	\$7	none*
Reno, NV	\$12	\$150
Richmond, VA	\$20	\$500
Tulsa, OK	\$10	\$250
Clark County, WA	\$15	\$225
Mecklenburg, NC	\$10	\$200
Nova Scotia, Canada	\$13	\$167

Another component of the penalty and reward policy is to develop a major penalty for occasional departure from the 90 percent standard. This penalty is in addition to the per-call penalties and progresses in increasingly severe amounts for each percentage point below the 90 percent standard. For example, if a provider's response-time compliance for any given month for life-threatening emergencies is only 89 percent, the provider may be assessed an additional lump-sum penalty. If substandard performance continues during the next month, the lump-sum penalty will increase incrementally as the compliance percentage drops from the standard. Caution should be exercised in determining the lump-sum penalty amounts to ensure that they are relative to the size of the emergency ambulance service system. The performance-based contract must describe the specific circumstances under which sustained substandard performance constitutes major contract default.

⁸⁸ Overton J. High performance and EMS: market study 2006. Richmond, VA: Coalition of Advanced Emergency Medical Systems; 2006, p 18.

The independent oversight entity may develop other types of penalties for occasional performance issues that do not constitute major contract default. Some examples of these include:

- Missing, inaccurate, or altered data on patient care reports.
- Failure to keep personnel certification records current.
- Failure to meet minimum state and/or local ambulance service requirements.
- Required payment or write-off of a patient bill in the event of a severe and substantiated customer service problem.
- Other minor contract deviations.

It is recommended that the independent oversight entity place all funds from assessed penalties into a dedicated account used to further community health programs or other such activities that benefit the community and do not directly benefit either party.

Many emergency ambulance service contracts contain provisions to reward superior performance, typically for response-time performance. For example, if the provider’s response-time compliance for any given month exceeds 90 percent, the provider may earn lump-sum rewards. If superior performance continues, the lump-sum rewards increase incrementally as the compliance percentage exceeds the established standard. Figure 15 provides an example of the superior performance.

Figure 15: Superior Performance Incentives	
<i>Adjustments to Base</i>	
<i>Actual Reliability Fine of \$15.00/minute</i>	
Greater than 95%	no deduction
93% to 95%	(\$6.00)/minute
90% to 93%	(\$3.00)/minute
86% to 90%	no adjustment

Performance Security

A well-designed contract incorporates a variety of performance security measures to minimize the potential for failure and to sustain uninterrupted service in the event of major contract default. Enforceable performance security measures should be described in the RFP document and established in the contract for emergency ambulance services.

The independent oversight entity carefully balances the amounts and types of performance security required. If too much performance security is required, qualified smaller high-performance emergency ambulance providers may inadvertently be excluded from competition. This reduces the community’s chance of receiving the highest quality at the optimum cost. Conversely, if the performance security is too small, the community is at risk in the event of contract default.

Properly structured performance security measures include provisions to immediately transfer the essential assets (e.g., vehicles, medical equipment, communications systems, etc.) to ensure the provision of uninterrupted emergency ambulance service in the event of contract breach. The transfer of these assets to the independent oversight entity remains in place during the course of any appeal. One legal mechanism to facilitate this transfer of assets is a “three-way lease.” When the emergency ambulance provider leases equipment, such as vehicles, for the performance of the contract, the executed lease agreement includes all three parties, the ambulance provider, the vendor, and the independent oversight entity. The three-way lease assures uninterrupted emergency ambulance service in the event there is a change in the provider of service. The independent oversight entity should obtain legal counsel to ensure this mechanism is enforceable in its jurisdiction.

In addition to securing access to the essential assets, immediate access to sufficient cash flow is necessary to sustain uninterrupted emergency ambulance services. The procurement process should require providers to secure a performance bond that will be paid to the entity responsible for contractual oversight on declaration of major contract default.

The amount of the performance security should be sufficient to sustain interim operations, yet should not be so high as to eliminate competent and qualified firms from competition. The size of the performance security should be commensurate with the projected cash-flow needs required to continue to operate the emergency ambulance service. If the independent oversight entity does not own the assets and the accounts receivable, a general rule is the provision of 30 to 60 days operating expenses. If the independent oversight entity owns some or all of the assets and the accounts receivable, the cash-flow needs are reduced significantly. Caution should be exercised not to overly restrict the business activities of potential providers by requiring an inflated performance bond. Unrealistic or unnecessary financial barriers may preclude otherwise qualified providers from participating in a procurement process.

Terminating a Contract

Professionally managed procurements offer significant safeguards against major contract default. One of the key advantages of a performance-based contract is the ability to terminate the emergency ambulance service contract if the provider does not meet the contract's specified levels of performance. This can occur due to continued lackluster performance, failure to meet the contract's minimum requirements, or cost overruns. The incentive to avoid contract termination is a powerful reason for the provider to fully meet the terms of the agreement. This incentive does not exist for government providers unless pre-determined performance and economic efficiency standards are mandated and enforced, up to and including termination of contract.

In the case of major contract default, the provider is notified and given 30 days in which to correct the problem. Failure to comply within the 30-day period results in contract default, with assumption of emergency ambulance operations by the independent oversight entity occurring immediately. Sample reasons for major contract default include:

- Failure to meet contractual response-time performance specifications.
- Failure to maintain necessary licenses, certifications, and registrations required by ordinance, law, or by contract.
- Failure to take action to correct operational deficiencies.
- Failure to comply with proposal commitments relating to clinical standards, medical communications center standards, operational practices, fleet maintenance operations, accounts receivable management practices, or other offers made in the winning provider's proposal.

In the event of contract termination, the independent oversight entity assumes the operational responsibility until a decision is made to exercise one of the following:

- Award the contract to the runner-up provider from the most recent procurement process.
- Initiate a subsequent procurement process to secure a qualified provider.
- Operate the system for a defined time period to enhance the community's ability to attract qualified providers.

Essential Transition Issues

The RFP and the emergency ambulance services contract should describe how to handle certain essential issues in the event a transition occurs from one ambulance provider to another. Figure 16 lists examples of essential transition issues, including the transition of essential service records.

If the emergency ambulance provider is responsible for key assets, a mechanism, legally enforceable and agreed to by the parties, must be established to allow the transition to proceed in an orderly and fair manner without interruption of service to the community.

In the event the independent oversight entity does not already collect ambulance fees and perform accounts

receivable management, it should be prepared to immediately outsource this function to ensure cash flow while decisions are made regarding how ambulance fee collections will be managed over the longer term.

The key is to preplan these contingencies during the RFP and contract phases, and not during the actual transition. These complex issues require the attention and input from an expert in emergency ambulance service procurement during document development and negotiations.

Figure 16: Essential Transition Issues

- Personnel records
- Patient records
- Financial records
- Maintenance records
- Training records
- Asset and capital-lease records
- Medical communication center records
- Records required by local, state, and federal laws
- Equipment and supplies
- Lists of business and operational contacts (such as vendors and customers)
- Administrative, communications, and operations software



**Focus on Efficiency:
Developing the Financing Strategy**

CHAPTER 6

Focus on Efficiency: Developing the Financing Strategy

How do high-performance emergency ambulance service systems achieve the highest levels of clinical performance and response-time reliability while maximizing economic efficiency and customer satisfaction? To answer this question, community leaders need a thorough understanding of the complexities of developing the financing strategy within an effective high-performance emergency ambulance service system design.

Emergency Ambulance Service Costs

This section describes the process used to identify and evaluate the data that will furnish a fair and meaningful comparison of emergency ambulance service costs and productivity. When evaluating emergency ambulance service costs, priority is given to understanding the following principles.

Price Does Not Equal Cost. The “price” of emergency ambulance service (i.e., the patient charges or ambulance fees), rarely equals its “cost.” The availability of community tax support affects the public’s perception of service cost. As a result, some of the most efficient emergency ambulance services charge high ambulance fees, while the artificially low ambulance fees charged by services that receive significant funding from community tax support create the illusion of a bargain.

Another reason price often does not equal cost is the below-cost ambulance reimbursement by the Medicare and Medicaid programs. The result is a cost shift to other payers, such as commercial insurance, private payers, and taxpayers. In other words, the below-cost reimbursement rates of Medicare and Medicaid force emergency ambulance service providers to charge other payers higher ambulance fees to cover their costs. Based on a federal ambulance cost study, the national Medicare ambulance fee schedule is 6 percent below the national average cost per transport.⁸⁹ While Medicaid reimbursement varies by state, Medicaid base rates for advanced life support emergency service (ALS-E) in 49 states are below cost, with the majority of the states (31 states) paying less than 50 percent of the national average cost per transport.⁹⁰

Direct Cost Does Not Equal Full Cost. The full cost of operating an emergency ambulance service includes many different costs, including all operations labor, vehicles and fleet maintenance, medical supply and equipment, medical communications center, building and facilities, administrative, and other operating costs. A comprehensive analysis and comparison of emergency ambulance service costs must include all direct, indirect, and shared costs. This approach has been identified as valid and reliable by the federal Government Accountability Office (GAO)⁹¹.

⁸⁹ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 24.

⁹⁰ Werfel B, Werfel D, Staffan B. 2008 Medicaid rate survey. Mclean, VA: American Ambulance Association; 2008.

⁹¹ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 5.

More Community Tax Support Does Not Necessarily Result in Higher-Quality Emergency Ambulance Service. The quality of an emergency ambulance service is best determined by the presence of specific performance requirements that ensure the provider meets predetermined response times and defined clinical standards, and not by the amount of community tax support it receives. There may be a legitimate purpose for the community to provide tax support, for example, it may be needed to adequately fund ambulance services provided to the uninsured. In addition, incentives should be in place to ensure efficiency of the operation. Without these provisions, increased tax support can actually remove incentives to optimize efficiency. Unless access to community tax support is carefully structured, costs could be driven higher without achieving optimum service quality and reliability.⁹²

Measuring Cost of Readiness

When a patient experiences a medical emergency, the ambulance must arrive within a few minutes or the patient may not survive. For providers of emergency ambulance service, this “cost of readiness” is defined as all the costs associated with placing enough resources (i.e., ambulances) in the community to meet clinically meaningful response times. The basic unit of measure for ambulance service cost of readiness is the unit hour, which is defined as one hour of service by a fully equipped and staffed ambulance assigned to a call or available for dispatch. Since the majority of an ambulance provider’s costs are fixed and they do not change as the number of transports change, there is a high cost of readiness associated with ambulance services.⁹³

Significant resources are required to meet clinically meaningful response times to medical emergencies; therefore, most of the cost of emergency ambulance service is used to maintain readiness. For example, even the most efficient urban emergency ambulance services expend approximately two-thirds of all unit hours produced *being ready* to respond. That is, more than three unit hours are produced for every one hour used to treat and transport patients. This production capacity (deployed unit hours) is necessary to ensure that the time between demand and supply—the response time—is clinically meaningful and reliably achieved. The cost of readiness is directly associated with the expenditures required to place the right number of ambulances in the right locations waiting for the next medical emergency. In rural areas with less population density per square mile and remote service areas, the cost of readiness is an even greater component of total cost.⁹⁴ In these areas, four or more unit hours may be produced for every one hour used to treat and transport patients.

Cost of readiness has been highlighted in several national reports:

- ***Government Accountability Office.*** “The majority of ambulance providers’ costs are related to readiness—the availability of ambulance and crew for immediate emergency response—and are fixed costs.”⁹⁵
- ***Annals of Emergency Medicine.*** “The cost of readiness includes on-call staffing for coverage of the geographic service area.”⁹⁶

⁹² General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 22.

⁹³ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 17.

⁹⁴ General Accounting Office (US) [GAO]. Ambulance services: Medicare payments can be better targeted to trips in less densely populated rural areas. Washington, DC: U.S. General Accounting Office; 2003 Sep. GAO-03-986. p 12.

⁹⁵ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 17.

⁹⁶ Lerner B, et al. A comprehensive framework for determining the cost of an emergency medical services system. *Annals of Emergency Medicine*. Dallas, TX: American College of Emergency Physicians; 2007 March. p 307.

- **Institutes of Medicine.** “EMS costs include the direct costs of each emergency response, as well as the readiness costs associated with maintaining the capability to respond quickly, 24-hours a day, 7-days a week—costs that are not adequately reimbursed by Medicare.”⁹⁷
- **Project Hope.** “Stand ready costs are the excess capacity required to be able to respond in the event of an emergency.”⁹⁸

Cost of readiness has also become a major issue in the development of the financing strategy for emergency ambulance services. For example, during the development of the national Medicare ambulance fee schedule which was implemented in 2002, the federal Centers for Medicare and Medicaid Services (CMS), addressed the issue of the relative cost of emergency and non-emergency services in the fee schedule base rates. In the Medicare ambulance payment system, relative value units (RVUs) account for the relative resources needed to provide services during an ambulance transport for each of the seven levels of service defined by Medicare. RVUs are a ratio representing the relative cost of each service level compared to the base service which is set at a value of 1.0. For ambulance service, the RVU for basic life support, non-emergency is equal to 1.0.

CMS adopted the following RVUs when the Medicare ambulance fee schedule was implemented on April 1, 2002⁹⁹:

BLS-NE	1.0
BLS-E	1.6
ALS-NE	1.2
ALS-E	1.9
ALS-2	2.75
SCT	3.25

Based on the above, payments for BLS-E (RVU=1.6) are 60% higher than payments for BLS-NE (RVU=1.0); and payments for ALS-E (RVU=1.9) are 70% higher than payments for ALS-NE (RVU=1.2). These RVUs are the method by which the cost of readiness is built into the ambulance fee schedule payment structure.

In its April 2007 letter to the GAO, CMS again stated that “the cost of readiness was built into the ambulance fee schedule payment structure.”¹⁰⁰ CMS is referring to the Medicare ambulance fee schedule relative value units described above which are an example of how a one-payer system is structured to account for the fact that emergency services cost more to deliver than non-emergency services due in large part to the cost of readiness.

However, there was not adequate overall funding when the Medicare fee schedule was implemented in 2002. The consequences of this inadequate funding include—the value of the Medicare conversion factor is too low, ambulance payments are below the cost of service, and the cost of readiness is under-funded. These impacts have been validated by data from both federal and ambulance profession sources.

Because the majority of emergency ambulance services are funded through user fees, the rates paid by each insurer *must* incorporate the cost of readiness. Below-cost reimbursement from any payer group threatens access to essential emergency ambulance services to all patients, regardless of their ability to pay or the

⁹⁷ Institutes of Medicine [IOM]. *Emergency Medical Services at the Crossroads*. Washington DC: The National Academies Press; 2007. p 7.

⁹⁸ Mohr P, Cheng M, Mueller C, Good C. Findings from the 1999 national survey of ambulance providers. Bethesda, MD: Project Hope Center for Health Affairs; 2000 Mar. p 25.

⁹⁹ Centers for Medicare and Medicaid Services. Medicare program; fee schedule for payment of ambulance services and revisions to the physician certification requirements for coverage of non-emergency ambulance services; final rule. Washington DC: Department of Health and Human Services. In *Federal Register* 67, no. 39 (2002 Feb 27):9100-9135.

¹⁰⁰ General Accounting Office (US) [GAO]. *Ambulance providers: Costs and expected margins vary greatly*. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 52.

type of their insurance coverage. To the extent that the cost of readiness is not funded adequately through the rate-setting processes of each payer group, providers and communities should consider alternative funding sources, such as community tax support.

Relevant Costs in an Ambulance Service Financial Analysis

The chart in Figure 17, adapted from the Project Hope study, *Findings from the 1999 National Survey of Ambulance Providers*,¹⁰¹ describes the categories that should be used to determine the full cost of providing emergency ambulance service. Later sections of this chapter will describe the process for gathering, analyzing, and comparing cost and revenue data to develop the financing strategy of the emergency ambulance service function and to establish important public policies for the entire EMS system.

When developing a cost-accounting system, establish a common understanding of the following terms:¹⁰²

- **Fixed Cost** – A cost that does not change as the number of ambulance transports changes in the short run, including, labor costs, vehicles, medical equipment, facilities, management and administrative support functions.
- **Full Cost** – The total direct, indirect, and shared costs of ambulance service.
- **Direct Cost** – A cost that can be traced specifically to ambulance transports, including costs for items or services that are provided by or shared with a parent hospital, government agency, corporation, or other operating division. Direct costs include operations labor, vehicles and fleet maintenance, medical supplies and equipment, and medical communications center equipment.
- **Indirect Cost** – A cost that cannot be traced specifically to ambulance transports, including costs for items or services that are provided by or shared with a parent hospital, government agency, corporation, or other operating division. Indirect costs include administrative labor; building and facilities; and administrative support functions such as accounting, legal, billing, payroll, purchasing, human resources, marketing, public education, quality improvement, training and education, risk management, information technology, taxes, interest, performance penalties, performance security, medical director fees, accreditation, and other administrative and operations costs.
- **Marginal Cost** – The direct cost of producing one additional ambulance transport.
- **Shared Cost** – A cost that is provided by or shared among one or more operating divisions or departments of a hospital-based, government-based, or multi-jurisdictional provider. Shared direct costs include items or services such as loaned vehicles, loaned medical equipment, shared fleet maintenance services, and shared medical communications center services. Shared indirect costs include items or services such as shared facilities, shared management functions, and shared administrative support functions.

To accurately determine emergency ambulance service costs, include all costs incurred by any other organization—through outsourcing or shared services—that relate to the operation of the ambulance service. These other organizations could include a government agency, hospital, corporate office, subcontractor, or other entity. It is also important to *exclude* all costs incurred by the ambulance organization that do not relate to the operation of the ambulance service. These expenses often apply to the operation of other types of ambulance functions, such as air medical transportation or wheelchair services.

While budget surplus or profit is not considered a cost from an accounting perspective, this factor should be included in the full-cost calculation. Regardless of the type of service, earning a surplus is essential for all high-performance ambulance services. Surplus funds are used to reinvest in the service's infrastructure, including financing capital improvements in communications systems and facilities, funding a replacement schedule for new ambulance vehicles and other major equipment, creating reserves for unexpected crises, and providing a return on the investment for nongovernmental providers. Surplus is essential in achieving all of the Hallmarks.

¹⁰¹ Mohr P, Cheng M, Mueller C, Good C. Findings from the 1999 national survey of ambulance providers. Bethesda, MD: Project Hope Center for Health Affairs; 2000 Mar. p C3-C12.

¹⁰² Horngren C, Datar S, Foster G. Cost accounting 12th ed. Upper Saddle River, NJ: Prentice Hall; 2004. p 483.

Figure 17: Emergency Ambulance Service Cost Categories

Operations Labor Costs

Including, but not limited to, full-time, part-time, and overtime wages and salaries; health and miscellaneous benefits; retirement; continuing education and training; payments to volunteers; workers' compensation; replacement costs for paid time-off (i.e., vacation and sick); bonus pay for skills upgrade; payroll taxes; and miscellaneous personnel costs for operations, medical communications center, maintenance, operations support, and first line operations supervisor personnel

Vehicles and Fleet Maintenance Costs

Including, but not limited to, ambulance and other operations vehicle lease or purchase, vehicle licenses and taxes, vehicle insurance, fuel, fleet repairs and maintenance, and maintenance shop equipment

Medical Supply and Equipment Costs

Including, but not limited to, medical supplies (i.e., drugs, oxygen, sheets, and gloves), medical equipment (i.e., stretchers and defibrillators), medical equipment repairs and maintenance, and uniforms

Medical Communications Center Equipment Costs

Including, but not limited to, medical communications center equipment and software, and communications equipment and software maintenance

Building and Facilities Costs

Including, but not limited to, building rent, lease, or purchase; property taxes; property insurance; and repair and maintenance for operations, fleet maintenance, administrative, station, and medical communications center facilities

Administrative and Other Operating Costs

Including, but not limited to, management and administrative support salaries, benefits, and payroll taxes; general and professional liability insurance; utilities; office supplies and equipment; postage and freight; dues and subscriptions; travel; accounting and audit; legal; billing; payroll; purchasing; human resources; marketing; public education; quality improvement; training and education; risk management; information technology; business licenses and taxes; interest; performance penalties; performance security; medical director fees; accreditation; miscellaneous costs; and any shared services

Formulas Required for Cost Analysis

There are four measures to assist community leaders analyze the economic efficiency of an emergency ambulance service:

- Cost per transport
- Cost per capita
- Cost per unit hour
- Unit hour utilization (UHU) productivity ratio

These measures allow community leaders to compare providers in the same or similar service areas objectively and reveal how efficiently each provider manages its ambulance resources. To accurately account for seasonal variations, gather and use data for these calculations from the most recent *one-year* period of time.

The most efficiently managed firms are those that operate at an effective UHU and maintain a low cost per transport, low cost per capita, and low cost per unit hour, *while maintaining* quality patient care and response-time reliability. These figures will vary in each system due to a number of geographic, demographic, and system design factors. For example, a requirement for a higher standard of care (such as a more stringent response-time standard) generally results in a lower UHU or higher cost per transport, or both.

Figure 18 lists operations and service-area data from the most recent one-year period for a sample emergency ambulance provider serving a medium sized city. These basic data will be used in the next few examples to illustrate how to calculate the performance measures for efficiency. For calculating the collection rate, divide actual cash collected by total gross billings for the same transports over a finite period of time.

Population	400,000
Costs	\$13,280,000
Transports	32,000
Unit Hours	115,000
Collection Rate	55%

Cost Per Transport

Figure 19 provides the formula used to calculate the emergency ambulance service's *cost per transport*: divide the total costs (full cost of the service, including all direct, allocated indirect and shared costs) during a given period by the number of total transports in the same period.

Another method of calculating the cost per transport is to divide the cost per unit hour by the UHU ratio (based on the formulas described in Figures 21 and 22).

Economies of scale have a powerful effect on the cost per transport. In general, when fixed costs are spread across a larger volume of transports, the cost per transport is lower. Conversely, when fixed costs are spread across a smaller volume of transports, the cost per transport is higher. Rural emergency ambulance providers generally serve large geographic areas with low population density, resulting in low call volumes and high cost per transport.¹⁰³ Two independent^{104 105} and three government^{106 107 108} studies have documented the relationship of call volume to cost as the major reason that rural ambulance providers experience higher cost per transport than do comparable urban emergency ambulance service providers. This relationship is also the reason that rural providers generally achieve lower UHU ratios than do their urban counterparts.

¹⁰³ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 19.

¹⁰⁴ Mohr P, Cheng M, Mueller C. Establishing a fair Medicare reimbursement for low-volume rural ambulance providers. Bethesda, MD: Project Hope Walsh Center for Rural Health Analysis; 2001 Jul. p 3.

¹⁰⁵ Lerner EB. A comprehensive framework for determining the cost of an emergency medical service system. Irving, TX: Annals of Emergency Medicine. 2007 Mar; p 304-313.

¹⁰⁶ General Accounting Office (US) [GAO]. Rural ambulances: Medicare fee schedule payments could be better targeted. Washington, DC: U.S. General Accounting Office; 2000 Jul. GAO/HEHS-00-115. p 4-5.

¹⁰⁷ General Accounting Office (US) [GAO]. Ambulance services: Medicare payments can be better targeted to trips in less densely populated rural areas. Washington DC: U.S. General Accounting Office; 2003 Sep. GAO-03-986. p 20.

¹⁰⁸ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 19.

Figure 19: Cost Per Transport Formula

$$\frac{\text{Total Costs}}{\text{Total Number of Transports}} = \text{Cost Per Transport}$$
$$\frac{\$13,280,000}{32,000} = \$415.00$$

Cost Per Capita

Figure 20 outlines the formula for calculating the emergency ambulance service’s *cost per capita*: divide the total costs during a given period by the total population of the service area. Identifying cost per capita is essential in establishing the emergency ambulance service’s financing strategy as described later in this chapter.

Figure 20: Cost Per Capita Formula

$$\frac{\text{Total Costs}}{\text{Total Population}} = \text{Cost Per Capita}$$
$$\frac{\$13,280,000}{400,000} = \$33.20$$

Cost Per Unit Hour

A unit hour is defined as one hour of service by a fully equipped and staffed ambulance assigned to a call or available for dispatch. Figure 21 illustrates the formula for calculating *cost per unit hour*: divide each provider’s total costs during a given period by the total number of actual unit hours produced for that same period. To calculate the total annual number of unit hours available in the system, aggregate the total unit hours produced each day for an entire year. For example, a unit on duty for a continuous 24-hour period (e.g., a 24-hour unit) results in the production of 24 unit hours. A community with two 24-hour units and one 8-hour unit on duty on a particular day produces 56 unit hours on that day. In calculating cost per unit hour (or unit hour cost), total costs *must* account for all direct, indirect, and shared costs. Each provider’s cost per unit hour will vary by area served due to variances in local costs such as labor, rent and fuel.¹⁰⁹

Figure 21: Cost Per Unit Hour Formula

$$\frac{\text{Total Costs}}{\text{Total Number of Unit Hours}} = \text{Cost Per Unit Hour}$$
$$\frac{\$13,280,000}{115,000} = \$115.48$$

¹⁰⁹ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 28.

UHU Ratio—The Productivity Measure

Efficient management and deployment of ambulance unit hours has a powerful effect on the number of unit hours required to serve emergency patients. While enough unit hours must be deployed to meet clinically meaningful response times, deploying too many unit hours can be wasteful. One of the key productivity measures for an emergency ambulance service is the UHU ratio. Figure 22 illustrates the formula for calculating productivity: divide the total transports during a given period by the total number of unit hours in the same period.

Each provider's total transports, not responses, and all actual unit hours produced in the same period, are used to calculate the UHU ratio. Unit hours used for long-distance transports, special event coverage, and certain other classes of activity should be excluded from these calculations.

A UHU ratio closer to one (i.e., .35) indicates the provider has achieved a higher level of productivity, while a UHU ratio closer to zero (i.e., .15) indicates a less productive provider. Ratios will vary among ambulance service providers depending on the type of services offered, call volume, deployment strategy, geography, hospital turn-around time, and other factors. However, when making a comparison of providers in the same or comparable service area, the more productive services typically have a higher UHU ratio.

After calculating the four essential measures of economic efficiency using data from the community's emergency ambulance service provider, a comparison can be made with the performance of other high-performance providers.¹¹⁰

Figure 22: UHU Ratio Formula	
$\frac{\text{Total Transports}}{\text{Total Number of Unit Hours}}$	= UHU Ratio
$\frac{32,000}{115,000}$	= .28

Bringing it All Together

The four measures of economic efficiency are useful tools to maximize quality service while simultaneously managing costs. The following two exercises are examples of how an emergency ambulance provider serving a medium-sized community utilized these tools to evaluate and manage its ambulance resources.

Exercise One – Optimizing Operational Efficiency

This first exercise demonstrates how the sample provider manages ambulance operations to optimize efficiency. Since most emergency ambulance service costs are expended to maintain readiness, this provider must place enough ambulance unit hours in the community to meet clinically meaningful response times. In the first year, the sample provider produced 115,000 unit hours and performed 32,000 transports, resulting in a UHU ratio of .278. The provider's cost per unit hour was \$115.48, and cost per transport was \$415.00.

¹¹⁰ Market studies such as High Performance and EMS: Market Study 2006 by Jerry Overton and Comprehensive Market Review by Fitch and Associates are examples of studies that could be used for comparative purposes.

Knowing that productivity has a powerful affect on cost per transport, the provider made the following operational changes:

- **Reduced emergency call-processing time**—Reduced the time from call received until emergency-ambulance alert (via medical dispatch protocols).
- **Reduced emergency ambulance out-of-chute time**—Reduced the time from unit alert until unit en route to call.
- **Reduced non-productive on-scene time**—Reduced the amount of time that the unit stayed on the scene.
- **Reduced hospital turn-around time**—Reduced the time from unit arrival at the hospital until unit available for next call or next post assignment.
- **Proactively managed emergency department overcrowding problems**—Implemented policies to reduce ambulance diversions and decrease the amount of time ambulances waited to deliver patients at the emergency department.
- **Reduced vehicle out-of-service time**—Implemented policies to reduce vehicle failure rates, equipment failure rates, unscheduled maintenance, and accidents.
- **Reduced the time required for shift changes**—Improved the administrative processes for crews arriving on-duty and going off-duty.
- **Improved routing of ambulances**—Ensured ambulances received accurate routing to and from calls, including use of advanced vehicle location technology such as a global position system (GPS) and use of better mapping technology.
- **Refined ambulance deployment plans**—Fine tuned system status management plans to deploy and re-deploy ambulances by hour of day and day of week and geographic locations based on detailed studies of call demand patterns.
- **Used management and supervisory personnel**—Staffed ambulances with management and supervisory personnel during periods of unusual call demand.

Because of these changes, the provider reduced the total unit hours produced from 115,000 to 110,000, in the second year, while still performing 32,000 transports and simultaneously maintaining the same clinically meaningful response times. The UHU ratio increased from .28 to .29, and the cost per transport dropped from \$415 to \$397 the provider became more efficient and saved \$18 per transport. It is important to note that the cost per unit hour did not change because the operational changes did not affect indirect costs. Rather, they achieved more economic use of unit hours, resulting in the need for fewer total unit hours and a lower cost per transport.

When multiplied by the number of patients transported during a 12-month budget cycle (32,000 transports), the ability to save \$18 per transport resulted in a total annual savings of \$576,000 for the provider. These savings could be available for investing in new vehicles and equipment, communications infrastructure, clinical upgrades, salary increases for personnel, improved public education in health and safety awareness, and other emergency ambulance service improvements.

When deciding to reduce unit hours, there is one caveat. As stated in Chapter 3, medical research does not support the practice of reducing ALS ambulance unit hours and extending ALS ambulance response times as a tradeoff for ALS co-response. Regardless of the savings generated, this approach to reducing ambulance unit hours could negatively impact patient care.

Exercise Two – Optimizing Economies of Scale

This second exercise demonstrates how the sample provider reduces the cost per transport by spreading direct costs across a larger volume of transports. As in the first exercise, the sample provider produced 115,000 unit hours and performed 32,000 transports, resulting in a UHU ratio of .28 for the first year. The provider's cost per unit hour was \$115.48 and cost per transport was \$415.

Knowing that economies of scale have a powerful affect on cost per transport, the sample provider successfully marketed its services to area health-care facilities, resulting in a relatively small increase in

interfacility transports of approximately two transports per day. As a result, the provider increased total transports performed from 32,000 to 33,000, in the second year, while still producing 115,000 unit hours and maintaining the same clinically meaningful response times. The UHU ratio improved from .278 to .287 because the service was performing more transports from the same number of unit hours, and the cost per transport dropped from \$415 to \$402. Furthermore, the provider generated additional revenue by performing 1,000 additional transports.

After accounting for its realistic collection rate (55 percent in this example), the additional net revenue collected could be available to invest in a variety of emergency ambulance service improvements.

Emergency Ambulance Service Revenues

There are essentially two primary revenue sources available to fund the emergency ambulance service—ambulance fees and community tax support. When designing the financing strategy of the emergency ambulance service function, particular emphasis should be placed on the stability of the primary funding sources. Since ambulance service universally is considered a key component of the health-care system, it is included in the basic coverage policies of most health-care insurance plans. However, since many health plans, especially government programs such as Medicare and Medicaid, pay set rates that often do not cover the full cost of service,¹¹¹ community tax support often is needed to ensure that service is available to all community residents and visitors, regardless of their ability to pay.¹¹² While the community may have access to other sources of revenue, such as charitable donations, state and federal grants, and subscription programs, this section focuses on ambulance fees and community tax support.

Ambulance Fees

Effective management of the ambulance fee billing function, including the assurance of reasonable ambulance collection practices, is critical to determining the financing strategy of an emergency ambulance service. Effectively managing the process of collecting ambulance fees can generate considerable revenue, in many cases fully funding a high-performance, clinically sophisticated emergency ambulance service. By effectively managing the billing function, many emergency ambulance services can increase their clinical sophistication and response-time reliability, while simultaneously eliminating the need for additional community tax support.

Ambulance services are an essential community service. As such, reasonable ambulance fee billing practices should be established for patients without insurance and patients who are unable to pay for services. At a minimum, patients and their families should receive all necessary assistance in filing insurance claims, especially with Medicare, Medicaid, worker's compensation programs, and other government-based insurance programs. Patients should have the opportunity to work out payment arrangements if they have no insurance.

Assuming the emergency ambulance services system is capable of achieving increasing levels of efficiency, it is good public policy to maximize reimbursement from health insurance providers and minimize the need to shift the financial burden to taxpayers. In other words, by optimizing third-party payments, neither patients nor taxpayers are required to pay for services that have already been purchased through health benefit plans.

Communities that currently fund all or the majority of emergency ambulance services with community tax support may find the transition to increased ambulance fees confusing and difficult. However, effective management of the billing and collection process and clear communication with patients, their families, and the public can minimize the challenges of this transition. Maximizing the reimbursement received from third-party payers reduces patients' out-of-pocket costs. Good communication will provide some assurance

¹¹¹ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 24.

¹¹² Hogan C. AAA 2006 Ambulance Cost Study. McLean, VA: American Ambulance Association; 2007 Jan. p 50.

to both patients and the public, and they will be more likely to accept ambulance fees at levels that cover service costs.

To maximize third-party reimbursement, professionals with experience in ambulance service billing and collection processes should perform the billing services function. Ambulance billing operations face numerous challenges. For example, reimbursement may be denied after services are delivered due to stringent medical necessity criteria and after-the-fact utilization review processes that vary from one payer to another. In addition, failure to comply with federal regulations can result in severe criminal and civil penalties.

The “payer mix” impacts the collection performance of an emergency ambulance service. Payer mix is defined as the percentage of patients transported within each major payer category: Medicare, Medicaid, commercial insurance, private pay, and other payers. Providing a high volume of transports to uninsured patients obviously results in larger amounts of uncompensated care. This reduces collection rates and can prevent the provider from generating enough revenue to cover the cost of service and to avoid the need for significant community tax support.

Figure 23 illustrates the impact of payer mix on collection performance.¹¹³ While private pay gross revenue (a payer category that includes many uninsured patients) is 14 percent of total gross revenue, transports from this source is only 10 percent of total net transports. Conversely, gross revenue from the insurance payer category is 21 percent of total gross revenue, while transports from this source jumps to 29 percent of total transports. These statistics demonstrate that uninsured patients often cannot pay for ambulance services.

Figure 23: Payer Mix Percentages

Payer Category	Gross Revenue	Net Revenue
Medicare	44%	41%
Private Pay	14%	10%
Commercial Insurance	21%	29%
Medicaid	14%	11%
Other	7%	8%

When projecting the additional revenue generated by the implementation of ambulance fees or raising ambulance fees, ambulance administrators should consider the “diminishing returns” of such rate increases. Due to the fixed rates, co-pay amounts and deductibles of certain payers (such as Medicare, Medicaid and some commercial insurance programs), ambulance rate increases generate additional revenue only from certain commercial insurance programs and private-pay patients, and not from all patients. Therefore, a 10 percent rate increase does not generate a 10 percent increase in revenue. In fact, the higher the rate increase the lower the relative increase in revenue, as the provider’s charges exceed the rate ceilings established by various government and commercial insurance programs.

Medicare

The Social Security Act was passed by Congress on July 30, 1965 as part of Public Law 89-97. Title XVIII of the Act established the Medicare program to provide health care coverage to individuals 65 and over. The Medicare program was expanded in 1973 to provide health insurance benefits to individuals of any age

¹¹³ Hogan C. AAA 2006 Ambulance Cost Study. McLean, VA: American Ambulance Association; 2007 Jan. p 35.

with certain disabilities. The federal Centers for Medicare and Medicaid Services (CMS) administers the program and promulgates regulations regarding coverage, payment amounts, and other related policies.

Medicare patients comprise 40 percent of a typical ambulance service's total transports.¹¹⁴ Since federal regulations related to ambulance reimbursement from the Medicare program are extremely detailed and require strict compliance, providers should scrutinize claims carefully. Violation of these regulations, however unintentional, can result in severe penalties.

As part of the Balanced Budget Act of 1997, the U.S. Congress mandated a national fee schedule for reimbursement of ambulance transportation services provided to Medicare beneficiaries which was implemented in 2002. It also mandated "assignment," which is a requirement that ambulance services accept the Medicare fee schedule amount as payment in full, including applicable co-pays and deductibles. The regulations also strengthened the program's medical necessity criteria. The Medicare ambulance fee schedule has a significant impact on ambulance providers because it is 6 percent below the national average cost per transport of providing ambulance service.¹¹⁵

Medicaid

Title XIX of the Social Security Act established programs, referred to as Medicaid, to provide state-level aid for the medically indigent. Medicaid rates are established by each state, and the ambulance provider is required to accept the state Medicaid rate as payment in full. The difference between the amount billed and the payment received from Medicaid cannot be collected from any other source, by law, and therefore becomes a "contractual allowance." While Medicaid rates vary by state, they are generally significantly below the cost of service, often not covering one-half of the full costs.¹¹⁶

Commercial Insurance

Most insurance policies provide coverage for emergency and interfacility ambulance service with various reimbursement rates depending on the insurance company and the individual insurance policy. Similar to Medicare, the patient is normally responsible for paying a deductible amount as stated in the policy.

The obligation of emergency ambulance services to guarantee universal access without regard to the patient's ability to pay has resulted in the need for cost shifting. Most providers charge higher ambulance fees to all patients to offset the below-cost payments of some patients and their respective insurance policies. Thus, insured patients bear the costs of providing services to uninsured patients and to those covered by government reimbursement programs such as Medicaid and Medicare. Commercial payers pay about 50 percent more per transport than Medicare.¹¹⁷

Uninsured Patients and Uncompensated Care: Universal Access without Universal Payment

It is the moral and legal responsibility of emergency ambulance service providers to deliver treatment and to transport patients requiring emergency care regardless of their ability to pay. In the United States, communities guarantee universal access to emergency medical services without a universal funding system. Approximately 45 million Americans are uninsured (about 15 percent of the population), resulting in a significant number of patients in many service areas that have no health insurance and often cannot pay for the ambulance service they receive.¹¹⁸

¹¹⁴ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 11.

¹¹⁵ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 24.

¹¹⁶ Werfel B, Werfel D, Staffan B. 2008 Medicaid rate survey. McLean, VA: American Ambulance Association; 2008.

¹¹⁷ Hogan C. AAA 2006 Ambulance Cost Study. McLean, VA: American Ambulance Association; 2007 Jan. p 36.

¹¹⁸ Institutes of Medicine [IOM]. Hospital-based Emergency Care at the Breaking Point. Washington DC: The National Academies Press; 2007. p 42.

This fact alone is major justification for the implementation of a well-designed, financially stable emergency ambulance provider to serve the needs of an entire medical trade area as efficiently as possible. The agency responsible for collecting ambulance fees must maximize reimbursement from third-party payers and use reasonable collection practices when dealing directly with patients who have no insurance coverage.

Because many patients simply cannot afford to pay, both the independent oversight entity and the emergency ambulance service must recognize the impact of uncompensated care. An AAA study found that uninsured patients make up an average of 14 percent of ambulance transports and ambulance providers experience a charity care burden that is about double that of US hospitals and physicians.¹¹⁹ This cost of uncompensated care is a burden for the community at large to share. An accurate calculation of the collection rate in the same or comparable service area can offer insight into each service's relative efficiency and success in managing accounts receivable. Based on the actual collection experience of several high-performance emergency ambulance services,¹²⁰ actual collection rates range from 35 percent to 55 percent.

Community Tax Support

Community tax support does not necessarily increase the quality of service. Rather, it is a source of non-health care dollars to fund a health-care service. While some level of community tax support may be necessary for emergency ambulance services in certain communities, the goal should be to minimize the level of community tax support required by employing a combination of the following to increase revenues and decrease costs:

- Maximize reimbursement from third-party payers.
- Increase ambulance fees.
- Optimize collections efficiency.
- Maximize operational efficiency.
- Competitively award service-area rights.

Many emergency ambulance services receive community tax support from a variety of sources. Local governments that choose to contract for emergency ambulance services may need to provide community tax support to bridge the gap caused by inadequate health-care reimbursement. This gap may be created by insufficient ambulance volume, inadequate revenue from ambulance fees, or high levels of uncompensated care.

The amount of community tax support to be used is a public policy decision that must be made by local government officials. Tax support can be arranged for valid reasons including:

- To ensure that a minimum level of out-of-hospital care exists in rural, sparsely populated or remote areas where call volume is low and ambulance fees alone cannot support a minimum level of service.^{121 122 123}
- To fund a higher level of clinical care, especially when the current level of ambulance fees cannot generate necessary funds.

¹¹⁹ Hogan C. AAA 2006 Ambulance Cost Study. McLean, VA: American Ambulance Association; 2007 Jan. p 51.

¹²⁰ Overton J. High performance and EMS: market study 2006. Richmond, VA: Coalition of Advanced Emergency Medical Systems; 2006 Aug. p 67.

¹²¹ Mohr P, Cheng M, Mueller C. Establishing a fair Medicare reimbursement for low-volume rural ambulance providers. Bethesda, MD: Project Hope Walsh Center for Rural Health Analysis; 2001 Jul. p 3.

¹²² General Accounting Office (US) [GAO]. Rural ambulances: Medicare fee schedule payments could be better targeted. Washington, DC: U.S. General Accounting Office; 2000 Jul. GAO/HEHS-00-115. p 4-5.

¹²³ General Accounting Office (US) [GAO]. Ambulance services: Medicare payments can be better targeted to trips in less densely populated rural areas. Washington DC: U.S. General Accounting Office; 2003 Sep. GAO-03-986. p 20.

- To temporarily fund transitions from a level-of-effort model of service to a performance-based contract, where community tax support is used to fund the procurement process, start-up costs, and certain capital expenditures, but is phased out over time.
- To fund the uncompensated care delivered by the emergency ambulance service provider as a result of large numbers of uninsured patients.

The increasing number of uninsured Americans is creating a hardship for ambulance providers nationwide. An AAA study found that uninsured patients make up an average of 14 percent of ambulance transports and experience a charity care burden that is about double that of US hospitals and physicians.¹²⁴

Community tax support often affects the public's perception of the true cost of the emergency ambulance service. Some services use tax support to keep ambulance fees low, artificially lowering ambulance fees below what insurance programs will pay. This amounts to tax support of insurance programs. The Community Tax Support/Ambulance Fee Tradeoff Analysis presented in Figure 24 and Figure 25 describe the process of determining this policy decision.

Developing the Financing Strategy

When developing the emergency ambulance service's financing strategy or establishing the pricing variables in an RFP, the strategy should include:

- A projection of the level of revenue needed to achieve clinical excellence and response-time reliability based on full service cost.
- An assessment of the potential sources of revenue needed.
- A determination that patients and the community can afford the proposed level of ambulance fees and tax support, respectively.

As mentioned earlier in this chapter, it is good public policy to fund high-performance emergency ambulance services by optimizing the collection of ambulance fees. Once these strategy decisions have been made, the independent oversight entity must implement the regulations that involve policy decisions in the following two areas:

- Establish ambulance fees
- Establish level of community tax support

The Community Tax Support/Ambulance Fee Tradeoff Analysis¹²⁵ and the Emergency Ambulance Service Financial Model are tools community leaders can use to make these determinations.

¹²⁴ Hogan C. AAA 2006 Ambulance Cost Study. McLean, VA: American Ambulance Association; 2007 Jan. p 51.

¹²⁵ Stout J. The EMS subsidy/price tradeoff. *Journal of Emergency Medical Services*. San Diego, CA: Elsevier Public Safety; 1988 Aug, p 74-76.

Community Tax Support/Ambulance Fee Tradeoff Analysis

Appendix B provides a description of the data required and the steps necessary to conduct a Community Tax Support/Ambulance Fee Tradeoff Analysis of the community's emergency ambulance service. Using this tool, community leaders can compare their current service's financial performance with other high-performance emergency ambulance services of similar size and demographics. By using the basic operations and service-area data of a sample provider serving a medium-sized city (as presented in Figure 18), Figure 24 compares data from the sample provider with that of several nationally recognized high-performance emergency ambulance services.¹²⁶

Figure 24: Community Tax Support/Ambulance Fee Tradeoff Analysis

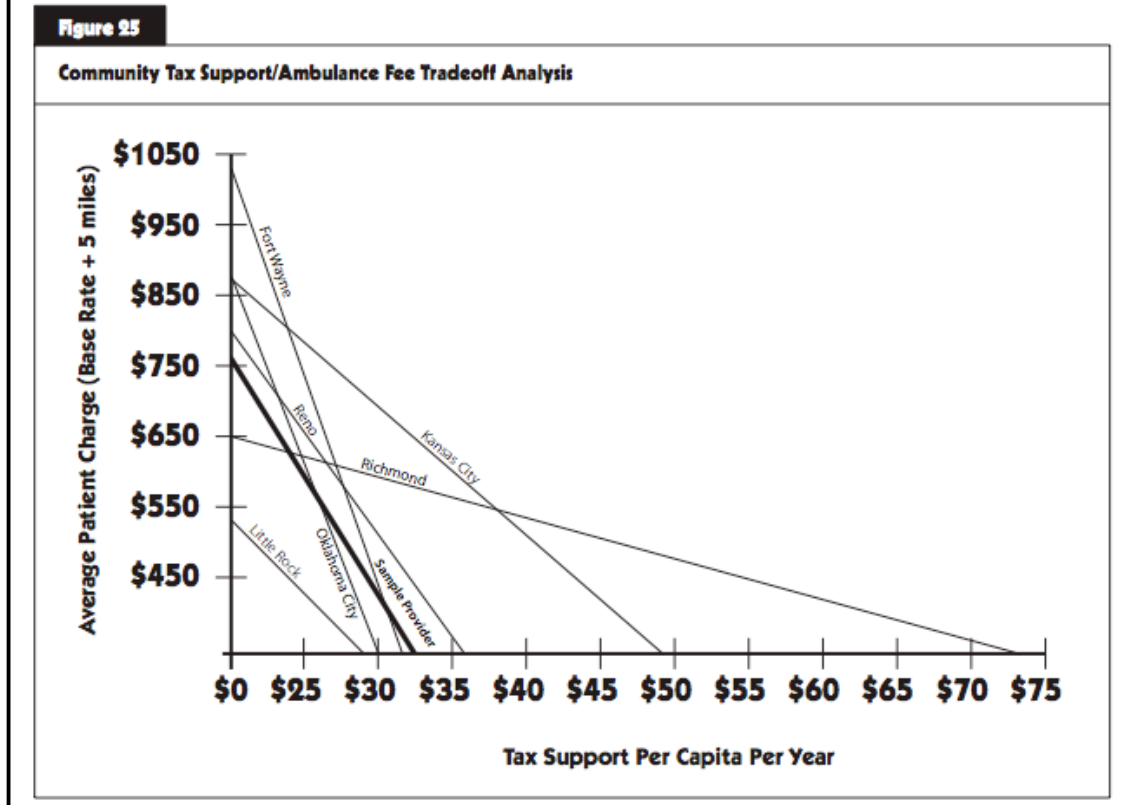
<i>Location</i>	<i>Service Area Population</i>	<i>Current Policy</i>		<i>Range of Options</i>	
		<i>Average Patient Charge</i>	<i>Tax Support Per Capita</i>	<i>Average Patient Charge (Zero Tax Support)</i>	<i>Tax Support Per Capita (Zero APC)</i>
Fort Wayne (A)	220,486	\$1,030	\$0	\$1,030	\$32
Reno (B)	450,000	\$800	\$0	\$800	\$36
Oklahoma City (C)	650,000	\$765	\$6	\$875	\$30
Sample Provider (D)	400,000	\$754	\$0	\$750	\$33
Kansas City (E)	588,000	\$745	\$22	\$875	\$49
Little Rock (F)	500,000	\$517	\$0	\$525	\$29
Richmond (G)	193,000	\$435	\$18	\$650	\$73

Depending on local preferences and available resources, Figure 25 illustrates how each community can select the relative levels of average patient charge and tax support per capita. By moving up each respective tradeoff line (e.g., to the left), community leaders raise the average patient charge and reduce revenue from community tax support. By moving down each respective tradeoff line (e.g., to the right), community leaders lower the average patient charge and increase revenue from community tax support.

¹²⁶ Overton J. High performance and EMS: market study 2006. Richmond, VA: Coalition of Advanced Emergency Medical Systems; 2006, p 57 and 59.

Figure 25: Community Tax Support/Ambulance Fee Tradeoff Chart

Note: The tradeoff lines in this chart are represented as a straight line. However, rate increases are characterized by diminishing returns. For example, a 10 percent rate increase results in less than a 10 percent increase in cash collections. Therefore, a more exact calculation of the above tradeoff line, which is too complex for the scope of this example, would result in a curved tradeoff line, that is, as the average patient charge increases the collection rate decreases. Nonetheless, the straight tradeoff line as presented is a useful tool to illustrate the relationship between the two major sources of revenue.



Emergency Ambulance Service Financial Model

Included with this *Guide* is a comprehensive Microsoft Excel spreadsheet tool designed to assist community leaders gather and analyze the basic operations and service-area data needed to ensure the accuracy of the financial analysis for all types of providers. Appendix C presents the Emergency Ambulance Service Financial Model, which is also helpful for completing the Community Tax Support/Ambulance Fee Tradeoff Analysis. The *Model* consists of an introduction, data input instructions, and worksheets containing data input fields.

After entering data into the input sheets, the *Model's* results are summarized in a series of output schedules. One of the *Model's* most important features is its ability to convert the financial principles presented in this *Guide* into an easy-to-use tool which can be used to perform an apples-to-apples comparison between providers serving the same community, such as in a competitive procurement. Based on data entered by the user, the *Model* calculates the projected surplus or deficit resulting from ambulance operations.

The *Model* was field tested using actual ambulance service operational and procurement data from a variety of EMS system designs, including small rural systems where the margin of error is narrow and large urban

systems with complex system designs. The *Model* also incorporates the expertise of its designers and reviewers based on their extensive experience in public accounting, ambulance operations finance, cost accounting, economics, ambulance procurement processes, EMS system design, and ambulance operations management.

Ensure Reliability of Financial Assumptions

The integrity of the financial analysis is integral to achieving high-performance emergency ambulance service, and community leaders are vested with this responsibility. There are financial consequences for the owners of any service who fail to account for all costs. For nongovernmental providers, the financial risk of failure is borne by shareholders or owners. Since government providers of emergency ambulance services use public assets and resources, the financial risk of failure is borne by taxpayers. Therefore, the public is best served when government proposals to provide emergency ambulance service meet all five Hallmarks and follow government accounting standards (as described in Chapter 7).

Community leaders often rely on the financial information submitted by prospective providers. When any provider proposes to deliver new services or to significantly expand existing services, the following are important cost principles for preparing the financial analysis:

- All direct and indirect costs are relevant in the financial analysis.
- Ignoring cost “creep” causes faulty conclusions.
- Do not set ambulance fees based on marginal costs.

All Direct and Indirect Costs are Relevant in the Financial Analysis

When identifying the cost items to be measured in the provision of emergency ambulance service, the primary general accounting principle is that the longer the time involved, the more cost items that are relevant. If an organization considers adding an activity on a temporary basis, it may be appropriate to consider only the direct costs of the activity. However, if adding a permanent activity, all direct, allocated indirect and shared costs should be included. This requires not only an exhaustive list of the probable added direct costs, but also an assignment of all the indirect and shared costs, including administrative overhead. This principle is a generally accepted cost accounting practice and was identified as valid and reliable by federal researchers.¹²⁷ This conservative approach to developing the financing strategy also ensures that the community does not establish policies that put the emergency ambulance service provider at financial risk of failure.

The decision to perform emergency ambulance service is a long-term decision and should be made according to the long-term consequences of offering and providing the service. Caution should be exercised when evaluating proposals from providers that share costs with other institutions or that offer other types of services as they may have very inconsistent methods for separating staff time and other resources across different service levels and their data may be unreliable.¹²⁸ Full-cost accounting systems should be employed to identify all the direct costs necessary to produce and sustain the service, in addition to allocating a portion of overhead costs to the service. Regardless of the provider type, this is an appropriate decision model for community leaders to use in evaluating ambulance services.^{129 130}

Ignoring Cost “Creep” Causes Faulty Conclusions

The accounting concept of “creep” is that costs creep upwards when any organization moves, slowly or quickly, to provide new services in areas not fully investigated. Community leaders may be understandably impressed by the argument that existing local resources can be utilized to provide emergency ambulance

¹²⁷ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 39.

¹²⁸ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 38.

¹²⁹ Horngren C, Datar S, Foster G. Cost accounting 12th ed. Upper Saddle River, NJ: Prentice Hall; 2004. p 483.

¹³⁰ Charles T. Horngren, Edmund W. Littlefield Professor of Accounting, Stanford University. Personal communication; 2004 Jun 9.

services in a neighboring community at a fraction of the cost of other providers. For example, a local hospital may argue they have available capacity in the form of headquarters office and garage space (i.e., “bricks and mortar”); a local nongovernmental provider may argue they have available capacity in the form of ambulance vehicles and personnel (i.e., “unit hours”); or, a local public safety agency may argue it wishes to expand its role beyond fire suppression based on the premise that the public safety infrastructure (i.e., the “front line”) already exists. However, in all three of the above examples, there are additional costs associated with the long term decision to begin ambulance service in a neighboring community. While CMS has asserted that hospital-based and joint fire/ambulance services have higher than average costs, GAO determined that their cost data were unreliable.¹³¹

Economists characterize the ambulance industry as one with high “fixed costs” and low “variable costs.” Fixed costs consist of expenses that must be paid regardless of the volume of ambulance transports. To assure 24/7 ambulance coverage in an area, these costs include wages and benefits for round-the-clock staffing, as well as the capital costs of the building and vehicles. Variable costs, by contrast, are the costs that will rise as transport volume rises, such as fuel, mileage-related vehicle depreciation and maintenance, and supplies. Variable costs typically account for just a few percent of the total cost of ambulance service.¹³²

While it is true that economies of scale can be achieved when ambulance providers serve multi-jurisdictional areas, ignoring creep causes faulty conclusions. For example, if administrators from any of the above organizations propose to provide emergency ambulance service at significantly lower cost than other providers, it would be prudent for these proposals to be carefully analyzed to assure that they do not constitute a “cavalier proposal” containing unrealistic commitments. The typical argument is that because a physical plant and organization have already been established (building, vehicles and administrative personnel), a large portion of the cost of service is fixed. Since these costs will continue at approximately the same annual amount regardless of whether the organization offers ambulance service, the argument follows that ambulance service can be added without causing increases in fixed costs. Only the costs of the added ambulance service need to be considered, such as fuel, medical supplies, new equipment, and new personnel. The bulk of the indirect costs can be ignored because they will be unaffected by the new service. The organization can provide a “real bargain.”

The expectation of a “real bargain” overlooks various creep factors. For example, if the organization is in a position to make permanent additions, such as ambulance service, without significantly adding to its other costs, something is awry with the existing system. Fixed costs reflect capacity to operate, therefore, if the organization believes it can assume ambulance service responsibilities without adding the additional infrastructure required to perform the service, then the organization is likely to experience serious cost overruns. If the organization believes it can assume ambulance service responsibilities without adding all the personnel and vehicles required to perform the service, then the organization is currently overstaffed and over-equipped for its regular work; or, it may be unknowingly degrading its current service capabilities by over working existing personnel and stretching thin its current infrastructure capacity. For health care and public safety providers, this circumstance has the potential to have a negative impact on patients and the community.

One lesson learned from creep is to beware of cost studies that appear to justify adding an activity, formerly provided by an outsider, on the argument that existing capacity can be reassigned with no cost and that fixed costs can be ignored. This lesson is particularly important for ambulance service because changes in health care and reimbursement will likely decrease revenues and make full cost recovery more challenging, yet more important. In the end, an organization cannot introduce an added activity like ambulance service without impinging on its existing activities.¹³³

¹³¹ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 32 and 53.

¹³² Hogan C. AAA 2006 Ambulance Cost Study. McLean, VA: American Ambulance Association; 2007 Jan. p 39.

¹³³ Hornngren C. Cost accounting analysis of Arthur Andersen paramedic transport cost model. In: EMS System Cost Template. McLean, VA: American Ambulance Association; 1995. p 16-20.

Do Not Set Ambulance Fees Based on Marginal Costs

During the process of developing the financing strategy and establishing ambulance fees, the accuracy of the cost accounting process is essential. A common pitfall occurs when revenue projections based on the collection of ambulance fees are compared to the marginal cost of providing a new service (i.e., the direct cost of producing one additional unit of service). Ambulance service is described as a “fixed cost industry,” where the majority of an ambulance provider’s costs are fixed and there is a high cost of readiness. Because revenues from ambulance fees for the provision of new or expanded services are “new” dollars to the organization, there is a tendency to not consider the additional costs required to generate the new revenue (such as the cost of operating an expanded and complex ambulance service billing function). There is also a tendency to ignore the full cost of services, including all direct, indirect, and shared costs. Finally, there is a tendency to set ambulance fees at marginal cost—levels that are inadequate to cover the full cost of the service over the long term. A calculation of the marginal cost of the activity is not an accurate reflection of the full costs that will be incurred by the organization to produce the service.

Community leaders should reject proposals to establish ambulance fees based on the marginal (or partial) cost of the service. To ensure the long-term financial stability of the emergency ambulance service, regardless of which business structure community leaders select, the average net revenue per transport must be at least equal to the average cost per transport.¹³⁴ Therefore, the average patient charge, which is the user fee rate that is normally charged to all patients, must be established based on the full cost, not marginal cost, of the service including a reasonable margin for reserves or profit. If ambulance fees are set at the marginal cost of the service, substantial community tax support is required and insurance programs are given a free ride at the expense of local taxpayers.

Why Focus on Economic Efficiency?

To many readers, the focus on economic efficiency may seem self-evident. However, because policy decisions regarding the design of the emergency ambulance service function can affect patients’ lives, local community leaders can be placed under tremendous political pressures to make emotionally based decisions, regardless of associated costs. An often quoted statement about many policy proposals is “... if it will save one life ...” Arguments like these can be distracting and counter-productive and often cause community leaders to ignore the health-care cost pressures and emergency health system over-utilization issues that continue to be a challenge.¹³⁵

Substantial evidence supports systems with improved coordination, expanded regionalization and increased accountability in the delivery of emergency health care which will improve patient outcomes and reduce costs.¹³⁶ Data also indicate that significant economies of scale are achieved as the number of transports performed by the provider increases—the cost per transport decreases as the number of transports performed increases.¹³⁷

By integrating into the system design the four Essential Performance Results—clinical excellence, response-time reliability, economic efficiency, and customer satisfaction—as outlined in Chapter 3, local community leaders will be able to achieve high performance and economic efficiency *at the same time*.

¹³⁴ Mohr P, Brown D, Fiske M, Owen B. A study of payments for ambulance services under Medicare: final report. Bethesda, MD: Project HOPE Center for Health Affairs; 1991 Oct 21. p xii.

¹³⁵ McCaig LF, Burt CW. National hospital ambulatory medical care survey: 2002 emergency department summary. Advance Data from Vital and Health Statistics; No. 340. Hyattsville, MD: National Center for Health Statistics, Centers for Disease Control and Prevention; 2004 Mar 18. p 2.

¹³⁶ Institutes of Medicine [IOM]. Emergency Medical Services at the Crossroads. Washington DC: The National Academies Press; 2007. p 74.

¹³⁷ Hogan C. AAA 2006 Ambulance Cost Study. McLean, VA: American Ambulance Association; 2007 Jan. p 27-28.



**The Provider's Perspective:
Ensuring Fair Competition**

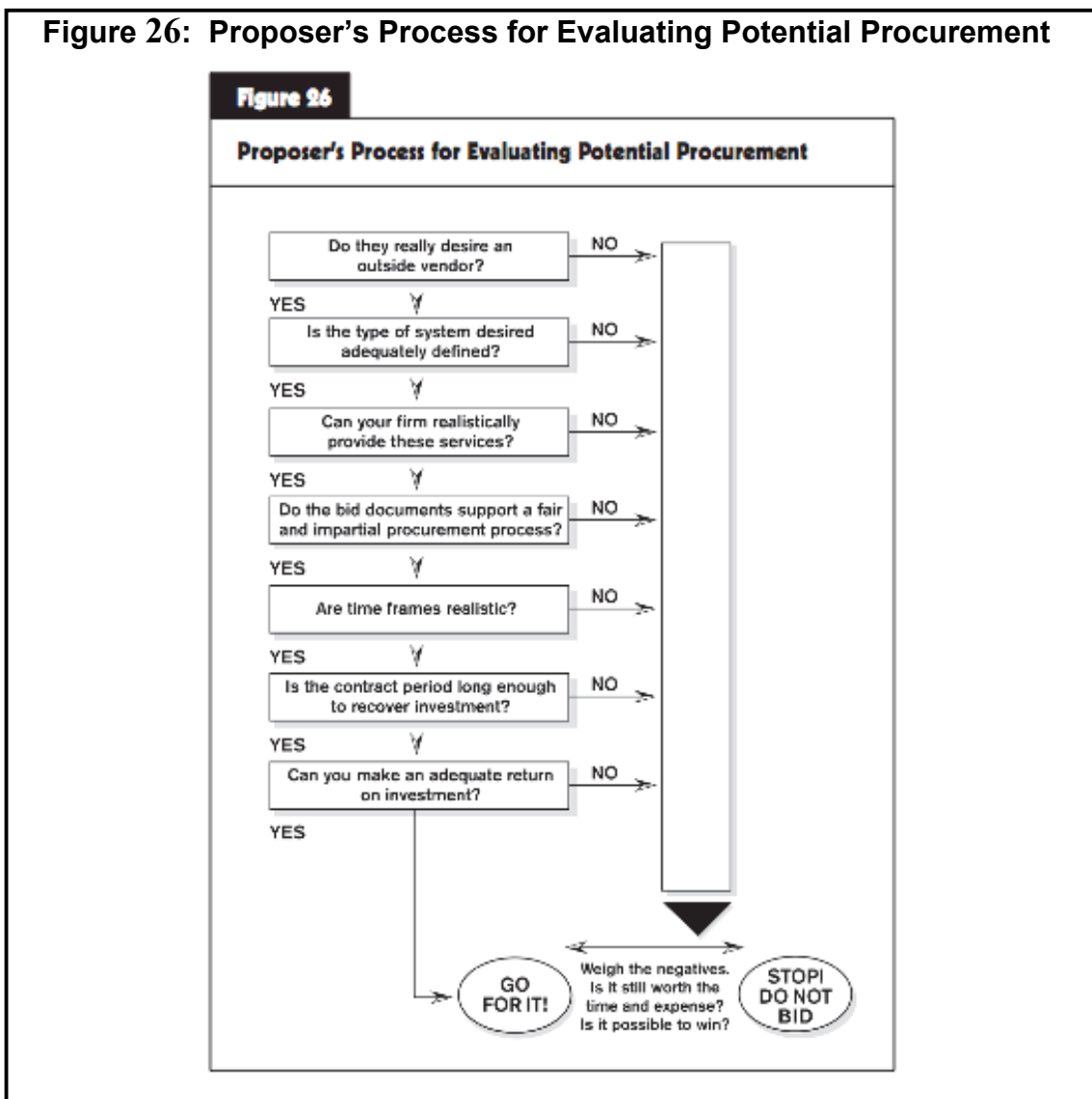
CHAPTER 7

The Provider's Perspective: Ensuring Fair Competition

In evaluating an RFP, potential proposers will complete their own assessment of the business opportunity being offered. Considerations for procurement managers include ensuring a sufficiently desirable offering, addressing concerns of incumbent providers, creating fair competition especially when local government providers compete, preventing violation of federal laws, and fair treatment of the existing workforce.

Figure 26 outlines some of the issues of concern for potential providers.¹³⁸

Figure 26: Proposer's Process for Evaluating Potential Procurement



¹³⁸ Fitch J, Keller R, Raynor D, Zalar C, et al. EMS management 2d ed. Solano Beach, CA: JEMS Publishing Company; 1993. p 128.

A Sufficiently Desirable Offering

What constitutes a desirable opportunity? Potential providers will ultimately decide the answer to this question. Procurement managers should ensure that the data made available to prospective providers is relevant and accurate. Data may include information on call volumes, current response times, the ratio of emergency to interfacility calls (call mix), common payment sources and collection percentages (payer mix), payment history, geopolitical factors that may impact coverage, and many other detailed pieces of demographic and economic information. Accurate data not only assists potential providers determine whether to submit a proposal, it also helps ensure that the submitted proposal is well prepared and cost effective.

Ensuring Infrastructure Development

Reducing the amount of capital required by bidders to begin service helps to remove barriers to infrastructure development and provides incentives to bidders to keep prices low. The independent oversight entity plays a major role in containing the costs of the emergency ambulance service. Similar to the community tax support/ambulance fee tradeoff options available, the amount of public capital invested in infrastructure development is a matter of public policy. Of course, the responsibility for the development of infrastructure depends on the business structure of the emergency ambulance service contract. Methods for assisting with infrastructure development include:

- **Contract Term.** The term of the contract should be long enough (e.g., approximately five years) for the provider to recoup its investment in capital costs.
- **Facilities.** Reducing or eliminating the provider's rent will limit the cost for securing such facilities. The assumption that charging rent offsets the cost of government-provided facilities and actually saves the contracting entity money within the contract period is a false economy. Those costs are built into the bidder's contract and typically are passed onto the consumer.
- **Capital Equipment.** Having the contracting entity provide the capital equipment such as a radio system, Computer Aided Dispatch (CAD) software, or ambulance vehicles, dramatically reduces barriers to infrastructure development and increases the number of potential competitors. However, this equipment must be high quality, and it must meet the needs of the provider in fulfilling the commitments of the contract and other requirements as stipulated in the RFP. Inadequate equipment or software inflates overall costs and reduces the number of potential competitors.

Avoiding Oversimplified and Unrealistic Financial Provisions

An unrealistic combination of performance requirements, service-area conditions, service-area rights, and community tax support/ambulance fee tradeoff expectations can undermine a successful procurement process. Financial pitfalls that must be avoided to ensure a successful procurement include:

Inadequate Term and Renewal Provisions. The initial term of the agreement should be long enough to ensure that the provider has a fair opportunity to realize a return on its initial capital investment and will not be left with partially depreciated equipment at the end of a short contract period. A minimum of five years is the recommended duration of the initial contract, with additional earned extensions based on performance.

Failure to Understand the Community Tax Support/Ambulance Fee Tradeoff.

Emergency ambulance service may be funded by community tax support, ambulance fees, or some combination of the two. The Community Tax Support/Ambulance Fee Tradeoff Analysis (see Chapter 6) illustrates the inter-relationship between community tax support and ambulance fees. It is the responsibility of the independent oversight entity to develop and make appropriate adjustments to the schedule of

community tax support/ambulance fee options according to the production costs, reimbursement profiles, performance requirements, health-care changes, and economic factors.

Failure to Account for Extraordinary Cost Increases beyond the Provider's Control. As previously described, there may be extraordinary cost increases beyond the provider's reasonable control. Both the RFP and the emergency ambulance service contract should include a process for the provider to request appropriate compensation or rate increases due to these causes.

Failure to Provide for Routine Inflation Adjustments. Routine inflation adjustments should be anticipated after the first year of service.

Failure to Provide for Financial Dispute Resolution. The settling of all disputes fairly and expeditiously is important to the financial stability of the system. Provision for financial dispute resolution in the RFP and resulting contract can create assurances that disputes will be handled effectively from the perspective of both parties.

Failure to Accurately Account for the Full Costs of a Local Government Provider. It is important that all costs incurred by the local government provider during the term of the agreement be documented through an independent annual audit.

Inadvertent Violation of Federal Anti-Kickback Statute. Care must be taken in developing the RFP document and the emergency ambulance service contract to avoid violating the federal anti-kickback statute. This statute makes it illegal to give or to receive anything of value in return for referrals or for ordering, arranging, or recommending a service that is reimbursed in whole or in part by Medicare or Medicaid (see later section of this chapter).

Allowing for Contract Changes

EMS systems can and do change rapidly. Changes in the conditions under which the provider submitted its proposal, which are outside the provider's reasonable control, must be anticipated during the term of the contract. When unanticipated changes result in reduced revenues or increased costs, the independent oversight entity and the provider should negotiate solutions to mitigate the impact of those changes and to maintain quality and efficient emergency ambulance service. These solutions could include combinations of increased tax support, increased user-fee rates, or other operational modifications. An example of such a change took place in 2002 when the Medicare reimbursement system changed dramatically due to a new Medicare ambulance fee schedule. For ambulance service contracts in which user-fee rates had been previously specified, providers worked with their independent oversight entity to examine the new fee-schedule rates and determine how to mitigate any projected losses in revenue.

Other examples are the challenges facing the country's emergency care system—including the documented national increase in the number of hospitals closing their emergency departments, overcrowding in hospitals and the increased number of ambulance diversions caused by factors outside the control of emergency ambulance provider.^{139 140} As a result, ambulance providers may not have access to the closest hospital or to the hospital of the patient's choice. This causes longer scene times while the paramedic attempts to find the most appropriate "open" hospital for the patient, increased transport times and delayed turn-around times at hospitals. This, in turn, dramatically reduces productivity and increases the cost per transport, while potentially impacting response-time reliability. It is ultimately the responsibility of the independent oversight entity to address problems outside the provider's direct control, either by solving the system problem or granting the provider some other type of relief.

¹³⁹ General Accounting Office (US) [GAO]. Hospital emergency departments: crowded conditions vary among hospitals and communities. Washington, DC: U.S. General Accounting Office; 2003 Mar 2. GAO-03-460. p 3.

¹⁴⁰ Institutes of Medicine [IOM]. Hospital-based Emergency Care at the Breaking Point. Washington DC: The National Academies Press; 2007. p 41.

System Upgrades

Emergency medicine is evolving, and the standard of care in each community may change over time to meet these evolving practices, requiring significant equipment, personnel, and operational upgrades. It is not reasonable to require the provider to absorb all the unexpected expenses that may be dictated by changing standards in the medical community, especially when they fall outside the scope of the initial RFP.

Communities should anticipate that such changes might occur during the term of the contract. They should also anticipate some additional costs during the term of the contract due to changes in medical standards. In this case, the contract may authorize the collection of a rate surcharge throughout the term of the agreement. This amount is deposited in a fund jointly controlled by the independent oversight entity and the provider, to be used solely for the purpose of clinical upgrades. Should there be no approved expenditures from the fund, the total dollars—plus interest earned—can be used to fund clinical upgrades, reduce community tax support, or accomplish other negotiated system goals.

Concerns of Incumbent Providers

Every community embarking on an emergency ambulance service evaluation will need to address the issues and concerns of incumbent providers. There are no easy approaches because every jurisdiction will have a different set of issues.

Both government and nongovernmental incumbent providers will be affected in some manner by a competitive procurement process. Incumbent providers have served the community and deserve fair treatment. The way a community treats its incumbent provider(s) can mean the difference between the success and failure of a procurement process and can affect the transition to a performance-based contract. An overly aggressive approach can discourage both incumbent and prospective providers, while a laissez faire approach may result in no effective change. Balance is the key. The following sections outline common concerns of incumbent providers.

The System Design

Community leaders should honestly assess whether current service deficiencies are caused by flawed system design or by poor provider performance. Has the incumbent provider been denied the opportunity to serve the community well, despite its efforts, because of a flawed system design? Have past system design features prevented the incumbent provider from developing the track record and experience that the RFP now requires from potential providers? Since experience has demonstrated that system design flaws are often the cause of poor provider performance, incumbent providers deserve an opportunity to demonstrate their ability to perform in a well-designed system.¹⁴¹

For example, one community needed to upgrade its ambulance service and determined that the multiple-provider system it had in place was not adequately serving the community's needs. The elected officials determined that the system design had impeded the progress and development of the two incumbent providers and awarded interim contracts to both companies. Similar in scope to the long-term contract that would later be open to competition, the contracts gave the incumbent providers an 18-month test. At the end of the first year, the community opened a long-term contract to national competition, and the best companies competed for the contract with the local firms.

One of the two local firms had taken the challenge seriously and had dedicated its efforts to becoming a superior emergency ambulance company. Submitting a superior proposal, the provider prevailed over all other competitors and was awarded the countywide ambulance contract. By providing an interim contract, this community received an immediate improvement in service, attracted highly competitive proposals from several qualified firms, and gave a local company the chance to grow, compete, and win the final contract.

¹⁴¹ Balaker T, Summers A. Emergency medical services privatization: frequently asked questions. Los Angeles, CA: Reason Public Policy Institute; 2003 Aug. p 7.

Opportunity for Input

Incumbent providers will want to contribute to the system evaluation and redesign. This input is crucial and often extremely valuable. In addition, the services of an expert EMS system designer can help facilitate input from incumbent providers in a way that captures the benefits of their participation and ensures that the incentives and needs of the providers and community are aligned.

Open Competition

Competitive award of a contract or other service area rights should be conducted only when community leaders believe that better value can be realized by doing so and are committed to identifying the organization that can provide the best and most qualified offer. Open-bid competition should be employed only after a complete exploration of options with the existing emergency ambulance service.

Account for Tax Support

Tax support is of particular concern when government and nongovernmental organizations compete for the service area. To ensure a level playing field, government providers must include in their proposal all costs associated with administrative overhead, such as accounting, legal, billing, payroll, purchasing, and human resources functions that are provided to the bidding government provider through the general fund. This effort may prove challenging as a recent federal report found that government providers, including all fire departments, could not distinguish their costs for providing ambulance services from other costs and therefore, their costs were deemed unreliable.¹⁴² If these assurances are not made, the public entity will have a significant pricing advantage, and community leaders will not be able to make a true comparison of proposals. The most qualified ambulance companies will avoid participation in procurements where the indirect costs for government providers are subsidized by taxpayers without being included in the cost structure.

Lawsuits

Local government can protect itself from lawsuits by conducting the entire assessment and procurement process in accordance with local, state, and federal laws. Successful EMS system designers are experienced with legal challenges from incumbent providers and can prepare a legal strategy as an integral part of the overall system redesign process. These issues are complex and unique to each EMS system's situation. However, the process will be made more acceptable to all involved if the treatment of incumbent providers is fair and open.

When Local Government Providers Compete

Qualified providers cannot be expected to participate in a procurement process without reasonable assurance that the award will be made fairly, impartially, and non-politically. There should be reasonable assurance that no provider, including a potential local government provider, submitting a proposal in response to a RFP has an unfair advantage over any other provider.

Nongovernmental providers are financially at risk for errors in projecting and managing costs and revenues. Conversely, when local government providers submit a proposal, by definition, local taxpayers assume these same risks. Therefore, a local government provider that submits an unrealistic, or cavalier, proposal can win the procurement unfairly and then sustain cost overruns at the taxpayer's expense. A nongovernmental provider making a similar mistake assumes all the risk and faces financial losses.

To ensure fair competition for all providers when a local government provider is participating in the process, the RFP document *must* require the following:

- Financial statements and proposal documents prepared in accordance with applicable guidelines of the Government Accounting Standards Board, particularly related to accounting for enterprise funds; and prepared in accordance with all applicable pronouncements of the American Institute of Certified Public Accountants and the Financial Accounting Standards Board.
- An independent audit is submitted with the proposal. This audit will identify all direct, indirect,

¹⁴² General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 4.

- and shared costs that fund the offering contained in the local government provider's proposal, including costs of vehicles, facilities, allocated administrative overhead, increased liability exposure, and tax advantages (see Figure 27).
- If the government provider wins the procurement, it must establish an independent system of accounting for all emergency ambulance service costs and revenues, such as an enterprise-fund accounting system.
 - If the government provider wins the procurement, an independent audit will be conducted every year. If the government provider incurs net cost overruns over the proposed amount in any given year (a range of 5 percent to 10 percent as determined by the community is recommended), an alternative provider selection process is initiated. An annual audit is required to protect the taxpayers from escalating exposure throughout the term of the emergency ambulance service contract.

The GAO found a relationship between greater local tax support and higher average costs, explained as the income effect: if an organization has more money, it is able to and likely to spend more.¹⁴³ However, access to community tax support may or may not have a beneficial affect on achieving the Hallmarks and policy makers must determine the purpose of greater local tax support. For example, community tax support may be needed to adequately fund ambulance services provided to the uninsured. On the other hand, unless access to community tax support is carefully structured, costs could be driven higher without achieving optimum service quality and reliability.

Figure 27: Key Government Provider Cost Considerations

Direct Cost of Providing Emergency Ambulance Services. Proposals from government providers must include all direct costs. These costs include all labor costs for operations, maintenance, medical communications center, and operations supervisory personnel; vehicles and vehicle maintenance; fuel; medical supplies and equipment; and medical communications equipment. Any proposal that promises to deliver services at a fraction of the cost of other providers should be scrutinized carefully.

Indirect Cost of Public Facilities and Services. Proposals from government providers must include indirect costs. Examples of such costs may include, but are not limited to, facilities; administrative labor; accounting, legal, billing, payroll, purchasing, human resources, public education, quality improvement, education, and information technology functions; miscellaneous costs; insurance or risk pool reserves; and surplus reserves.

Shared Cost of Public Facilities and Services. Proposals from government providers must include an appropriate allocation of direct and indirect costs that are shared with other government departments. Further, government providers, including fire departments, must be able to distinguish costs for providing ambulance services from other costs, a requirement that is consistent with a major federal ambulance cost study conducted in accordance with generally accepted government auditing standards.¹⁴⁴

Opportunity Cost of Working Capital. The government provider must account for any working capital interest costs, including interest lost on cash reserves withdrawn from investments, or interest paid on borrowed funds.

Tax Advantages. The government provider should account for taxable items that normally would be paid by other bidders but for which the government is exempt from liability. These costs include, but are not limited to, personal property tax, fuel tax, business licenses, company-owned vehicle licenses, and operational income or profits. The analysis must reflect the tax revenues that are lost to other government general funds.

¹⁴³ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 22.

¹⁴⁴ General Accounting Office (US) [GAO]. Ambulance providers: Costs and expected margins vary greatly. Washington DC: U.S. General Accounting Office; 2007 May. GAO-07-383. p 4.

Increased Liability Exposure. An independently prepared projection of the full cost of reserving for, or otherwise insuring for, the new risks created by entry into the ambulance service business must be included in the cost adjustments.

Supplied Equipment, Facilities, or Services. The successful bidder (whether a government or nongovernmental provider) should have equal access to equipment, facilities, or services offered by the community for use in the design of the EMS system. However, if the equipment, facilities, or services are offered only to the government provider (i.e., nongovernmental providers are prohibited access), the government provider's proposal must declare the fair market value of these costs.

Prevent Violations of Federal Anti-kickback Laws

The Anti-Kickback Statute, or AKS, makes it illegal to offer, to solicit, or to accept any “remuneration” in exchange for referrals for items or services reimbursable under Medicare, Medicaid, or any other federal health care program. The law applies to both the offering and the solicitation (or acceptance) of remuneration, therefore, it applies to both sides of a potential arrangement. Figure 28 provides the actual language of the federal anti-kickback statute (42 U.S.C. §1320a-7b(b)).

“Remuneration” is defined by the statute to include anything of value, including but not limited to kick-backs. Although many people typically think of cash when they think of a “kick-back,” the statute clearly states that *nothing* of value can be accepted or even solicited by anyone, including a city or county, in return for giving the contract to a particular provider. This includes services and goods that are provided in exchange for award of the contract. Likewise, nothing of value can be offered by a provider (or anyone on the provider's behalf) to induce anyone, including a city or county, to give the contract to that provider.

The Office of the Inspector General (OIG) of the Department of Health and Human Services, which is the primary agency responsible for interpreting and issuing guidance regarding the anti-kickback statute, specifically has identified EMS contracts as raising AKS concerns when improper inducements are requested or offered, both in the context of contracting between ambulance providers and cities or counties, as well as, in the context of contracting between ambulance providers and health care facilities. Specifically, the OIG has stated that “[a]mbulance suppliers should not offer anything of value to cities or other EMS sponsors in order to secure an EMS contract.”¹⁴⁵

As indicated above, “remuneration” means anything of value. In the most obvious example, the OIG has publicly stated that “any municipality requesting money from an ambulance company to award such a contract and/or any ambulance company providing a fee to the municipality for referrals of patients may be in violation of the Medicare and Medicaid anti-kickback statute.”¹⁴⁶ The same rule would apply to offers or requests to provide free services or other in-kind consideration in exchange for the award of a contract. Other examples of other potentially illegal requirements of local government contracting entities that OIG may consider suspect in contracts and RFPs include:

- Requiring the provider to pay a fee based on the number of dispatches or transports.
- Requiring the provider to routinely waive co-payments and deductibles for the government agency's residents, unless the agency pays a subsidy to the provider sufficient to replace the lost co-insurance and deductible revenue.
- Declaring that the government agency's residents are “subscription members,” even though the arrangement does not meet Medicare's requirements for subscription programs.

¹⁴⁵ Office of Inspector General (US) [OIG]. OIG compliance program guidance for ambulance suppliers. Washington DC: Department of Health and Human Services; 2003 Mar 24. In Federal Register 68, no. 56 (2003 Mar 24):14252.

¹⁴⁶ Morey L. Medicare fraud alert 91-27. Washington DC: Office of Inspector General, Department of Health and Human Services; 1991. p 1.

- Requiring the provider to bill Medicare and/or Medicaid, but not other patients or third-party payers.
- Requiring the provider to provide free or discounted services to agency personnel or to the government agency such as fire scene rehab units or training of personnel.
- Staffing contractor ambulances with government agency personnel paid for by the contractor at a rate that is higher than fair market value.
- Paying rent for ambulance station facilities owned by the government agency at higher than fair market value.
- Requiring the purchasing of dispatch services either at a price greater than fair market value or for more services than the contractor actually uses.
- Requiring the contractor to pay more than the difference between the ALS and BLS payments when the municipality provides the ALS services to a 911 patient that is transported.
- Government agencies making contractor selection decisions in part or in whole based on the contractor that bids the highest for franchise fees, first responder payments, etc., unrelated to fair market value.
- Payment for elements of government agency infrastructure or programming that are unrelated to the ambulance services being contracted for, such as equipment not used by the ambulance provider.
- Agreements for the contractor to fund unspecified future enhancements at unspecified costs.

The OIG has issued a small number of advisory opinions allowing some contract terms as mentioned above even though the OIG acknowledged the contract terms implicated the federal anti-kickback statute.¹⁴⁷ Those opinions were based on the specific sets of circumstances presented to the OIG for review and may not legally be relied upon by anyone other than the parties to the arrangements addressed by the opinions. Moreover, those should not be regarded by government agencies or others as a green light to engage in suspect practices. The conduct addressed by the OIG in those opinions was very limited, and the OIG would likely address more suspect relationships very differently.

Items or services provided by and to contracting parties must be provided at “fair market value.” Fair market value means that the price of the good or service is the result of bona fide bargaining between well-informed buyers and sellers who are not otherwise in a position to generate business for the other party. A good faith estimate of fair market value must document that prices are not based on referral of Medicare business. The determination of fair market value includes an assessment of the cost of the good or service, the return on investment and other local market factors such as competitor’s prices for the good or service.

Violating the AKS and other Medicare rules can subject public officials, as well as providers, to potential criminal liability and substantial civil monetary penalties. The AKS imposes a maximum fine of \$25,000 and/or imprisonment for five years for each violation. In addition, Medicare laws impose civil penalties of \$50,000 per kickback violation, plus three times the amount solicited or offered, even if no payment ultimately is made.

¹⁴⁷ OIG Advisory Opinion Number 06-06, <http://oig.hhs.gov/fraud/docs/advisoryopinions/2006/AdvOpn06-06.pdf>

Figure 28: Federal Anti-kickback Statute

The following is the actual language of the federal anti-kickback statute, which applies to any party that solicits or receives illegal remuneration in return for referrals [42 U.S.C. 1320a - 7 (b) (1)]:

Whoever knowingly and willfully solicits or receives any remuneration (including any kickback, bribe or rebate) directly or indirectly, overtly or covertly, in cash or in kind:

(A) In return for referring an individual to a person for the furnishing or arranging for the furnishing of any item or service for which payment may be made in whole or in part under subchapter XVIII of this chapter or a State health-care program, or

(B) In return for purchasing, leasing, ordering or arranging for or recommending purchasing, leasing or ordering any good, facility, service or item for which payment may be made in whole or in part under subchapter XVIII of this chapter or a State health-care program,

shall be guilty of a felony and upon conviction thereof, shall be fined not more than \$25,000 or imprisoned for not more than five years, or both.

Section 1320a - 7 (b) (2) is the mirror image of 1320a - 7 (b) (1), making the party giving the kickback just as guilty as the party that accepts the kickback. The civil money penalty provision imposes civil penalties of \$50,000 for the commission of any act described above, plus damages of not more than three times the amount of remuneration offered, paid, solicited, or received, regardless of whether any money actually changes hands.

Human Resource Issues

A successful procurement process should also consider how to address the incumbent personnel involved in the emergency ambulance service function, including, but not limited to, those who provide patient care, answer telephone requests, maintain the fleet, bill for services, supervise field operations, and manage the system. These people are essential to ensuring high-quality, cost-effective service. A well-designed procurement process provides the system's personnel with an opportunity to participate in the high-performance emergency ambulance service function, enhancing their opportunities for personal and professional growth.

There may be no greater assurance of the success of the community's emergency ambulance service than the retention of clinically-experienced members of the incumbent workforce. Quality-minded prospective providers typically enter into the marketplace with a concerted effort to incorporate incumbent personnel in their operating plan.

Communicating About Change

Any process that results in a significant change in the emergency ambulance service should be carefully explained to the incumbent personnel. Personnel should understand that the change will improve the system conditions and provide the tools needed to enhance patient care. As health-care providers, personnel have a stake in the success and stability of the service. The credible employer will appreciate the opportunity to demonstrate the strengths of its plan, which will result in a stable and secure working environment.

Treatment of the Incumbent Workforce

Everyone working to enhance emergency ambulance service in a community should be concerned with how the incumbent personnel will be treated under a new contract. Legal, contractual, moral, and political constraints all affect what is required from a provider. The RFP should carefully and clearly establish requirements that include:

- Contractual obligations that may arise out of existing collective bargaining agreements and individual employment contracts.

- Affirmative action responsibilities.
- Required compliance with state licensing and certification, including requirements for OSHA, the Department of Transportation, the Fair Labor Standards Act, and so on.
- Particular wages, benefits, and/or other working conditions required by law, contract, or simply desired by the independent oversight entity, including transferability of benefits.
- Preferential retention of experienced personnel.
- 401(k) provisions that allow for rollover of personnel monies to ensure continuity from one plan to another in the event of a change in providers.
- Training for clinical upgrades.

Finally, it is important to include contractual language that clearly states that the independent oversight entity will not interfere with issues between personnel and the provider. While methods should be in place to ensure that personnel can report suspected contractual non-compliance appropriately, it is unwise for the independent oversight entity to become involved in personnel/employer issues.



Appendix

APPENDIX A

National Resources

American Ambulance Association

The American Ambulance Association (AAA) is a national membership organization representing more than 600 ambulance services with members in every state. AAA members include private, public, fire-based, hospital-based and volunteer providers serving urban, suburban and rural communities with both emergency and non-emergency ambulance services. The AAA assists its members in becoming an integral part of the health care delivery system in their community through programs such as membership education, strategic initiatives and federal advocacy. The AAA's vision is for patients and communities to be served by economically stable, cutting edge, quality ambulance services that deliver timely, efficient and medically necessary care with optimal patient outcomes. The AAA provides information at the local, state and national level highlighting the essential role of ambulance services in health care and disaster response. The AAA was formed in 1979 in response to the need for improvements in medical transportation and emergency medical services. For more information, contact the American Ambulance Association at (800) 523-4447 or go to www.the-aaa.org.

Ambulance Service Management Certificate Program

High-performance ambulance services require superior management skills in many areas, including resource allocation, deployment, quality practices, labor relations, compliance, and reimbursement management. The nation's leading ambulance management training course is the Ambulance Service Manager (ASM) program which provides a broad foundational curriculum that matches cutting edge management theory with real-life practical applications. The core faculty includes experts in the art and science of EMS management, as well as distinguished guest faculty representing current leaders in emergency medical services management. The American Ambulance Association, the leading ambulance service advocacy organization across the United States, sponsors this program. The program is designed and hosted by Fitch and Associates, Inc. For more information, go to www.fitchassoc.com/ASM_Ambulance_Service_Manager.html.

Commission on Accreditation of Ambulance Services

The Commission on Accreditation of Ambulance Services (CAAS) was formed in 1990 as a not-for-profit agency to be a standard bearer for medical transportation systems. Accreditation signifies that ambulance services have met the "gold standard" determined by the ambulance industry to be essential in a modern emergency medical services provider. CAAS accreditation is a voluntary process, open to all types of services—private, fire-based, volunteer, hospital-based, or municipal. CAAS is sponsored by the American Ambulance Association, the American College of Emergency Physicians, the National Association of EMS Physicians, the National Association of State EMS Officials, the National Association of EMTs, and the International Association of Fire Chiefs, with liaison representation from the National Highway Transportation Safety Administration. More information is available on the CAAS web site at www.caas.org.

Commission on Accreditation of Medical Transport Systems

The Commission on Accreditation of Medical Transport Systems (CAMTS) is an organization of non-profit entities dedicated to improving the quality and safety of medical transport services, with 16 current member organizations each of which sends one representative to the CAMTS Board of Directors. The

Commission offers a program of voluntary evaluation of compliance with accreditation standards demonstrating the ability to deliver service of a specific quality. The Accreditation Standards address issues of patient care and safety in fixed and rotary wing services as well as ground interfacility services providing critical care transports. Each standard is supported by measurable criteria used to measure a program's level of quality. Accreditation Standards are periodically revised to reflect the dynamic, changing environment of medical transport with considerable input from all disciplines of the medical profession and serve as a marker of excellence for federal, state, and local government agencies, as well as private agencies and to the general public. For more information, go to www.camts.org.

EMS Agenda for the Future

The *EMS Agenda for the Future* and the subsequent *Implementation Guide* were published in 1996 and 1998, respectively, by the U.S. Department of Transportation, National Highway Traffic Safety Administration. The purpose of the project was to determine the most important directions for future EMS development based on advancing 14 EMS attributes. The emergency medical services of the future will be community-based health management that is fully integrated into the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. This new entity will be developed from redistribution of existing health care resources and will be integrated with other health care providers and public health and public safety agencies. It will improve community health and result in more appropriate use of acute health care resources. EMS will remain the public's emergency medical safety net. To obtain a complete copy of the *Agenda* and *Implementation Guide*, go to www.nhtsa.dot.gov/people/injury/ems/web_order_form.htm. For more information about the federal Office of Emergency Medical Services at the National Highway Traffic Safety Administration, go to www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.2a0771e91315babbbf30811060008a0c/.

Institutes of Medicine—The Future of Emergency Care in the U.S. Health System

The Institutes of Medicine (IOM) published its much-anticipated report *The Future of Emergency Care in the United States Health System* in 2007. The IOM's prestigious panel recommended a national effort to address the crisis in the nation's emergency and trauma care system through improved coordination, expanded regionalization, and increased transparency and accountability. The report has three volumes: 1) Hospital-Based Emergency Care: at the Breaking Point; 2) Emergency Medical Services: at the Crossroads; and 3) Emergency Care for Children: Growing Pains. The EMS report contains recommendations in the following areas: Lead Federal Agency, System Finance, Regionalization, Medical Direction, Air Medical Services, Accountability, Disaster Preparedness, Research, and Demonstration Program. To download the free executive summaries and to order the full reports, go to www.nap.edu/catalog/11629.html.

National Academy of Emergency Dispatch

The National Academy of Emergency Dispatch (NAED) is a non-profit standard-setting organization promoting safe and effective emergency dispatch services world-wide. Comprised of three allied academies for medical, fire, and police dispatching, the NAED supports first-responder related research, unified protocol application, legislation for emergency call center regulation, and strengthening the emergency dispatch community through education, certification, and accreditation. The 20 points of accreditation requirements are presented as a guide for emergency dispatch centers and public safety agencies to become officially recognized as an Accredited Center of Excellence (ACE) by the National/International Academies of Emergency Dispatch. For more information, go to www.emergencydispatch.org.

National Association of EMS Physicians

The National Association of EMS Physicians (NAEMSP) is an organization of physicians and other professionals partnering to provide leadership and foster excellence in out-of-hospital emergency medical services. NAEMSP is the pre-eminent organization for EMS medical directors, and it has offered the NAEMSP Medical Director's course for a number of years. The distinguished faculty are recognized as experts in various aspects of the prehospital and disaster medicine/management fields. In addition to curriculum elements that run the range and depth of issues vital to EMS medical directorship, students of the course will have the opportunity to network with faculty and fellow students to critically evaluate their system. The companion texts for the course are the 3rd edition of NAEMSP's *Prehospital Systems and Medical Oversight* (by AE Kuehl) and *Improving Quality in EMS* (by Swor and Pirrallo). For more information, go to www.naemsp.org.

National Association of State EMS Officials

The National Association of State EMS Officials (NASEMSO) is the professional association for state emergency medical services officials and is a respected voice for national EMS policy with comprehensive concern and commitment for the development of effective, integrated, community-based, universal and consistent EMS systems. The NASEMSO is advancing the recommendations of the Institutes of Medicine with a *Model State Emergency Medical Services System* which encompasses the IOM concept of "emergency care system." The project includes a description of the model state EMS system; a guide to rating the strengths and weaknesses of the state EMS system (self-assessment); and tools for state EMS system planning. For more information about the NASEMSO, go to www.nasemsd.org. For a copy of the model state EMS plan, go to www.nasemso.org/documents/ModelPlanDraft_12-31-07_Model_Document.pdf.

APPENDIX B

Community Tax Support/Ambulance Fee Tradeoff Analysis

Below is a description of the data required and the necessary steps to conduct a Community Tax Support/Ambulance Fee Tradeoff Analysis of the community's emergency ambulance service. This example provides a description of the necessary steps if the user conducts the analysis manually. The user is encouraged to enter data into the *Emergency Ambulance Service Financial Model*, presented in Appendix C, which automates the analysis using a custom-designed Microsoft Excel spreadsheet program.

This example uses the basic operations and service area data from the most recent *one-year period* for the sample emergency ambulance provider serving a medium-sized city as presented in Figure 18. The sample provider has exclusivity for both emergency and interfacility ambulance transport services. A caution is offered regarding analysis of providers who do not have exclusivity of both emergency and interfacility ambulance transport services. These services will likely experience higher tax support per capita and/or average patient charges on the analysis scale.

In gathering data for the financial analysis, the information should be based on actual data from local providers and regulators. Useful sources include the provider's own audited financial statements, bond applications for government providers, census bureau data, Medicare data from the Centers for Medicare and Medicaid Services (CMS), and data from the state EMS regulatory agency. In circumstances where this data is non-existent, unavailable or unreliable, it will be necessary to employ estimates in combination with actual data.

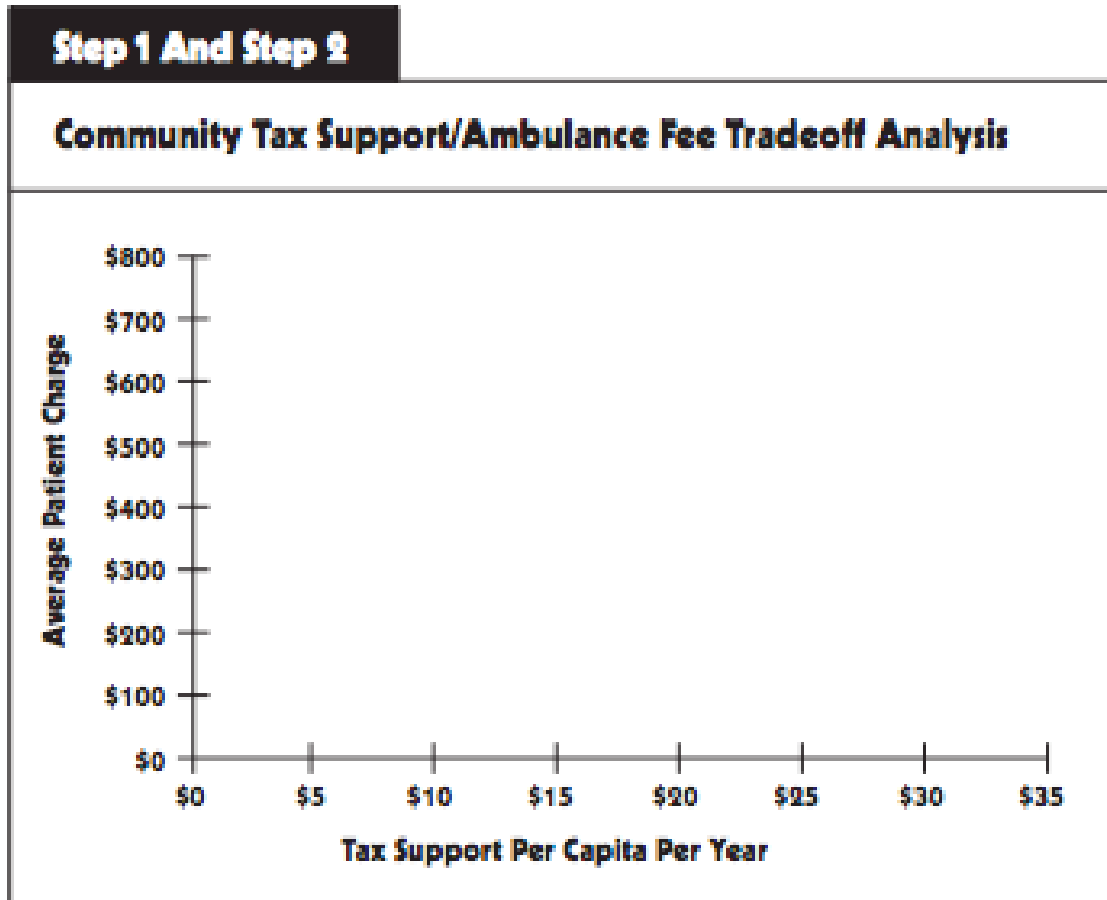
Another important consideration is that collection rates are often miscalculated or overestimated. Collection rate is calculated by dividing actual cash collected by total gross billings for the same transports over a finite period. To guide the reader in estimating a realistic collection rate, consider that the actual collection rate experience from various high-performance emergency ambulance services ranges from approximately 35 percent to 55 percent.

To plot the Community Tax Support/Ambulance Fee Tradeoff Analysis, complete the steps on the following pages.

Sample Provider	
Population	400,000
Costs	\$13,280,000
Transports	32,000
Unit Hours	115,000
Collection Rate	55%

STEP 1 AND STEP 2

Community Tax Support/Ambulance Fee Tradeoff Analysis

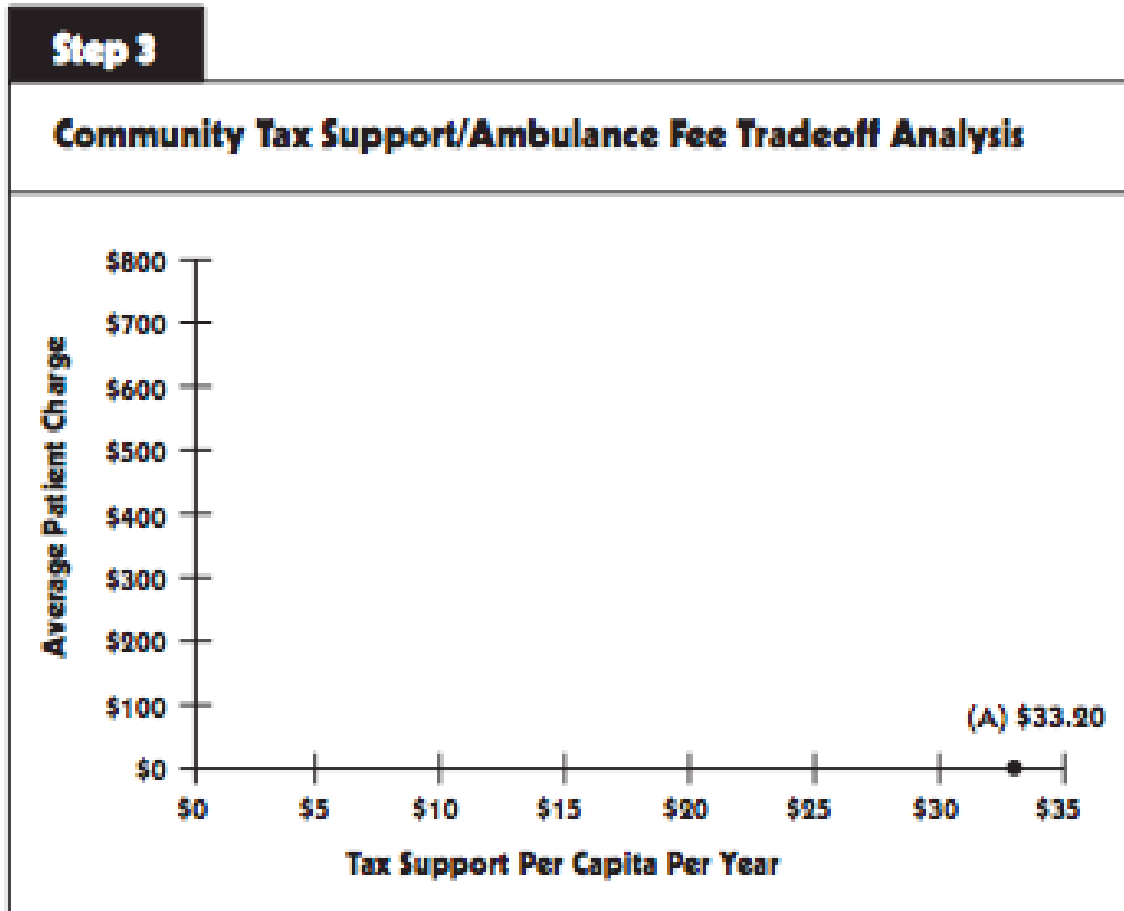


Step 1 — Draw the Chart for the Community Tax Support/ Ambulance Fee Tradeoff Analysis. Draw a chart with a horizontal axis and a vertical axis. The horizontal axis is labeled “Tax Support Per Capita Per Year,” and the vertical axis is labeled “Average Patient Charge.”

Step 2 — Identify Total Ambulance Service Costs. Identify the total cost of operating the ambulance service in the service area, including costs associated with all emergency and interfacility transports and projected surplus or profit. This is the single most important step in the analysis because this data forms the foundation for determining both end points on the chart and establishes the range of policy options available to community leaders. To ensure an accurate accounting (Hallmark 3), the costs of all services contributed by government agencies or other organizations, direct, indirect, and shared, should be included in total emergency ambulance service cost (see Figure 17 and Figure 27). In this example, the total cost is \$13,280,000 and total population of the service area is 400,000.

STEP 3

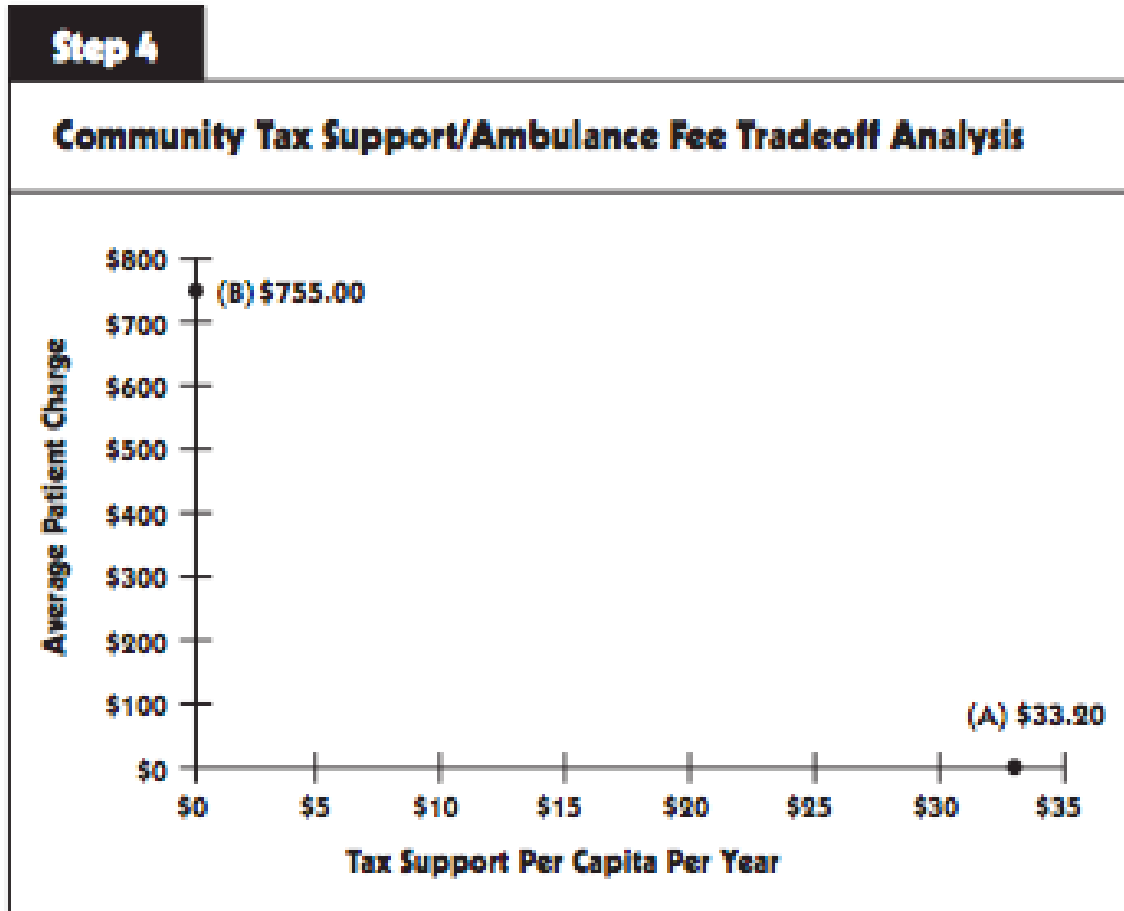
Community Tax Support/Ambulance Fee Tradeoff Analysis



Step 3 — Calculate the Ambulance Service Cost Per Capita. Calculate the ambulance service cost per capita by dividing the total cost (\$13,280,000) by the total population of the service area (400,000). If no charges were billed to patients, this number represents the annual cost borne by taxpayers to fund emergency and interfacility ambulance services in the community. Cost per capita is the foundation for all further policy options because the total cost per capita equals the tax support per capita when zero charges are billed to patients. In this example, the cost per capita is \$33.20 (A). Plot this number along the horizontal axis.

STEP 4

Community Tax Support/Ambulance Fee Tradeoff Analysis



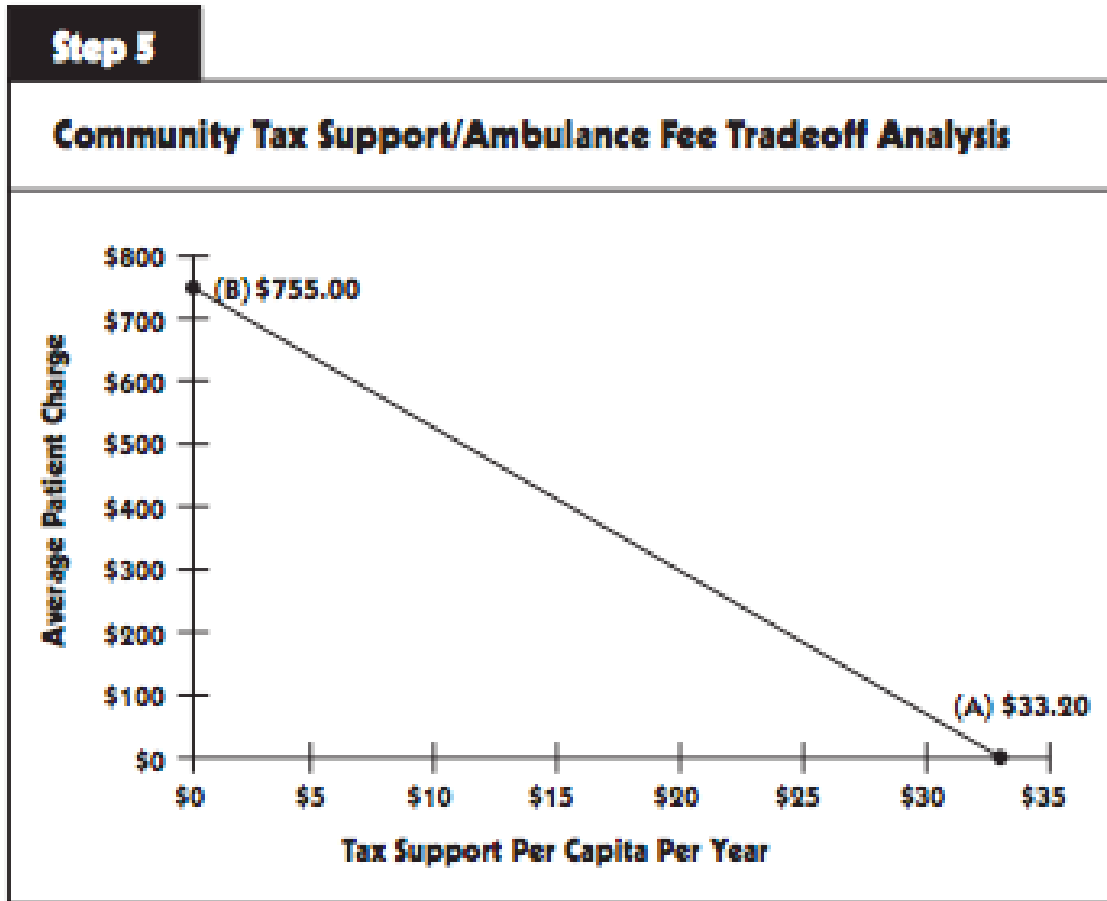
Step 4 — Calculate the Average Patient Charge Required Without Tax

Support. To accomplish this step, three pieces of information are required: total cost, total transports, and the realistic collection rate. In this example, the total cost is \$13,280,000, total transports per year are 32,000, and the realistic collection rate is 55 percent.

- Calculate the cost per transport by dividing the total cost (\$13,280,000) by the total transports (32,000). The total cost per transport is \$415.
- Calculate the average patient charge (average ambulance fee for all service levels) required to cover total costs by dividing the cost per transport (\$415) by the collection rate (.55). The average patient charge (ambulance fee) is \$755 (B).
- Plot the average patient charge on the vertical axis. This is the other end point on the chart establishing the range of policy options available to community leaders.

STEP 5

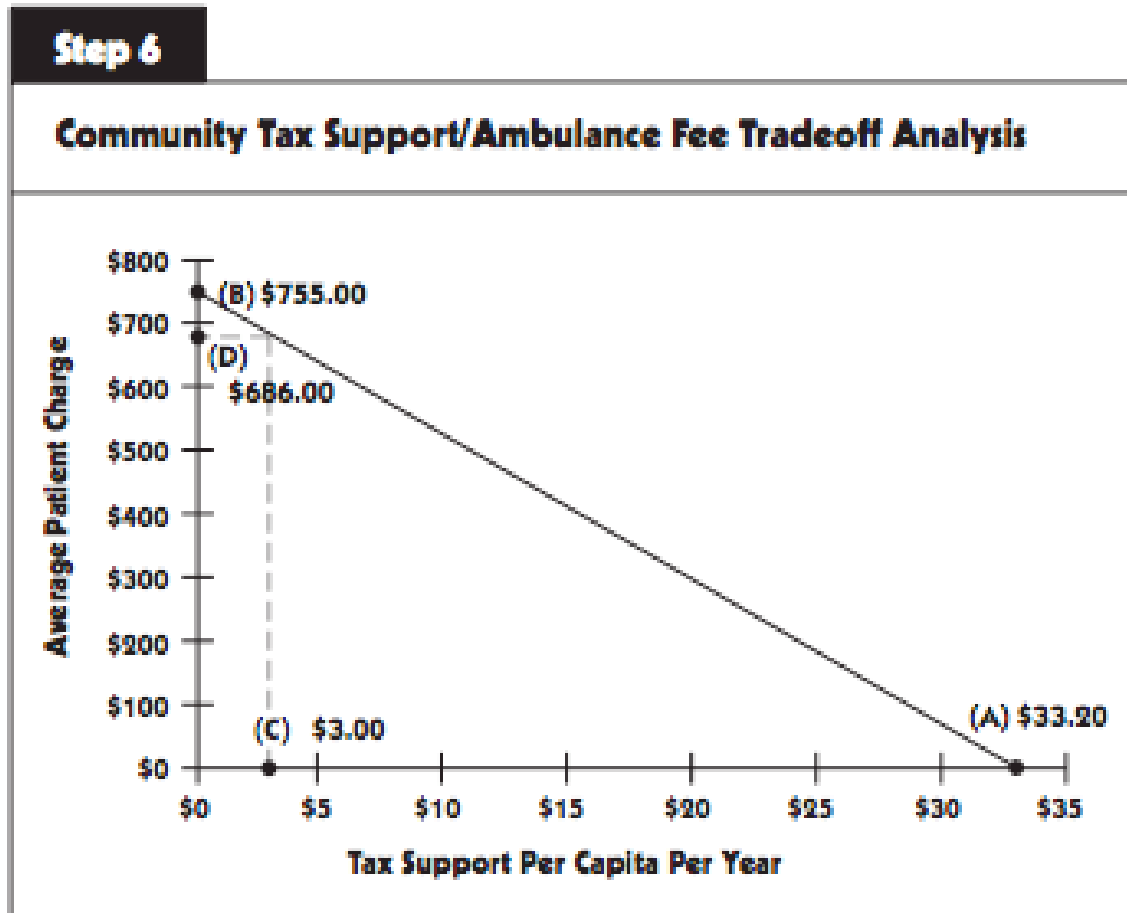
Community Tax Support/Ambulance Fee Tradeoff Analysis



Step 5 — Draw the Tax Support/Ambulance Fee Tradeoff Line. With a ruler, connect the two points on the chart, extending the left end upward to the vertical axis, and extending the right end toward the horizontal axis. The result is the community tax support/ambulance fee tradeoff line. In this example, where the line intersects the vertical axis, the average patient charge (adjusted for uncollected accounts) with \$0 tax support is \$755 (B). Where the line intersects the horizontal axis, the tax support per capita is \$33.20 (A) reflecting service funded solely by tax dollars without any patient charges.

STEP 6

Community Tax Support/Ambulance Fee Tradeoff Analysis

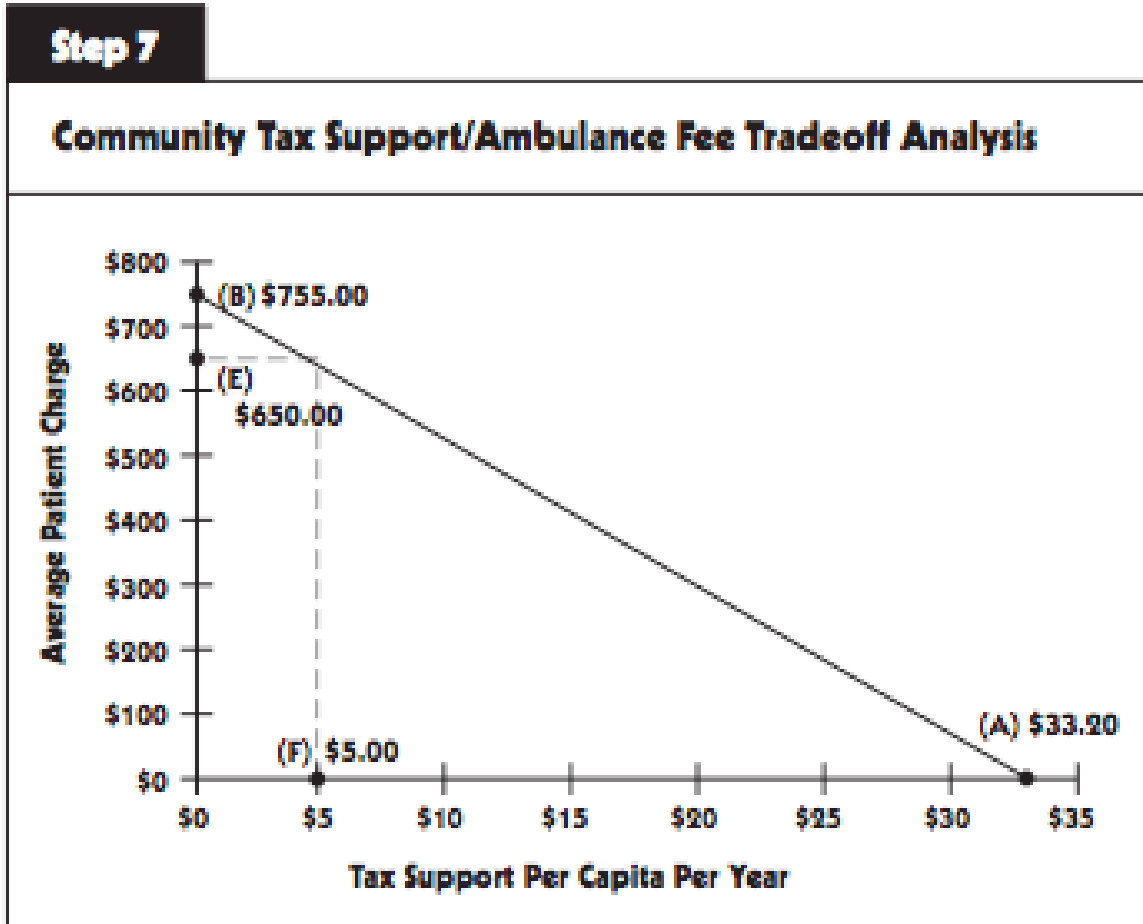


Step 6 — Calculate the Average Patient Charge at Various Tax Support

Levels. What average charges must be billed to patients if the community is willing to pay, for example, \$3 tax support per capita per year? First, plot the point on the horizontal axis at \$3 (C) tax support per capita, draw a vertical line so that it intersects with the tax support/ambulance fee tradeoff line, then draw a horizontal line so that it intersects with the vertical axis at \$686 (D) average patient charge. To confirm this plot, multiply the tax support per capita (\$3) by the population of the service area (400,000). Total tax support is \$1,200,000. Subtract this total from the total cost (\$13,280,000 minus \$1,200,000) which equals the amount of revenue needed from ambulance fees (\$12,080,000). Calculate the average patient charge by dividing this total by the total transports and multiplying by the collection rate (\$12,080,000 divided by 32,000, divided by .55). The average patient charge is \$686.

STEP 7

Community Tax Support/Ambulance Fee Tradeoff Analysis



Step 7 — Calculate the Required Level of Tax Support when Rates are Regulated.

What level of tax support per capita is required when the community regulates rates charged to patients and the current average patient charge limit is \$650 per transport? First, plot the point on the vertical axis at \$650 (E) average patient charge. Draw a horizontal line so that it intersects with the tax support/ambulance fee tradeoff line, and then draw a vertical line so that it intersects with the vertical axis at \$5 (F) tax support per capita. To confirm this plot, multiply the average patient charge (\$650) by total transports (32,000) which equals gross revenue (\$20,800,000). Multiply this total by the collection rate (55%) which equals net revenue (\$11,440,000). Subtract this total from total cost (\$13,280,000) which equals required tax support (\$1,840,000). Divide this total by total population (400,000) which equals tax surcharge per capita (\$4.60).

Once the community tax support/ambulance fee tradeoff line is drawn, community leaders can evaluate the corresponding impact of any level of tax support or average patient charge. In this manner, various points along the tradeoff line are illustrated, and the various policy options available to community leaders are identified.

The tradeoff line created by this example is represented as a straight line. However, rate increases are characterized by diminishing returns. For example, a 10 percent rate increase results in less than a 10

percent increase in cash collections. Therefore, a more exact calculation of the above tradeoff line, which is too complex for the scope of this example, would result in a curved tradeoff line; that is, as the average patient charge increases the collection rate decreases. Nonetheless, the straight tradeoff line presented above is a useful tool to illustrate the relationship between the two major sources of revenue.

APPENDIX C

Emergency Ambulance Service Financial Model

The *Emergency Ambulance Service Financial Model* is a tool designed to assist community leaders and ambulance administrators in establishing the emergency ambulance service's financing strategy by accurately analyzing ambulance service costs and revenues. As an essential component of this *Guide, EMS Structured for Quality: Best Practices in Designing, Managing and Contracting for Emergency Ambulance Service*, the *Model* consists of a comprehensive Microsoft Excel spreadsheet that guides users through the process of gathering basic operations and service-area data necessary to ensure the accuracy of the financial analysis. The *Model* assists in completing the Community Tax Support/Ambulance Fee Tradeoff Analysis and also allows users to compare the financial aspects of competing proposals in a procurement process or other type of benchmarking comparison.

This *Model* requires an estimated 2 to 8 hours to input and analyze the requested operational data. Less time would be required if the necessary data were readily available; more time would be required if it was a lengthy process to gather or assemble the necessary data. The *Model* has been tested using actual ambulance service operational and procurement data from a variety of EMS system designs.

To access the *Model*, subscribers can simply visit www.EmergencyAmbulanceQuality.org and log in. You can download the *Model* in the Tool Kit.

This *Model* is presented in a Microsoft Excel spreadsheet for PC-based computers. If you are a Macintosh user, and have difficulties with the file, please contact the AAA for the Macintosh CD-ROM version. For questions about the *Model*, please contact the AAA at (800) 523-4447.

APPENDIX D

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About Jack Stout

The authors would like to recognize Mr. Jack L. Stout for teaching his principles of EMS to so many ambulance providers, contracting officials, and community leaders. The Hallmarks and Essential Performance Results underscore his foresight into a better way to provide high-quality, cost-effective emergency medical services to communities. Mr. Stout has been recognized internationally as an EMS system designer, consultant, author and visionary whose valuable contributions over four decades changed the way emergency medical services were delivered in many communities around the U.S. and the world. As founder of The Fourth Party, Inc., Mr. Stout designed and implemented dozens of high-performance EMS systems including the public utility models. He is the originator of many of the concepts in this *Guide* and other innovations which are now standard practices for high-performance EMS systems and emergency ambulance services.

APPENDIX E

About the Authors

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Services, the National Academy of Emergency Dispatch—Center of Excellence and the Commission on Accreditation of Ambulance Services. Mr. Smith's 34-year career includes participation on all sides of competitive procurement process—as a buyer, incumbent provider, and new bidder. As a consultant with The Fourth Party, Inc. for over ten years, he was directly involved in the implementation of most of the country's public utility model-based (high performance) EMS systems. Mr. Smith has extensive experience in managing clinical, operations, communications, and finance areas in high-performance emergency ambulance services. He served as the chair of the AAA's Management Training Institute Committee, serves on the Editorial Board of the *EMS Best Practices* management newsletter, and is an officer and board member of the Coalition of Advanced Emergency Medical Systems. He speaks and consults internationally on high-performance emergency ambulance system designs and operational issues. REMSA is also under contract to manage other emergency ambulance services.

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APPENDIX F

Abbreviations

AAA	American Ambulance Association
ACEP	American College of Emergency Physicians
ACLS	Advanced Cardiac Life Support
AED	Automatic External Defibrillator
ALS	Advanced Life Support
APC	Average Patient Charge
AHA	American Heart Association
AHA	American Hospital Association
AKS	Anti-kickback Statute
ASM	Ambulance Service Management
ASTM	American Society of Testing and Materials
AVL	Automated Vehicle Location
BLS	Basic Life Support
BTLS	Basic Trauma Life Support
CAAS	Commission on Accreditation of Ambulance Services
CAD	Computer Aided Dispatch
CAEMS	Coalition of Advanced Emergency Medical Systems
CCT	Critical Care Transport
CMS	Center for Medicare & Medicaid Services
CON	Certificate of Need
CPR	Cardiopulmonary Resuscitation
CPI	Consumer Price Index
CQI	Continuous Quality Improvement
DOT	Department of Transportation
DHS	Department of Homeland Security
DHHS	Department of Health and Human Services
EMD	Emergency Medical Dispatch
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EOA	Emergency Operating Area
FDA	Food and Drug Administration
FICEMS	Federal Interagency Committee on Emergency Medical Services
FLSA	Fair Labor Standards Act
FTE	Full-time Equivalent
GAO	Government Accountability Office
GPS	Global Positioning System
HIPAA	Health Insurance Portability and Accountability
HMO	Health Maintenance Organization
IAFC	International Association of Fire Chiefs
IOM	Institute of Medicine

<i>IV</i>	Intravenous Line
<i>MTI</i>	Management Training Institute
<i>NAED</i>	National Association of Emergency Dispatch
<i>NAEMSP</i>	National Association of EMS Physicians
<i>NAEMT</i>	National Association of Emergency Medical Technicians
<i>NASEMSO</i>	National Association of State EMS Officials
<i>NFPA</i>	National Fire Protection Association
<i>NHTSA</i>	National Highway Traffic Safety Administration
<i>OIG</i>	Office of Inspector General
<i>OSHA</i>	Occupational Safety and Health Administration
<i>PAD</i>	Public Access Defibrillation
<i>PALS</i>	Pediatric Advanced Life Support
<i>PEPP</i>	Prehospital Emergency Pediatric Program
<i>PHTLS</i>	Prehospital Trauma Life Support
<i>PSAP</i>	Public Safety Answering Point
<i>RFC</i>	Request for Credentials
<i>RFP</i>	Request for Proposals
<i>SCT</i>	Specialty Care Transport
<i>SSM</i>	System Status Management
<i>SSP</i>	System Status Plan
<i>SWAT</i>	Special Weapons and Tactical Unit
<i>UHU</i>	Unit Hour Utilization

APPENDIX G

Table of Figures

<i>Figure</i>	<i>Title</i>	<i>Page</i>
Figure 1:	Hallmarks to Ensure High-Performance Emergency Ambulance Service.....	11
Figure 2:	Public Policy Options Matrix	15
Figure 3:	EMS System Service Elements	23
Figure 4:	Six Quality Aims for Health Care	36
Figure 5:	Factors of Quality Patient Care	37
Figure 6:	Response-Time Events.....	44
Figure 7:	Sample Response-Time Report.....	45
Figure 8:	Comparison of Response-Time Measurement Methods	46
Figure 9:	System Design Characteristics that Maximize Performance Results – Urban Communities.....	53
Figure 10:	System Design Characteristics that Maximize Performance Results – Small Towns & Rural Communities.....	56
Figure 11:	Benchmarking Characteristics.....	66
Figure 12:	Sample Timeline for Model Emergency Ambulance Service Procurement Process.....	67
Figure 13:	Sample Credentials Evaluation Criteria.....	68
Figure 14:	Life-Threatening Emergency Response-time Penalties.....	72
Figure 15:	Superior Performance Incentives.....	73
Figure 16:	Essential Transition Issues	75
Figure 17:	Emergency Ambulance Service Cost Categories	80
Figure 18:	Sample Emergency Ambulance Service Provider.....	81
Figure 19:	Cost Per Transport Formula	82
Figure 20:	Cost Per Capita Formula	82
Figure 21:	Cost Per Unit Hour Formula.....	82
Figure 22:	UHU Ratio Formula	83
Figure 23:	Payer Mix Percentages.....	86
Figure 24:	Community Tax Support/Ambulance Fee Tradeoff Analysis	90
Figure 25:	Community Tax Support/Ambulance Fee Tradeoff Chart.....	91
Figure 26:	Proposer’s Process for Evaluating Potential Procurement.....	95
Figure 27:	Key Government Provider Cost Considerations	100
Figure 28:	Federal Anti-kickback Statute.....	103

APPENDIX H

Glossary

Advanced Cardiac Life Support (ACLS): Training program and certification for advanced-level emergency care for victims of heart attack and stroke.

Advanced Life Support (ALS): Patient care assessment and treatment services provided by ALS personnel (i.e., a paramedic), including the services of Basic Life Support (BLS) and advanced emergency care such as intravenous therapy, endotracheal airway, cardiac monitor (EKG), cardiac defibrillator, medications, relief of pneumothorax, and other invasive procedures and services.

Ambulance: Vehicle (ground, air, water) designed to provide medical services and safe transport for sick or injured persons. The ambulance also safely accommodates the health care providers, medical equipment and supplies providing a clinical work environment for providing medical care for the patient.

Ambulance Service: Organization that provides community emergency mobile health care to sick and injured persons including, assessment, treatment, safe transfer, and communications with the health care system. Ambulance services also provide non-emergency transfers of patients between health care facilities.

Ambulance Service Contract: Agreement between an ambulance service provider and any local government agency, independent oversight entity, health facility, or third-party payer that incorporates clinical standards and financial provisions.

Asset: Economic resources that a company owns and that are expected to benefit future activities. Assets are depreciated over their estimated useful life and include ambulances and other vehicles, medical equipment, medical communications center equipment and software, fleet maintenance equipment, office equipment and software, and facilities.

Asset, Value of Use: The value of use for each asset is computed using a standard methodology: for purchased assets, compute the straight-line annual depreciation amount based on its useful life; for leased assets, compute the total annual lease payments; and for assets obtained from a parent organization or provided by local government, compute an equivalent annual usage cost based on the useful life of the asset. In making these computations and in order to assure an accurate accounting of costs, all major equipment has a useful life of five years and all facilities have a useful life of 30 years. (See Asset.)

Automated Vehicle Location System (AVL): Computerized mapping system displaying location of vehicles and call assignments.

Automatic External Defibrillator (AED): A medical device that co-responders and trained members of the general public use to provide electric shock to cardiac arrest victims.

Average Patient Charge: The average total amount normally charged to all patients, including base rate per transport, the average mileage per transport, and average add-on charges per transport.

Average Response Time: A response-time calculation method in which all cumulative elapsed response times are divided by the number of incidents to determine an average.

Bad Debt: The total amount of revenue forgone for which full payment was expected from third-party

payers or patients, including, uncollected billed amounts due to insurance denials, uncollected patient co-pays and deductibles and any uncollected billed amounts due to unresolved payment disputes about coverage or eligibility.

Basic Life Support (BLS): Patient care assessment and treatment services provided by BLS personnel (i.e., an emergency medical technician) such as defibrillation, first aid, oxygen administration, application of splints and bandages, and CPR.

Basic Trauma Life Support (BTLS): A trauma certification program for field personnel.

Benchmarking: A process that allows the independent oversight entity to evaluate the incumbent provider by assessing certain performance indicators within specific parameters. The performance indicators are measured against comparables from other high-quality, efficient systems to determine the value and quality of the service that the provider is delivering to the community.

Calls: The total number of events to which an ambulance is dispatched that may or may not result in patient transport. (Also known as requests for service or responses.)

Cash Collections: The total amount of cash collected from ambulance fee billings to all patients and insurance programs. (Also known as collected ambulance fee revenue.)

Cavalier Proposal: A proposal to provide ambulance service that contains unrealistic commitments.

Center for Medicare & Medicaid Services (CMS): Formerly known as the Health Care Financing Administration (HCFA), CMS is the principal operating component of the Department of Health and Human Services, composed of organizational units with responsibilities related to the administration of Medicare, Medicaid, and their supporting functions and services.

Charity Care: The total amount of revenue forgone for which no payment was expected from patients because they had no insurance coverage.

Claim: A request to an insurer by an insured person or his assignee for payment of benefits under an insurance policy.

Collection Rate: The rate of collection of revenues calculated by dividing actual cash collected by total gross billings for the same transports over a finite period.

Communications Infrastructure: Fixed (i.e., not mobile or portable) components of the CAD and communications systems, such as radios, radio towers, telephone systems, computers, consoles, etc.

Community Tax Support: Revenues provided to an ambulance service from local government tax sources.

Computer Aided Dispatch (CAD): A communications system including, but not limited to, primary medical dispatch data entry and automated time stamping, 9-1-1 data interface, demand pattern analysis, system status management, automated patient locator aids, response-time reporting and documentation, automated vehicle tracking, and automated reporting.

Contract Service Area: The geographic area served by the contracted ambulance service provider, as defined and regulated by the local government agency, and including other cities or counties that may choose to contract with the provider. The services provided in this geographic area are subject to a contract incorporating clinical standards and financial provisions consistent with those contained in the emergency ambulance service system design.

Contracting Entity: The entity (often an agency of local government) with the legal authority to arrange for the delivery of emergency ambulance service in a specific operating area including allocating market rights and contracting for services. The contracting entity is responsible to determine the essential components of system design including performance requirements, independent oversight, business structure, legal framework, and financing strategy. Also referred to in this *Guide* as the “purchaser.”

Contractual Allowance: An accounting adjustment to reflect the difference between charges for services rendered to an insured person and the amount paid for those services according to the terms of each third-party payer.

Co-payment: A type of health-care cost-sharing whereby the insured person pays a fixed amount per unit of medical service or unit of time (for example, \$10 per physician visit, \$60 per inpatient hospital day) and the insurer pays the rest of the charges.

Co-responder: A non-transporting response unit capable of providing emergency medical treatments such as BLS procedures and automated defibrillation.

Cost, Direct: A cost that can be traced specifically to ambulance transports, including costs for items or services that are provided by or shared with a parent hospital, government agency, corporation, or other operating division. Direct costs include the total of operations labor, vehicles and fleet maintenance, medical supplies and equipment, and medical communication center equipment. Shared direct costs include items or services such as loaned vehicles, loaned medical equipment, shared fleet maintenance services, and shared medical communications center services.

Cost, Direct Labor: The total of salaries, wages, and benefits for full-time and part-time employees (or full-time equivalents) engaged in directly providing a particular service. For ambulance services, direct labor costs include salaries, wages, and benefits for operations personnel, operations support personnel, and personnel responsible for first line supervision. Direct labor costs also include payments to volunteers, vacation and sick pay, continuing education and training pay, bonuses for skills upgrade, and miscellaneous personnel costs.

Cost, Fixed: A cost that does not change as the number of ambulance transports changes in the short run, including, labor costs, vehicles, medical equipment, facilities, management and administrative support functions.

Cost, Full: The total direct, indirect, and shared costs of ambulance service.

Cost, Indirect: A cost that cannot be traced specifically to ambulance transports, including costs for items or services that are provided by or shared with a parent hospital, government agency, corporation, or other operating division. Indirect costs include the total of administrative labor, building and facilities, administrative support, other operating costs, and shared indirect costs including items or services such as shared facilities, shared management functions, and shared administrative support functions.

Cost, Indirect Labor: The total of salaries, wages, and benefits for full-time and part-time employees (or full-time equivalents) that serve in management or administrative support functions for a particular service.

Cost, Marginal: The direct cost of producing one additional ambulance transport.

Cost, Shared: A cost that is shared among one or more operating divisions or departments (e.g., shared costs can occur when ambulance services are provided by a hospital-based, government-based, or multi-

jurisdictional provider).

Costs, Total: The total of all direct, indirect, and shared costs representing the total cost of ambulance service. If there is a net projected surplus, the total cost to the community is the total cost plus the net projected surplus.

Cost, Variable: A cost that changes as the number of ambulance transports changes, including, fuel and medical supply costs.

Cost of Readiness: All the costs associated with placing enough ambulances in the community to meet clinically meaningful response times.

Cost-Benefit Analysis: A process for determining the cost and benefit of adding new system design features, equipment, drugs, or protocols to the EMS system. An item that passes the cost-benefit test is assured to improve the system.

Critical Care Transport (CCT): See Specialty Care Transport (SCT).

Deficit: See Surplus (Deficit).

Demand Analysis: A statistical chart showing historical call volumes and demand fluctuations for each hour of the day and each day of the week.

Deployment: The procedures by which ambulances are distributed throughout the service area, including the locations at which the ambulances are placed and the number of ambulances placed in service for each hour of the day and day of the week.

Deployment Plan: The formal plan used to maximize ambulance coverage for a designated service area.

Dispatch Time: The interval between the time the call is received at the medical communications center until the time the ambulance has been selected and notified of its assignment.

Diversion: A procedure used by hospitals to notify ambulance services that no beds are available and ambulances need to take patients to other hospitals.

Economies of Scale: The efficiencies gained as the number of ambulance transports increases. For ambulance services, the cost per transport decreases as the number of transports performed increases.

Emergency: An unforeseen condition of a pathophysiological or psychological nature that a prudent layperson, possessing an average knowledge of health and medicine, would judge to require urgent and unscheduled medical attention, thus requiring an immediate response by an ambulance.

Emergency Medical Dispatch (EMD): The science of dispatching emergency vehicles utilizing protocols, including priority-dispatch functions, pre-arrival instructions, and other response-management functions.

Emergency Medical Services (EMS): The full spectrum of out-of-hospital care and transportation (including interfacility transports), encompassing bystander action (e.g., citizen CPR, PAD), priority dispatch and pre-arrival instructions, co-response and rescue service, ambulance services, and medical oversight.

Emergency Operating Area (EOA): A geographic area, such as a municipality or a county, where

limited market rights are awarded for emergency ambulance service responses only.

EMS System: The EMS system consists of those organizations, individuals, facilities, and equipment whose participation is required to ensure a timely and medically appropriate response to each request for out-of-hospital care and medical transportation.

Emergency Medical Technician (EMT): An individual trained and certified to perform basic life support procedures.

EMT: An individual trained and certified as a basic EMT (requiring about 120 hours of instruction) and trained in the use of an automated external defibrillator (about 4 to 20 additional hours).

EMT-P: See Paramedic.

Enroute Time: See Out-of-Chute Time.

Essential Performance Results: The four outcomes that result in optimal patient care, including clinical excellence, response-time reliability, economic efficiency, and customer satisfaction.

External Medical Oversight: The supervision and coordination of emergency medical services through an independent medical entity, as prescribed, adopted and enforced through protocols and procedures.

Fair Market Value: The price of the good or service that is the result of bona fide bargaining between well-informed buyers and sellers who are not otherwise in a position to generate business for the other party. The determination of fair market value includes an assessment of the cost of the good or service, the return on investment and other local market factors such as competitor's prices for the good or service.

Fee-for-Service: A method of reimbursing for services rendered based on fees paid by government and private third-party insurers or individuals.

Flexible Deployment: The process used to distribute ambulance and personnel resources to provide coverage in a designated service area. The procedures match expected demand for services with the distributed resources (i.e., staffed ambulances). Variable numbers of ambulances and locations are used to match the resources with historical call patterns based on the time of day, day of week, and week of year.

Fractile Response-Time Measurement: A method of measuring ambulance response times in which all applicable response times are stacked in ascending length, and the total number of calls generating response within the specified standard (i.e., eight minutes) is calculated as a percentage of the total number of calls. A 90th percentile, or 90 percent, standard is most commonly used. Where a 90th percentile response-time standard is employed, 90 percent of the applicable calls are answered in under the 8-minute standard, while only 10 percent take longer than 8 minutes.

Full-Time Equivalent (FTE): A full-time equivalent is one full-time position or a combination of part-time employees filling a full-time position.

Global Positioning System (GPS): An advanced vehicle location system utilizing satellite technology.

Gross Billings: Total amount charged via ambulance user fees to all patients and insurance programs calculated by multiplying average patient charge by total transports billed. (Also known as gross ambulance fee revenue.)

Hallmarks: The five system design features that are integral to achieving optimal patient care and economic efficiency: hold the emergency ambulance service accountable, establish an independent oversight entity, account for all service costs, require system features that ensure economic efficiency, and ensure long-term high performance service.

Health Maintenance Organization (HMO): Any organization that, through an organized system of health care, provides or ensures the delivery of an agreed set of comprehensive health maintenance and treatment services for an enrolled group of people under a prepaid fixed sum or payment-per-capita arrangement.

Income Tax: The total annual corporate or business taxes paid by nongovernmental for-profit ambulance services based on applicable federal, state, and local tax rates.

Independent Oversight Entity: The entity established by one or more local governments responsible for establishing the system design and performance requirements, managing the contracting and procurement process, monitoring the emergency ambulance provider's performance, and performing other oversight functions.

Inflation Rate, Labor: The expected average annual increase in all salaries and wages. Annual salary increases may be determined based on several internal and external factors. Information about the current year's CPI-Urban and CPI-Medical may be found at www.bls.gov/cpi/home.htm.

Inflation Rate, Other Expense: The expected average annual increase in all other non-labor expenses which are typically a mix of medical and non-medical goods and services. Information about the current year's CPI-Urban and CPI-Medical may be found at www.bls.gov/cpi/home.htm.

Inflation Rate, Revenue: The expected average annual increase in ambulance revenues. Many sources of revenue, especially Medicare and Medicaid rates, are increased annually by the CPI - Urban established by the Department of Labor, Bureau of Labor Statistics. Information about the current year's CPI-Urban and CPI-Medical may be found at www.bls.gov/cpi/home.htm.

Interfacility: Transportation of patients between health-care facilities, such as hospitals, nursing homes, diagnostic facilities, and treatment centers, including transports from nursing homes to patient homes.

Interlocal Agreement: An agreement in a multi-jurisdictional system enabling one or more municipality or county to pool their purchasing powers to achieve economies of scale and to contract with an emergency ambulance service provider while retaining the right to choose separately from the uniform schedule of community tax support/ambulance fee options.

Level-of-Effort: A rate and level of activity measured only in terms of resources consumed over a specific period of time and not the result of that resource usage.

Local Ambulance Ordinance: A legal instrument that establishes key components of the ambulance service system, including establishing the independent medical director function, authorizing regulation of the levels of ambulance fees and community tax support, creating the independent oversight entity, and establishing other regulations affecting the delivery of ambulance services.

Medicaid: As authorized by Title XIX of the Social Security Act, Medicaid is a federally assisted program, operated and administered by individual states, that provides medical benefits for eligible low-income people.

Medical Communications Center: The central point where emergency and non-emergency phone lines terminate, requests for service are received by emergency medical dispatchers, pre-arrival instructions

are delivered to callers, and ambulances are dispatched.

Medical Director: The physician under whose license and authority EMTs and paramedics provide services.

Medical Trade Area: A geographic area such as a region that extends beyond city and county jurisdiction borders and reflects the use pattern of medical resources by the population.

Medicare: As authorized by Title XVIII of the Social Security Act, provides health care coverage to individuals age 65 and older and to people who have been eligible for Social Security disability payments for more than two years.

Member Jurisdiction: Cities and counties participating in the EMS system and that are signatories to the Interlocal Agreement.

Mutual Aid: Emergency ambulance service performed by neighboring providers during periods of severe weather, multi-casualty incidents, disasters, or other extraordinary events that overwhelm existing resources.

Non-Emergency: A scheduled or non-urgent medically necessary request for ambulance transportation service.

9-1-1 CAD: The CAD system (or a “module” of a larger system that also handles law enforcement, fire, and EMS functions) that is designed to handle the 9-1-1 complaint-taking function. Where Enhanced 9-1-1 exists, the phone company links incoming 9-1-1 calls with callback number, location, and (sometimes) other geographic information to provide enhanced patient locator functions.

On-Scene Time: The interval from the time the ambulance arrives on scene to the time the ambulance leaves the scene and initiates transport.

Out-of-Chute Time: The interval between the time the ambulance is notified of the request for service to the time the ambulance responds enroute to the assignment. For emergency requests, an out-of-chute standard of 30 seconds maximum is optimal.

Overtime Pay: The Federal Fair Labor Standards Act (FLSA) provides regulations governing employer treatment of employees in various areas, including federal minimum wage and overtime pay. Many states also have regulations which may exceed the federal requirements.

Paramedic: An individual trained and licensed to perform advanced life support procedures under the direction of a physician. (Also known as an EMT-P.)

Participating Jurisdiction: Any municipality or county that is not a signatory to the Interlocal Agreement, but which enters into an ambulance service contract with the ambulance provider, incorporating the clinical standards and financial provisions consistent with those set forth in the contract and (in the case of a city) adopting the Local Ambulance Ordinance.

Patient Care Protocols: A compilation of protocols that govern the delivery of patient care, including medical priority dispatching protocols; pre-arrival instruction protocols; medical treatment protocols (for both co-responder and ambulance personnel); protocols for selecting destination hospital; standards for certification of EMS personnel (i.e., telephone call-takers, co-responders, ambulance personnel, and the physician medical director); as well as standards governing requirements for medical equipment and supplies, and licensing of ambulance services and co-responder agencies.

Payer Mix: The percentage of patients transported within each major payer category: Medicare, Medicaid, commercial insurance, private pay, and other payers.

Payer Type: The categories of revenue from ambulance fees charged to patients including Medicare, Medicaid, commercial insurance, private pay (i.e., individual patients), and other payers (i.e., Veterans Administration).

Peak-Load Staffing: The design of multiple shift schedules and staffing plans so that coverage by ambulance crews matches the call demand pattern changes for every hour of every day based on the requirements of the system status plan.

Post: A designated location for ambulance placement within the system status plan. Depending on its frequency and type of use, a post may be a facility with sleeping quarters or day rooms for crews, or simply a street corner or parking lot location to which units are sometimes deployed.

Pre-Arrival Instructions: Directions approved by a medical director and given to bystanders by trained medical dispatchers to help provide care to the patient until EMS providers arrive.

Prehospital Trauma Life Support (PHTLS): Training program and certification for advanced level emergency care for trauma victims.

Preventive Maintenance: Planned or scheduled maintenance conducted on vehicles to reduce the potential for failure.

Productivity: The measure of how efficiently the ambulance provider manages and deploys unit hours calculated by dividing the total number of transports in a period by the total number of unit hours in the same period. (Also known as the Unit Hour Utilization or UHU ratio.)

Protocol: A planned set of actions or course of treatment.

Provider Type: The types of organizations that provide ambulance service based on operation base (nongovernmental public and personnel type (paid, volunteer or combination)).

Public Access Defibrillation (PAD): Automatic defibrillations performed by trained members of the lay public with access to automatic defibrillators located in public places such as airplanes, airports, businesses, sports stadiums, public buildings, and other places where large numbers of people gather.

Public Safety Answering Point (PSAP): A communications center capable of receiving 9-1-1 calls. In some systems, the medical communications center serves as a “secondary” PSAP, meaning that 9-1-1 callers can be directly transferred to the medical communications center.

Request for Credentials (RFC): A process by which possible proposers are pre-qualified before responding to a Request for Proposal (RFP).

Request for Proposals (RFP): An invitation for ambulance services to submit proposals to provide services.

Requests for Service: The total number of events to which an ambulance is dispatched that may or may not result in patient transport. (Also known as responses or calls.)

Response Time: The interval from the time the medical communications center receives enough information to initiate the response to the time a properly equipped and staffed ambulance arrives on the scene.

Response-Time Performance: The performance of the ambulance provider in reliably meeting or exceeding specified response times measured on a fractile basis.

Response-Time to Patient: The interval from the time the medical communications center receives enough information to initiate the response to the time ambulance personnel arrive at the patient's side.

Responses: The total number of events to which an ambulance is dispatched that may or may not result in patient transport. (Also known as requests for service or calls).

Revenue: Sources of funding available to ambulance services, primarily including ambulance fees and community tax support.

Revenue, Collected Ambulance Fee: The total amount of cash collected from ambulance fee billings to all patients and insurance programs calculated by multiplying net revenue per transport by total transports billed. (Also known as cash collections.)

Revenue, Gross Ambulance Fee: Total amount charged via ambulance fees to all patients and insurance programs. (Also known as gross billings.)

Revenue, Net Per Transport: The expected average cash collected per transport for each type of payer, including payments from patients in the form of coinsurance amounts, co-payments, and deductibles.

Revenue, Other Ambulance: Additional net revenues that are not related to ambulance transports billed to patients, including ambulance service contract payments, capitated payments from commercial insurers, grants, standby services, special event coverage, disaster services, interest income, performance awards, and other special services or miscellaneous revenue.

Revenue, Total Net: The total of expected cash collections from ambulance fees, plus other ambulance revenues.

Revenue Sharing: Payments from the ambulance service provider to the local government derived from revenues generated through ambulance user fees for the purpose of supporting other EMS system components such as co-response services.

Risk Pool Reserve: If self-insured, the amount placed annually in a reserve fund to cover the cost of all claims payouts (auto, general liability, professional liability, and workers' compensation) and follow up legal defense expenses.

Service Level: The categories of ambulance services including, but not limited to, specialty care transport (SCT), advanced life support (ALS) and basic life support (BLS) which may vary according to coverage and payment policies of government and commercial insurance programs, as well as state regulations.

Specialty Care Transport (SCT): An interfacility transport of a critically ill or injured patient that requires services at a level beyond the scope of a typically trained paramedic. (Also known as Critical Care Transport or CCT.)

Surplus (Deficit), Net Projected: The excess or shortfall resulting from ambulance operations, calculated by deducting total income taxes (if applicable such as for a private for-profit ambulance service) from pre-tax surplus.

Surplus (Deficit), Pre-Tax: The excess or shortfall resulting from ambulance operations, calculated

by deducting total costs from total net revenues. If the provider is not subject to income taxes, such as for a government or non-profit ambulance service, pre-tax surplus is the same as net projected surplus.

System Design: The process of selecting and implementing the public policies that create the emergency ambulance service's underlying organizational infrastructure including performance requirements, independent oversight, business structure, legal framework, and financing strategy.

System Status Management (SSM): The science of matching the production capacity of an ambulance provider to the changing patterns of call demand, including managing the system's resources *before and between* calls.

System Status Plan (SSP): A planned protocol governing the deployment and event-driven redeployment of ambulance resources, both geographically and by time of day and day of week.

Tax Support Per Capita: *The amount of community tax support per resident.*

Third-Party Payer: Any organization, public or private, which pays or insures health or medical expenses on behalf of beneficiaries or recipients.

Three-Way Lease: To ensure uninterrupted emergency ambulance service in the event there is a change in the provider of service, the executed lease agreement for major assets (such as vehicles and medical communications center equipment) includes all three parties—the ambulance provider, the vendor, and the independent oversight entity.

Transport Volume: The total number of requests for service that result in patient transport.

Turn-Around Time: The interval from the time the patient arrives at the receiving facility destination until the ambulance is back in service and available for another assignment according to the system status plan.

Uncompensated Care: The total revenue forgone due to bad debt plus total revenue forgone due to charity care.

Uncompensated Care Offset: Cash received, such as from government sources in the form of community tax support, intended to offset the revenue lost (or the value of uncompensated care delivered) due to bad debt and charity care.

Under-compensated Care: Below cost reimbursement, such as from Medicare and Medicaid, from third-party payers.

Unit Hour: One hour of service by a fully equipped and staffed ambulance assigned to a call or available for dispatch.

Unit Hour Utilization (UHU) Ratio: A measure of how efficiently the ambulance provider manages and deploys unit hours as calculated by dividing the number of transports (not calls) performed during a given period by the number of unit hours produced during the same period. Units involved in long-distance transfer work, special events coverage, and certain other classes of activity are excluded from these calculations.

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