Emergency Medical Services Plan

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## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission Statement</td>
<td>3</td>
</tr>
<tr>
<td>Introduction</td>
<td>4</td>
</tr>
<tr>
<td>Authority</td>
<td>6</td>
</tr>
<tr>
<td>Model EMS Response System</td>
<td>7</td>
</tr>
<tr>
<td>EMS Administrative Structure</td>
<td>11</td>
</tr>
<tr>
<td>EMS Agenda for the Future</td>
<td></td>
</tr>
<tr>
<td>The Vision</td>
<td>13</td>
</tr>
<tr>
<td>Priority Areas Goals and Objectives</td>
<td></td>
</tr>
<tr>
<td>• Regulation and Policy</td>
<td>14</td>
</tr>
<tr>
<td>• Resource Management</td>
<td>16</td>
</tr>
<tr>
<td>• Human Resources and Education</td>
<td>18</td>
</tr>
<tr>
<td>• Transportation</td>
<td>20</td>
</tr>
<tr>
<td>• Facilities</td>
<td>22</td>
</tr>
<tr>
<td>• Communications</td>
<td>24</td>
</tr>
<tr>
<td>• Public Information and Education</td>
<td>26</td>
</tr>
<tr>
<td>• EMS for Children</td>
<td>27</td>
</tr>
<tr>
<td>• Trauma Systems</td>
<td>28</td>
</tr>
<tr>
<td>• Mass Casualty Care</td>
<td>30</td>
</tr>
<tr>
<td>• Data and Evaluation</td>
<td>31</td>
</tr>
<tr>
<td>• Medical Direction</td>
<td>33</td>
</tr>
<tr>
<td>• Preparedness</td>
<td>35</td>
</tr>
<tr>
<td>• Funding</td>
<td>37</td>
</tr>
<tr>
<td>Conclusion</td>
<td>38</td>
</tr>
</tbody>
</table>
Office of Emergency Medical Services

Mission Statement

The mission of the Office of Emergency Medical Services is to be responsible for program development activities, including, but not limited to:

- Public education and information programs
- Regional council oversight
- Training and Education
- Providing staff support to the EMS Advisory Board
- EMS for Children (EMS-C)
- Proactive administration, oversight and regulation of the statewide EMS and trauma system.
Introduction

“What Is EMS?

Emergency Medical Services, more commonly known as EMS, is a system that provides emergency medical care. Once activated by an incident that causes serious illness or injury, the focus of EMS is emergency medical care of the patient(s), transportation to a hospital, documentation of patient condition and treatment and handoff to appropriate medical personnel. EMS is most easily recognized when emergency providers, vehicles or helicopters are seen responding to incidents. But EMS is much more than a ride to the hospital, it also includes non-emergency transportation, interfacility transport, and transport from a facility to home. It is a system of coordinated response and emergency medical care, involving multiple people and agencies. A comprehensive EMS system is ready every day for every kind of emergency. The goal of EMS for each patient is stabilization, treatment and timely transport to a hospital that provides the required level of medical care.

EMS is an intricate system, and each component of this system has an essential role to perform as part of a coordinated system of emergency medical care. An EMS system comprises all of the following components:

- Private and Public types of EMS agencies and organizations
- Communications and transportation networks
- Hospitals including but not limited to trauma centers and specialty care centers
- Highly trained professionals, including
  - Volunteer and career prehospital personnel
  - Physicians and nurses.
  - Administrators and government officials
- An informed public that knows what to do in a medical emergency
EMS cannot exist in isolation, but must be integrated with other services and systems intended to maintain and enhance the community's health and safety. As seen in the previous graphic, EMS operates at the intersection of health care, public health and public safety. A combination of the principles and resources of each is employed in the EMS system. Since EMS providers work in the community, they may be the first to identify public health problems and issues. Since EMS providers respond to all kinds of emergencies and all kinds of hazards, they often work with public safety colleagues in law enforcement and fire services. But their primary mission is emergency medical care.

The organizational structure of EMS, which includes who provides and finances the services, varies significantly across the country and from community to community. Prehospital services can be based in an independent governmental agency, fire department, hospital, non-profit corporation (e.g. volunteer corps) or a commercial non-profit entity. Regardless of who provides the services, the essential components of an EMS system remain the same. Connecticut's EMS system includes all of these organizational structures. In order to be ready every day for every kind of emergency an EMS system must be comprehensive. Developing and maintaining such a system requires thoughtful planning, preparation, and dedication from EMS stakeholders at the local, state and federals levels. For more information about EMS, please see [http://www.ems.gov/what](http://www.ems.gov/what) is EMS.htm.
Authority

Connecticut General Statutes Sec. 19a-178(b). (Formerly Sec. 19-73z). Office of Emergency Medical Services. Statewide coordinated delivery plan. Model local emergency medical services plans and performance agreements. (a) There shall be established within the Department of Public Health an Office of Emergency Medical Services. The office shall be responsible for program development activities, including, but not limited to: (1) Public education and information programs; (2) administering the emergency medical services equipment and local system development grant program; (3) planning; (4) regional council oversight; (5) training; and (6) providing staff support to the advisory board.

(b) The Office of Emergency Medical Services shall adopt a five-year planning cycle for the statewide plan for the coordinated delivery of medical emergency services required by subsection (a) of this section. The plan shall contain: (1) Specific goals for the delivery of such emergency medical services; (2) a time frame for achievement of such goals; (3) cost data and alternative funding sources for the development of such goals; and (4) performance standards for the evaluation of such goals.
Model EMS System

Based on a national model

The National Highway Traffic Safety Administration developed a “Model EMS System” as a guide to understanding what constitutes a coordinated and comprehensive emergency medical response system. Each of the components should be addressed to achieve maximum effectiveness from the EMS system by strengthening the Chain of Survival. The term Chain of Survival is a metaphor that refers to a series of actions taken to reduce the mortality associated with cardiac arrest. It can be applied to EMS actions no matter what the diagnosis.

Prevention

Prevention is a response to the reality that many medical emergencies are indeed preventable. The two most prominent medical emergencies in the United States are traumatic injury (falls, vehicular accidents, violence, etc.) and sudden cardiac death.

- Traumatic Injury is a preventable public health problem. It is a leading cause of death between the ages of 1 and 44 years old. (National Vital Statistics System, National Center for Health Statistics, CDC -2012) A reduction in mortality and morbidity can be accomplished through coordinated public information/education and prevention efforts that include:
  - Providing programs and enacting laws designed to alter behavior or guide decision-making, such as drunken driving campaigns, seatbelt education, distracted driving and gun safety programs.
  - Providing conflict resolution education to help mitigate potentially volatile situations, for emergency responders.

- Cardiovascular disease is the leading cause of death in the adult population. Providing programs that promote cholesterol and blood pressure management, smoking cessation, exercise, proper diet and weight control are part of comprehensive prevention.

Citizen Recognition and Action

Through public information and education programs, the general population must know several facts about the EMS System. They must know what the system is and must appreciate what the system is not.

- EMS is a system to deliver fast and effective medical care in emergency situations. It is not a replacement for primary care.
- EMS should be used when an individual believes that a time critical, potentially life-threatening health crisis has occurred.
- The public should be trained in the recognition of life-threatening injuries and illness, accessing the 9-1-1 emergency phone system, Cardiopulmonary Resuscitation (CPR) and Automated External Defibrillator (AED) learning to control hemorrhage and understanding when not to move a patient unnecessarily.
Notification
Rapid citizen access to emergency care is greatly facilitated by statewide availability of an enhanced 9-1-1 (E9-1-1) system that immediately pinpoints the address and telephone number of the calling party on a computer screen at the appropriate public safety answering point (PSAP). A model system should:

- Educate the public on the proper use of 9-1-1.
- Ensure cell phone and cable phone user’s accurate access through 9-1-1.
- Ensure that all streets are clearly identifiable for responding emergency services and that all businesses and residences are properly and visibly numbered.

Dispatch
The public safety answering point should be designed so that minimal time is lost between the receipt of the call and the dispatch of emergency medical help to the incident location. A model system has:

- All dispatch centers staffed by properly trained and certified Emergency Medical Dispatchers (EMDs).
- EMDs perform medically appropriate interrogation to determine the best utilization of emergency personnel and equipment.
- Trained EMDs effectively providing pre-arrival instructions to callers based on established protocols, such as:
  - Giving CPR instructions over the phone.
  - Clear an obstructed airway.
  - Open an airway
  - Performing other lifesaving maneuvers
- Medical direction incorporated to provide quality assurance review and continuous quality improvement.

Scene Care
Successful intervention in medical and traumatic emergencies is time-critical, and dependent upon a multi-disciplinary, organized system. Various levels of EMS personnel are utilized.

- First responders must be identified in each community with sufficient units strategically deployed to ensure a quick response to all life threatening calls with personnel and equipment that is included in the most recent OEMS approved equipment list.
  - Trained and certified at least to the Emergency Medical Responder level.
  - Trained and equipped to provide early defibrillation through the use of an Automatic External Defibrillator (AED).
- Basic Life Support (BLS) ambulance must be dispatched simultaneously with the first responders.
  - Staffed by two Emergency Medical Technicians (EMTs).
  - BLS vehicle certified by the Connecticut Department of Public Health.
  - BLS vehicles equipped with radio communications to CMED centers for recorded coordination between field providers and hospital medical direction.
• Paramedic level service should be available to all communities to provide advanced life support care and carry equipment and medications in the most recent OEMS approved equipment list.

An emergency medical system can be configured in a number of ways, taking into consideration rural, urban and suburban modifications, as long as it meets community medical needs and regulatory requirements.

Transportation and Care Enroute to Hospital
All transportation should be directed to the facility that has the capability for providing the necessary care in accordance with the patient’s condition.
• Determination is made based on written protocol and/or medical control via radio.
• Transportation of a patient is usually by ground ambulance.
• Aeromedical EMS service, with its rapid transport and sophisticated medical care capability may be summoned according to established guidance.
• In most cases, the patient destination is the nearest acute care hospital/emergency medical facility.

All determinations of patient destination must be in compliance with established guidelines and subject to medical control.

Facilities
All emergency medical facilities should be categorized in accordance with their capabilities in the area of emergency and critical care medicine.
• All hospital emergency departments should have the capability to treat all patients according to accepted standards.
  ➢ Physician and nursing personnel staffing these facilities must have specialized emergency medical training. The proper equipment necessary to provide for basic emergency care and advanced resuscitative needs of both pediatric and adult patients must be available. Daily inventories of critical areas, including ICU and CCU, so that patients can be directed to where critical care capability exists at any given time.

Specific specialty care centers that treat cases including but not limited to ST segment elevation myocardial infarction (STEMI), burns, pediatric patients, traumatic brain injury (TBI), or strokes, should be designated so the patient population requiring the sophistication of specialty care centers have such availability in the most timely manner.
Medical Direction
Standardization of medical direction would allow pre-hospital personnel who are certified/licensed by the state to function statewide.

Medical direction should be provided for all pre-hospital care levels.

- All services should be in conformance with established statewide patient care protocols.
  - “Direct Medical Oversight” means immediate and concurrent clinical directives to EMS field personnel, provided by a physician, or as delegated to properly trained advanced practice registered nurses or trained physician assistants, responsible for giving, consultation, instruction and authorization to appropriately trained or certified EMS personnel.
  - “Indirect Medical Oversight” means administrative medical directives to EMS field personnel, provided by a physician responsible for medical oversight. Administrative medical directives include, but are not limited to, written policies and protocols, education, and quality measurements.

A tracking system should be in place at the state level that allows for the identification of individuals who have had their medical direction privileges removed.

Interfacility Transfer
Critical patients requiring transfer to specialty care centers must be transported appropriately.

- The transferring facility must communicate with the receiving facility to ensure that it is able to accept the patient and provide the necessary care.
- Transfer of patients must ensure continued acute medical care during the transport. This may require the mobilization of a specialized transport team.
EMS Administrative Structure

Connecticut Department of Public Health, Commissioner
The Connecticut Department of Public Health Commissioner has overall authority and responsibility for the EMS System in Connecticut. (Connecticut General Statutes (CGS) Sec. 19a-176)

Office of Emergency Medical Services (OEMS)
The Office of Emergency Medical Services is responsible to the Commissioner for the coordination, administration, and enforcement of the state’s EMS statutes, regulations, programs and policies. (CGS Sec. 19a-178)

Connecticut Emergency Medical Services Advisory Board (CEMSAB)
The EMS Advisory Board, utilizing its committees, serves as an advocate for EMS system development. The Board advises the Commissioner on EMS issues, assists with regulation review and process, and develops program standards for the EMS system for approval by the Commissioner. Advisory Board Members serve in voluntary positions appointed by the Governor and State Legislators. (CGS 19a-178a)

Connecticut EMS Medical Advisory Committee (CEMSMAC)
The Connecticut EMS Medical Advisory Committee is representative of the pertinent statewide physician community. It provides both the Advisory Board and the Commissioner with advice regarding medical policy and protocols for the EMS system. (CGS 19a-178a(c))

Regional EMS Councils
The five Regional EMS Councils function with no state funding and serve a statutory role in implementing and evaluating state policy and programs at the regional and local level in concert with OEMS. They develop regional plans in conformance with state EMS Plan, coordinate and evaluate the delivery of EMS in their regions, and serve as a voice for the local communities in recommending continued development of the EMS system. (CGS 19a-183)

Regional Council membership consists of representatives of local government, fire service, law enforcement, medical and nursing professions certified and licensed ambulance providers, educational institutions and consumers.
Council of Regional Chairpersons
The Council of Regional Chairpersons (CORC) serves as an advocate for the EMS system development. CORC provides coordination of the Regional EMS Councils. CORC Chairpersons are elected by their regional councils and serve in a voluntary capacity. (CGS 19a-184)

Sponsor Hospitals
According to state regulation, Section 19a-179-12, mobile intensive care (MIC) activities, or the provision of advanced life support (ALS), including automated defibrillation, and other “advanced” skills performed by basic life support (BLS) personnel, are subject to medical oversight by sponsor hospitals. Almost every acute care hospital in the state is a sponsor hospital for at least one, local EMS service.

There are twenty seven Sponsor Hospitals, thirteen of which are designated as trauma centers; these include five level one centers, six level two centers, one level three center and two pediatric trauma centers. Sponsor Hospitals establish and enforce continuing education (CE) requirements for MIC personnel between recertification periods, and must provide copies to OEMS of their prehospital treatment protocols. To be approved by the OEMS as a sponsor hospital, a hospital must fulfill objectives focused on MIC personnel, performance, and quality control. Sponsor hospitals appoint a MIC physician medical director from their ED staff who has the ultimate responsibility for indirect medical oversight functions, such as maintenance of protocols, training, and CE. Direct medical oversight is generally provided to MIC personnel by an emergency physician at the destination hospital, and is accessed through the local Coordinated Medical Emergency Dispatch (CMED) by radio or telephone. Emergency telecommunicator training and certification is referred to under the Department of Emergency Services and Public Protection Regulations Connecticut General Statutes Sections 28-30-1 through 28-30-10.
EMS Agenda for the Future

THE VISION

“Emergency medical services (EMS) of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. This new entity will be developed from redistribution of existing health care resources and will be integrated with other health care providers, public health, and public safety agencies. It will improve community health and result in more appropriate use of acute health care resources. EMS will remain the public’s emergency medical safety net.”

(NHTSA EMS Agenda for the Future 1996)
Priority Areas: Status, Goals and Objectives

**Regulation and Policy**

**Status**

The Office of Emergency Medical Services (OEMS) resides within the Department of Public Health and is the lead agency for EMS in Connecticut. The Office of Emergency Medical Services is tasked by statute with: Providing public education and information programs; Administering the EMS equipment and local system development grant program; System planning; Regional council oversight, training; Providing staff support to the Advisory Board. The office is further tasked by regulation with providing regional EMS coordinators, assigning Primary Service Area Responders (PSAR’s) for each service area of the state, oversight of licensure and certification of EMS providers, establishing EMS vehicle standards, and rate setting for EMS services. EMS regulations are promulgated which further define these duties and EMS roles throughout the system, recently a revised set of draft regulations have been developed, which will modernize the current regulations.

OEMS is funded through a variety of sources and has no specific funding line from the state legislature. The regional coordinator positions are considered “durational employees”. Fees obtained through licensure are not reinvested in the EMS system in CT. All DPH licensing fees go to the General Fund for allocation by the legislature. These funding inadequacies are potentially enough to adversely impact the long-term sustainability of the EMS system and need further discussion.

The practice of issuing primary service areas (PSA’s) to multiple agencies for different aspects of EMS care within each of the 169 local jurisdictions is complex. EMS regions are established and recognized but there is a failure to actualize the full potential of EMS regionalization. The lack of County government in the state is also a factor.

There is an active Connecticut Emergency Medical Services Advisory Board. There are many prevention and public education programs in place and there is an active Emergency Medical Services for Children program within the state that tends to the unique needs of children in the EMS system.

The practice of rate setting, certificate of need requirements (CON), and issuance of PSAR’s for EMS organizations are dated, and law and regulation are silent on many contemporary EMS system issues.

**Goal 1**

To enact comprehensive legislation, regulations, and operational policies and procedures to provide an updated framework for a statewide system of emergency medical and trauma care.
Objectives

Objective #1: Regulations should be reviewed biennially and updated in a process that takes about 180 days.

Objective #2: The OEMS should review regulations for other aspects of the EMS system and update where needed. This may include, but not be limited to, trauma care, need-for-service and do-not resuscitate regulations.

Objective #3: DPH should work with the Connecticut Governor’s Office and the Legislature to improve the appointment process and the composition of the EMS Advisory Board, and ensure that the Board members represent the EMS community and the public. Additionally, OEMS should work with the Advisory Board regarding various administrative issues surrounding the functioning of the Board.

Objective #4: DPH should work with the Governor’s Office and the Legislature to review the viability of the certificate of need process and the established laws on EMS rate setting.

Objective #5: The DPH should work collaboratively with stakeholders and others, to improve and seek efficiencies within the system.
Resource Management

Status
Since the National Highway Traffic Safety Administration system review report in 2000, the Connecticut EMS and trauma system has continued to evolve and build upon recommendations in that report, and incorporating many of the contemporary standards and guidelines adopted throughout the industry. A statewide plan was developed in draft form in 2006 pursuant to statutory requirements; the plan was not published in final form. OEMS has been reorganized within the DPH in a regulatory branch. The office is actively working to ensure adoption and implementation of relevant standards about education, data collection and system integration. Although significant work is yet to be done in each of these areas, the commitment of OEMS staff and a supportive atmosphere from DPH leaders is providing a basis for future success.

In 2012, a new director of OEMS was selected and has brought a robust level of energy, dedication and innovation to the statewide process. A resource in the Connecticut EMS system is the existence of the five regions and their coordinators. The system of regionalization is a key link between DPH and the 169 municipalities. The five regional coordinators are presently employed by DPH and are part of the OEMS staff, however, these positions are “durational” with a current funding commitment scheduled to end in mid-2015.

The OEMS has significant authority in terms of responsibility to administer, oversee and regulate the statewide EMS and trauma system. Important areas Include: Ambulance rate setting authority; Assignment of specific primary service areas (PSA's), for first response, basic ambulance and advanced life support functions; Implementation of statewide treatment protocols; and Data collection. The concept of primary service areas is a process where the lead state agency grants sole response authority and responsibility to a single entity to provide a specific level of service for a specific geographic area.

The provision of EMS care and transportation, along with the assurance that trauma, stroke and ST elevation myocardial infarction patients (STEMI) are transported to the most appropriate facility in a timely manner is a fundamental component of the statewide health system. The fiscal resources that support those activities on a statewide basis seem to be inconsistent with the system needs and expectations. Connecticut has significant EMS system resources with approximately 23,000 responders of various levels handling 350,000 ambulance transports per year. A key component of effective resource management is the ability of the regulatory agency and community to understand where resources are located, how they are being used and measurement of the effectiveness of policies related to those resources. Although a statewide data collection system for both EMS and trauma exists, the ability of the lead agency and stakeholders to utilize those systems for evaluation purposes is greatly limited due to insufficient resources.

The Connecticut Emergency Medical Services Advisory Board (CEMSAB) was developed in statute in 1997 and has a number of active committees. This board has been in place for many years and consists of 41 members, serving in voluntary positions appointed by the Governor.
and State Legislature. Although it has some very active members, it is a large board and at times presents issues with regard to overall effectiveness in terms of participation and appointments.

Goal
To identify, categorize and coordinate resources necessary for establishment and operation of regionalized, accountable EMS and trauma systems.

Objectives
Objective #1: The DPH should pursue continued and permanent funding to ensure OEMS sufficient staff and resources are permanently available to support the provision of care and transportation across the state.

Objective #2: The DPH should expand and enhance the support of the EMS and trauma data collection systems to ensure data’s readily available to system policy makers, service agencies, hospitals and the public on a regular basis. This data is essential to patient care, resource management and quality assurance.

Objective #3: The OEMS should seek opportunities to partner with the Connecticut Highway Safety Office and other appropriate partners to enhance integration of EMS and trauma care into the statewide health system.

Objective #4: The DPH and OEMS should pursue the development of a regionalized system of emergency care including trauma, stroke, cardiac and other time critical conditions, working with municipal and other partners.

Objective #5: The statewide EMS plan should be updated every five years to remain consistent with current practice and industry standards providing a contemporary plan to support these activities for the next five years.
Human Resources and Education
Status
The OEMS has adopted the National Scope of Practice standards as minimum requirements for education programs and courses. Successful certification through the National Registry is required for initial certification of Emergency Medical Technician and licensure of Paramedic students. Providers are not required to maintain National Registry certification beyond initial state certification or licensing, however all EMS education programs are required to have physician medical director support. Connecticut has adopted the current national educational standards for the Emergency Medical Responder (EMR) but does not require National Registry for state credentialing. OEMS requires successful completion of standardized refresher course examinations for the recertification of all levels every three years with the exception of paramedics.

The OEMS certifies Emergency Medical Instructors are well as approves all courses across the state on an individual basis. These courses are conducted in a variety of venues as dictated by local educational needs and traditions. This effort has resulted in a relatively high number of courses and state certification/licensure of over 23,000 providers at all levels. The number of providers has remained consistent for the past several years. Clinical training is readily available across the states and issues with personnel shortages likely stem from causes other than shortages in training opportunities.

Concerns exist with ongoing oversight and quality assurance evaluation of EMS education courses, given the limited resources within the OEMS to support such activities. Other than monitoring pass/fail rates on certification exams and psychomotor skill testing, there is relatively little opportunity for state or regional staff to visit local educational offerings. Presently the processing time for certification of EMS providers is approximately 30 days with current staffing availability. Processes are not digitally driven or automated and opportunities for eliminating duplication of effort and improving efficient likely exist. It is important to note that at present there is no requirement for criminal background checks for the purposes of EMS provider certification/licensure.

Stakeholders have indicated that one of the most significant educational shortcomings of the EMS workforce in Connecticut is the shortage of leadership and management training opportunities for current and future EMS system leaders. Quality clinical training and experience does not necessarily translate to successful skill sets of managing and directing the business components of modern EMS systems.

In 2014 the OEMS in collaboration with the Council of Regional Chairpersons, supported the development of the Connecticut EMS EXPO, an educational and networking event for the public safety community (fire, police and EMS) with educational tracks covering a wide variety of current topics. Event attendees were also able to interact with 82 vendors and education providers. The three-day event involved more than 750 attendees.
Goal
EMS training programs will conform to uniform national and statewide standards. Training programs will be available to ensure an approved proficiency level for every type of EMS personnel (emergency telecommunicators, EMR, EMT, A-EMT, and Paramedics).

Objectives
Objective #1: The OEMS should work with government and system leaders to develop additional resources dedicated to the support of improved system education oversight and enforcement. Sufficient resources must be dedicated to this system activity to ensure quality educational experiences. Appropriate steps should be taken to strengthen programs where necessary.

Objective #2: The DPH should explore and consider a criminal background check system, to ensure that all EMS providers are appropriately screened prior to authorization to practice, though costly this would help to ensure appropriate protection for vulnerable populations in the health care system.

Objective #3: The OEMS should continue to support the efforts of the Council of Regional Chairpersons regarding the annual EXPO by participating in the planning process and promoting attendance.

Objective #4: The OEMS should develop a standardized operating procedures manual for training. The manual training should include requirements for all certification levels, practical/written testing process and a quality improvement program for EMS training programs.

Objective #5: The OEMS training staff, in conjunction with the Regional Coordinators, should develop a plan to provide oversight of EMS courses and evaluate course test results. Coordinators will identify problems and develop a process of checks and balances to monitor course content.
Transportation Status
Connecticut issues licenses and certifications to ambulances and first responders to operate within specific geographic areas. Even though the geographic areas are specifically designated, the OEMS has not had the opportunity or staff to utilize a GIS mapping system to demonstrate the levels of care being provided within each Primary Service Area (PSA).

Specific consideration for determining service areas include: population size, effect of proposed service on other services in the area, response and activation times and level of service. The OEMS also seeks advice from the affected municipalities and regional council. Cost and access to emergency care are considered in determining the PSAs. However, patient care data are not readily available for analysis of the quality of care provided within PSAs.

The DPH has a certificate of need process for assigning PSAs and a structure for maximum rates. Financial data gathered from providers, and other economic indices such as the consumer price index are utilized to determine approved rates.

There are 169 municipalities and eight counties in Connecticut. There are 186 services in Connecticut, 72 are volunteer ambulance and 61 are volunteer fire. The other 53 EMS services are licensed or certified at the first responder, basic, advanced, and paramedic levels. Licenses and certificates are issued annually. Vehicles are inspected biennially. There are 655 ambulances, 101 invalid coaches, two helicopters, two boats, seven non-transport mobile intensive care intermediate (MICI) vehicles and 177 mobile intensive care paramedic non-transport (MICP) vehicles. To add a vehicle, a service must submit an application to OEMS that, demonstrates need.

For-profit services are charged a $200 license fee. Municipal, volunteer and not-for-profit services are not charged for the issuance of a certificate. The Department of Motor Vehicles (DMV) inspects the vehicles for road safety, and OEMS inspects the vehicles for medical requirements. There are no fees assessed by the OEMS for inspections, although DMV assesses a $20 fee for their inspections. A single staff member from the OEMS conducts the vehicle inspections. The OEMS has investigative staff to address complaints.

There are two hospital-based air ambulance services, with helicopters strategically based throughout the State. Lifestar is based at Hartford Hospital, with a satellite location at Backus Hospital and has been nationally accredited since 2004 to provide service statewide. Their critical care transport teams are trained to manage neonatal, pediatric, cardiac and trauma patients. They provide rapid transport to definitive care from the scene and interfacility transports. SkyHealth, which began operations in late 2014, operates one helicopter in a joint venture between Yale New Haven Health System and North Shore – LIJ Health System, in partnership with Med-Trans Corporation. Currently, they only conduct interfacility and non-scene transports. They are staffed by highly skilled medical professionals, including a critical care flight nurse and paramedic.
The OEMS has established regulatory standards defining the minimum equipment and staffing resources for ambulance services – the minimum equipment lists are reviewed on an annual basis and modified as appropriate. There are no requirements currently within the regulatory standards for emergency vehicle operators to have emergency vehicle operations training.

Management Service Organizations (MSOs) are utilized primarily by rural EMS services to help provide EMS personnel.

Issues with patient care data collection greatly impact the capabilities of the state to assess the cost, quality and access to emergency medical care statewide. This inability to utilize patient care data hinders the assessment process for a PSA, system performance improvement efforts and further development of a comprehensive and coordinated statewide EMS system.

Goal(s)
Ensure safe, reliable EMS transportation, including the identification of EMS service areas and integration with hospitals and CMEDs.

Develop routine, standardized methods for inspection and licensing of all emergency medical transport services and vehicles.

Objectives
Objective #1: The DPH should ensure that cost, quality and access to emergency care are standard criteria for PSA assignments.

Objective #2: The OEMS should utilize stakeholders and CEMSAB to establish performance measures that assess the provision of EMS.

Objective #3: The OEMS should incorporate training requirements into the new regulatory standards for ambulance vehicle operators.

Objective #4: The OEMS should utilize GIS software to map current PSAs by level of service.

Objective #5: Every emergency vehicle operator should successfully complete an Emergency Vehicle Operations Course, which is approved by the State Office of Emergency Medical Services.
Facilities
Status
Connecticut has 29 acute care hospitals with hospital-based emergency departments distributed primarily based on population density. There are two veterans’ hospitals, one of which is a federal facility. Thirteen hospitals are designated trauma centers: two pediatric Level I, two adult Level I, eight Level II, and one Level III have been verified by the American College of Surgeons.

DPH Regulation 19a-177 allows for Level IV trauma centers within Connecticut; however, there is neither a state process nor a current ACS process to verify Level IV trauma centers. The same 1995 Regulation (19a-177) includes Trauma Field Triage Protocols that require severely injured patients be taken to a Level I or Level II trauma center. Although EMS providers across the state follow these requirements, they are outdated. Each of the Level I pediatric trauma centers is a full service children’s hospital. Trauma field protocols instruct that severely injured children less than 13 years of age be taken to a Level I or Level II facility with pediatric resources including a pediatric ICU. There is one accredited burn center in the state, Bridgeport Hospital, and three surrounding states have additional burn center capacity.

Twenty-one acute care hospitals are designated as Primary Stroke Centers by the state, but only 12 are Joint Commission, (TJC) certified for stroke care. Three Connecticut hospitals have obtained credentials as “Chest Pain Center with Percutaneous Coronary Intervention (PCI) capabilities from the Society of Cardiovascular Patient Care. Additional facilities also provide PCI capability, although there is no state level credentialing beyond CON at present. A 2012 document “DPH Policy Guidance for STEMI Patients” is intended to facilitate timely PCI and has been distributed to the EMS community.

There is no formal coordination of interfacility transfer at the state or EMS region level. Interfacility transfer agreements exist between hospitals for time critical diagnoses, some formal and some are based on historic referral patterns within the state.

Hospitals may go on diversion when there is not sufficient staff or beds to adequately care for patients. Hospitals in Connecticut rarely go on full diversion and a policy has been developed to provide guidance for pre-hospital providers faced with this challenge. The Connecticut Emergency Medical Services Advisory Committee (CEMSMAC) Statewide Diversion Guidelines recommend, “A hospital regardless of (its) diversion status must accept a patient who is so unstable that, in the opinion of the ambulance crew, the patient must be taken to the closest hospital. On-line medical direction must be contacted in this circumstance to discuss the final destination” (10/11/07 CEMSMAC).
All acute care hospitals within the state are required to submit trauma patient care data to the state trauma registry housed in OEMS. Only 19 acute care hospitals submit this data, including the 13 trauma centers. Two of these non-designated hospitals submit their data to the National Trauma Bank as well. There is one trauma center participating in the Trauma Quality Improvement Program (TQIP) of the American College of Surgeons.

Goal
Ensure that an adequate number of designated emergency medical facilities and specialty care centers are accessible to patients needing such care.

Objectives
Objective #1: The OEMS should publish the capabilities of each hospital in the state and provide updates as necessary.

Objective #2: The OEMS should use trauma registry data to provide blinded comparative outcomes to each trauma hospital on an annual basis.

Objective #3: The DPH should complete statewide implementation of modern trauma triage guidelines based on 2011 CDC Field Trauma Triage Guidelines.

Objective #4: The OEMS in collaboration with the Stroke Task Force should recommend and support the re-invigoration of the designation of Primary Stroke Centers and PCI Centers program and annually publish region-based lists of state-designated centers as a component of statewide programs for stroke and cardiac emergencies.

Objective #5: The OEMS should propose statutory language in order to enforce the existing requirement that all acute care hospitals submit trauma patient data to the state trauma registry, in order to begin system performance improvement activities.
Communications

Status
Connecticut was one of the first states in the country to implement a statewide 9-1-1 system. The enhanced E 9-1-1 system facilitates a prompt and accurate response by emergency medical service providers. The system is in place within the 109 Public Safety Answering Points (PSAPs) and 13 regional Coordinated Medical Emergency Direction Centers (CMEDs). The CMEDs are able to connect communications for ambulances to all the hospitals for medical oversight. All ambulances and hospitals are equipped with narrow band UHF radios and hospitals are also equipped with satellite phones.

The DPH is currently migrating its radio communications capabilities into the Connecticut State Police communications system and is creating statewide DPH talk groups. In 2014 full interoperability was achieved with a mandated standard for UHF MED radio capability, requiring services to have a minimum of 256 channels programmed to a standardized list provided through OEMS.

All public safety telecommunications personnel answering 9-1-1 calls are required to take a state approved training course, which includes EMD training required by statute. EMD training and certification is done under the authority of the Office of Statewide Emergency Communications (OSET), housed within the Department of Emergency Services and Public Protection (DESPP). Emergency Medical Dispatch was implemented in 2000, but there are no OEMS certification or recertification criteria for EMD and there are no reporting criteria for communities to maintain certified telecommunicators. There is no routine quality improvement process to assess the capabilities of telecommunicators and the medical priority dispatch systems. In addition, there are no data available to assess the impact on patient care outcomes or to evaluate the dispatch protocol used.

Discussion continues regarding the consolidation of PSAPs and the 13 CMEDs. The CMEDs have varying degrees of volume and some have no hospitals within their area. CMEDs are experiencing varying levels of financial distress.

Goal
Develop a technologically effective and comprehensive communications network to facilitate rapid access to care and provide communication pathways between the field and the emergency medical facility necessary to ensure on-line medical control.

Objectives

Objective #1: Support the efforts of the State 9-1-1 Commission and OSET in updating the capabilities of the statewide E 9-1-1 system and provide technical assistance as needed.
Objective #2: In conjunction with DESPP, the OEMS should develop a comprehensive State EMS Communications Plan. The plan will address coordination issues; provide standards and operating procedures for the EMS communications system.

Objective #3: The OEMS should maintain a statewide EMS communications committee with representation from CMEDs for the purpose of coordination of resources.

Objective #4: As the EMS data collection system progresses, the OEMS should collaborate with DESPP to facilitate automation of the emergency dispatch system statewide, as well as auto-population of data from the computer-aided dispatch systems to the electronic patient care report (ePCR).
Public Information and Education

Status
Operating on very limited budgets, varying degrees of emergency medical services public information and education activities have been conducted across the state. There continues to be statewide activities related to public awareness and education through the EMS for Children program.

The OEMS website is continually updated and pertinent information is available to providers on a regular basis. There are established links on the website to other EMS related programs and resources. The OEMS participates in EMS Week activities and the annual Children’s Conference, and provides a display at the Legislative Office building for Public Health Week. The OEMS also participates in the annual EMS recognition awards. In 2014, the OEMS supported the development of the Connecticut EMS EXPO, an educational and networking event for the public safety community and interested members of the public.

The OEMS has successfully implemented the HEART Safe program and actively supports new designations and renewals. A collaborative relationship has been established with the American Heart Association to promote CPR courses and the use of automated external defibrillators (AED’s) to the public. Efforts will continue to support this program with attention to capturing data on its effectiveness, securing financial resources and recognizing citizens who have successfully used the knowledge to save a life.

Once the EMS data collection system is fully functional, the data can be used to assess the nature and type of injury in Connecticut to target prevention programs and to support legislative initiatives. Despite state budgetary constraints, the OEMS has recently refilled the vacant epidemiologists position and hopes to soon improve the quality and utility of EMS reports found on the DPH website.

The Connecticut Emergency Medical Services Advisory Board has an active Public Information and Education Committee.

Goal
To provide information and educational programs concerning all aspects of the EMS system to the public and EMS providers.

Objectives

Objective #1: The OEMS should utilize resources to enhance the development of reports and fact sheets that educate system stakeholders, legislators and the public about the emergency health care system.

Objective #2: The OEMS should evaluate the effectiveness of the HeartSafe program and share success stories during EMS week activities and throughout the year.
EMS for Children
Status
Early EMS systems were designed to provide rapid intervention for sudden cardiac arrest in adults and transportation for motor vehicle accident victims, but children did not receive a commensurate level of attention as the system developed.

Each year, more children age between one and 14 years old die from unintentional injuries than from all childhood diseases combined. In addition, childhood illness resulting from respiratory, circulatory or neurologic crises account for a significant percentage of hospital admissions.

In 1984, legislation established the Emergency Medical Services for Children (EMSC) Program. Since then, EMSC grant funds have improved the availability of child-appropriate equipment in ambulances and emergency departments, supported injury prevention programs, and provided pediatric-specific training to EMS providers and other emergency caregivers.

In 1994, OEMS received federal grant funding to assist in the enhancement of the EMS system to provide optimal care to children. As a result, the EMSC program conducts an annual conference, provides outreach education, and participates with partners on prevention activities. PEPP (Pediatric Education for the Prehospital Provider) and PALS (Pediatric Advanced Life Support) courses are conducted as necessary. A total of 178 pediatric medical kits have been distributed to service providers to enhance their delivery of care.

There are continued statewide activities related to injury prevention, public awareness and education through the Emergency Medical Services for Children Program (EMSC). The program resides within OEMS and the program manager is engaged in meeting HRSA performance measures.

Goal
Optimize the level of emergency care for children within the existing structure of the statewide EMS system.

Objectives
Objective #1: The OEMS should develop a comprehensive five-year plan that will address the needs of children within the EMS system.

Objective #2: Statewide data collection should be standardized regarding pediatric prehospital care.
**Trauma Systems**

**Status**

In the mid 1980’s physicians and interested persons began discussions about the care of patients with multi system injuries. There had been many forums in which the need for a trauma system had been articulated. They included the Helicopter Destination Committee, the Trauma Network Committee, the State Medical Advisory Committee, the NHTSA Development of Trauma Workshop and the NHTSA evaluation of Connecticut’s EMS system in 2013. It was recognized by these groups that the major problem in providing improved care for the injured patient in Connecticut was the lack of a defined system of care for the critically injured. Patients whose injuries were considered to be life-threatening were frequently taken to the nearest hospital, rather than a hospital with surgeons and surgical support services in house on a twenty-four hour basis.

Connecticut was a leader in the state trauma system implementation. This was evidenced by the statewide trauma plan that was completed in 1995, based on the HRSA Model of Trauma Care System Plan, followed by development of statewide trauma triage guidelines. Since that time progress has been slow for many reasons, including the fact that there is not a dedicated staff person within the Office of Emergency Medical Services. The original trauma system plan and trauma triage guidelines are now outdated. Both an updated state trauma plan and updated trauma triage guidelines, consistent with the public health model based on the 2006 HRSA Model Trauma System Planning and Evaluation document, are future goals for the Office.

Thirteen hospitals are designated as trauma centers. The two pediatric Level I, two adult Level I, eight Level II, and one Level III have been verified by the American College of Surgeons. DPH Regulation 19a-177 allows for Level IV trauma centers within Connecticut; however, there is neither a state process nor current ACS process to verify Level IV trauma centers. Each of the two Level I pediatric trauma centers is also a full service Children’s hospital.

Although the current Connecticut trauma system has many of the necessary components and appears to function well, there are no data to support this observation. The trauma centers submit trauma data to a state trauma registry, but no data returns to the contributing hospitals. A region-based statewide preventable mortality study would shed light on strengths and weaknesses of the current system. A study of patients transferred from one facility to another within and between regions, would provide additional information on quality and timelines of care and system efficacy.

The Trauma Committee, a standing committee of the Connecticut Emergency Medical Services Advisory Board, meets jointly with the American College of Surgeons Connecticut Committee on Trauma. The goal of the two committees is the same, to improve care of the injured patient. NHTSA 2013 recommended that better integration of these two closely related committees may serve to facilitate additional productivity through less redundancy.
Goal
Develop an organized statewide system of trauma care. Implement the necessary components of such a system in order to insure that the performance of the trauma system is effective, efficient, and provides the appropriate level of care to patients with major injuries.

Objectives
Objective #1: Pre-hospital and hospital care providers should be educated regarding the system, policies, procedures and protocols.

Objective #2: Statewide information related to trauma should be collected and analyzed. Enhancements to the system should be based on the analysis of data.

Objective #3: The OEMS should secure required full time equivalent support and permanent funding for trauma care system function and maturation, including hospital verification and system performance improvement/assurance, as guided by statewide EMS and trauma registry data.

Objective #4: DPH should participate in the development of the Statewide Trauma Plan revision process led by the Trauma Committee and the American College of Surgeons Connecticut Committee on Trauma.

Objective #5: The DPH should identify all injury prevention programs within the State and work with them in an effort to provide effective and consistent injury prevention programming based on state and regional needs.
Mass Casualty Care

Status
The State of Connecticut utilizes the principles of the National Incident Management System (NIMS), which provide a common language and procedures for all responders to follow when operating on a scene where different agencies are operating. The establishment of an Incident Commander, Unified Command and a Command Post as soon as possible along with several other positions such as a safety officer help to ensure the safety of the scene and are one of the first interventions of responding EMS providers.

Goal
Ensure that the appropriate resources are allocated during an incident in which patient load exceeds the capacity of the local EMS system. A well-designed and well-practiced system will provide for both the safety of the responders and the efficient triage, treatment and transportation of victims. It is the goal of the EMS system to limit the morbidity and mortality of all patients.

Objectives
Objective #1: 100% of all Connecticut municipalities should have a current written EMS plan including a formal mutual aid pact, written protocols and procedures governing the response to a mass casualty incident, and a formal definition of what constitutes an MCI for the locality.

Objective #2: All EMS responders should have a working understanding of the incident command framework and basic Incident Command System (ICS) concepts, which includes medical staging, triage, treatment and transport of the patients. This is achieved by mandating that all personnel be trained in NIMS and the SMART Triage System.

Objective #3: An EMS Branch within the incident command structure should be established in 100% of all declared mass causality incidents.

Objective #4: Interoperability among mutual aid EMS agencies should be ensured through the use of medical communications networks. This may be accomplished by the use of regional communication centers such as CMED.

Objective #5: An evaluation tool should be developed and implemented, such as an after-action plan, to review all MCI drills and events, and determine weakness and areas for improvement.
Data and Evaluation

Status
All licensed and certified services that transport patients are required by statute to collect and submit electronic data to OEMS. The current model OEMS usages allows EMS organizations to choose their ePCR software solution, and OEMS provides Panasonic Toughbooks. To date, OEMS has deployed 611 Toughbooks across the state. There are currently 12 different ePCR software programs being utilized by EMS organizations across Connecticut.

In 2012, Connecticut became the 39th state to begin submitting EMS data to the National EMS Information System (NEMSIS) database in Utah. Approximately 600,000 records are sent annually. Inclusion in NEMSIS is critical to a standardized, best-practices approach to EMS data, and will enable OEMS to drive evidence-based patient care.

The state trauma registry exists in the state’s trauma regulations and all acute care hospitals are required by statute to submit trauma data. Despite this requirement, only 19 hospitals provide data to the state trauma registry. OEMS currently lacks enforcement powers. The state has no registries or for other databases for time-critical illnesses such as stroke, ST-elevation myocardial infarction (STEMI) or cardiac arrest.

Data in the registries is owned by the state. There appears to be no legislation or rule that protects the databases from legal discovery although contributors have been unable to obtain functional data out of the system. There is a data/quality subcommittee of the CEMSAB, and they have been unable to do meaningful QI because of the lack of access to the data. A statewide data dictionary is still in development (hampered by limited OEMS resources), and all QA/QI activities occur at the local level between the sponsoring hospital’s EMS director and the agencies. Only one region has QA/QI standards and goals. Protection from discoverability is an initiative to be pursued in the future.

The OEMS has become involved in the Traffic Records Coordinating Committee (TRCC) and has recently been awarded a $100,000 grant for a large project to link EMS, Trauma, law enforcement crash and hospital outcome data.

Goal
Design and implement a functional system for collecting data and evaluating system components to ensure the ongoing quality and integrity of the EMS system. This system should include visual analytics, GIS mapping capabilities to analyze geographic trends, and should provide a public access portal where the public can easily query de-identified EMS data on the OEMS website.
Objectives

Objective #1: The OEMS should work with the CEMSAB Data/QI Committee as well as the Trauma committee to implement a State EMS Data Plan.

Objective #2: The DPH should develop legislation that protects QA/QI activities from discovery, whether performed at the local, regional or statewide level. This should include the CEMSMAC and the CEMSAB Trauma Committee.

Objective #3: The DPH should ensure that patient outcome data are available to all levels of the EMS system.
Medical Direction
Status
EMS involves medical practice as delegated by physicians to non-physician medical providers who manage patients outside the traditional confines of a physician’s office or healthcare facility.

Medical oversight is provided through the sponsor hospital system. Each agency that provides care above EMT-Basic level (National Standard Curriculum) is required to have a signed agreement with a sponsor hospital. Each sponsor hospital is currently required to provide an EMS Medical Director and EMS Coordinator, although the draft revised regulations will only require the sponsor hospital to provide a Medical Director. Direct medical oversight is not frequently utilized as most systems are protocol driven. When needed Online Medical Control is provided from the sponsor hospital through CMED. There is variability in the sponsor hospital provision of medical oversight services regarding physician involvement, quality management expertise and EMS education. There is no funding specifically for medical oversight, and as a result, sponsor hospitals are reluctant to have even minimal regulatory standards for provision of medical oversight. EMS Medical Directors are required to be board certified in emergency medicine.

The State EMS Medical Director is a contracted consultant who provides advice to the OEMS regarding clinical and EMS system issues but the consultant does not have any individual authority. The current job description appears to be an accurate representation of duties. Under the current State EMS Director’s leadership, the state has embarked on a statewide guideline/protocol project, which has developed into a New England regional protocol project, led by the State Medical Director. The position is not required by statute or current regulations but does appear in the proposed regulations.

The EMS regions have a role in creating regional protocols and policy. Only two regions currently have regional protocols, and there is great variability of regional involvement. The regulations include a “regional Medical Director” but that role seems to only represent the region to outside entities and does not have a regional authority or role. While PSAPs are required to perform Emergency Medical Dispatching (EMD), there is no ongoing requirement for medical oversight of EMD.

There are significant challenges surrounding quality improvement within the system. The only legal protection from discoverability is if there is a regular specific quality assurance meeting with peer participation at the hospital. Although sponsor hospitals provide medical direction there is still little patient outcome data available, especially if the patient goes to another hospital. There is no legal protection for quality management activities that occur at the dispatch, EMS agency, medical director and hospital, regional or state level. It appears that EMS medical direction is a low risk liability here in Connecticut, but there are no legal protections in places.
Connecticut has two pediatric hospitals that are Level 1 trauma centers. Their expertise in assuring Pediatric specifics in the statewide protocols would be invaluable.

**Goal**

Ensure that emergency medical care is consistent with standards of quality practice through involvement of physicians in the design, implementation, management and provision of emergency care.

**Objectives**

Objective #1: The OEMS should ensure that revised regulations require all levels of EMS and EMD providers to have at least indirect medical oversight from an EMS Medical Director.

Objective #2: The OEMS should implement statewide protocol guidelines as soon as possible.

Objective #3: The DPH should pursue legislation providing discoverability protection for the quality management activities at the dispatch, EMS agency, and hospital and state levels.

Objective #4: The DPH and CEMSAB should investigate potential funding mechanisms for appropriate compensation of medical oversight activities.

Objective #5: The OEMS should ensure that regular education/training opportunities are provided for EMS Medical Directors throughout the state.

Objective #6: The OEMS should establish requirements for both initial and ongoing training of EMS medical directors.

Objective #7: OEMS should require pediatric specialist input for all EMS protocol development.

Objective #8: The DPH should ensure that patient outcome data are available to all levels of the EMS system, and to the public in an understandable format.
**Preparedness**

**Status**

The relationship between the Office of Emergency Medical Services and the Office of Public Health Preparedness and Response is well established and EMS is involved with planning, exercise, response and after action reviews. The OEMS role in public health response and in the DPH Emergency Operations Center as well as the State Emergency Operations Center is well understood. Connecticut has experienced an unusually high number of real world events in recent years, and these events have tested and improved the coordination of EMS emergency response. These events include a power plant explosion, severe hurricanes, a train crash and multi-fatality school shooting. There have also been incidents that brought about evacuation of long term care facilities.

Mutual aid agreements, the ability to participate in the Emergency Management Assistance Compact, and use of National Incident Management System is evident and prevalent. There are considerations for EMS in the pandemic influenza plan for the state. There are protocols for assessment, triage and tracking of patients, and the two offices are working together on an EMS management module to supplement the triage protocols. Another accomplishment of note is the development of mass gathering regulations for large events, which also includes considerations for EMS care.

Most EMS provider agencies are prepared for disaster events, and there are mechanisms in place for events requiring the extended use of personal protective equipment (PPE) as well as events that create healthcare system surge conditions.

Work is underway on EMS Crisis Standards of Care and there is evidence of past execution of altered dispatch protocols during past events, in keeping with the totality of emergency circumstances.

The system of Emergency Management Agency response is distributed among the 169 municipalities in Connecticut. DEMHS regions and the EMS regions are consistent and it may be productive to consider regionalization of EMS disaster response as a way of streamlining readiness of capability and readiness cost.

There are many opportunities available for EMS and Public Health Preparedness to collaborate. Development of more robust EMS run data analysis and trauma data analysis would be of benefit for surveillance. Preparedness funding for EMS positions in the EMS regions could potentially improve both EMS care and statewide preparedness.

**Goal**

Ensure that EMS resources are effectively and appropriately dispatched and provide prehospital triage, treatment, transport, tracking of patients and documentation of care appropriate to an incident, while maintaining the capabilities of the EMS system for continued operations.

**Objectives**
Objective #1: The OEMS should identify and close preparedness gaps that may exist with response agencies, specifically in the areas of PPE stockpile, preparedness training and planning and exercises.

Objective #2: The DPH should continue to strengthen collaboration between the OEMS and Public Health Preparedness programs and work to more effectively leverage developed capabilities and resources.

Objective #3: The OEMS should work with Public Health Preparedness and the Department of Emergency Services and Public Protection to develop a written statewide EMS workforce plan.
Funding
Status
There is no dedicated funding source for development, implementation and maintenance of the Connecticut EMS system. EMS funding depends on general tax revenues and is subject to fluctuations of that source. A source of dedicated funding will be difficult in Connecticut due to the role of the legislature in allotting budget monies.

Goal
Establish a stable source of funding for EMS system development.

Objectives
Objective #1: Identify existing funding mechanisms and amounts should be identified that pertain to OEMS and EMS programs.

Objective #2: Current grant or other dedicated funding streams should be researched that support OEMS and EMS programs.

Objective #3: The $1.00 for life program, surcharge on moving violations and EMS license plates, should be considered as funding streams for OEMS and EMS programs.
Conclusion

In Connecticut, EMS is viewed as one doorway to the healthcare system. Over the next five years, Department efforts to further integrate Emergency Medical Services into a transformed healthcare system will be needed.

Particular areas that will be strengthened in the timeframe include the communication system and appropriate designation of hospital specialty centers for critical conditions including trauma, STEMI and stroke. Continued improvement and depth of both EMS and trauma data systems will inform future decision and directions for service delivery. Finally, the continued “professionalism” of the EMS workforce, via the use of statewide or national standards of practice is necessary to the full integration of EMS with the rest of the health care system.