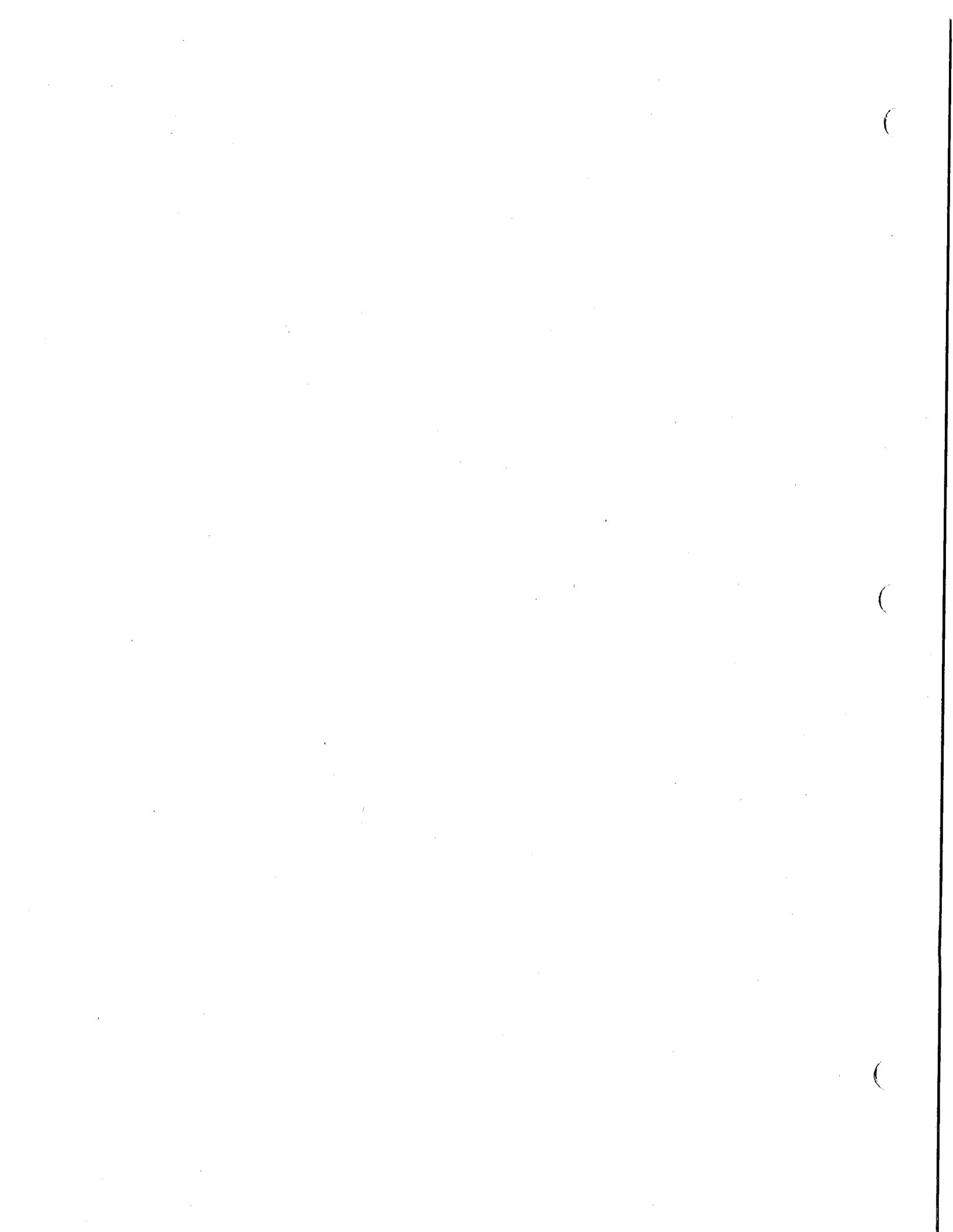


**2016-2022
FIRE, RESCUE, EMERGENCY
MEDICAL SERVICES AND
COMMUNITY RISK REDUCTION
MASTER PLAN**



SEPTEMBER 30, 2015



**2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES,
AND COMMUNITY RISK REDUCTION MASTER PLAN**

GLOSSARY

Acceptable (or Unprotected) Risk - That risk which the jurisdiction (e.g., Montgomery County) is willing to accept rather than provide the extraordinary amount of resources and programs required to eliminate, or nearly eliminate, all fire/rescue-related risk throughout the jurisdiction.

Accreditation - A comprehensive self-assessment and evaluation model that enables organizations to examine past, current, and future service levels and internal performance and compare them to industry best-practices for the purpose of improved service delivery. [Source: CFAI]

Accredited Agency Status – The status awarded to a fire-rescue agency that has successfully completed the requirements for accreditation and has been granted that status by the Board of Directors overseeing the process. To obtain Accredited Agency Status by the Commission for Fire Accreditation International, a fire-rescue agency must be granted that status by the CFAI Board of Directors.

Advanced Life Support (ALS) – Advanced-level emergency medical services including the administering of controlled life-saving drugs; electrical therapy including defibrillation; advanced airway management including orotracheal and nasotracheal intubation; intravenous maintenance therapy, and other advanced-level life support services.

Aerial Unit - A vehicle equipped with an aerial ladder, elevating platform, aerial ladder platform, or water tower that is designed and equipped to support fire fighting and rescue operations by positioning and providing access for personnel, supporting the vertical movement of equipment, providing continuous egress, and discharging water from positions elevated from the ground. MCFRS deploys ladder trucks (e.g., tractor-drawn aerials, rear-mount aerials) and aerial towers.

AFRA - Advanced life support First Responder Apparatus is any MCFRS unit other than an ambulance, medic unit or ALS chase unit that has a paramedic and an ALS Kit on board. The ALS provider(s) on board an AFRA can initiate ALS service to a patient having a life-threatening condition prior to arrival of an ALS transport unit.

ALS Provider – Firefighter or EMS-provider trained and certified as an Paramedic or Cardiac Rescue Technician-Intermediate (CRT-I).

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

ALS Unit – A fire-rescue vehicle equipped with an ALS Kit and staffed by at least one ALS provider. An ALS unit may or may not have patient transport capabilities. Examples: medic unit, paramedic engine, paramedic truck, paramedic rescue squad, ALS chase unit, EMS Duty Officer.

ALS Chase Unit – A fire-rescue unit (e.g., SUV) staffed by an ALS provider (occasionally two ALS providers) capable of providing advanced life support care but lacking patient transport capability.

Ambulance - An emergency medical service unit that is equipped and staffed to provide basic life support services, including patient transport. An ambulance is staffed by a minimum of two personnel minimally trained at the EMT level.

Apparatus - Fire-rescue vehicle(s) used for emergency response.

Basic Life Support (BLS) – Basic-level emergency medical services including patient assessment; airway management; cardiopulmonary resuscitation (CPR); rescue breathing; use of automated external defibrillators (AEDs); treatment of contusions, puncture wounds, broken bones, sprains and strains; spinal immobilization; child delivery; and similar basic-level life support.

Brush Truck – An all-wheel drive fire suppression unit specially equipped for fighting fires in brush, forest, grasslands, and croplands. Brush trucks are typically all-wheel drive pickup trucks equipped with a small water tank, small diameter hose, and equipment for suppressing fires in terrain that larger apparatus cannot navigate.

Cardiac Rescue Technician - Intermediate (CRT-I)¹ – The State certification given to EMS providers who meet the minimum requirements for providing an intermediate level of emergency medical services within the State of Maryland. Skills required of personnel certified at the CRT-I level include all EMT skills, plus intravenous fluid administration, medication administration, external jugular cannulation, intraosseous cannulation, decompression thoracostomy, combitube, EKG monitoring, defibrillation/cardioversion, and endotracheal intubation. To become licensed at the CRT-I level, personnel must successfully complete the State's CRT-I curriculum and written licensing exam.

Compressed-air foam (CAF) – Fire suppression foam consisting of Class A foam solution, water and compressed air. CAF suppresses fire through cooling action and by cutting off the oxygen supply to the fire. CAF results in very little runoff and water damage and is effective in suppressing fires in structures, vehicles, brush, woods, and Class A debris, but is not effective in suppressing flammable liquid fires (which require Class B foam).

¹ The National Registry is phasing out its sponsorship of the EMT-I level, and the State did not adopt the national scope of practice for the newer Advanced EMT but instead adopted this higher level CRT-I.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

Compressed-air foam system (CAFS) – The system attached to the pump on board a pumper to produce compressed-air foam. Compressed-air foam is produced at the pump by mixing Class A foam solution, compressed air, and a small percentage (by volume) of water.

Computer Aided Dispatch (CAD) – A computerized system used by public safety agencies for emergency call processing and dispatch, tracking of unit status, call status maintenance, and for recording event-related notes. CAD is used by call-takers and dispatchers at emergency communications centers as well as by field personnel utilizing mobile data computers in apparatus.

Effective Response Force (ERF) – The minimum amount of staffing and equipment that must reach a specific emergency location within a maximum prescribed travel time. [Ref. Fire & Emergency Service Self-Assessment Manual, CFAI]

Electronic Patient Care Reporting (EPCR) – A pre-hospital patient care data collection and reporting application which allows for the generation of quick, complete, real-time patient care reports in the field during EMS incidents. Use of EPCR by public Fire-Rescue and EMS agencies is mandated by the State of Maryland.

Emergency – An event that has resulted in, or has the potential to cause, casualties and/or property damage. Examples include fires, explosions, medical incidents, severe weather, vehicle collisions, hazardous materials releases, structural collapse, and acts of terrorism.

Emergency Management Group (EMG) – The EMG is composed of the heads of each County department, designated senior staff of each department, and designated representatives of the County's municipalities, MCPS, Montgomery College, public utilities, and non-profit public safety/disaster services organizations. The EMG is convened under the direction of the County's Chief Administrative Officer to advise the County Executive on the County's capability to respond to disasters; to recommend improvements in emergency management planning, mitigation, response and recovery capabilities; to enhance that capability through improvements to the infrastructure, through training and exercises; and to respond to emergencies as needed.

Emergency Medical Services – Pre-hospital emergency medical assessment, care and transport services for patients with illnesses, injuries and other acute medical conditions, typically provided by public fire-rescue or EMS departments and/or private EMS companies operating exclusively or jointly to provide these services. In Montgomery County, EMS services – both basic and advanced level, including transport – are provided to the public by the MCFRS.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

Emergency Medical Services Transport (EMST) Fee – Beginning January 1, 2013, the Emergency Medical Transport Insurance Reimbursement Law authorizes MCFRS to seek reimbursement for EMS transports from private health insurance companies, Medicare and Medicaid. Per Montgomery County Executive Regulation 15-12, the reimbursement schedule varies depending upon the level of service provided (i.e., basic life support, advanced life support, specialty care transport), plus a mileage fee.

Emergency Medical Technician (EMT): The State certification given to EMS providers who meet the minimum requirements for providing basic life support services within the State of Maryland. Skills required of personnel certified at the EMT level include patient assessment, control and bandaging of bleeding, shock management, fracture management, CPR, oxygen administration, medical emergency management, patient-assisted and certain other life-saving medications, spinal immobilization, patient movement and transport. EMT-certified personnel must successfully complete the State's EMT course and a field evaluation, and pass a series of State-issued written and practical tests² to receive the State's EMT certification. All MCFRS personnel whose names appear on the IECS List are State-certified at the minimum skill level of EMT.

EMS Unit - A vehicle designed to provide emergency medical services and, with the exception of an ALS chase unit, patient transport.

Engine (or Pumper) - Fire apparatus with a permanently mounted fire pump of at least 1000 GPM capacity, water tank of at least 500 gallons, and hose body whose primary purpose is fire suppression.

Engine-Tanker - A unit that combines the features of both an engine and a small-capacity tanker. Engine-tankers typically carry 1500-2000 gallons of water.

Fire and Emergency Services Commission (FESC) – A body composed of seven commissioners appointed by the County Executive and confirmed by the County Council. Three FESC members represent the public, two members are uniformed career employees of MCFRS, and two members represent the volunteer fire and rescue departments in the County. Chapter 21 of the County Code charges the FESC with recommending how the County can achieve and maintain effective, efficient, and equitable fire-rescue services and improve the policy, planning, and regulatory framework for all fire-rescue operations. The FESC has the authority to approve policies and regulations proposed by the Fire Chief. The FESC may also advise the Fire Chief, County Executive, and County Council on fire-rescue policies, standards, procedures, plans, programs, and related matters.

² The State has adopted the national scope of practice standard for EMT.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

First-Due Area – The area surrounding a fire-rescue station whose boundary is the halfway point between that station and surrounding stations. One or more fire-rescue units, as appropriate, are considered “first-due” from that station to incidents occurring within the station’s first-due area, unless the appropriate unit(s) is/are unavailable due to being committed to another incident or held in an uncontrolled status within the CAD System.

First Responder Unit – Any fire-rescue unit (e.g., engine, aerial unit, rescue squad, brush unit, tanker) that is staffed with at least one EMT, a BLS Kit, and an AED. A first responder unit is dispatched on certain EMS incidents to begin patient assessment and care when the closest EMS unit has a greater distance to travel.

Flashover – The stage in the development of a fire within a closed space or room in which all exposed surfaces reach ignition temperature simultaneously and fire spreads instantaneously throughout the space/room with flames appearing on all surfaces.

Hazardous material (“hazmat”) - Any substance or material posing a threat to health and the environment. Hazmats are classified as flammable/combustible liquids, compressed gases, corrosives, poisons/toxic materials, oxidizers, flammable solids, etiologic (biological) agents, cryogenics, and radioactive materials.

Hazmat Team – MCFRS’ specialty team that responds to incidents involving hazardous materials, destructive devices, and weapons of mass destruction; working in coordination with the MCFRS Bomb Squad when appropriate. The Hazmat Team is composed of specialized apparatus and equipment and specially trained personnel assigned to Stations 7, 20, 25 and 28.

Integrated Emergency Command Structure (IECS) – The operational chain of command and rank structure that integrates all fire and rescue services personnel, both career and volunteer, who have met the applicable training, experience, certification, and credentialing requirements. An IECS List is published periodically listing all certified fire and rescue service personnel in Montgomery County who are qualified to comprise minimum staffing on fire-rescue apparatus.

Incident (fire-rescue) – An emergency event of a nature and scope requiring the services of fire-rescue and/or EMS personnel.

Insurance Services Office (ISO) - A company providing underwriting, risk management, legal/regulatory services, and related information/data, with special focus on community fire-protection and building code effectiveness. ISO evaluates community fire protection through its Public Protection Classification Program (see PPC below), using the ISO’s Fire Suppression Rating Schedule.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

Local Fire-Rescue Department - One of nineteen independent State-chartered volunteer fire and rescue departments in Montgomery County. Each LFRD has at least one station, and nearly half of the LFRDs have two or more stations. Each LFRD has a uniformed Volunteer Chief, a Board of Directors, and uniformed and administrative personnel who volunteer their services to the community.

Medic Unit - An emergency medical services unit that is equipped and staffed to provide advanced life support services, including patient transport. A medic unit is staffed by a minimum of two personnel – one paramedic and one EMT, or occasionally two paramedics.

Montgomery County Fire and Rescue Service (MCFRS) – The organization responsible for providing all fire, rescue, EMS and special operations services and risk reduction programs to the public in Montgomery County, Maryland.

Natural hazards - Hazards related to acts of nature such as severe thunderstorms, windstorms, tornadoes, hurricanes, winter storms, floods, extreme heat, extreme cold, drought, earthquakes, and others.

Paramedic - The State certification given to EMS providers who meet the minimum requirements for providing the highest level of advanced life support services within the State. Skills required of personnel certified at the Paramedic level include all skills required under the CRT-I level, plus additional medication administration, nasotracheal intubation, and external transcutaneous pacing. To become a licensed Paramedic, personnel must successfully complete the State's Paramedic curriculum³ and a field evaluation, participate in hospital emergency room training, and pass a State-issued ALS protocol licensing exam.

Personal injury collision (PIC) – A collision resulting in injury to the occupant(s) of the vehicle(s) involved. [Note: A pedestrian struck by a vehicle is a separate incident type.]

Public Protection Classification (PPC) – A classification, or rating, assigned to a community by the Insurance Services Office based upon an evaluation by ISO using ISO's Fire Suppression Rating Schedule. A community's PPC will be between Class 1, representing superior fire protection, and Class 10, indicating a level of fire protection in the community that does not meet ISO's minimum criteria. The community's PPC is based upon an evaluation of their fire alarm and communications systems, the water supply system for fire suppression, and the fire department's apparatus, equipment, staffing, training, and geographic distribution of stations.

³ The State has adopted the national scope of practice for Paramedic.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

Public Safety System Modernization (PSSM) Project – A Montgomery County public safety communications system project that will replace the existing computer-aided dispatch (CAD) and radio systems used by public safety departments as well as the fire station alerting system. The project is scheduled for completion in CY2018.

Rescue Squad - A special service unit equipped to provide a wide variety of tools and equipment necessary to effect vehicle extrication, complex rescues, and to assist at structure fire incidents.

Response Time – The elapsed time from the MCFRS call-taker answering the 9-1-1 call transferred by the PSAP, to the arrival of MCFRS unit(s) at the incident scene. Upon implementation of universal call-takers under MCP, response time will be redefined as the elapsed time from the call-taker answering the 9-1-1 call to the arrival of MCFRS unit(s) at the incident scene

Risk - The likelihood or probability of a damaging or injury-causing event (e.g., fire, heart attack, vehicle collision, hazmat incident, act of terrorism, tornado,) in combination with the consequences or severity of that event. Stated mathematically: $RISK = PROBABILITY\ OF\ OCCURRENCE \times SEVERITY$, where probability and severity can be stated numerically to derive a numerical level of risk that can be compared with other risks in order to rank them. When not stated mathematically, risk may be ranked in subjective terms such as special, high, medium, and low or similar rankings.

Self-Assessment Manual (SAM) – The manual prepared by a candidate fire department (i.e., “Candidate Agency”) as the department proceeds through the accreditation process and readies itself for evaluation by peer assessors. For CFAI accreditation, the SAM must address all criteria and performance indicators as published in the latest edition of the CFAI’s *Fire & Emergency Service Self-Assessment Manual* guidebook.

Societal hazards - Hazards related to the close interaction of people in daily activities and adverse occurrences that arise due to various political, physiological, and psychological factors, influences and events. Societal hazards include health/disease epidemics, civil disorder, commodity shortages, and war.

Special service unit – A term used by MCFRS that refers to an aerial unit or rescue squad, as both units provide specialized services in support of engines and EMS units.

Standards of Cover – The document prepared by a fire department seeking agency accreditation through the Commission on Fire Accreditation International (CFAI) based upon a comprehensive risk analysis of the department’s service area that leads to the establishment of service level objectives upon which the distribution and concentration of the department’s resources are based. The Standards of Cover is a required document for CFAI accreditation.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

Tanker - A fire suppression unit that carries a minimum of 2000 gallons of water and provides firefighting water supply to areas without fire hydrants. MCFRS tankers carry 3000-3500 gallons of water and are a key resource with respect to the MCFRS' goal to achieve a fire flow of at least 500 gpm for the initial 30 minutes of a structure fire in a non-hydranted area.

Task Force - A group of any type of resources, with common communications and a leader, temporarily assembled for a specific mission. Within MCFRS, a fire suppression Task Force (TF) consists of two engines and a special service (i.e., aerial unit or rescue squad). A Water Supply Task Force (WSTF) consists of three tankers and an engine to operate at the tanker fill-site. An EMS Task Force (EMSTF) consists of five transport units, two paramedic engines, an additional ALS resource if an ALS unit is not included among the five transport units, an EMS Duty Officer if not already assigned to the incident, and a command officer if not already assigned to the incident.

Technological hazards - Hazards created by or related to technological infrastructure, business/manufacturing processes, and by-products of a technological civilization. Technological hazards include utility disruptions (power, water, natural gas, and communications systems), dam failures, pollution emergencies, conflagrations, and others.

Terrorism - The unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political, religious or social objectives.

Weapons of Mass Destruction (WMD) - Weapons used by terrorists to cause casualties, intimidation, fear, panic, and/or property damage to the intended target and population. WMDs include biological, radiological, incendiary, chemical, and high-yield explosive materials.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

budget, to the County Executive for review and submission to the County Council as required by the County Charter.”

- [Section 21-26] “A newly constructed fire-rescue station, purchased with tax funds after July 1, 1999, may be held under a title reflecting concurrent ownership by the County and local fire and rescue department if: (1) the station complies with the adopted master fire, rescue and emergency medical services plan.” Two other conditions apply, as well, unrelated to planning.

ACCREDITATION REQUIREMENTS AND BEST PRACTICES

As MCFRS is an accredited agency through the Commission on Fire Accreditation International (CFAI), there are a number of accreditation-related requirements that must be met, including a set of approximately 250 performance indicators (a.k.a., “competencies”) as well as preparation of three comprehensive documents – the Self-Assessment Manual, Standards of Cover, and a strategic/master plan. In addition, there are fire department best practices that CFAI publishes in their guidebooks that accredited agencies should strive to meet and address in their Standards of Cover. Accreditation is addressed in greater detail in Section 3 of this master plan.

REQUIREMENTS FOR TRAINING-RELATED ACCREDITATIONS

In addition to agency accreditation through CFAI (see above), there are several training-related accreditations that MCFRS pursues in order to provide its fire, rescue, paramedic and EMT training programs. Achieving accreditation status every five years through the Committee of Accreditation of Educational Programs for the Emergency Medical Services Professions (COAEMSP) allows the MCFRS Fire-Rescue Training Academy (FRTA) to continue its paramedic training program. Achieving a passing evaluation rating and certification every five years from the Maryland Institute for Emergency Medical Services Systems (MIEMSS) is required for the FRTA to provide its EMS training programs. In addition, the FRTA must achieve a passing evaluation rating and certification for its fire and rescue training programs from the National Board on Fire Service Professional Qualifications (a.k.a., “Pro Board”). These training accreditations/certifications are addressed in Sections 5 and 6 under the Training heading.

STANDARDS OF COVER AND DEPLOYMENT CRITERIA

MCFRS has established standards of cover and deployment criteria that the department uses for resource allocation planning and performance measurement purposes. While they are not mandates, MCFRS uses them to establish and modify resource levels to meet risks and related emergency service needs.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

STANDARDS OF COVER

MCFRS standards of cover address distribution and concentration of emergency resources and response time objectives as described briefly below. These standards of cover are discussed in greater detail in Section 4 of this master plan.

Distribution and Concentration of Resources

Based on risks present in Montgomery County, distribution of incidents, and established response time objectives (see below), MCFRS has determined the appropriate distribution of fire-rescue stations and concentration of resources to be deployed in those stations. The need for new-additional fire-rescue stations and renovation/expansion of existing stations is presented in Sections 5 and 6 of this plan under the Facilities heading. The need for new-additional resources or reallocation of existing resources is presented under the Preparedness /Readiness and the Resource Deployment and Staffing headings in Sections 5 and 6.

Response Time Objectives

A key factor in determining resource distribution and concentration is response time. While total response time is of greatest importance, response time is recorded and analyzed in its three component time frames – call processing/dispatch, turnout, and travel. Response time objectives that have been established by MCFRS, approved by the County Executive, and adopted by the County Council, are instrumental in determining the locations of stations and the number and types of apparatus deployed in them. Response time objectives are broken down into baselines (i.e., response times presently or recently achieved) and benchmarks (i.e., response time goals intended to be met by a specific date in the future following implementation of operational improvements).

DEPLOYMENT CRITERIA

The MCFRS uses several deployment-related criteria to assist in the decision-making process concerning resource allocation. These criteria include 2500 incident responses per unit per year and failures to respond (FTRs). Each is described below. NFPA Standard 1710, described below, is another deployment criteria that could be used by the MCFRS in the future if adopted into law by the County Council.

2500 Unit Responses per Year

Although not appearing in previous editions of the *Fire, Rescue and Emergency Medical Services Master Plan*, the MCFRS has been using the criterion of 2500 unit responses per year as the threshold for identifying a unit that has become overextended and for which an additional unit may be required in the same station or a nearby station providing the same type of service to the community. This threshold was found to be used in the late 1990s by several other fire-rescue departments in the United States of similar size and characteristics as MCFRS.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

PLANNING & ACCREDITATION SECTION

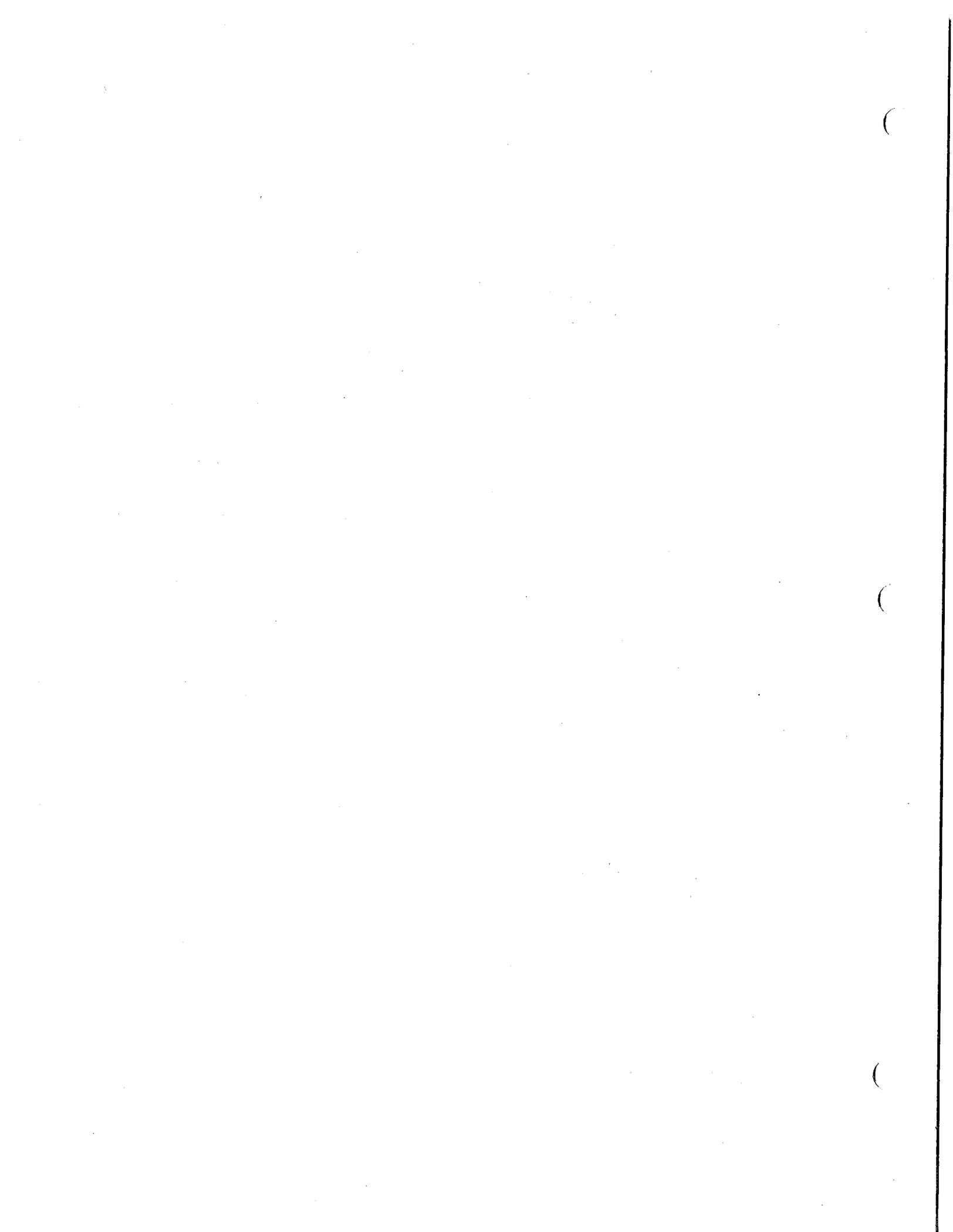
The Planning & Accreditation Section provides comprehensive planning, departmental performance assessment, accreditation management, Geographic Information System (GIS) services, analytical services, and related technical services to assist the MCFRS in meeting its mission. The Section analyzes risk and historical incident data and considers it along with growth and development to project strategic resource needs, facility placement, operational requirements, and future workforce levels. The Section develops planning documents, including the *Fire, Rescue, Emergency Medical Services, and Community Risk Reduction Master Plan*, annual strategic plan, and station location studies/reports. The Planning & Accreditation Section also tracks and updates MCFRS performance and provides quarterly and annual performance reports to the CountyStat Office. Comprehensive mapping, geographic incident data analysis, and other GIS services are provided by this Section as well.

The Section, through its Accreditation Manager, ensures that MCFRS meets annual accreditation compliance requirements to maintain its agency accreditation as well as the full spectrum of re-accreditation requirements every fifth year in the five-year accreditation cycle. Each year in July, MCFRS must submit to the Commission on Fire Accreditation International (CFAI) an Annual Compliance Report showing the status of the department's efforts to continually maintain its compliance in relation to CFAI-established core competencies as well as progress made in improving the department with regard to recommendations made by the CFAI Peer Assessment Team during its most recent on-site evaluation. Every five years during the re-accreditation process, the Planning & Accreditation Section coordinates the preparation of a new Self-Assessment Manual and an updated Standards of Cover document for submission to CFAI prior to the on-site visit of the Peer Assessment Team. [Section 3 of this master plan addresses the accreditation process in greater detail.]

FESC, POLICY, RECORDS & LEGISLATION

Staff in the FESC, Policy, Records & Legislation work unit within the Office of the Fire Chief provide administrative services and oversight for several requirements outlined in County Code and in County policies, procedures and regulations. Under County Code, Section 21-2, the Fire and Emergency Services Commission (FESC) recommends how the County can achieve and maintain effective, efficient, and equitable fire, rescue, and emergency medical services and improve the policy, planning, and regulatory framework for all fire, rescue and emergency medical services operations. The Fire Chief is responsible for promulgating all fire-rescue service policy, procedures, and Fire Chief's General Orders for the MCFRS. The FESC must review and may approve or disapprove any generally applicable Fire and Rescue Service policy or regulation proposed by the Fire Chief, including any regulation that may be issued by the County Executive.

Staff in this work unit also maintain all records for the Integrated Emergency Command Structure (IECS) Regulation, as required in Section 21-8 of County Code. Additional



**2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES,
AND COMMUNITY RISK REDUCTION MASTER PLAN**

SECTION 3

**FIRE DEPARTMENT
ACCREDITATION**



2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

SECTION 3

FIRE DEPARTMENT ACCREDITATION

As MCFRS is an accredited fire department²³ and its leadership is committed to having the department remain accredited for the long-term, the accreditation process and its importance to the department's success is described in this master plan. Section 3 is focused solely on agency accreditation, including a description, its benefits, and MCFRS' commitment to the process. An overview of the accrediting organization - the Center for Public Safety Excellence²⁴ and its subsidiary the Commission on Fire Accreditation International - is also provided. An overview of the three primary documents that an accredited fire and emergency service agency must have and continually maintain is provided as well.

OVERVIEW OF FIRE DEPARTMENT ACCREDITATION

A general overview of fire department accreditation is provided below, including a description, purpose and benefits of accreditation. MCFRS' commitment to the accreditation process is described as well.

DESCRIPTION

- **ACCREDITATION DEFINED**

Accreditation is a "comprehensive self-assessment and evaluation model that enables organizations to examine past, current, and future service levels and internal performance and compare them to industry best-practices. This process leads to improved service delivery. The CFAI accreditation process provides a well-defined, internationally-recognized benchmark system to measure the quality of fire and emergency services. The Center for Public Safety Excellence (CPSE)'s Accreditation Program, administered by the Commission on Fire Accreditation International (CFAI), allows fire and emergency service agencies to compare their performance to industry best practices in order to:

- Determine community risk and safety needs and develop community-specific Standards of Cover.

²³ MCFRS was first awarded accreditation status by CFAI in August 2007 and was re-accredited in August 2013 following a year under a deferred status during FY2013.

²⁴ CPSE is an organization that helps public safety agencies throughout the world improve their services. CPSE accredits fire and other emergency service agencies and credentials fire/emergency service officers.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

- Evaluate the performance of the department.
- Establish a method for achieving continuous organizational improvement.”²⁵

The CPSE’s Accreditation Program is the sole accreditation program for fire and emergency service agencies in the world. In FY15, there were 207 accredited fire and emergency service agencies worldwide, with most of them in the United States.

• PROCESS vs. PROJECT

Accreditation is not a one-time or intermittent project that has beginning and end dates and requires only a temporary effort and short-term commitment of resources. Accreditation is a continuous process that must be addressed by the fire department from that perspective. As accreditation is focused on continuous improvement, the department must work toward that goal on a continual basis, not intermittently. The accreditation process requires the full commitment of the entire department and is dependent upon adequate resources, including a dedicated Accreditation Manager, that must be committed to the process year-round, every year. An accredited department that takes a break from the process for an extended period will not achieve continuous improvement and will have great difficulty in becoming reaccredited at the end of its five-year accreditation cycle (see below).

• STATUS LEVELS/STEPS TO ACCREDITATION

There are four steps to achieving accreditation. At each step, the fire and emergency service agency seeking accreditation is given one of four hierarchical designations, or status levels:

- “Registered Agency” – This status allows an agency to be involved with the accreditation process for up to three years where it can gain access to the CFAI network, receive the CPSE newsletter, and obtain the latest edition of the *Fire & Emergency Service Self-Assessment Manual*.
- “Applicant Agency” – This status allows a Registered Agency that is ready to make a firm commitment to accreditation to submit the Applicant Agency Status Form and to receive an Applicant Agency packet of the materials needed to proceed. While holding this status (i.e., 18 months for career agencies; 24 months for volunteer agencies), an Applicant Agency is assigned a volunteer mentor, and a SharePoint site is created for the agency to post draft documents for review by the mentor and for communication between the agency and mentor.
- “Candidate Agency” – This status allows an Applicant Agency that has completed its self-assessment process to upload the required documents (i.e., Self-Assessment Manual, Standards of Cover, Strategic Plan) to the CPSE SharePoint site for review by

²⁵ Source: CPSE web page

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

the CFAI-assigned Peer Assessment Team. Following an on-site visit, the team submits a final report on its recommendation for accreditation to the agency and the CFAI.

- “Accredited Agency Status,” or “Deferred Agency Status,” or Denial – During the CFAI’s Spring or Fall meeting, the Commission hears the candidacy report from the Peer Assessment Team Leader in the presence of the Candidate Agency’s representatives. The Commission then grants, denies, or defers accreditation. A successful agency is awarded “Accredited Agency Status” applicable for a period of 5 years (see “5-Year Cycle” below). An agency receiving “Deferred Agency Status” is granted a period of up to one year to address deficiencies under the guidance of the Peer Assessment Team Leader and then goes before the Commission again for a decision. An agency receiving a denial decision by the Commission can reenter the system at the first step as a Registered Agency for another attempt at earning accreditation status.

There is a fee structure in place for each of the status levels. Payment is due to CPSE/CFAI in accordance with an established timeline. Fees are based upon the size of the fire department as determined by the population protected.

- **5-YEAR CYCLE**

“Accredited Agency Status” that has been awarded to a fire department by CFAI is applicable for a period of 5 years, provided that the department submits an Annual Compliance Report (ACR) in the first through fourth years that is approved by the Commission. The ACR has a standard format created by CFAI and serves as a progress report. The ACR includes reporting on any major organizational/environmental changes; status of meeting mandatory federal, State and local laws/requirements pertaining to fire-rescue services; status of core competencies; and status of implementing recommendations of the CFAI Peer Assessment Team appearing in their final report. An annual accreditation maintenance fee is also due.

MCFRS was awarded Accredited Agency Status in August 2013, so the department will need to work on maintaining its status annually through August 2017 (i.e., fourth year of cycle) and seeking reaccreditation in 2018 (fifth year). To maintain its Accredited Agency Status through 2017, MCFRS will need to submit its ACR by July 15 each year and receive an ACR approval from CFAI annually.

ACCREDITATION BENEFITS

“The Commission on Fire Accreditation International (CFAI) comprehensive self-assessment process promotes excellence and encourages quality improvement by enabling fire and EMS agencies to:

- Assure colleagues and the public that they have definite missions and objectives that are appropriate for the jurisdictions they serve
- Provide a detailed evaluation of the services they provide to the community
- Identify areas of strength and weakness within the department

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

- Create methods or systems for addressing deficiencies while building organizational success
- Encourage professional growth for both the department and its personnel
- Provide a forum for the communication of organizational priorities
- Foster national recognition by colleagues and the public
- Create a mechanism for developing strategic and program action plans.”²⁶

AGENCY COMMITMENT TO THE PROCESS

The MCFRS leadership and all levels of management are fully committed to the CFAI accreditation process and its tenet of continuous improvement. The County Executive and Chief Administrative Officer fully support MCFRS accreditation as well. While accreditation requires considerable time and effort by the department and has direct and indirect costs, its benefits (see above) far outweigh the effort and costs. It is the intention of the Fire Chief for MCFRS to embrace and follow the CFAI accreditation model for the long-term and to pursue Accredited Agency Status at the intervals (e.g., every fifth year) established by CFAI.

In addition to assisting MCFRS in providing effective and efficient services to its customers and achieving continuous improvement, CFAI accreditation has also played a role in Montgomery County achieving a lower (i.e., improved) Insurance Services Office (ISO) rating.²⁷

COMMISSION ON FIRE ACCREDITATION INTERNATIONAL

The Commission on Fire Accreditation International (CFAI) administers the fire and emergency service agency accreditation program for the Center for Public Safety Excellence. The CFAI mission, model and guidance documents are addressed below.

CFAI MISSION

“The Commission on Fire Accreditation International (CFAI) is committed to assisting and improving fire and emergency service agencies around the world in achieving organizational and professional excellence through its strategic self-assessment model and accreditation process that provide continuous quality improvement and enhancement of service delivery to the community and the world at large. CFAI provides fire department training to assist departments with the tools necessary to begin and maintain the self-assessment process.”⁴

²⁶ Source: CPSE web page

²⁷ Based on an evaluation conducted in 2012, ISO lowered the County’s Public Protection Classification from PPC-4 to PPC-3 within areas served by fire hydrants and from PPC-9 to PPC-6 within areas lacking hydrants. Lower ISO ratings can lead to lower property insurance premiums for property owners depending upon the rates set by individual insurance carriers.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

CFAI MODEL

The CFAI accreditation model consists of ten broad performance categories that are broken down into approximately 40-45 performance criteria²⁸ that serve as a measure upon which an assessment of performance can be based. The criteria have then been broken down into over 250 detailed performance indicators⁵ that define the desired level of performance or achievement for each specific capability or task. The ten broad performance categories include:

- Governance and Administration
- Assessment and Planning
- Goals and Objectives
- Financial Resources
- Programs
- Physical Resources
- Human Resources
- Training and Competency
- Essential Resources
- External Systems Relations

About one-third of the performance indicators (a.k.a., “competencies”), or approximately 80-85 indicators²⁹, have been designated as “core competencies” which must be met (i.e., mandatory requirement) for the agency to achieve accreditation status. Core competencies have been designated by CFAI as critical elements deemed necessary for an agency to be considered credible as judged by peer assessors and the Commission. While the remaining performance indicators (a.k.a., “non-core competencies”) are considered beneficial for evaluating agency performance, they are less critical in importance than core competencies. There are both core and non-core competencies within each of the ten broad performance categories listed above. Candidate Agencies must address all performance indicators in their Self-Assessment Manual.

CFAI GUIDANCE PUBLICATIONS

CFAI publishes two primary guidance documents for use by fire and emergency service agencies working toward or maintaining accreditation status. The guides are described below.

- FIRE & EMERGENCY SERVICE SELF-ASSESSMENT MANUAL

The CFAI's *Fire & Emergency Service Self-Assessment Manual* (FESSAM) explains the CFAI accreditation model and process and guides fire and emergency service agencies on how to

²⁸ The exact number of criteria and performance indicators is not identified in this master plan as the criteria and indicators are subject to change over time as the accreditation model is periodically modified by CFAI.

²⁹ The exact number of core competencies is not identified in this master plan as the core competencies are subject to change over time as the accreditation model is periodically modified by CFAI.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

prepare their agency's Self-Assessment Manual and specifies the contents. The FESSAM contains the complete list of criteria and performance indicators; addresses risk assessment, standards of response coverage, and strategic planning; and provides guidance on research and information collection.

As of FY15, the FESSAM was in its 8th edition; however, the 9th edition was in development and expected to be published during the Summer or Fall of CY2015. This is the edition under which MCFRS was reaccruited in 2013 and under which the Annual Compliance Report will be prepared through FY2017. For reaccruited in 2018, MCFRS will use and comply with whichever FESSAM edition is in effect at that time (i.e., 9th or later edition).

- **STANDARDS OF COVER**

The CFAI's Standards of Cover (SOC) is a companion guide to the FESSAM. It explains the SOC process and provides guidance to fire and emergency service agencies on how to prepare their agency's Standard of Cover document and specifies the contents. A key component of an agency's SOC document is a comprehensive risk assessment of the service area, and the CFAI's SOC guide explains how to perform a risk assessment and what is to be addressed. The SOC guide also explains performance measurement and agency evaluation which need to be addressed in the agency's SOC document as well.

As of FY15, the CFAI's SOC guide was in its 5th edition. For reaccruited in 2018, MCFRS will use and comply with whichever edition of the SOC guide is in effect at that time (i.e., 5th or later edition).

ACCREDITATION TRAINING

CPSE/CFAI offer several training opportunities for fire and emergency service agencies who are participants in the accreditation program as a Registered Agency or at a higher level. Basic, intermediate and advanced-level workshops are offered periodically at locations throughout the U.S. and Canada. On-line training is also offered. Workshops and other training opportunities for agencies pursuing or maintaining accreditation status include:

- CFAI Self-Assessment Workshop
- CFAI Basic Standards of Cover Workshop
- CFAI Peer Assessor Workshop
- Data Analysis and Presentation Using Microsoft Excel (workshop or on-line)
- Advanced Technology for Community Risk/Standards of Cover
- Dayroom Discussions and other webinars

CPSE/CFAI also convenes an annual conference as an educational and networking opportunity.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

PEER ASSESSMENT

Peer assessment is a vital component of the accreditation process. The peer assessment process allows for a fair, thorough and close-up evaluation of the Candidate Agency by their peers.

When a Candidate Agency is ready to be evaluated for accreditation status, it is a group of peers from within the accreditation system that conducts the evaluation, not CFAI commissioners and/or staff. CFAI maintains a cadre of trained, volunteer peer assessors comprised of personnel from fire and emergency service agencies within the system. A Peer Assessment Team (PAT) of 3-5 individuals is assembled by CFAI, and that team reviews required documents (see below) prepared by the Candidate Agency and then conducts an on-site visit to determine whether the agency meets the core competencies and demonstrates credibility. The PAT then prepares a report of their findings and recommendations. The report is shared with the Candidate Agency and is presented to the Commission by the PAT Leader along with the team's recommendation to the Commission on whether the agency should receive accreditation status, deferral, or denial. Whether or not the Commission awards Accredited Agency Status, the Candidate Agency will have a list of recommendations from the PAT for improvements that can be pursued by the agency to help them attain or maintain accreditation in the future..

ACCREDITED AGENCY REQUIRED DOCUMENTS

There are three primary documents required for accreditation, including an agency's Self-Assessment Manual, Standards of Cover, and Strategic Plan or Master Plan. Each type of document is described below.

SELF-ASSESSMENT MANUAL

MCFRS had prepared its most recent Self-Assessment Manual (SAM), completed in 2013, in accordance with CFAI's *Fire & Emergency Service Self-Assessment Manual (FESSAM)*, 8th edition. The MCFRS SAM addresses all criteria and performance indicators (i.e., competencies) addressed in the ten broad accreditation categories listed under the "CFAI Model" heading above. The 82 core competencies identified in the 8th edition FESSAM have been denoted in the SAM. The MCFRS SAM was prepared in accordance with the CFAI-required format which, for each performance indicator, includes:

- A "*Description*" of what MCFRS has been done or put in place to address the stated competency (written in the past tense as required).
- An "*Appraisal*" of how well MCFRS is meeting the stated competency (written in the present tense as required).

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

- A “*Plan*” describing what MCFRS will do within the next five-year accreditation cycle to address any deficiencies or make additional improvements in meeting the stated competency (written in the future tense as required).
- A list of “*References*” that can be viewed to verify that MCFRS has done, or is in the process of doing, that which it has stated in the Description and Appraisal sections. References must be actual documents (e.g., plans, reports, SOPs, policies, general orders, memoranda, web site content, etc.) that a peer assessor or other reader can view.

Leading up to its next reaccreditation in CY2018, MCFRS will need to prepare a new SAM in accordance with the specific list of competencies included in the latest edition of the FESSAM as well as the latest CFAI-required format. Work on the new SAM will need to begin in CY2017.

STANDARDS OF COVER

The Standards of Cover (SOC) is the second document required for accreditation. The document is prepared by a fire department seeking accreditation, based upon a comprehensive risk analysis of the department’s service area, that establishes service level objectives upon which the distribution and concentration of the department’s resources are based. Although there have been many attempts to establish a common methodology in determining the precise number of resources needed to mitigate incidents, build future fire stations, and staff firefighter positions, every community has its own set of innate risks and needs. To that end, every fire department must conduct a self-assessment and community risk assessment that, together, yield the development of an all-hazards response system that successfully meets the needs of the community. This is particularly challenging for departments such as MCFRS that have assumed responsibilities for a variety of emergency services in addition to basic fire suppression, including EMS, hazmat response, water-ice rescue, technical rescue, explosive device (bomb) response, and aviation fire-rescue.

As communities such as Montgomery County continue to grow, the fire department must also continue to grow and develop to meet the evolving emergency needs of the community. The fire department must establish an effective number of resources, assure their full capabilities, and establish and meet appropriate response time objectives to address any given emergency event. An inappropriate number of resources dispatched within an ineffective time period will cause the emergency event to escalate; thus continuing to draw upon the department’s more distant resources while threatening the safety and welfare of both the public and emergency responders.

The development of a SOC document induces decisions that determine the deployment of operational resources in relation to the potential demand identified through historical incident analysis and the determination of future community risk through the risk assessment process. The SOC involves analysis and decision-making in four primary areas, each requiring significant research and examination. First, a community risk assessment is conducted to identify the fire and non-fire related risk inherent in the community. Secondly, service levels encompassing personnel, apparatus and equipment must be determined for the area served. Thirdly, an analysis of the agency’s capabilities in relation to response times and on-scene performance must be

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

conducted. Lastly, standards of coverage must be developed that identify how the department's resources will be delivered to maximize response effectiveness.

MCFRS has utilized the CFAI SOC guide (5th edition) to develop its own SOC document. Past versions of this comprehensive document have been submitted to CFAI peer assessors to assist them in evaluating MCFRS for accreditation purposes. The MCFRS SOC must be continuously reviewed, updated and modified to ensure that appropriate standards of response coverage are in place to meet evolving needs and that service delivery performance is continually evaluated.

MASTER/STRATEGIC PLAN

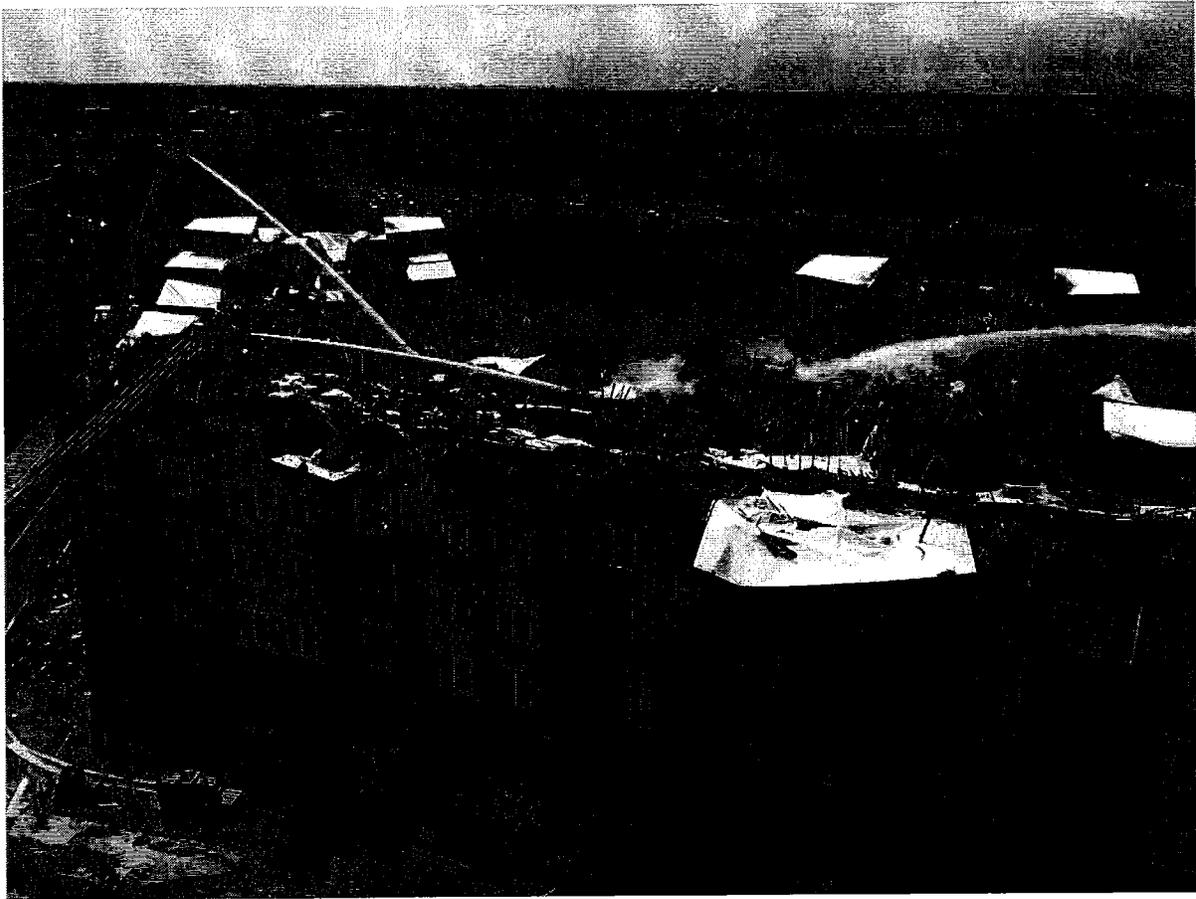
The third document required for accreditation along with the SAM and SOC is the department's strategic plan or master plan. MCFRS has had a master plan since 1994. The initial master plan sunset in 2004 and was replaced by another 10-year plan in 2005. The latter plan (*Fire, Rescue, Emergency Medical Services, and Community Risk Reduction Master Plan*) was used by MCFRS for its 2007 and 2013 accreditations. This new 6-year master plan replaces the 2005-2015 plan and will be used for the 2018 reaccreditation.

In addition to being a required document for accreditation, the MCFRS' master plan is mandated by Montgomery County Code, Chapter 21, Section 12. The plan must be approved (i.e., adopted by resolution) by the County Council following earlier approvals by the County Fire Chief and County Executive.

**2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES,
AND COMMUNITY RISK REDUCTION MASTER PLAN**

SECTION 4

**ALL-HAZARDS RISK
ASSESSMENT AND
STANDARDS OF COVER**



**2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES,
AND COMMUNITY RISK REDUCTION MASTER PLAN**

SECTION 4

**ALL-HAZARDS RISK ASSESSMENT
AND STANDARDS OF COVER**

Section 4 addresses all-hazards risk assessment for Montgomery County. This section defines the concepts of “risk,” and “acceptable risk,” defines and provides examples of target hazards, and describes the many categories of risk present in the County for which MCFRS has a sole or shared responsibility for mitigating to an acceptable level. Section 4 also describes the impact that changing demographics and new development (i.e., community and transit-related development) have on overall risk.

Section 4 addresses the MCFRS standards of response coverage (a.k.a., standards of cover) as well. The standards of cover address the distribution and concentration of resources that are needed to effectively respond to various types and levels of risk as well as the response times that the County has established for arrival of resources at the scene of emergency events following the sequence of MCFRS call-taking/dispatch, turnout from station, and travel to the incident scene.

RISK DEFINED

Montgomery County’s fire/rescue-related risk is the combined risk that County residents, business owners, and visitors encounter on a daily basis from the following hazards:

- Fire (involving structures, vehicles, trains, aircraft, infrastructure, vegetation, other property)
- Acute medical conditions, bodily injury, illness, etc.
- Transportation networks (e.g., highway, rail, air) and vehicles/trains using them
- Hazardous materials, including destructive/explosive devices
- Terrorism (with or without use of hazardous materials/WMD)
- Bodies of water (rivers, streams, lakes, ponds, canal, including when iced over); pools
- Natural hazards (e.g., thunderstorms, tornados, winter storms, floods, temperature extremes)
- Technological hazards (e.g., utility disruptions, dam failure)
- Societal hazards (e.g., health/disease epidemics, civil unrest)

Residents face other types of risk, as well, such as crime, civil unrest, commodity shortages and financial crises, but those types of risk are beyond the scope of the fire/rescue-related risk (as defined above) typically addressed by MCFRS and discussed within this Master Plan.

**2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES,
AND COMMUNITY RISK REDUCTION MASTER PLAN**

Risk is defined for the purposes of this plan as: the **probability** of an event (e.g., building fire, vehicle collision, hazardous material spill, etc.) causing harm to people, damage to property or the environment, and/or business interruption, combined with the **consequences** or severity of that event. Stated mathematically:

RISK = PROBABILITY OF OCCURRENCE X CONSEQUENCES

where probability and consequences can be stated quantitatively to derive a numerical level of risk that can be compared with other risks in order to rank and evaluate them. Risk can also be examined and compared subjectively in terms of categories such as low, medium, high, and special risk, or variations of these qualitative measures.

Considering both probability and consequences, risk can be viewed as a combination or product of the two component factors. For example, there is a low probability that on any given day a train carrying hazardous materials would derail, leak and produce a toxic vapor cloud within a densely populated area of Montgomery County; however, the consequences of that event could impact tens of thousands of residents and visitors resulting in many casualties and widespread evacuation of the impacted area. Damage to nearby buildings and the environment could be significant as well as substantial costs associated with disruption of business over the duration of the evacuation. The level of risk associated with this example could therefore be designated as a "special risk" as shown below in Figure 4.1.

Figure 4.1

PROBABILITY/CONSEQUENCE RISK MATRIX

<p align="center">HIGH PROBABILITY LOW CONSEQUENCES (MODERATE RISK)</p>	<p align="center">HIGH PROBABILITY HIGH CONSEQUENCES (HIGH RISK)</p>
<p align="center">LOW PROBABILITY LOW CONSEQUENCES (LOW RISK)</p>	<p align="center">LOW PROBABILITY HIGH CONSEQUENCES (SPECIAL RISK)</p>

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

An example of a “high risk” on a daily basis in Montgomery County, one having both a high probability of occurrence and high consequences across a large area, is a line of severe thunderstorms with heavy rain, strong winds, and frequent cloud-to-ground lightning which can occur during any month of the year (likeliest during Spring, Summer and Fall) in the County and could result in injuries/deaths and severe property damage having long-term consequences (e.g., damage to homes, businesses, utility lines, roads, etc.) county-wide. A second example is a fire in an occupied residence posing significant damage to the structure and its contents as well as the potential for death/injuries to occupants and firefighters.

A “moderate risk” is that having a high probability of occurrence on a daily basis combined with low consequences. Examples include a vehicle collision resulting in non-life threatening injuries, a child injured (e.g., arm fracture) during an athletic event, and a small fuel spill from a vehicle or a fuel pump. MCFRS typically responds to several such incidents daily. Injuries, if any, and property damage would be expectedly minor.

A “low risk” is that having both low probability and low consequences. Examples include a fire involving a riding mower, a hiker bitten by a non-venomous snake, and people trapped in a stalled elevator. MCFRS would be expected to respond to less than 100 of these type incidents annually. Injuries, if any, and property damage, if any, would be expectedly minor.

Additional examples of low, moderate, high and special risk are shown in Figure 4.2 below.

Historically, risks in Montgomery County have been reduced or mitigated to an acceptable level utilizing a variety of risk reduction strategies, including the implementation of preventative and risk minimization measures and the deployment of fire-rescue resources. In some cases, however, an unacceptable level of risk exists which potentially threatens the health, safety, and welfare of the overall population as well as MCFRS firefighters-rescuers. The line between acceptable and unacceptable level of unprotected risk is not precise.

The potential for a given event to occur based upon historical frequency must be examined in combination with the severity of the event should it occur. While the frequency of certain incidents may be low, the associated risk may be very high depending upon the scope and severity of the incident. Since 1935, Montgomery County has experienced at least eight notable incidents of this nature. In 1935, a B&O train struck a school bus in Rockville killing fourteen children and injuring thirteen³⁰. During WWII, three trains collided in Dickerson killing and injuring numerous passengers (number unknown), mostly U.S. servicemen³¹. In the early 1950s, two U.S. Navy fighter jets collided in mid-air and crashed in the up-county area killing several on board³². In more recent times, six residents were killed in a farmhouse fire in Boyds in 1986;

³⁰ Source: Rockville Volunteer Fire Department, 75th Anniversary Program, 1996.

³¹ Source: Former Chief George Hillard, Upper Montgomery County Volunteer Fire Department.

³² Source: Rockville Volunteer Fire Department, 75th Anniversary Program, 1996.

**2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES,
AND COMMUNITY RISK REDUCTION MASTER PLAN**

Figure 4.2 - LEVELS OF RISK

SPECIAL RISK	HIGH RISK
<ul style="list-style-type: none"> • Large airplane (5 or > passengers) on fire or crashed • Bomb Squad special risk responses including confirmed explosive device • Smoke in a house, building, school, apartment, garage, barn, etc. in a non-hydranted box area • Fire in a house, building, school, apartment, garage, barn, etc. in a non-hydranted box area • Smoke or fire in a high-rise building, apartment, office, etc. • Hazmat box alarms for a building fire involving hazmat, or a 2-inch or > high pressure natural gas line break; outside or inside • Technical rescues • Swift water rescues (e.g., Potomac River) 	<ul style="list-style-type: none"> • Smoke in a house, building, school, non-high-rise apartment, garage, barn, etc. in a hydranted area • Fire in a house, building, school, non-high-rise apartment, garage, barn, etc. • Small airplane (4 or < passengers) on fire or crashed • ALS2 EMS incidents, including ALS2 motor vehicle crash with or without entrapment • Bomb Squad high risk responses, including creditable suspicious and unattended packages/devices • Train or Metro Rail crash/derailment/fire • Hazmat inhalation emergencies, including CO alarms with symptomatic patients • Still water rescues (e.g., Potomac River), or incidents involving White's Ferry
MODERATE RISK	LOW RISK
<ul style="list-style-type: none"> • Inside contained appliance fire (dryer, oven, etc.) • Inside odor of smoke • Inside natural gas leak • Inside electrical short circuit • Detached shed fire • Large vehicle fire • Metro Rail subway 3rd rail insulator issue • Malfunctioning furnace • ALS1 EMS incidents, including ALS1 motor vehicle crash with or without entrapment • Bomb Squad moderate risk responses, including suspicious and unattended packages • Hazmat releases not involving fire, including white powder responses • Inland water/ice rescue; not including swimming pool, bathtub, etc. 	<ul style="list-style-type: none"> • Automobile fires • Brush, grass, leaf, field fire • Outside trash, dumpster fires • Outside transformer fire • Home automatic or commercial fire alarms; local alarm bells • Outside natural gas leaks; small fuel spills • Outside electrical short circuit • Citizen lock-out with hazard (food on stove, baby locked inside, etc.) • Outside smoke or odor investigation • Stalled elevator with people on board • BLS EMS incidents, including BLS motor vehicle crash • Metrorail arcing insulator • Public service call (performance not measured). Examples: <ul style="list-style-type: none"> ○ Assist fallen citizen off the floor ○ Water leaking from an apartment above ○ Citizen lock-in ○ Tree down blocking the roadway ○ CO alarm with asymptomatic patients

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

eleven people were killed in a train collision/fire in Silver Spring in 1996; a crowded passenger train derailed in Kensington in July 2002 injuring 120 passengers; and a sniper killed five people in Montgomery County (and another County resident in Virginia) in October 2002. In June 2007, a woman and her three young children died in a townhouse fire in Burtonsville where a small fire generated considerable smoke and toxic gases. In December 2014, a twin-engine corporate jet crashed into a Gaithersburg neighborhood upon approach to the Montgomery County Airpark killing all three people on board, and three residents were also killed when their house was set ablaze as a result of the crashed aircraft and leaking jet fuel. While all eight of these incidents had a low probability of occurrence, the consequences of each incident impacted not only the victims and their families but much of the general population of the County and metropolitan area, directly or indirectly, due to the horrific and unusual nature of the incidents.

These historical incidents underscore the potential for similar low-probability, high-consequence incidents in the future. In fact, overall risk within Montgomery County will likely increase due to population growth and continued development throughout the County in combination with ever present natural, technological and societal hazards. Taking into account the combined risk posed by transportation networks, aircraft flight paths, hazardous materials transport/storage, underground fuel pipelines, potential acts of terrorism, and other hazards, there is a moderate-high likelihood of another large-scale, major event occurring in Montgomery County during the time frame of this Master Plan (i.e., 2016-2022).

ACCEPTABLE LEVEL OF RISK

It is not feasible to eliminate all fire/rescue-related risk facing Montgomery County's residents, business owners and visitors, however, the overall level of risk can be reduced to a level that is acceptable to County elected officials, County Fire Chief, residents and business owners. The County strategically utilizes many resources and programs in an effort to reduce its fire/rescue-related risk, including deployment of firefighter-rescuers and other personnel working to reduce fire/rescue-related risk; modern fire, rescue and EMS apparatus and equipment; automatic fire protection systems; and a variety of risk reduction programs including fire code compliance as well as fire safety, injury prevention, and other risk reduction programs.

Despite these on-going efforts to reduce fire/rescue-related risk, a portion of the overall level of risk remains. This remaining risk is referred to as "unprotected risk" or "acceptable risk." Simply stated, unprotected risk is that which the County is willing to accept rather than funding an extraordinary number of resources and programs in an attempt to eliminate all fire/rescue-related risk. Minimizing or eliminating unprotected risk requires significant expenditures by the County, its municipalities, the private sector, and individual property owners. By choosing not to fund the vast number of resources and programs that would be required to eliminate or nearly eliminate the overall fire/rescue-related risk throughout the County, the County accepts a certain level of unprotected risk.

It is imperative that the County Fire Chief and elected officials of Montgomery County take great care in periodically reassessing and reestablishing an acceptable level of fire/rescue-related

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

risk, as this important determination will impact County residents, business owners and visitors for many years. This acceptable level of risk will serve as the basis upon which the delivery of fire-rescue services will be established or maintained, the number and distribution of stations, and the concentration of personnel, apparatus and specialized equipment that will be deployed.

Using funding allocated by the County Council, EMS-Transport revenue, fee-generated revenue via the Fire Marshal's Office, State-provided Senator Amoss Fund monies, various public and private sector grants, and funds raised by the LFRDs, the MCFRS must maximize its risk reduction efforts to close the gap between the County's protected and unprotected risk. In addition, the private sector and individual property owners, collectively, must do their part to reduce risk by such measures as installing automatic fire detection and suppression systems, carbon monoxide detectors, and lightning protection systems; securing adequate insurance coverage (e.g., property, vehicle, life, health, etc.); learning to perform CPR; purchasing and learning to use automatic external defibrillators; preventing injuries and fires; and taking other steps to minimize the impacts of fire/rescue-related emergencies. Risk reduction is a critical responsibility and vitally important measure to be undertaken by Montgomery County and its municipalities, as well as the general public, in order to close the gap between protected and unprotected risk.

TARGET HAZARDS

A "target hazard" is defined as any structure, occupancy or place that presents a major risk to occupants and a significant challenge or risk to firefighters-rescuers due to one or more of the following factors relating to safety, rescue, loss potential, and/or access:

- Potential for significant number of casualties
- Structural design, condition, use, and/or surrounding topography
- Potential for high dollar loss from fire, explosion, collapse or similar event
- Potential for significant loss of jobs and/or long-term business interruption following a fire, explosion, collapse or similar event
- Potential for significant disruption or loss of a key public service such as a governmental, medical, postal or utility service
- Potential for a reduced level of community pride due to loss of an important historical, social, recreational, or religious facility or landmark.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

Target hazards³³ in Montgomery County include the following types of occupancies, facilities, landmarks, transportation networks, and recreational areas:

- Unsprinklered residential high-rises, garden apartments, and townhouses
- Large, unsprinklered single-family homes, particularly in non-hydranted areas
- Hospitals, nursing homes, assisted-living facilities, and group homes
- Senior housing
- Places of public assembly (e.g., theaters, gymnasiums, fairgrounds)
- Terrorist targets – including many of the target hazards appearing in this list
- Places of worship
- Schools and college campuses
- Shopping malls and large retail stores
- Correctional facilities
- Businesses, research facilities, and other buildings storing, using, manufacturing and/or processing hazardous materials/wastes
- Interstate and major highways (e.g., I-495, I-270, I-370, MD-200, U.S. Route 29)
- METRO Rail
- CSX Railroad
- Purple Line (planned/future)
- Corridor Cities Transitway (planned/future)
- Airparks/airstrips
- Federal, State, County and municipal government facilities
- Barns and other agricultural buildings
- Historic buildings
- Interstate fuel pipelines
- Utility networks and facilities
- Potomac River, primarily the swift water section - Seneca to Little Falls
- Dams

Fire, rescue and EMS incidents have occurred frequently at many of these target hazards, while incidents have occurred less frequently at others. Regardless of their past incident frequency, each of these target hazards poses a significant daily risk, and MCFRS must maintain a constant state of readiness to respond to incidents involving these hazards.

FIRE-RESCUE RISK

Fire-rescue related risk can be best described in terms of its component categories, including emergency medical risk, fire risk, hazardous materials risk, bomb/destructive device risk, water/ice risk, technical rescue-related risk, and aviation risk. Other risks, usually associated with homeland security/emergency management rather than fire-rescue, include risks related to terrorism and to natural, technological and societal hazards. This latter group of risks; however,

³³ Specific facilities and their locations are not revealed for security reasons.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

The CCT is anticipated to have an impact on MCFRS primarily in terms of increased EMS incidents involving individual passengers as well as collisions at intersections involving CCT (BRT) buses and other vehicles resulting in injuries to bus passengers, other motorists and pedestrians. Fires involving BRT buses will inevitably occur but will be greatly outnumbered by EMS/collision incidents. While it is difficult to estimate the number of incidents (by incident type) relating to CCT/BRT, it is reasonable to anticipate approximately 200-300 incidents annually involving fall-related injuries, sick persons, cardiac patients, struck pedestrians, and collisions with other vehicles. The distribution of fire-rescue stations and concentration of fire, rescue and EMS resources in the areas to be served by the CCT (Phase I) are expected to be adequate; although additional EMS incidents will contribute to an increased need for EMS resources in general due, in part, to other types of risks present in these same areas. Specialized training for MCFRS personnel will be needed to effectively and safely perform passenger extrication and fire suppression involving CCT/BRT buses which will have a different design than conventional buses.

STANDARDS OF COVER

The MCFRS' standards of response coverage are identified and described in a document titled *MCFRS Standards of Cover* (a.k.a., "SOC"). The document has been prepared in accordance with the CFAI guidance publication *Standards of Cover – 5th Edition*. The primary purpose of the MCFRS SOC is to describe and quantify the County's fire-rescue risk and related service demand and to set forth the level of response coverage (i.e., station distribution, resource concentration, and response time goals) that will be in place to meet service demand and mitigate the defined risk at a level that is acceptable to the Fire Chief, County Executive, County Council and County residents and business owners.

Standards of response coverage are determined by identifying critical tasks to be performed at the incident scene and then defining staffing levels for various types of apparatus as well as response time goals for assembling required resources (i.e., personnel, apparatus and equipment) at the incident scene. Critical tasks, staffing levels and response time goals are discussed below.

CRITICAL TASKS

The first step in determining appropriate standards of response coverage is to identify the critical tasks that must be performed by fire-rescue personnel to effectively and safely manage and control fire, rescue, EMS and special operations incidents. This is known within accreditation circles as performing a critical task analysis. To streamline the process of identifying critical tasks, the tasks are categorized by incident category (i.e., emergency program – ALS1, ALS2, BLS, fire full- assignment, etc.) and by level of risk (i.e., low, moderate, high, special).

Section C of the *MCFRS Standards of Cover* (SOC) document includes the results of the critical task analyses performed by the Operations Division for each of the risk levels within each of the

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

emergency programs. For each risk level within each emergency program, a table is presented listing the critical tasks to be performed, number of personnel required to complete each task, and the unit or riding position(s) associated with each task. The number of personnel required to complete all critical tasks per risk level within each program is known as the effective response force (ERF) for that risk level/program, ranging from two personnel for a low-risk EMS incident (i.e., BLS incident) up to 30 or more personnel for a special-risk, fire full-assignment (e.g., high-rise) incident. The ERF can also be described in terms of the number and type of apparatus that deliver that amount of personnel and equipment to the incident scene. For example, a high-risk, fire full-assignment (e.g., house fire) incident requires a minimum response of five engines, two aerial units, a rescue squad, an EMS unit and two chiefs (i.e., command officers), or a total of 28 personnel, to effectively and safely perform the 11 critical tasks that have been identified for that incident type and associated risk level.

STAFFING LEVELS

The County has established minimum staffing levels for apparatus in Executive Regulation 25-08AM, "Apparatus Staffing Policy," as follows: engine-3 personnel, aerial unit-3, rescue squad-3, ALS unit (e.g., medic unit)-2, BLS unit (e.g., ambulance)-2, tanker-1, brush unit-1, special unit-1. In FY07, MCFRS initiated a strategy to increase staffing on frontline engines, aerial units and rescue squads to the desired staffing level of four personnel; although minimum staffing remained at three for these units. The fourth individual can be a career or volunteer firefighter. With at least one of the four personnel a firefighter-paramedic, these units serve a second function as ALS first-responder apparatus.

At the time this master plan was being finalized, four-person staffing had been achieved on most frontline engines, except Engines 702, 705, 710, 711, 720 and 726 plus one aerial unit (i.e., Aerial Tower 708). The MCFRS strategy is to complete four-person staffing on the remaining frontline engines, then the remaining frontline aerial units, followed by frontline rescue squads. Once four-person staffing has been achieved on all frontline engines, aerial units and rescue squads, minimum staffing should, by future amended policy, be established as four personnel on these unit types. Minimum staffing on medic units and ambulances will remain as two personnel, with a desired staffing level of three. If MCFRS were to implement ALS chase units in place of most medic units, the chase units would have minimum staffing of one person – a paramedic.

RESPONSE TIMES

An important element of the MCFRS standards of cover is response time to incidents. **Response time (a.k.a., "total response time") is the sum of 9-1-1 call processing/dispatch time, turnout time, and travel time.** This definition is consistent with the CFAI accreditation model. Alternatively stated, total response time is the elapsed time from the point when MCFRS

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

communications personnel⁶⁴ begin the 9-1-1 incident triage process with the caller, to the on-scene arrival of MCFRS apparatus.

Consistent with the CFAI accreditation model, total response time (hereafter referenced as “response time”) is viewed by MCFRS in two ways with respect to the number of resources arriving at a given incident. It is a common performance measure for fire departments, including MCFRS, to track response time of the first-arriving unit for all incident types. The first-arriving unit can initiate incident scene assessment and communicate this information to ECC for the benefit of other incoming units. There are certain incidents; however, where the first-arriving unit will be the sole unit required to handle the emergency such as a BLS incident (e.g., an ambulance handling a patient with a minor injury) or a low-risk fire incident (e.g., engine handling a dumpster fire without exposures). Likewise, it is useful for fire departments, including MCFRS, to track the response time of all units dispatched to an incident whether that be two units, ten units, or more. Alternatively stated, this is the response time of the “effective response force” (ERF) which is based on the response time of the last-arriving unit of the ERF. For higher risk incidents that require more resources, the difference in response time between first-arriving unit and last-arriving unit can be significant.

Also in keeping with the CFAI accreditation model, MCFRS has two sets of response time metrics it tracks and uses for performance measurement – baselines and benchmarks. The CFAI accreditation model requires that response time baselines and benchmarks be established at the 90th percentile⁶⁵ rather than the average response time, as 90th percentile indicates a more credible level of performance. The baseline set of metrics are based upon data mining and analysis performed at least annually. Whatever 90th percentile times are derived from that data become the new set of baselines, which will have improved, remained equal, or declined compared to the previous set of baselines. Benchmarks are a set of 90th percentile response time goals that are established by MCFRS at a level that will be challenging, but realistic, to achieve at a future date chosen by the department. Benchmarks are meant to be achieved incrementally as a result of planned/implemented enhancements such as additional resources, improved policies and procedures, improved management practices, application of new technologies or innovative approaches, etc. As benchmarks are achieved by the department, they should be reset to further challenge the department to seek continuous improvement.

FIRST-ARRIVING UNIT RESPONSE TIMES

First-arriving unit response time is greatly influenced by station distribution in that travel time of a first-arriving unit is mostly related to distance of travel; although traffic congestion, weather, and lane closures can be factors as well. Station distribution in Montgomery County is based on both population density, building density and level of risk. Stations are closely spaced within

⁶⁴ Following implementation of the universal call-taker model under MCP, “MCFRS communications personnel” will be replaced by “universal call-takers” in this definition.

⁶⁵ 90th percentile response time indicates that 89.99% of response times analyzed over a period of time were lower (i.e., better) than the 90th percentile value and 10% were worse (i.e., higher).

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

areas of metropolitan and urban density, further apart in suburban areas, and furthest apart in rural areas of the County.

MCFRS has identified within its SOC the type of unit per incident category (i.e., emergency program – ALS1, BLS, fire-full assignment, etc.) that meets the criteria for being an appropriate first-arriving unit. For example, the unit meeting the appropriateness criteria for first-arriving unit to an ALS1 or ALS2 incident is an ALS unit (e.g., medic unit or ALS first-responder apparatus such as a paramedic engine or ALS chase unit) even if some other type of first-responder unit of lesser patient care capability (e.g., ambulance) arrives beforehand. As another example, the unit meeting the appropriateness criteria for first-arriving unit to a fire full-assignment incident is an engine even if another type of unit lacking a pump, water and hoses (e.g., aerial unit, rescue squad, ambulance) arrives beforehand.

FIRST-ARRIVING UNIT BASELINES

Based on FY15 response time data, MCFRS had compiled a set of 90th percentile response time baselines for first-arriving unit for each emergency program and density zone. At the time this master plan was being finalized, the FY15 first-arriving unit baselines were the most recent set of full fiscal year baselines. First-arriving unit baselines indicate the department's most recent level of performance for comparison to previous baselines as well as to first-arriving unit benchmark goals for the future.

FIRST-ARRIVING UNIT BENCHMARKS

Based on FY13 - FY15YTD⁶⁶ response time data as well as future factors such as planned resource and technological enhancements and call load projections, MCFRS has compiled a set of 90th percentile response time benchmark goals for first-arriving unit for each emergency program and density zone. It is envisioned that these benchmarks will be met by 2022 if operational and technological resource enhancements recommended in this master plan were to be fully implemented. The 2022 first-arriving unit benchmarks are shown in Table 3 in Appendix G.

EFFECTIVE RESPONSE FORCE RESPONSE TIMES

Effective response force (ERF) is about resource concentration in relation to risk and service demand. Concentration relates to having sufficient quantities of appropriate apparatus, equipment and personnel to handle the overall risk and service needs of a given area in a timely, effective, efficient and safe manner.

MCFRS has determined an appropriate ERF for each type of incident and risk level based on critical tasks to be performed and has developed a response assignment for each, consisting of specific apparatus to be dispatched. For example, the ERF for a special-risk, high-rise fire requires the response of 5 engines, 3 aerial units, a rescue squad, an EMS transport unit, and two

⁶⁶ FY15 year-to-date was through February 28, 2015 while this master plan was being written.

2016-2022 FIRE, RESCUE, EMERGENCY MEDICAL SERVICES, AND COMMUNITY RISK REDUCTION MASTER PLAN

command officers. These units must assemble within a reasonable time frame (as specified below) to control the fire, perform rescues as needed, treat/transport the injured as needed, and minimize property damage. The ERF response time is based on the response time of the last-arriving unit of the ERF, which in the case of the high-rise fire would likely be the fifth-due engine, third-due aerial, or second-due battalion chief traveling the longest distance.

A large concentration of varied resources is needed most within areas of the County having high density and/or high-special risk. This is important for not only the initial incident but for a multiple alarm incident or several concurrent incidents within the same geographic area. The need for a large concentration of resources in a particular area might be addressed by close distribution of stations and/or deployment of more than one specific type of resource (e.g., two ambulances, two engines, etc.) at a given station.

ERF BASELINES

Based on FY15 response time data, MCFRS had compiled a set of 90th percentile response time baselines for effective response force (ERF) for each emergency program and density zone. At the time this master plan was being finalized, the FY15 ERF baselines were the most recent set of full fiscal year baselines. ERF baselines indicate the department's most recent level of ERF performance for comparison to previous baselines as well as to ERF benchmark goals for the future.

ERF BENCHMARKS

Based on FY13 through FY15-YTD⁶⁷ response time data as well as future factors such as planned resource and technological enhancements and call load projections, MCFRS has compiled a set of 90th percentile ERF response time benchmark goals for each emergency program and density zone. It is envisioned that these ERF benchmarks will be met by 2022 if operational and technological resource enhancements recommended in this master plan were to be fully implemented. The 2022 ERF benchmarks are shown in Table 4 in Appendix G.

⁶⁷ FY15 year-to-date was through February 28, 2015 while this master plan was being written.

