

NFPA[®]

450

Guide for Emergency Medical Services and Systems

2017



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NFPA®450

Guide for

Emergency Medical Services and Systems

2017 Edition

This edition of NFPA 450, *Guide for Emergency Medical Services and Systems*, was prepared by the Technical Committee on Emergency Medical Services. It was issued by the Standards Council on May 13, 2016, with an effective date of June 2, 2016, and supersedes all previous editions.

This edition of NFPA 450 was approved as an American National Standard on June 2, 2016.

Origin and Development of NFPA 450

In January 1999, the NFPA Standards Council considered NFPA's role in Emergency Medical Services (EMS). After a review of extensive information submitted on the need for such a project, the council voted to create a new EMS project to address EMS-related topics not covered by other existing NFPA projects. A forum on EMS was scheduled at the May 1999 Association meeting in Baltimore, Maryland. In June 1999, NFPA held a focus group meeting to further discuss NFPA's role in EMS. A request for persons interested in being members of this new project was sent out, and a Technical Committee was formed. The first meeting of the Technical Committee was held in Tampa, Florida, to discuss what specific projects the Technical Committee wanted to address. The first edition of NFPA 450, *Guide for Emergency Medical Services and Systems*, was issued in 2004 to assist individuals, agencies, organizations, or systems, as well as those interested or involved in emergency medical services system design, by providing EMS guidelines and recommendations.

For the 2009 edition, the Technical Committee reviewed and revised a number of definitions in Chapter 3 and added new definitions for new material in Chapter 5. The committee also revised material in Section 5.6, Essential System Analysis Components. The table from Annex B was modified and moved to Chapter 5, and Annex B was deleted.

For the 2013 edition, the committee went through and updated the referenced publications to ensure that they were still relevant or pertinent to the document. The intent was to bring the document in line or ensure correlation with many of the nationally published EMS documents in use. Some changes were also made to clarify commonly used terms that initially might have been presented with some confusion or misuse.

For the 2017 edition, the Technical Committee updated several of the references throughout the document and addressed the many changes in the delivery of healthcare services as a result of the Affordable Care Act. Special attention was also made to include mobile integrated healthcare and community paramedicine, growing areas in the delivery of emergency medical services.

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Committee Scope: This Committee shall have primary responsibility for documents relating to emergency medical services, except those documents covered by other existing NFPA committees.

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex B. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1 Scope. This document is designed to assist individuals, agencies, organizations, or systems as well as those interested or involved in emergency medical services (EMS) system design.

1.2 Purpose. The purpose of this document is to provide guidelines, resources, and recommendations to assist those interested or involved in EMS system design. Provision of development and/or pre-hospital care requires the coordination and cooperation of disparate elements. This document also provides a framework for designing and/or evaluating a comprehensive EMS system. The foundation of this document is based on multiple references, including the *EMS Agenda for the Future*.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this guide and should be considered part of the recommendations of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1071, *Standard for Emergency Vehicle Technician Professional Qualifications*, 2016 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 2016 edition.

NFPA 1451, *Standard for a Fire and Emergency Service Vehicle Operations Training Program*, 2013 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety*, 2014 edition.

NFPA 1581, *Standard on Fire Department Infection Control Program*, 2015 edition.

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2016 edition.

NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, 2014 edition.

NFPA 1917, *Standard for Automotive Ambulances*, 2016 edition.

NFPA 1999, *Standard on Protective Clothing for Emergency Medical Operations*, 2013 edition.

2.3 Other Publications.

2.3.1 FEMA Publications. Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20402.

Civil Preparedness Guide (CPG), 1992.

National Fire Incident Reporting System (NFIRS), 2011.

2.3.2 NEMSIS Publications. P.O. Box 581289, Salt Lake City, UT 84158-1289.

NEMSIS National Elements Subsets, 2014.

2.3.3 NHTSA Publications. National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, DC 20590.

Delbridge, T. R., et al., *Emergency Medical Services: Agenda for the Future*. August 1996. DOT HS 808-441, NTS-42.

Emergency Medical Services Performance Measures: Recommended Attributes and Indicators for System and Service Performance. Dec. 2009.

2.3.4 NIH Publications. National Institutes of Health, 9000 Rockville Pike, Bethesda, MD 20892.

Pub. No. 93-3304, *Staffing and Equipping EMS Systems: Rapid Identification and Treatment of Acute Myocardial Infarction*, National Heart, Lung, and Blood Institute, September 1993.

2.3.5 U.S. Government Publications. U.S. Government Publications. U.S. Government Printing Office, Washington DC 20402.

Title 29, Code of Federal Regulations, Part 1910.1030, *Blood-borne Pathogens*.

2.3.6 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Advisory Sections.

NFPA 79, *Electrical Standard for Industrial Machinery*, 2015 edition.

NFPA 402, *Guide for Aircraft Rescue and Fire-Fighting Operations*, 2013 edition.

NFPA 901, *Standard Classifications for Incident Reporting and Fire Protection Data*, 2016 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2013 edition.

NFPA 1521, *Standard for Fire Department Safety Officer Professional Qualifications*, 2015 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety*, 2014 edition.

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2016 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter apply to the terms used in this guide. Where terms are not defined in this chapter or within another chapter, they should be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, is the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Guide. A document that is advisory or informative in nature and that contains only nonmandatory provisions. A guide may contain mandatory statements such as when a guide can be used, but the document as a whole is not suitable for adoption into law.

3.2.4 Should. Indicates a recommendation or that which is advised but not required.

3.2.5 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase "standards development process" or "standards development activities," the term "standards" includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 Address. A number or other code and the street name identifying a location.

3.3.2 Alarm. A signal or message from a person or device indicating the existence of an emergency or other situation that requires immediate action.

3.3.3 Ambulance. A vehicle designed, equipped, and operated for the treatment and transport of ill and injured persons.

3.3.4 Ambulance Service. An organization that exists to provide patient transportation by ambulance.

3.3.5 American College of Emergency Physicians (ACEP). A national organization of emergency medical physicians.

3.3.6 Arrival. The point at which a vehicle is stopped on the scene of a response destination or address.

3.3.7 Arrived at Destination. The time that the responding unit arrived at the hospital or transfer point.

3.3.8 Automated Vehicle Locator (AVL). A computerized mapping system used to track the location of vehicles.

3.3.9 Available for Service. The time the unit was available for response.

3.3.10 Bloodborne Pathogens. Microorganisms that are present in human blood and can cause diseases in humans.

3.3.11 Call. A request for assistance to which equipment and personnel are deployed.

3.3.12 Call for Help. The time that a third party or the patient first attempts to contact outside assistance.

3.3.13 Call Intake. The procedure for answering the phone or other device that is used to receive a signal or message from a person or device indicating the need for medical assistance, learning the nature of the emergency, and verifying the address of the emergency.

3.3.14 Call Processing. The interval from call intake by the unit-dispatching agency to the time of unit notification, including answering the phone (alarm), gathering vital information, and initiating a response by dispatching the appropriate unit(s).

3.3.15* Chain of Survival. A metaphor to communicate the interdependence of a community's emergency response to cardiac arrest.

3.3.16 Compliance. Adherence or conformance to laws, regulations, and standards.

3.3.17 Cross-Trained/Dual Role (CT/DR). An emergency service that allows personnel trained in two service functions, such as fire suppression and emergency medical care, to function in either role.

3.3.18 Defibrillation. The delivery of an electrical shock to the heart intended to reverse abnormal electrical activity.

3.3.19 Defibrillator.

3.3.19.1 Automated External Defibrillator (AED). A device that administers an electric shock through the chest wall to the heart using built-in computers to assess the patient's heart rhythm and defibrillate as needed.

3.3.19.2 Manual Defibrillator. A device that delivers an electric shock through the chest wall to the heart and that requires operation by trained medical personnel.

3.3.20 Deployment. The procedures by which resources are distributed throughout the service area.

3.3.21 Dispatch. To send out emergency response resources promptly to an address or incident location for a specific purpose.

3.3.21.1 Computer-Aided Dispatch (CAD). A dispatching method or process in which a computer and its associated terminal(s) are used to provide relative dispatch data to the concerned telecommunicator.

3.3.21.2 Emergency Medical Dispatch. The receipt and management of requests for emergency medical assistance in the emergency medical services (EMS) system.

3.3.22 Dispatch Time. The time the responding unit was notified by the telecommunicator.

3.3.23 Documentation. The process of gathering, classifying, and storing information.

3.3.24 Emergency. A condition or situation in which an individual perceives a need for immediate response.

3.3.25 Emergency Medical Dispatcher (EMD). EMS personnel specifically trained and certified in interviewing techniques, pre-arrival instructions, and call prioritization.

3.3.26 Emergency Medical Services (EMS). Providing patient services that might include the provision of assessment, treatment such as first aid, CPR, BLS, ALS, and other pre-hospital procedures, including ambulance transportation of patients.

3.3.27 Emergency Medical Services for Children (EMS-C). A national initiative to reduce child and youth disability and death from severe illness or injury.

3.3.28 Emergency Medical Technician (EMT). A term for any pre-hospital provider trained and certified at the EMT-Basic level or higher.

3.3.28.1 Emergency Medical Technician — Basic (EMT-B). A pre-hospital basic life support (BLS) provider with training based on the National Highway Traffic Safety Administration (NHTSA) National Standard Curriculum.

3.3.28.2 Emergency Medical Technician — Intermediate (EMT-I). A pre-hospital provider trained according to the National Highway Traffic Safety Administration (NHTSA) National Standard Curriculum to intermediate levels.

3.3.28.3 Emergency Medical Technician — Paramedic (EMT-P). A pre-hospital provider trained according to National Highway Traffic Safety Administration (NHTSA) National Standard Curriculum to advanced levels.

3.3.29 Emergency Operations. Activities of the emergency responders relating to rescue, fire suppression, emergency medical care, and special operations.

3.3.30 Employee Assistance Program (EAP). An EAP is an employer-sponsored service designed for personal or family problems, including mental health, substance abuse, various addictions, marital problems, parenting problems, emotional problems, or financial or legal concerns.

3.3.31 Employee Illness and Injury. A work-related illness or injury requiring evaluation or medical follow-up.

3.3.32 Employee Turnover. Termination of employment with the organization for any reason.

3.3.33 Fire Suppression. The activities involved in controlling and extinguishing fires. [1500, 2013]

3.3.34 First Intervention Time. The time that the first intervention, such as an IV, defibrillation, CPR, extrication, and so on, is begun.

3.3.35 First PSAP Call Time. The time the telephone begins to ring in the first public safety answering point (or other designated entity).

3.3.36 First Responder (EMS). Functional provision of initial assessment (i.e., airway, breathing, and circulatory systems) and basic first-aid intervention, including CPR and automatic external defibrillator (AED) capability. [1710, 2016]

3.3.37 GSA KKK Specifications. A set of federal specifications relating to purchasing requirements for ambulance design and manufacture.

3.3.38 Hazard. A source of possible injury or damage to health. [79, 2015]

3.3.39 Hazardous Material. A substance that presents an unusual danger to persons due to toxicity, chemical reactivity, decomposition, corrosiveness, explosion or detonation, etiological hazards, or similar properties.

3.3.40 Health Care Financing Administration (HCFA). The former name of the Center for Medicare and Medicaid Services (CMS).

3.3.41 Health Maintenance Organization (HMO). An organized system of health care that provides or arranges for a range of basic and supplemental health care services to a voluntarily enrolled group of persons under a prepayment plan.

3.3.42 Incident Location. The address or other identifiable area of an event.

3.3.43 Incident Management System. A system that defines the roles and responsibilities to be assumed by responders and the standard operating procedures to be used in the management and direction of emergency incidents and other functions. [1561, 2014]

3.3.44 Incident or Onset Time. The time the incident occurred or the time that the symptoms developed.

3.3.45 In-Service Utilization Ratio. An efficiency ratio that divides the cumulative unit-elapsed intervals by the total time that the unit is on duty.

3.3.46 Interval.

3.3.46.1 Fractile Response Interval. A method of describing response intervals that uses frequency distribution as its basis for reporting.

3.3.46.2* Turnout Interval. The time beginning when units acknowledge notification of the emergency to the beginning point of response time.

3.3.47 Interview Ends. The time that the PSAP telecommunicator completes the interview with the caller. This time stamp can occur before or after resources are identified, or before or after units arrive on the scene.

3.3.48 Lead Agency. An organization assigned to organize the interagency oversight of the day-to-day conduct of policy related to a particular operation.

3.3.49 Life Support.

3.3.49.1 Advanced Cardiac Life Support (ACLS). A nationally recognized curriculum to teach advanced methods of treatment for cardiac and other emergencies.

3.3.49.2 Advanced Life Support (ALS). Emergency medical treatment beyond basic life support level as defined by the medical authority having jurisdiction. [1500, 2013]

3.3.49.3 Basic Life Support (BLS). Emergency medical treatment at a level as defined by the medical authority having jurisdiction. [1500, 2013]

3.3.50 Management.

3.3.50.1 Critical Incident Stress Management (CISM). A program designed to reduce acute and chronic effects of stress related to job functions.

3.3.50.2 Total Quality Management (TQM). A management system fostering continuously improving performance at every level of function and focusing on customer satisfaction.

3.3.51 Medical Direction. The granting of authority to an EMS system or agency and its providers in the delivery and improvement of EMS pre-hospital care.

3.3.51.1* Off-Line (Indirect) Medical Direction. The medical direction that consists of standing orders, training, protocol development, and supervision that are authorized by the medical director.

3.3.51.2* On-Line (Direct) Medical Direction. The medical direction provided to out-of-hospital providers by the medical director or designee, generally in an emergency situation, either on-scene or by real-time communication.

3.3.52* Medical Director. A physician trained in emergency medicine, designated as a medical director for the local EMS agency.

3.3.53* Medical Oversight. The supervision and administration of the medical aspects of an EMS system or agency and its providers.

3.3.54 Mobile Integrated Healthcare (MIH). The provision of healthcare using patient-centered, mobile resources in the out-of-hospital environment, including, but not limited to, services such as providing telephone advice to 9-1-1 callers instead of resource dispatch; providing community paramedicine care, chronic disease management, preventive care, or post-discharge follow-up visits; or transport or referral to a broad spectrum of appropriate care not limited to hospital emergency departments.

3.3.55 Multiple Casualty. Injury or death of more than one individual in an incident.

3.3.56 Mutual Aid. Reciprocal assistance by emergency services under a prearranged plan. [402, 2013]

3.3.57 National Association of EMS Physicians (NAEMSP). A national organization of emergency medical physicians and other professionals.

3.3.58* National EMS Information Systems (NEMSIS). The national repository that will be used to potentially store EMS data from every state in the nation.

3.3.59 National Highway Traffic Safety Administration (NHTSA). The agency under the Department of Transportation that is responsible for preventing motor vehicle injuries.

3.3.60 National Institutes of Health (NIH). An agency of the Public Health Service of the Department of Health and Human Services, responsible for promoting the nation's health.

3.3.61 Outcome. The result, effects, or consequences of an emergency system encounter on the health status of the patient.

3.3.62 Patient Contact. The time that responding personnel first arrived at the patient's side.

3.3.63 Phone "Off-Hook" (answered in first PSAP). The time that the telephone is answered in the first PSAP center.

3.3.64 Protocol. Protocols define the pre-hospital care management of specific patient problems.

3.3.65 Public Safety Answering Point (PSAP). A facility in which 9-1-1 or other emergency calls are answered, either directly or through rerouting.

3.3.66 Quality Assessment (QA). An assessment of the performance of structure, processes, and outcomes within the EMS system and their comparison against a standard.

3.3.67 Quality Assurance. The activities undertaken to establish confidence that the products or services available maintain the standard of excellence set for those products or services.

3.3.68 Quality Improvement. The activities undertaken to continuously examine and improve the products and services.

3.3.69 Response. The deployment of an emergency service resource to an incident. [901, 2016]

3.3.70* Response Resources Are Identified. The time that the PSAP telecommunicator, through computer-aided dispatch or other means, identifies the appropriate resources to send to the scene of the emergency.

3.3.71 Secondary Dispatch Phone "Off-Hook" Answered (if appropriate). The time that the second PSAP or second dispatcher answers the phone, begins the interview, collects caller data, begins prearrival instructions.

3.3.72* Secondary Dispatch Phone Rings (if appropriate). The time the telephone begins to ring in the second public safety answering point (or the call screener).

3.3.73 Staffing. The number and level of training of personnel deployed on an emergency call.

3.3.74 Standard Operating Procedure. A written organizational directive that establishes or prescribes specific operational or administrative methods to be followed routinely for the performance of designated operations or actions. [1521, 2015]

3.3.75 Standing Orders. A direction or instruction for delivering patient care without on-line medical oversight backed by authority of the system medical director.

3.3.76 System.

3.3.76.1 EMS System. A comprehensive, coordinated arrangement of resources and functions that are organized to respond in a timely, staged manner to medical emergencies regardless of their cause.

3.3.76.2 Geographic Information System (GIS). A system of computer software, hardware, data, and personnel to describe information tied to a spatial location.

3.3.77 Telecommunicator. The individual tasked by a public safety agency as the first of the first responders whose primary responsibility is to receive, process, transmit, and/or dispatch emergency and nonemergency calls for law enforcement, fire, emergency medical, and other public safety services via telephone, radio, and other communication devices.

3.3.78 Time.

3.3.78.1 Dispatch Time. A discrete time stamp that represents unit notification.

3.3.79 Time of Discovery of Event. The time that a third party or the patient becomes aware of the need for assistance.

3.3.80 Time of Result of First Intervention. The time that the responder first identifies results of the first intervention. For example, when extrication occurred, when return of spontaneous circulation occurred, and so forth.

3.3.81 Transfer of Care. The time that responsibility for treatment was transferred from a pre-hospital provider to another — when the hospital personnel physically take over care of the patient.

3.3.82 Turnout Activation. Personnel preparation, boarding the vehicle, starting the vehicle, placing the vehicle in gear, and moving the vehicle toward the emergency scene.

3.3.83 Unit. A staffed and equipped emergency response vehicle.

3.3.84 Unit Acknowledgment. The time that the response unit(s) acknowledges that they have received the notification.

3.3.85 Unit Arrived on Scene. The time that the vehicle comes to a complete stop at the scene.

3.3.86 Unit en Route. The time that the vehicle first begins moving toward the scene.

3.3.87 Unit Left Scene. The time that the vehicle first begins moving from the scene.

guide outlines the core elements of an effective process for developing and implementing EMS system regulations and policies.

4.2 Oversight. Within the boundaries of the EMS system, the authority having jurisdiction (AHJ) should provide a process for overseeing all system elements.

4.2.1 EMS Oversight. EMS system oversight should be the responsibility of a single entity.

4.2.2 Designation of Lead Agencies. The AHJ should designate a lead agency to implement and enforce system policies.

4.3 Authorization. Provider agencies and personnel should be authorized to provide services. The AHJ should ensure that processes or mechanisms are in place to authorize personnel and agency(ies) to provide services consistent with determined levels of need (*see Chapter 5*).

4.4 Evaluation. The AHJ should ensure that mechanisms are in place to continually evaluate and re-evaluate the components of the EMS system. The lead agency should develop a process to identify components of the EMS system, establish requirements for those components, and develop an evaluation process to ensure that components meet established requirements.

4.5 Roles and Responsibilities. The lead agency should establish and articulate roles and responsibilities for EMS system participation. Establishing roles and responsibilities for EMS participants should be accomplished through a comprehensive system assessment as described in Chapter 5.

4.6 Service Levels. The lead agency should identify service levels and develop guidelines or performance standards for each service level in the community. Service levels, guidelines, and performance standards should be determined by considering factors consistent with local resources and needs, such as community expectations, measurable patient outcomes, resource availability, and financial capability.

4.7 Management Structure. The lead agency should have a clear management structure and lines of accountability. The management structure of the lead agency should be defined according to depth and breadth appropriate to the system. Each position within the lead agency should be defined according to its role(s), responsibility(ies), and reporting relationships. EMS system participants should know and understand the management structure and function of the lead agency.

4.8 Planning. The lead agency should provide planning for EMS system design. The lead agency should ensure that the EMS system design is based on a systematic planning process. While planning processes may vary significantly between EMS systems, the lead agency should ensure that the process occurs in a manner consistent with identified needs.

4.9 Authority to Implement Plans. The lead agency should be empowered to implement plans. Within the system, the AHJ should formally vest the lead agency with responsibility and authority to implement plans.

4.10 Resources. The lead agency should have the resources necessary to carry out its function. The AHJ should ensure that adequate fiscal and nonfiscal resources are available and accessible, thereby allowing the lead agency to function effectively.

Chapter 4 System Regulation and Policy

4.1 General. System regulation and policy is fundamental to providing emergency medical services and is the basis for effective system design. Consistent with this recognition is the core principle that a single entity has system oversight and responsibility for the effective coordination of system elements. This entity ensures that the EMS system components are clearly articulated and defined. Furthermore, appropriate mechanisms are instituted to ensure participation of system stakeholders in developing policies and regulations. This chapter of the

4.11 Participation in Policy Development. Representatives of user groups and system stakeholders should be involved in designing expectations and developing system policy. The lead agency should identify appropriate participants for system design and policy development. For example, stakeholders may include consumers or users of EMS services, health care providers, hospitals, public health agencies, nursing homes, special populations, educators, governmental officials, and payers.

4.12 Authority for Policy, Procedure, and Operation. The lead agency should have the authority to convene EMS expertise to assist in designing and implementing policies, procedures, and operations. The lead agency should be vested with the authority to establish advisory bodies or committees for specific EMS system design elements.

4.13 Patient Information Protection. The lead agency should ensure that appropriate policies and procedures are in place to protect patient and quality assurance records.

Chapter 5 EMS System Analysis and Planning

5.1 Introduction.

5.1.1 Virtually all communities have some form of emergency medical services (EMS) system. For any one community, the *components* of the system and the *level of service* should be tailored to the needs and wants of that community. While an EMS system is unique to the jurisdiction, the industry recognizes a standard approach to assessing local needs and meeting those needs with specific service elements. This chapter of the guide outlines a systematic approach for evaluating and analyzing a jurisdiction's existing EMS system or for determining the system design for a jurisdiction without a dedicated EMS system in place.

5.1.2 As specified in T. R. Delbridge, et al., *Emergency Medical Services: Agenda for the Future*, "Before creating an EMS system or implementing any EMS system design changes, a community should conduct a comprehensive community analysis that considers available resources, customers, geography, demographics, political conditions, and other unique and special needs of the system. This analysis should focus on these areas, identifying their potential impact on the effectiveness of EMS system components including human resources, medical direction, legislation and regulation, education systems, public education, training, communications, transportation, prevention, public access, communications systems, clinical care, information systems (data collection), and evaluation."

5.2 Analysis of System Resources. The EMS system should analyze the resources available to serve the system, including financial resources, equipment and facilities, providers, and participants in the system.

5.2.1 Finances.

5.2.1.1 Comprehensive Financial Analysis. The financial status of the community and its capacity to support the EMS system should be evaluated. The analysis includes the financial status of all the entities within the EMS system based on generally accepted accounting principles. (*See Chapter 6.*)

5.2.1.2 Solvency. The provider(s) of each EMS system component should be financially solvent by maintaining the financial resources to allow the uninterrupted delivery of essential services.

5.2.1.3 Funding Stability. Funding for each component may be through a variety of sources, such as municipal budget/taxes, fee for services, subscription programs, grants, or private donations. Each component should be self-supporting, with adequate reserves to continue to function if the primary funding mechanism is temporarily interrupted or if operating costs exceed available funding.

5.2.1.4 Budget. The system should evaluate both an annual operating budget and a capital budget consistent with generally accepted accounting principles.

5.2.2 Providers. The system should identify the roles, responsibilities, staffing requirements, and training levels of each provider required for the EMS system to function.

5.2.2.1 Provider Resources. EMS systems are composed of the personnel, vehicles, equipment, and facilities used to deliver emergency and nonemergency care to individuals outside a hospital. Key services of an EMS system include public access through a coordinated communications system, public safety and EMS response, and patient transportation. Resources of other nonconventional agencies such as nonemergency ambulance and municipal mass transportation services should be considered.

5.2.2.2 Role Description. Each type of service within the system should be clearly defined and fully described in the system design (e.g., the response system may be different from the transportation system).

5.2.2.3 Role Definition. Based on the needs and wants of the community, several different types and levels of providers may be required. Roles and responsibilities for each type and level of provider should be identified in order to ensure that the desired level of care is delivered continually and effectively. Examples of provider types are described in 5.2.2.3.1 through 5.2.2.3.6.

5.2.2.3.1 Telecommunicators. Telecommunicators provide verification of the incident address and notification of closest EMS system provider. Emergency medical dispatchers (EMDs) provide verification of the incident address; notification of the closest, most appropriate provider; and prearrival patient care instructions.

5.2.2.3.2 Emergency Medical Responders. The role of emergency medical responder is as referenced by the NHTSA Office of EMS.

5.2.2.3.3 Basic Life Support. The role of basic life support responder is as referenced by the NHTSA Office of EMS.

5.2.2.3.4 Advanced Life Support (ALS). The role of ALS responder is as referenced by the NHTSA Office of EMS.

5.2.2.3.5 Mobile Integrated Healthcare (MIH). The role of each MIH provider should be clearly defined by the AHJ over the MIH system.

5.2.2.3.6 Patient Transportation Provider(s). Patient transportation providers may offer emergency, nonemergency, or prescheduled medical transportation. The role of each provider type should be clearly defined by the AHJ over the EMS system.

5.2.3 Participants. The system identifies the roles and responsibilities of each organization type needed for the EMS system to function.