REPORT OF

THE

STATE AUDITOR

Emergency Medical and Trauma Services Programs

Department of Public Health and Environment

Performance Audit
July 2002

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July 23, 2002

Members of the Legislative Audit Committee:

This report contains the results of the performance audit of Emergency Medical and Trauma Services programs in the Department of Public Health and Environment. The audit was conducted pursuant to Section 2-3-103, C.R.S., which authorizes the State Auditor to conduct audits of all departments, institutions, and agencies of state government. The report presents our findings, conclusions, and recommendations, and the responses of the Department of Public Health and Environment.

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OFFICE OF THE STATE AUDITOR **REPORT SUMMARY**

JOANNE HILL, CPA
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Emergency Medical and Trauma Services Programs
Department of Public Health and Environment
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Authority, Purpose, and Scope

This performance audit of the Emergency Medical and Trauma Services (EMTS) programs in the Department of Public Health and Environment was conducted under the authority of Section 2-3-103, C.R.S., which authorizes the State Auditor to conduct audits of all departments, institutions, and agencies of state government. The audit was conducted in accordance with generally accepted government auditing standards. Audit work was performed from January through June 2002.

This report contains findings and 17 recommendations relating to the Department of Public Health and Environment's role in the Emergency Medical and Trauma Services (EMTS) system. We would like to acknowledge the efforts and assistance extended by management and staff of the Department. The following summary provides highlights of the comments contained in the report.

Overview

Colorado's emergency medical and trauma services (EMTS) system is composed of numerous local service providers, such as ambulance agencies, fire departments, and hospitals. According to statutes, the State's role is generally to assist and coordinate local systems. The Department of Public Health and Environment operates several programs that support this role, including (1) the Prehospital Care Program, which regulates emergency medical technicians (EMTs), administers a grant program for EMTS providers, and coordinates strategic planning and goal setting; (2) the Trauma Program, which designates health care facilities as trauma centers; and (3) the Injury Epidemiology Program, which maintains a registry of trauma injuries in Colorado and is developing a Prehospital Care database to collect information on prehospital emergency care. The Department is advised by the State Emergency Medical and Trauma Services Advisory Council (SEMTAC), which consists of 32 members representing a wide range of EMTS providers. In addition, the Department works with 11 Regional Emergency Medical and Trauma Advisory Councils (RETACs) that conduct planning and coordination of emergency medical and trauma services for their regions.

Emergency medical services are one component of the overall emergency management system. In Colorado, numerous organizations are involved in emergency preparedness, including local service providers, county and municipal governments, and various state and federal agencies. The Department is involved in the emergency management system through its roles in coordinating emergency medical and trauma services statewide and regulating certain aspects of the EMTS system.

For more information on this report, contact the Office of the State Auditor at (303) 869-2800.

Efficiency and Effectiveness

Statutes require the Department to coordinate, evaluate, and plan systematically for improvements in Colorado's emergency medical and trauma services (EMTS) system at all levels. To fulfill these responsibilities, the Department must have information on how the various components of the system are working. We noted the following problems with the Department's data collection and analysis efforts that prevent a full assessment of the effectiveness of the EMTS system and the identification of areas for improvement.

The Department lacks critical trauma and emergency medical services information needed for evaluation and system improvement purposes. First, the Trauma Registry does not contain information such as specific procedural outcomes and cost of treatments which would enhance the ability to evaluate and make improvements in the trauma system. Second, the Prehospital Care database, currently being developed, will not contain information that could help to analyze emergency services at all levels, such as the time dispatch was notified of an emergency or the time the EMTs arrived to assist the patient. The Prehospital Care database also will not include patient identifiers such as first and last name which are critical for tracking patients through the system from prehospital care to discharge and thus analyzing the effectiveness of the system. Third, the Department does not use the Trauma Registry to conduct broad-based analyses of the trauma system and does not regularly route information back to hospitals. Similarly, it is not clear that information from the Prehospital Care database will be aggregated and reported back to providers for their use. The Department should expand its databases, use them for broad-based system analysis and improvement, and provide more information back to those reporting.

The Prehospital Care reporting system will be costly and burdensome to EMS providers. As currently designed, the prehospital care data collection system will require EMS transport providers and RETACs to have individual software and hardware and sufficient data collection knowledge to meet reporting requirements. The RETACs and providers are responsible for the cost of purchasing, upgrading, and maintaining their data programs. One approach that could reduce the burden for at least some providers would be to develop a Web-based data entry system that providers could use for reporting if they choose. We found programs with a wide range of start-up prices from under $1,000 to over $10,000 annually. The Department should pursue the option of offering a Web-based data entry system as an alternative for providers to report information for the Prehospital Care database.

Trauma Designation

The Department designates trauma centers at one of five levels based on the trauma services the facilities are capable of and committed to providing to injured persons. There are currently 63 designated trauma centers in Colorado.

The Department is currently behind on its trauma surveys and has extended the designation periods of 50 Level III and IV trauma centers for up to 17 months. The Department has not extended the designations

of any Level I and II facilities. However, the extensions for the lower level facilities were granted as a means to manage workload and other resources within the Department. Extending designation periods without a thorough risk-analysis increases the risk that a facility will continue to operate at a trauma level for which it is not suited. A better way for the Department to manage its workload would be to use a risk-based approach to redesignation, involving two steps. The first is to analyze the risks and benefits of lengthening the standard designation period for trauma centers at any or all levels. The second is to modify the on-site surveys depending on each individual facility's situation. Using a risk-based approach to redesignation would reduce the costs of both the Department and the facilities for maintaining designation by reducing the frequency and/or intensity of surveys for facilities that pose a low risk.

EMT Regulation

In Colorado, emergency medical technicians (EMTs) must be certified by the Prehospital Care program at one of three levels: EMT-Basic, which authorizes the provision of basic emergency medical services; EMT-Intermediate, which authorizes limited acts of advanced emergency medical care; and EMT-Paramedic, the highest level of EMT certification. As of February 2002, there were 10,886 certified EMT-Basics, 736 EMT-Intermediates, and 2,180 EMT-Paramedics in Colorado. We identified a number of concerns with the EMT certification process.

The internally developed written exams administered by the Department have not been validated and may not be maintained in a secure manner. Because exam integrity is critical for ensuring that EMTs have achieved at least a minimal level of competence, the National Highway Traffic Safety Administration (NHTSA) recommended in 1997 that the Department either validate its written EMT tests or use services such as the National Registry of EMTs. The National Registry recognizes four levels of EMTs, with a written exam for each level. The Registry's written exams are fully standardized, nationally valid, and are securely maintained and administered. The Department already requires national registration for individuals applying for initial Paramedic certification and should consider expanding its use of national registration for other levels to address the concerns regarding exam integrity. The Department should begin requiring national registration for initial EMT-Basic certification and for EMT-Intermediate certification once Colorado's requirements for Intermediates are aligned with the National Registry. The Department should also consider mechanisms to help offset the added costs of requiring national registration for initial applicants.

The use of criminal history check information in the EMT certification process is varied and unclear. First, the Department allows an EMT applicant to submit any type of criminal history report that is less than three months old rather than requiring fingerprint-based CBI or FBI checks for some applicants as required by Section 25-3.5-203, C.R.S. Second, for applicants who have resided in Colorado more than three years, obtaining CBI fingerprint checks upon initial application rather than name checks for each certification renewal provides the advantages of increased accuracy over a name check, the ability for the CBI and the Department to be notified immediately of arrests subsequent to the initial check, and a reduction in long-term costs for EMTs (who would pay $14 for a CBI fingerprint check for initial certification instead of $5.50 to $10 for name checks every three years). Third, the Department could streamline its investigations of EMT applicants with criminal histories by using the

Judicial Department's Integrated Colorado On-Line Network (ICON) of court records or ICON's publicly available component, CoCourts.com. Finally, the Department does not have clear statutory guidance with respect to how criminal history information should be used in the certification process. The Department should seek statutory clarification of the use of criminal history checks for EMT certification, consider proposing statutory changes to require fingerprint checks for all applicants who have lived in the State more than three years, and develop rules for criminal history checks.

EMTS Grants

The Department administers an EMTS grant program which awards about $1.6 million to local providers each year. Priorities for the program are to provide funding for emergency vehicles, training, equipment, and communications. In 2002, EMS agencies requested a total of over $3 million in grants. Our recommendations in this area address the following issues.

There is some overlap with the Local Government Limited Gaming Impact Fund Grant Program, administered by the Department of Local Affairs. Like the EMTS grant program, the Limited Gaming Impact Fund grants provide funding for EMS training, communications, and equipment. The Department of Public Health and Environment presently provides no information to potential EMTS grant applicants on any alternative funding sources that may be available to them. Over the past two years, over 23 applicants to the EMTS grant program with requests totaling over $2.1 million were eligible in terms of location and type of request for Local Government Limited Gaming Impact funds. The Department should improve local access to grant funds that can be used to support the EMTS system by identifying overlapping state and federal grants, making this information available to EMTS grant applicants, and developing methods to monitor grant requests to reduce the risk that more that one grant program would fund the same project.

The EMTS grant evaluation process could be improved. We found all applications are not treated consistently by county and regional representatives who evaluate grant requests, in part because both Boards of County Commissioners and regional councils (RETACs) provide input into the grant process, but they do not follow standard procedures. In addition, the participation of State advisory council (SEMTAC) members in the grant process could be improved by holding teleconferencing meetings to review grant requests in place of the current regional meetings and having SEMTAC evaluators develop feedback for grant applicants. Finally, the Department could improve the clarity and comprehensiveness of the EMTS grant scoring tool and align the application form with the score sheet.

Our recommendations and the Department's responses can be found in the Recommendation Locator.

RECOMMENDATION LOCATOR

Rec. No.	Page No.	Recommendation Summary	Agency Addressed	Agency Response	Implementation Date
1	20	Improve the Trauma Registry by expanding data elements, the use of the data, and information sharing.	Department of Public Health and Environment	Agree	October 2003
2	24	Expand incentives and penalties related to reporting for the Trauma Registry and Prehospital Care database.	Department of Public Health and Environment	Partially Agree	August 2005
3	27	Reexamine and add data elements to the Prehospital Care database, and share aggregate data with providers.	Department of Public Health and Environment	Agree	January 2006
4	30	Pursue the collection of patient identifiers for the Prehospital Care database.	Department of Public Health and Environment	Agree	March 2004
5	32	Offer a Web-based data entry program as an optional method for prehospital care data submission to the State.	Department of Public Health and Environment	Agree	September 2004
6	36	Ensure contractual compliance with State Board of Health rules relating to trauma designation surveys.	Department of Public Health and Environment	Agree	August 2002
7	39	Develop a risk-based approach to trauma redesignation and seek changes to remove the three-year review period from statute.	Department of Public Health and Environment	Partially Agree	August 2003
8	46	Expand use of the National Registry in the EMT certification process.	Department of Public Health and Environment	Agree	July 2005
9	51	Improve tracking of EMT complaint and investigation information.	Department of Public Health and Environment	Agree	July 2003

RECOMMENDATION LOCATOR

Rec. No.	Page No.	Recommendation Summary	Agency Addressed	Agency Response	Implementation Date
10	53	Ensure that criminal history investigations for EMTs comply with statutes; consider statutory changes to require more fingerprint checks; and pursue the use of ICON or CoCourts.com for investigations.	Department of Public Health and Environment	Partially Agree	July 2003
11	56	Seek statutory changes to clarify the use of criminal history checks in certifying EMTs and draft rules consistent with the statutes.	Department of Public Health and Environment	Partially Agree	July 2003
12	58	Reduce the grace period for emergency medical technician recertification to no more than 60 days.	Department of Public Health and Environment	Agree	July 2004
13	61	Identify alternatives to the EMTS grant program, inform potential applicants, and monitor use of other grants.	Department of Public Health and Environment	Agree	March 2003
14	64	Work with the regional councils to standardize their participation in the EMTS grant program.	Department of Public Health and Environment	Agree	November 2003
15	66	Replace regional EMTS grant evaluation hearings with teleconference meetings.	Department of Public Health and Environment	Agree	November 2004
16	68	Direct SEMTAC evaluators to discuss and develop useful feedback to be provided to EMTS grant applicants.	Department of Public Health and Environment	Agree	November 2003
17	70	Improve the EMTS grant scoring tool and application form and make the score sheet accessible to applicants.	Department of Public Health and Environment	Agree	November 2004

Overview of Emergency Medical and Trauma Services in Colorado

Colorado's emergency medical and trauma services (EMTS) system is composed of numerous local service providers, such as ambulance agencies, fire departments, search and rescue units, and hospitals. According to statutes, the State's role is generally to assist and coordinate local systems. Specifically, Section 25-3.5-102, C.R.S., states:

> It is the intent of the general assembly ... to establish an emergency medical and trauma services system ... designed to prevent premature mortality and to reduce the morbidity that arises from critical injuries, exposure to poisonous substances, and illnesses. To effect this end, the general assembly finds it necessary that the department of public health and environment assist, when requested by local government entities, in planning and implementing ... systems ... [to meet] local and regional needs and requirements and that the department coordinate local systems so that they interface with an overall state system providing maximally effective emergency medical and trauma systems.

Several programs within the Colorado Department of Public Health and Environment's Emergency Medical Services and Injury Prevention Section coordinate and support Colorado's emergency medical and trauma services system. Specifically:

The Prehospital Care Program has general responsibility for regulating and assisting the emergency medical services (EMS) community. Its functions include:

- **Emergency Medical Technician (EMT) Certification** - The program administers exams, certifies EMTs, and investigates complaints regarding certified individuals.

- **EMT Training** - The program develops training curricula, approves course content, and monitors the quality of EMT instruction.

- **EMTS Funding** - The program distributes funds to regional advisory councils in accordance with statutory guidelines and administers a grant program that awards competitive grants to private and public emergency medical and trauma services (EMTS) providers.

- **Technical Support** - The program provides technical assistance to EMS providers across the State and coordinates strategic planning and goal setting.

The Trauma Program designates hospitals and other health care facilities as trauma centers in accordance with Section 25-3.5-704, C.R.S. The Trauma Designation program is intended to encourage emergency transports to take patients only to those hospitals with the proper facilities and personnel to meet the patients' needs. The State's designation program began in June 1998, and at this time, 63 health care facilities are designated trauma centers.

The Injury Epidemiology Program provides statistics on injury in Colorado for use in policy and injury prevention decision making. The program also analyzes data for trends, causes, and factors amenable to prevention. The program maintains a Trauma Registry, created in 1997, which contains data on trauma injuries in Colorado, and is currently developing a Prehospital Care database to collect information on emergency care provided before patients reach a hospital setting.

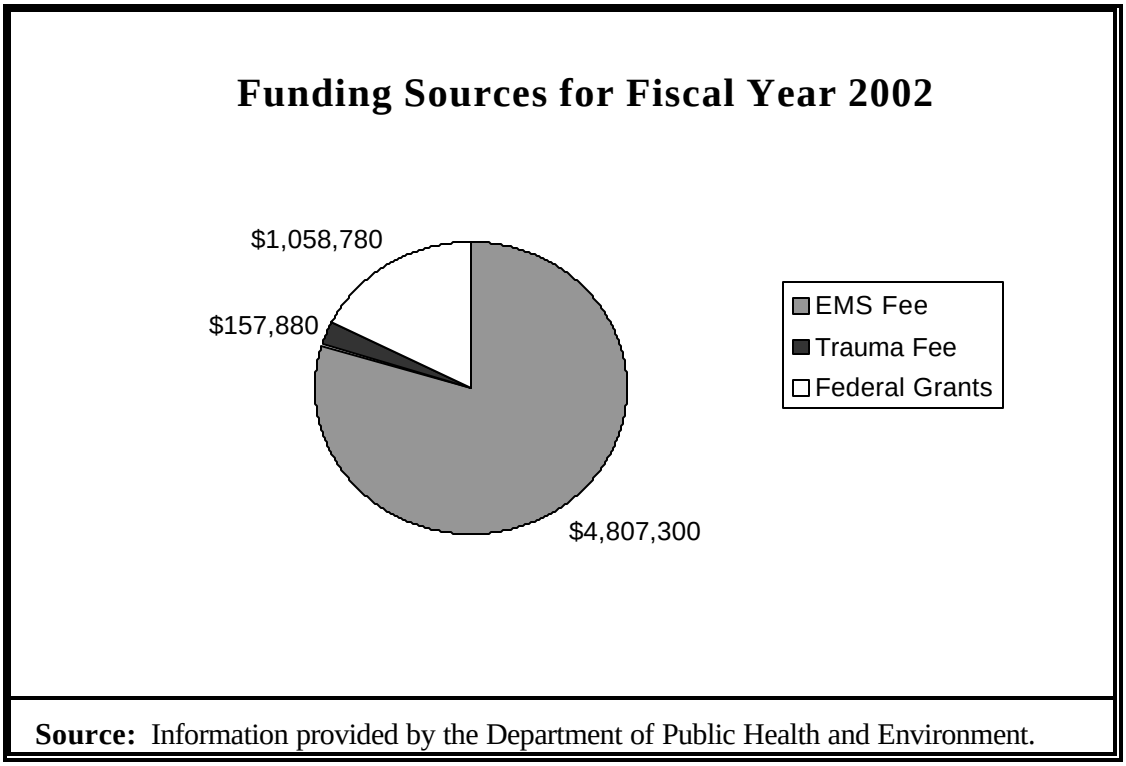
The Department shares regulatory responsibilities for overall EMTS system development with the Colorado Board of Medical Examiners and the governing bodies of each of Colorado's counties. Additionally, there are state and regional councils that provide advice on the emergency medical and trauma services system, as follows:

- The State Emergency Medical and Trauma Services Advisory Council (SEMTAC) consists of 32 members including fire chiefs, trauma center administrators, physicians, prehospital care providers, county commissioners and city council members, surgeons, nurses, county emergency managers, and members of the general public. The Council includes both urban and rural members. SEMTAC advises the Department on all EMS and trauma services programs; makes recommendations on rules, standards, and funding; and assists with the identification of system needs and priorities.

- Regional Emergency Medical and Trauma Advisory Councils (RETACs) are appointed by the governing bodies of five or more counties and are charged with planning and coordination of emergency medical and trauma services for their regions. As of early 2002, all 64 counties had organized into 11 RETACs. Most of the RETACs have hired coordinators to manage day-to-day duties related to the councils.

Funding and FTE

For Fiscal Year 2002 the Prehospital Care, Trauma Designation, and Injury Epidemiology programs had funding totaling just over $6 million. The Emergency Medical Services (EMS) Account within the Highway Users Tax Fund is the primary source of funding for the programs. The EMS Account is funded by the collection of a $1 fee charged each time a motor vehicle is registered in Colorado. In addition, the Statewide Trauma Care System Cash Fund contains trauma designation fees paid by health care facilities. Finally, additional monies are provided through a variety of federal grants for specific projects such as EMS for Children and statewide system planning. Funding by source is illustrated in the following chart.



Source: Information provided by the Department of Public Health and Environment.

Funding and staffing by source for the Prehospital Care, Injury Epidemiology, and Trauma programs are shown in the following table.

Emergency Medical Services, Injury Epidemiology, and Trauma Program Funding and Staffing for Fiscal Year 2002

Program	Cash Funds		Federal Funds		Total	
	Funding	# of Staff	Funding	# of Staff	Funding	# of Staff
Prehospital Care	$4,552,385	9.5	$697,709	1.9	$5,250,094	11.4
Trauma Designation	$157,880	1.8	$0	0.0	$157,880	1.8
Injury Epidemiology	$254,915	2.0*	$361,071	3.3	$615,986	5.3
Total	$4,965,180	13.3	$1,058,780	5.2	$6,023,960	18.5

Source: Information from the 2002 Long Bill and Department of Public Health and Environment records.
* 1.45 of the staff in the Injury Epidemiology program are contracted staff, not appropriated FTE.

Included in the Prehospital Care program is the EMS and trauma grant program, financial assistance for the RETACs, and administrative costs. The trauma designation fees support the costs of designating trauma centers. Federal grants support specific research and programs as determined by the grant source.

Legislation Affecting the EMTS Programs

Over the past three years the General Assembly enacted three bills that had a significant impact on the EMTS programs. Senate Bill 00-180 contained provisions affecting a variety of functions but also stated that certain sections of the bill would "take effect July 1, 2001, provided that sufficient moneys are appropriated by the general assembly ...." No funds were appropriated for the implementation of Senate Bill 180, so some of the provisions did not actually go into effect. In 2002, House Bill 1440 enacted most of the items from Senate Bill 00-180 that had not gone into effect. Both bills are described below.

Senate Bill 00-180 contained provisions that:

- Created the State Emergency Medical and Trauma Services Advisory Council (SEMTAC).
- Required that EMTs be subject to the medical direction of a licensed physician advisor and defined the duties of a physician advisor.

- Established a new level of trauma designation—Level V—for basic trauma care in rural areas.
- Required the State Board of Health to evaluate and report on the possibility of conducting criminal history background checks for EMTs having direct access to patients.

- Authorized the Department to license air ambulance services and charge a fee for such licensing.

- Created the Regional Emergency Medical and Trauma Services Advisory Councils (RETACs) and required that they submit biennial plans and annual financial reports to the Department.

House Bill 02-1440 addressed several of the provisions of Senate Bill 00-180 that had not gone into effect, including the Department's authority to license air ambulances and assigning specific functions to the RETACs

In 2001, **Senate Bill 174** established requirements for criminal history checks of individuals applying for EMT certification. The bill requires that applicants for initial certification or re-certification as EMTs undergo specific types of criminal background checks based on factors such as how long they have lived in the State and their employment situation at the time of application. The bill also authorizes the State Board of Health to adopt rules regarding how criminal history check results will be used in the EMT certification process.

Colorado Emergency Preparedness

Emergency medical services are one component of the overall emergency management system. In Colorado, numerous organizations are involved in emergency preparedness, including local service providers, county and municipal governments, and various state and federal agencies. The Department is involved in the emergency management system through its role in coordinating emergency medical and trauma services statewide and regulating certain aspects of the EMTS system, as well as through its participation in some of the emergency management and preparedness organizations described below:

- **The Department of Local Affairs, Colorado Office of Emergency Management (COEM)** is the designated point of contact/coordination for federally funded terrorism training programs. The COEM works with communities to prepare for emergency and terrorism response.

- **The Counter Terrorism Readiness Steering Committee** is sponsored by the COEM and involves the Colorado Departments of Public Health and Environment, Agriculture, and Public Safety as well as organizations such as fire, police, and sheriffs, to ensure a multi-agency perspective in developing the State's strategy for counter-terrorism.

- **The Colorado Counter Terrorism Advisory Council** ensures rapid notification and initial coordination of all state and federal agencies (including the FBI, FEMA, EPA, the U.S. Departments of Energy and Health and Human Services, the National Guard, the COEM, and the Colorado Departments of Public Health and Environment and Public Safety) and assists local responses to terrorism.

- **The Governor's Expert Emergency Epidemic Response Committee** supports statewide epidemic and biological crisis response planning and includes members from the Department of Public Health and Environment, the State Boards of Health and Pharmacy, the State Medical Society, the Colorado Health and Hospital Association, the COEM, and others involved in infectious disease control and emergency medicine.

- **Regional Emergency Medical and Trauma Advisory Councils (RETACs)** provide regional direction to the State's EMTS system and are required by Board of Health rules to develop "all-hazard" emergency response plans. The Department of Public Health and Environment provides technical assistance and support to the RETACs.

- **Local health departments and hospitals** are required by State Board of Health rules to develop "all-hazard" emergency response plans for use in the event of catastrophic hazards.

- **The Department of Public Safety** executive director is the State's Homeland Security Advisor, operating out of the **Office of Security and Preparedness**. The Department also houses the **Division of Fire Safety,** which helps to coordinate local fire prevention, protection, and investigation efforts and emergency medical services.

- **The Colorado Emergency Management Association (CEMA)** consists of individuals from local, state, and federal emergency management agencies, fire departments, law enforcement, and private corporations. The CEMA promotes coordination among emergency management entities, advises Colorado public officials on emergency management issues, and provides public education.

Audit Scope

Our audit reviewed the functions of the Prehospital Care, Trauma, and Injury Epidemiology programs within the Department's EMS and Injury Prevention Section. The audit focused on emergency medical and trauma services data collection efforts, the Trauma Designation program, the certification of emergency medical technicians, and the emergency medical and trauma services grant program.

Effectiveness of the Emergency Medical and Trauma Services System

Chapter 1

Background

The statewide emergency medical and trauma services (EMTS) system is made up of various interdependent components, including communications systems, emergency dispatchers, ambulance agencies, emergency medical technicians (EMTs), and health care facilities. For example, when an automobile accident involving injuries occurs on a Colorado road, an emergency 911 call is made, a dispatcher sends a local ambulance agency to the scene, and EMTs treat the injured individuals before transporting them to a hospital or other health care facility for further treatment.

The Department of Public Health and Environment is responsible for coordinating, evaluating, and improving Colorado's EMTS system. The emergency medical and trauma services statutes (Article 3.5 of Title 25, Colorado Revised Statutes) mandate that the Department evaluate the performance of each component of the EMTS system and report on the performance to the General Assembly. In addition, statutes require the Department to plan systematically for improvements at all levels. Such efforts are specifically required to include improving the quality of:

- The emergency medical and trauma services system.
- Patient management and care.
- Trauma education, research, and injury prevention programs.

To fulfill these responsibilities, the Department must have information on how the various components of the system are working.

The Department has the beginnings of a comprehensive system to collect and analyze data on the EMTS system. First, the Department's Trauma Registry, initially established in July 1997, contains a variety of information on trauma incidents in Colorado. The Trauma

Registry is intended, by statute, to provide information useful for evaluating and improving the quality of patient management and care, trauma education and research, and injury prevention programs. The database is also intended to integrate emergency medical and trauma system information related to patient diagnosis and care.

Second, a Prehospital Care database is currently in the planning stages and was authorized by the General Assembly to evaluate the performance of the emergency medical services system and plan systematically for improvements at all levels. It is intended to capture more comprehensive information on prehospital care, including treatments, response and transport times, and patient condition. The database will include information reported by over 200 prehospital transport agencies in Colorado, estimated by Department staff to run as many as 400,000 calls a year.

Although the Trauma Registry provides valuable trauma information and the Prehospital Care database is intended to maintain critical prehospital data, we found areas for improvement in both that would allow the Department to evaluate how well the EMTS system is functioning. Due to limitations in the data available and in the use of the data, it is not currently possible to provide an overall assessment of the effectiveness of the emergency medical and trauma services system.

Additional Information Is Needed to Fully Assess the Trauma System

Section 25-3.5-703 (8), C.R.S., defines the purpose of the Trauma Registry as providing information for evaluation and improvement of the trauma system. According to Department staff, input from stakeholders was obtained in determining what information to include in the Registry. However, we found that limitations in the Registry prevent the Department from fully accomplishing the intent of the statute. These limitations are generally due to the Department's not requiring hospitals to provide some data that are critical for analyzing the system.

We found several sources that encourage statewide EMS and trauma data collection efforts which include specific information that allows for system improvement. For example, the American College of Surgeons (ACS) offers trauma registry software called TRACs which collects a wide range of trauma data elements. The Department indicated that TRACs, which includes detailed emergency department information, cost data, and physician type, serves as a good model for determining data to be collected on a trauma system. The following table compares data being collected in the Trauma Registry with a number of TRACs data elements.

Comparison of Selected Emergency System Information Included in the TRACs Program With Data Collected in the Trauma Registry		
Information Element Included in TRACS	**In Trauma Registry?**	**Use**
Cost Data		Cost analysis including health care financing research; breakdown of facility costs; and cost for injury types.
C Total Charges	Yes	
C Variable Direct Costs	No	
Practitioner Data		Patterns of delivery analysis including monitoring of quality of patient care; administrative and policy decision making.
C Information on each Practitioner Type Called	No	
C Timely Arrival of Practitioners	No	
Emergency Department Assessment Data		Technical intervention analysis including quality of care; management of patient care and continuity of care. Aggregate data useful for emergency department administration.
C Test Results (i.e., CT Scans, Ultrasounds, etc.)	No	
C Admitting MD	Yes	
C Consult Comments	No	
Discharge Data		Outcome analysis including public health surveillance; epidemiological research; quality management and continuity of care.
C Discharge Disposition	Yes	
C Discharge Service	No	
C Discharge Diagnosis	Yes	
Source: Office of the State Auditor comparison of selected Trauma Registry data elements with the American College of Surgeons' TRACs data elements.		

National support for inclusion of these types of data elements is strong. A 1997 Centers for Disease Control (CDC) report entitled "Data Elements for Emergency Department Systems" lists information needed for overall improvement of emergency department systems. While trauma registries include more than emergency department information, the CDC report includes data elements useful for a variety of quality management, public health surveillance, and system improvement uses, and supports collection of data similar to the TRACs software.

Furthermore, the National Highway Traffic Safety Administration (NHTSA) recommends that a statewide EMS data collection system be able to track the full progress of individuals through each component of the EMS system, including trauma care. Although the NHTSA report is focused on emergency medical care, since trauma patients may use the emergency medical care system, many recommendations from NHTSA relate to trauma care. NHTSA recommends collecting data that are capable of documenting medical care provided; evaluating, monitoring, and improving the delivery of emergency medical care; and allocating resources locally. NHTSA highlights the importance of collecting data that can assess aspects of care delivered, including:

- Its presumed appropriateness.
- Patterns of delivery.
- Technical intervention success and failure rates.
- Patient outcomes.
- Detailed outcomes of treatment, such as the types and amounts of medications prescribed.
- Cost-effectiveness.

Lacking some of the essential data discussed above, the present Trauma Registry is limited in its ability to examine outcomes or analyze the effectiveness of the system so that areas for improvement can be identified and addressed in accordance with statute.

Expand Data Analysis and Reporting From the Trauma Registry

The purpose of the Trauma Registry is to support quality improvement of the statewide trauma system. However, the Department generates only a few reports that focus on the overall trauma system. In 2001 the Department produced the following three reports that contained broad-based trauma system information:

- The EMS Section's annual report, which provides general trauma information, such as the number of trauma deaths in the State.

- The "Assessment of Trauma Patient Volume, Severity, and Outcome for Level I, II, and III Trauma Centers Using Data From the Colorado Trauma Registry, 1998-2000" report, which examined the details of injury severity and death.

- The "Linking Traffic Accident Information to Data from the Colorado Trauma Registry" report, which focused on the challenges involved in linking the databases.

Each of these reports had a specific, limited purpose, which did not include providing systemwide data on items such as treatments, patterns of delivery for specific injuries, cost of treatment, or presumed appropriateness of procedural choices, as suggested by the TRACs software and recommended by the CDC and NHTSA. In 2002 the Department did issue a report entitled "Injury in Colorado" that provided a detailed summary of injury by location, type, severity, and final outcome. The report was required as part of a project funded through a grant from the Centers for Disease Control. Although this report provides a broader-based view of the trauma system, none of the reports described above contained analysis of treatments, intermediate outcomes, or cost of treatment. We believe these types of analyses are necessary for the Department to fully address the statutory goal of improving aspects of the overall system.

Increase Distribution of Data Analysis to Providers

Data analyses produced from the Trauma Registry are not regularly routed back to hospitals. As a result, the ability of the Registry to support local level improvement and patient management and care, as required by the statutes, is limited. During 2001 the Department used the Trauma Registry to generate the following 67 different reports in response to specific requests from injury prevention advocates, local health departments, legislators, Department programs, and others:

- Four reports on suicide.
- Eighteen reports on general injury information.
- Five reports on firearm-related injuries.
- Eight reports on deaths and hospitalizations due to traffic incidents.
- Thirty-two reports on individual topics including pediatric trauma cases, brain injury, lightning-related injuries, helmet use and related injuries, and average length of stay in the emergency room for various types of injuries.

Several of these reports went to the facilities that provide information to the Trauma Registry, in response to requests for specific data. However, the requested reports were narrowly focused and did not provide analyses intended for trauma system improvement.

We contacted a number of other states to determine the extent to which they disseminate medical provider data to interested parties, including trauma centers and the general public. New York and Utah both provide links to trauma reports on their Web sites. This is one effective means for providers to obtain and make use of the collected data. Alaska provides quarterly reports to the hospitals and prehospital providers that submit data. Though more time-consuming, this could function in Colorado as a direct means for supporting the local-level quality improvement mandated by statute. Nevada provides

real-time data analysis through a sophisticated online system. This option, while expensive, does permit the widest range of access to data for providers and other interested parties.

By reviewing past requests, the Department could identify the types of data and analyses that are most requested and develop reports to address these needs. For example, the Department could prepare an annual report on injuries, including breakdowns by basic demographics, injury type and severity, location, cause, treatment, and final outcome. The Department's 2002 report on "Injury in Colorado" included extensive data on injuries in Colorado but was costly to produce. A similar, but more condensed, report prepared annually could fulfill multiple data requirements, such as those of the 18 separate reports on injuries requested in 2001. In addition, this type of annual report would form the basis for many other data requests and provide a broad analysis of injuries that could be useful to prevention programs, providers, and researchers.

Improving and expanding its data collection efforts, using the data in broad analyses, and providing information and analyses back to health care facilities would allow the Department, providers, policymakers, and others to evaluate the system, and identify and address areas for improvement as intended by the statutes.

Recommendation No. 1:

The Department of Public Health and Environment should improve the ability of the Trauma Registry to provide data to evaluate the trauma system by:

a. Expanding the data elements collected in the Trauma Registry to include information such as outcomes, patterns of delivery, and cost.

b. Using the data gathered from the Trauma Registry to prepare analyses of those topics most commonly requested.

c. Developing methods to regularly route information back to all providers that submit data.

Department of Public Health and Environment Response:

Agree.

a. The Department has been working with the Trauma Registry Working Group of the Evaluation Committee of SEMTAC since September 2001 to review the current data elements, the data elements recommended by national registries (including National TRACS – Trauma Registry of the American College of Surgeons) and the data elements included in registries from other states. Inclusion of additional data elements will require approval by SEMTAC and rule change by the Board of Health. It is anticipated that this process will take 12-15 months. Any changes to the current data set will require additional state resources to implement, as the database structure, database processing programs and data quality check programs will need to be modified to accommodate the new variables.

b. In June 2002, the Department released the *Injury in Colorado* report, a comprehensive look at injury hospitalizations and deaths. The contents of this report were determined based on review of data requests received over the past 2-3 years. Age-, gender-, county-, and region-specific rates for the most common causes of injury are provided. The *Injury in Colorado* report has been posted on the Web at www.cpdhe.state.co.us/pp/injepi/. Additionally, our intent is to prepare annual updates of several of the *Injury in Colorado* data tables and post them on the Web. These data tables will include information on hospitalizations and deaths due to injury by grouped and specific causes, age group, county, and region. Although these reports and updates will provide general information, the Department will still need to prepare customized analyses in response to individual data requests.

c. The Department is currently working with the Trauma Registry Working Group of the Evaluation Committee of SEMTAC to develop standard benchmark reports to be distributed to data providers on a quarterly basis. Suggested benchmarks include: total number of patients reported to the registry, emergency department mortality rates, number of patients transferred from the emergency department, length of stay in the emergency department by injury severity, number of patients admitted as inpatients, inpatient mortality rates, and length of inpatient stay by injury severity. Additionally, selected analyses from specific data requests will be posted on the Injury Epidemiology Web page (www.cdphe.state.co.us/pp/injepi/) as well as the trauma program

Web page (www.cdphe.state.co.us/tp/tphom.html). Providing standard reports back to the data providers will require additional state resources, as the analysis programs, report formats and reporting process will need to be designed, written and implemented.

Trauma Registry Data Are Not Always Current

State Board of Health rules require trauma centers to report specified information within 60 days of the end of each month. This requirement is not always met. As of May 2002, nearly half of the trauma centers were behind on reporting. Specifically:

- One hospital had not reported data for January 2001, and one had not reported data for August 2001.
- One hospital had not reported eight months of data for the period July 2001 through February 2002.
- One hospital had not reported four months of data for the period November 2001 through February 2002.
- Three hospitals had not reported two months of data from January and February of 2002.
- Six hospitals were one month behind in reporting, missing data from February 2002.

Due to the missing data from these 13 hospitals, as of May 2002 the Trauma Registry did not have complete data for 2001 or for the first two months of 2002. According to the year 2001 data requests, there is often a need for analysis of all cases from a particular year. For example, the Department received requests for information on the distribution of patients with severe injuries (indicated by an Injury Severity Score greater than 15) and on injury hospitalizations reported by Level I, II, and III trauma centers. Without timely reporting by all institutions, the Department cannot accurately respond to these requests. Because some of these reports are used for policy making and legislation, it is critical that they be complete and accurate.

Problems with delays in reporting of trauma data appear long-standing. According to letters sent to hospitals in 1999, only nine trauma centers were current on their trauma reporting as of December 1999. Another 7 hospitals were one month behind on their

reporting, and 12 others were more than a month behind in submitting data to the Trauma Registry.

Improve Compliance With Reporting Requirements

With the establishment of the Prehospital Care database, the Department is likely to encounter similar, and perhaps more extensive, difficulties with obtaining required data from EMS providers. Section 25-3.5-501 (1), C.R.S., requires ambulance agencies to report data to the Department. However, the Department anticipates that due, in part, to the large number of small volunteer organizations, promoting compliance with reporting requirements will be a challenge.

For the Trauma Registry, the Department has some mechanisms in place to penalize trauma centers for failure to submit data as required. Trauma Designation rules allow the Department to revoke designation of a facility as a trauma center for failure to provide required reports to the Trauma Registry in a timely, complete, and accurate fashion. For the Prehospital Care database, the Department is planning to deny grants to those agencies that do not report data. However, this penalty will only apply to agencies that apply for grants.

The Department should expand and improve its efforts to motivate providers to report required data. Options to promote compliance with data reporting requirements include:

- For both the Trauma Registry and the Prehospital Care database, establishing penalties for late or deficient reporting. For example, Mississippi uses a combined system of assessing fines (for EMS providers) and withholding indigent care reimbursements (for facilities) to ensure compliance with reporting requirements.

- For the Trauma Registry, offering reduced redesignation fees to trauma centers that are current on reporting and/or expanding the rules to allow denial of or delay in redesignation if a trauma center is behind in reporting.

- For the Prehospital Care database, seeking a statutory change to allow the Department to withhold funds from the RETACs if providers in their regions fail to comply with reporting requirements. This penalty would be consistent with statutory authority the Department had previously to withhold funds from counties if local agencies were not meeting reporting requirements.

Since the Prehospital Care database is not yet in place, this may be the best time for the Department to consider additional options for incentives and penalties in this area.

Furthermore, the Department should use the penalties and incentives it establishes. We found no indication that the Department had ever revoked a trauma center's designation due to failure to report data as required. As noted above, even though many health care facilities were behind on their trauma reporting in 1999, no revocation actions were pursued. Penalties and incentives must be used in conjunction with other remedies to be effective in motivating compliance.

Recommendation No. 2:

The Department of Public Health and Environment should improve efforts to promote compliance with the reporting requirements for the Trauma Registry and Prehospital Care database by:

a. Expanding the penalties for late or deficient reporting and establishing incentives for complete, accurate, and timely reporting. This should include consideration of the need to seek statutory change to provide the Department with authority to withhold RETAC funds for regional noncompliance with reporting requirements.

b. Using the penalties and incentives developed.

Department of Public Health and Environment Response:

Partially agree. Each of these databases are in different stages of development, thus the Departments' response to the recommendations will be different.

Trauma Registry: Opportunities for further expansion of data submission requirements to the trauma registry will be discussed and addressed by the Department in conjunction with the State Emergency Medical and Trauma Services Advisory Council as they review and modify current rules for the revocation and suspension of designation. Additional resources will be needed for implementation of expanded enforcement or penalties and may require an increase in the designation fee. Implementation date: August 2003.

Prehospital Care Database: The opportunity does exist to build penalties and incentives into the rules for the prehospital providers submission of data. These rules will not be finalized until the database has been designed, tested and modifications made as needed. Penalizing the individual agency by means of not

funding grant applications may be a better incentive than not funding the RETAC. The SEMTAC will be considering such proposals in the coming years. Additional resources may be needed for implementation and enforcement of penalties. Implementation date: August 2005.

The Prehospital Care Database Will Lack Important Information

Section 25-3.5-501, C.R.S., indicates that the Prehospital Care database is intended to support the planning, implementation, and monitoring of the statewide EMS system. It is in the process of being created and will eventually contain information on prehospital emergency medical service calls, such as agency response times, treatments offered, and patient conditions, reported by over 200 transport providers. We examined the information the Department is planning to include in the Prehospital Care database and found that, like the Trauma Registry, the database will lack some of the data needed to evaluate all levels of the EMS system. For example, the National Highway Traffic Safety Administration (NHTSA) recommends 47 essential data elements and 29 desirable data elements be collected in a prehospital data system. The Department, after discussion with SEMTAC members and stakeholders, plans to include 28 of the essential data elements and 1 of the desired elements in its Prehospital database. Appendix A compares the data elements recommended by NHTSA with the data the Department plans to collect.

Examples of some of the data elements NHTSA recommends that are not included in the proposed Prehospital Care database, and how they might be used, are shown in the following table.

Examples of How NHTSA-Recommended Data Elements Could Be Used	
Data Element	**Use**
Time Dispatch Notified	Comparing the time at which dispatch was notified of an emergency and the time the provider arrived on the scene (which will be collected in the Prehospital Care database) would allow areas with slow dispatching to be identified and addressed. For example, the Department could consider methods to address slow dispatch problems, such as possibly providing dispatch training, as other states do. The addition of dispatch notification would thus serve as a useful policy making variable for patterns of delivery.
Time Incident Reported	Knowing the time from the incident report to the time of arrival at the patient would allow analysis on the length of time from injury to treatment and how long dispatch spends guiding the 911 caller in basic treatment. Combined with variables on injury and treatment types, these analyses would assist at the local level in determining what treatments are best for a patient based on the length of time with minimal or no care. This is an example of data useful for analyzing patient outcomes based on technical interventions and patterns of delivery.
Time of Arrival at Patient	
Time Back in Service	Tracking the time required for an ambulance to return to service after a call could help providers make improvements and could support the agency in obtaining grant funds for additional vehicles or to train more volunteers.
Source: Auditor analysis of NHTSA-recommended data elements for prehospital care analysis.	

Other states are using either most of the elements suggested by NHTSA or even more elements. For example, North Carolina designed its system to support state and local needs, working with its Prehospital providers to find 187 data elements designed to meet the needs of all levels of the system. California has developed a list of 58 standard elements and 7 optional elements for specific cases. Alaska, in the process of creating its prehospital database, is using the NHTSA elements as a basis, as is Utah.

Finally, the U.S. General Accounting Office issued a report in 2001 entitled "Emergency Medical Services: Reported Needs are Wide-Ranging, with a Growing Focus on Lack of Data." The report noted that reliable information is necessary for emergency care providers, administrators, and policymakers to determine in a systematic way the extent to which systems are providing appropriate and timely care as well as what is needed to improve performance and patient outcomes.

Department staff cited two reasons for limiting the number of data elements in the Prehospital Care database. First, the intent is to collect only information useful for decision making by the Department. However, data selected only for this purpose may not support

improvement to the system at all levels as required by Section 25-3.5-501 (1), C.R.S. Second, the Department intends to minimize the burden on providers to help encourage reporting compliance. However, expanding the types of data collected at the state level would allow the Department to aggregate and provide comparative information back to providers. These data would assist providers with their own quality improvement efforts and may encourage them to report. Four of the nine RETACs we contacted indicated that reporting compliance might be improved if the importance of data collection were clarified and the usefulness of the data elements were improved. Three rural providers we contacted indicated that more useful data elements could be collected.

Finally, we found no clear indication that the present system design will ensure that data analysis is made available to the providers. We believe the Department should design the system to provide aggregate and comparison information back to those reporting. This would support the statutory intent of improving EMS at all levels.

Recommendation No. 3:

The Department of Public Health and Environment should modify its plans for the Prehospital Care database to ensure it will generate information to improve the system at all levels by:

a. Reexamining the planned data elements and adding data elements as needed to evaluate outcomes and support improvement at all levels. Data elements should include information on patient outcomes, patterns of delivery, and cost analysis.

b. Developing methods to route aggregate and comparative data back to the providers.

Department of Public Health and Environment Response:

Agree.

a. The Department has been working with the Prehospital Data Collection Working Group of the Evaluation Committee of SEMTAC since December 2001 to draft the rules regarding prehospital data collection. Inclusion of additional data elements will require approval by SEMTAC and rule change by the Board of Health. It is anticipated that this process will take 15-18

months. Any changes to the current data set will require additional state resources to implement, as the database structure, database processing programs and data quality check programs will need to be modified to accommodate the new variables.

b. It has always been the intent of the Department to provide analysis results back to the prehospital care providers who submit data, either through written reports or by posting results on the Web. Analyses of the prehospital data available in the Trauma Registry have been presented to the SEMTAC/EMS Council as well as at the state EMS conference in October 2001. These presentations have also been posted on the Prehospital Program web page. Implementation of this recommendation cannot occur until the Department has received regional data. The current pilot implementation project time line anticipates download from three regions by July 2003. The Department should be able to provide analysis of this data by January 2004. It is anticipated that, with the resources currently available, consistent, accurate download from all regions will take 3-5 years. Providing standard reports back to the data providers will require additional state resources to implement, as the analysis programs, report formats and reporting process will need to be designed, written and implemented.

Patients Cannot Be Tracked Through the Emergency Medical and Trauma Services System

As currently designed, the Prehospital Care database will not include patient identifiers such as first and last name. Without such identifiers, the Department is severely limited in its ability to track patients through the system from prehospital care to discharge. In 2001 the Department recognized the need to collect patient names as identifiers when attempting to track information on traffic accident patients from the Traffic Accident Reporting System to the Trauma Registry. On the basis of this effort, the Department recommended including patient first and last names in the Traffic Accident Reporting System to facilitate linkage with other data sets.

Department staff indicated they do not plan to include identifiers, because the SEMTAC and EMS provider agencies are concerned about confidentiality, particularly regarding the federal Health Insurance Portability and Accountability Act (HIPAA) of 1996. This act

limits the collection of patient-identifying information and regulates who has access to patient files as a means to protect patient confidentiality in electronic records, with the focus on insurance companies and hospitals. However, we found support for collecting patient identifiers in prehospital care data is strong, nationally and in other states. Among the organizations that recommend collection of patient identifiers are:

- The National Highway Traffic Safety Administration (NHTSA). Both patient first and last name are included on NHTSA's list of essential Prehospital data elements. Further, in its 2000 report, "EMS Agenda for the Future," NHTSA prioritizes assessment of patient outcomes. The report recognizes that as patients often leave the EMS system to enter the hospital system, the patient outcome data may be best gathered in a second database, requiring reliable means of tracking cases between databases.

- The National Emergency Medical Services for Children Data Analysis Resource Center (NEDARC) recognizes the benefit of being able to establish "linkages among differing data systems." NEDARC suggests collecting patient names, emphasizing their importance in linking cases.

- Other states are collecting patient identifiers, including Utah, North Carolina, Texas, and Mississippi. In Washington, where unique numbers are assigned to every patient entering the system, patient names are still collected as an additional linking variable. Of the states we contacted, none believed HIPAA would cause legal problems for their collection of patient identifiers.

We contacted a sample of 14 EMS providers to discuss their concerns regarding the reporting of patient identifiers. All but one provider indicated a willingness to collect and report patient identifiers if the State gave them some assurance that they would not be subject to liability issues as a result. We also spoke with coordinators for 9 of the 11 Regional Emergency Medical and Trauma Advisory Councils (RETACs) who stated they are not concerned with reporting patient identifiers. Some councils that offer billing services to providers in their region already receive patient identifiers and other councils felt it was not an issue in their region.

Patient identifiers are critical for linking various data sets and allowing patients to be tracked from their first encounter with the EMS system to final discharge. However, they should be carefully protected, as noted by both NEDARC and the Colorado General Assembly. NEDARC emphasizes that patient identifiers are a critical data element that must be carefully protected from misuse. The Legislature, in House Bill 02-1440, states "If patient-identifying information is necessary, the Department should keep such

information strictly confidential." The EMTS statutes ensure confidentiality with specific requirements that patient identifiers submitted by providers be kept confidential. National standards and statutes both suggest that patient identifiers can be a valuable and necessary data element, but should be treated with care.

Recommendation No. 4:

The Department of Public Health and Environment should pursue the collection of patient identifiers by:

a. Using state and federal resources to obtain a legal opinion on whether HIPAA prohibits the collection of first and last names for the Prehospital Care database.

b. Finalizing the Prehospital Care data manual with inclusion of patient first and last name as soon as the legality of the issue is settled.

c. Providing agencies required to submit data with the legal opinion to encourage provider compliance.

Department of Public Health and Environment Response:

Agree. Appropriate requirements currently exist in statute to protect patient identifying information submitted to the state Prehospital database. With regard to HIPAA, the Department is currently reviewing HIPAA requirements for all Department databases. As part of this process, the Department will determine how/whether the HIPAA requirements apply to a given database. Modification of the list of prehospital data elements will require review by SEMTAC and rule change by the Board of Health. As mentioned in the comment to Recommendation 3a above, it is anticipated that this process will take 15-18 months. This step is required before finalization of the Prehospital Data Manual.

Any changes to the current data set will require additional state resources to implement, as the database structure, database processing programs and data quality check programs will need to be modified to accommodate the new variables.

Pursue Web-Based Reporting for Prehospital Care Data

The prehospital care reporting system will be costly and burdensome to EMS providers. As currently designed, the data collection system will require EMS transport providers and RETACs to have both individual software and hardware as well as data collection knowledge to meet reporting requirements. All providers will need to have access to software that can collect and export health care data. The RETACs will then compile and forward the information to the Department. The RETACs will need sufficient data knowledge and resources to handle information from the multiple software programs that may be used by providers in their regions and to export data in a standardized format to the Department. The RETACs and providers are responsible for the cost of purchasing, upgrading, and maintaining their data programs.

The Department has allocated $150,000 for database development in Fiscal Year 2003 and has requested an additional $335,000 for Fiscal Years 2004 and 2005. In addition, the Department awarded almost $150,000 of EMTS grant funds to providers for their data collection systems in 2001 and another $80,000, out of $225,000 requested, in 2002. Some agencies have already purchased software through their own resources or using EMTS grants, and the Department plans to have some RETACs begin reporting data next year. However, other providers currently lack software for data collection.

In addition to cost, both providers and RETAC coordinators we spoke with noted concerns with the time involved in training personnel on the complex commercial packages designed for EMS reporting. Partly as a result of cost and time constraints, the Department projects that all providers and RETACs will not be submitting regular reports to the Prehospital Care database until June 2005 and that it will require another five years to get the system fully operational.

Web-Based Reporting Can Be Affordable and Efficient

The Department has reviewed a sophisticated Web-based data reporting system utilizing specialized software and hardware and concluded the cost of the system was too high. However, Web-based data entry programs exist in a wide range of price and functionality options. For example, we found one program with a start-up price of $229 that operates using an Access database (which is a system the Department already uses) and can be tailored to meet specific data collection needs. We also found higher-end systems, costing around $12,000 a year, that can provide sophisticated analyses directly to providers. As

with any system for data collection the Department might use, a Web-based system will require additional resources in terms of both staff time and hardware.

According to Department staff, another reason Web-based reporting has not been pursued is that some providers have indicated that they will not use such a system due to the possibility that they would have to double enter data—once for the State and once for billing purposes. We discussed the idea of a Web-based reporting system with 14 rural agencies that rely partly or entirely on volunteer staff and 12 of the providers were very interested in a Web-based system. Even those providers that have already invested in software were interested due to the ease-of-use of a Web-based system.

We found that Web-based reporting is being used by other states. For example, Utah and Nevada offer Web-based data entry systems as options for their providers to send data to the state. In addition, North Carolina, Oregon, and Alaska are in the process of creating their prehospital reporting systems and are designing Web-based data entry systems, many of which include standardized trip sheets to simplify data entry for providers. Trip sheets are basic transport records given to the hospital receiving a patient by the ambulance at the time of transfer of care. Automating trip sheets in the reporting system reduces the documentation burden on providers. The most sophisticated systems also include real-time data analysis for providers to examine their own calls and records. In addition, the National Emergency Medical Services for Children Data Analysis Resource Center suggests that a Web-based data entry system has many advantages, including confidentiality, single-entry, user-friendly entry, flexibility in information retrieval, and decreased turnaround time for data requests.

The Department should pursue the option of offering a Web-based data entry system as an alternative for providers to report information for the Prehospital Care database. The Department should consider a program that includes an optional standardized trip sheet to aid in data collection. The selection and implementation of this system should occur as soon as possible to ensure the regions selected to begin submitting data this year can work with the new system from the start.

Recommendation No. 5:

The Department of Public Health and Environment should implement a Web-based data entry program and offer it as an optional method by which providers can submit Prehospital Care data to the State.

Department of Public Health and Environment Response:

Agree. As the prehospital data collection system is designed and implemented, efforts will be made to evaluate and implement a web-based data entry program. This effort will require additional state resources.

Trauma Designation

According to the Statewide Trauma Care System Act (Section 25-3.5-701, et seq., C.R.S.), a statewide trauma system is needed to:

> Assure that appropriate resources are available to trauma victims from the point of injury through rehabilitative care ... to provide Colorado residents and visitors with a greater probability of surviving a life-threatening injury and to reduce trauma-related morbidity and mortality in this state.

In accordance with statutes and State Board of Health rules, the Department designates trauma centers at one of the following levels based on the trauma services the facility is capable of and committed to providing to injured persons:

- **Level I -** Comprehensive trauma care, including acute management of the most severely injured patients. A Level I facility may serve as the ultimate resource for lower-level facilities. Colorado currently has two Level I facilities.

- **Level II -** Major trauma care based upon patient criticality and triage practices. Level II may serve as a resource for lower-level facilities when a Level I center is not available. There are nine Level II centers in Colorado at this time.

- **Level III -** General trauma care, including resuscitation, stabilization, and assessment of injuries, and either the provision of care or arrangement for appropriate transfer. There are currently 15 Level III facilities in Colorado.

- **Level IV -** Basic trauma care, including resuscitation, stabilization, and arrangement for appropriate transfer of persons requiring a higher level of care. Colorado currently has 36 Level IV facilities.

- **Level V -** Basic trauma care in rural areas and arrangement for transfer of patients as appropriate to higher-level facilities. This level was created in 2000 and there are currently no Level V facilities in Colorado.

- **Regional Pediatric Trauma Center -** Comprehensive pediatric trauma care including acute management of the most severely injured patients. These centers predominately serve children and may serve as an ultimate resource for lower-level facilities on pediatric trauma care. There is one Regional Pediatric Trauma Center in Colorado at this time.

- **Nondesignated** - Facilities that do not meet the criteria for Level I to V trauma centers, but that receive and are accountable for injured persons, are considered "nondesignated," and must have agreements to transfer persons to higher-level facilities. There are currently 18 nondesignated facilities in Colorado.

In addition, facilities may request specialty status as either burn or pediatric trauma care centers. Designation at any level lasts for three years.

Each facility applying for designation must undergo an on-site survey by a team of health care professionals. For Level I and II surveys, the Department contracts with the American College of Surgeons (ACS) to select and provide the survey team. For Level III and IV surveys, the Department selects a team from a pool of interested individuals and coordinates the survey itself. On the basis of its review, the survey team makes a recommendation regarding designation, which is considered by SEMTAC. The Department makes the final decisions on designation.

Ensure Contractual Compliance With State Board of Health Rules

In reviewing the Trauma Designation program we found the Department did not have sufficient processes in place to ensure contractual compliance with some State Board of Health rules for conducting surveys of Level I and II facilities. Examples of problems the Department has experienced with these surveys include:

- Delays in obtaining survey reports. On the basis of a review of files for 12 of the 13 Level I and II trauma centers that underwent surveys between 1998 and 2000, none of the survey reports were provided to the Department by the American College of Surgeons (ACS) within the 30-day deadline. On average, it took about 60 days for the reports to be submitted.

- Resubmission of survey reports that are incomplete. We found that the Department occasionally had to return survey reports to the ACS survey team because they did not clearly address state requirements. The team then had to provide the missing information and resubmit the report to the Department. This further delays the process and requires additional staff time and effort.

- A recent situation in which a designation survey team included a member who did not meet all the State's requirements. The Department learned of the problem only after the survey was complete. As a result, the Department scheduled a resurvey of the facility in June 2002 at an estimated cost of $6,000 to the Department and unidentified costs to the facility. This situation has also delayed the decision of whether to designate the facility at the requested level.

We identified two main reasons these issues have arisen. First, the Department's contract with the ACS to conduct trauma designation surveys did not address the following requirements, which are in the State Board of Health rules:

- That the survey team members selected by the ACS need to be employed at a trauma center at or above the level of the center they are surveying.

- That physicians included on a survey team must be certified by the Board of Medical Specialties.

- That the team members must be from outside Colorado.

- That the ACS team is required to use the State's survey tool and evaluate the facility for compliance with state requirements.

Second, the Department did not always monitor to ensure that all contract requirements were met. Specifically, the Department did not obtain or review resumes of trauma designation survey team members selected by the ACS to ensure the team members possessed all the required qualifications. In addition, the Department did not enforce the contract requirement that survey reports be provided within 30 days of the survey.

In June 2002 the Department established a new contract with the ACS for surveys of Level I and II facilities during Fiscal Year 2003. The new contract contains more specific language regarding survey requirements, addressing most of the items noted above. We commend the Department for making this improvement in the contract. Without such changes, the vagueness of the contract and inadequate controls increased the risk of problems such as delays in designating facilities, the need to resurvey if all requirements

were not met, and the potential for challenges to the process. We encourage the Department to continue the use of a more detailed contract, supplemented by controls and monitoring of the contract, to avoid such risks.

Recommendation No. 6:

The Department of Public Health and Environment should ensure all future contracts with the ACS specifically reflect all requirements and deliverables. In addition, the Department should implement processes to monitor and control the designation survey process.

Department of Public Health and Environment Response:

Agree. As noted in the audit report the Department has changed the contract with the American College of Surgeons and will continue to use this new contract with the ACS as well as any other contractor used for this purpose in the future to reflect the rule requirements. The monitoring and control documents currently being used by the Department to monitor the site review process will need some modifications to reflect all of the audit report's recommendations.

Trauma Designation Periods Have Been Extended

Section 25-3.5-704, C.R.S., states that designated trauma centers "shall be subject to review every three years in accordance with rules adopted" by the State Board of Health. These rules state that designation shall last three years. The purpose of reviewing and redesignating facilities periodically is to ensure they continue to meet requirements to provide trauma services at the appropriate level.

We found the Department is currently behind on its trauma surveys because the Trauma Designation coordinator position has been vacant since March 2001. Because of staffing difficulties, the Department has extended the designation period for Level III and IV facilities awaiting surveys, allowing them to remain designated at their current level until their surveys are complete, as follows:

- 42 trauma centers had designations that did or will expire between July 2001 and December 2002. The Department has extended the designation periods for these facilities for up to 17 months.

- 21 trauma centers have designations that will expire in 2003 or later. The Department plans to extend the designations of 8 of these centers for up to six months.

The Department has not extended the designations of any Level I and II facilities.

The Department has chosen to extend the designation periods of 50 facilities, as indicated above, until it is able to arrange for surveys to be conducted. The designation extensions were granted as a means to manage workload and other resources within the Department. However, lengthening the designation periods of facilities based on workload or other resource pressures, without the use of a thorough risk analysis process, creates a risk that a facility will continue to operate at a trauma level for which it is not suited. A better way for the Department to manage its trauma designation workload would be to implement a risk-based approach to redesignation as discussed below.

A Risk-Based Approach to Redesignation Could Improve Trauma Center Oversight

Currently, in order to be redesignated as a trauma center, a hospital or health care facility undergoes a review process that is essentially the same as for initial designation, which includes:

- Reviewing the pre-survey questionnaire for completeness.
- Assembling a survey team to conduct a six- to eight-hour on-site survey of the hospital. In addition to the team, the Department sends a staff member to facilitate and observe the review.
- Obtaining and reviewing the survey team's evaluation forms and following up with survey team members on any questions regarding the forms.
- Preparing a memo to SEMTAC regarding the results of the survey, including any deficiencies, and communicating the recommendation of the survey team.
- Informing the hospital of its designation status.

The Department does not adjust its redesignation process or frequency depending on factors such as the level of designation requested or changes in the facility since initial designation. Using a risk-based approach to determine the frequency and extent of reviews for redesignation would reduce the costs to both the Department and the facilities.

The health care facilities incur a substantial cost in paying the fee for trauma designation. Statutes authorize the Department to charge fees that are based on the direct and indirect costs of designating facilities. The current fees for designation or redesignation are:

- Level I and Regional Pediatric Trauma Center - $26,600
- Level II - $25,900
- Level III - $16,600
- Level IV - $6,800
- Level V - not yet determined

Facilities with speciality status as burn or pediatric trauma care centers pay an additional fee of $8,400 if the survey for the special status is done concurrently with the trauma level survey, or $17,400 if done separately. In addition to the fees, the facilities incur costs to complete a pre-survey questionnaire, meet with the survey team prior to the actual survey, assemble patient files and other documentation for review, make various staff members available for interviews with the survey team, and meet to discuss the results of the survey.

Using a risk-based approach could reduce the frequency and/or intensity of surveys for facilities that pose a low risk, allowing the Department to reduce its fees and saving the facilities the additional costs of preparing for and undergoing the survey. Implementing a risk-based redesignation program should involve two steps. The first is to analyze the risks and benefits of lengthening the standard designation period for trauma centers at any or all levels. For example, Level IV facilities handle less severe injuries and do not have to meet all the requirements of a higher level facility, such as having trauma surgeons available 24 hours a day. The Department may be able to extend the designation period for Level IV facilities without incurring any significant risks.

The second step is to modify the on-site surveys, on a case-by-case basis, depending on each individual facility's situation. Trauma program staff could obtain complaints reported to the Department's Health Facilities Division to help determine when a facility might need to undergo a more rigorous redesignation survey. Currently the Trauma Program does not routinely collect trauma-related complaints information from the Health Facilities Division. In addition, the Department could analyze data from the Trauma Registry to help assess risk factors of individual facilities. To the extent such analyses are used in the designation program, the Department should reflect the cost of them in its designation fees. Changing the frequency of designation surveys would also require a statutory change to eliminate the three-year review requirement currently in state law.

Recommendation No. 7:

The Department of Public Health and Environment should develop and implement a risk-based approach for trauma redesignation. This should include:

a. Assessing and identifying the risks and benefits of reducing the frequency of redesignation surveys for some or all trauma designation levels.

b. Developing procedures to reduce the extent of redesignation surveys based on an analysis of risk.

c. Seeking a statutory change to remove the three-year review requirement from the statutes.

Department of Public Health and Environment Response:

Partially Agree. The Department is willing to explore the concept of a risk-based approach to redesignation. Such models can be developed, reviewed and discussed with community input. Adoption of such a model or method may not be feasible or acceptable in terms of treating individual facilities differently. Modifications to the trauma designation review process will require legislative action and may require an increase in the designation fee by the State Board of Health. Further, implementation of these recommendations will be dependent upon stakeholder consensus.

Emergency Medical Technician Regulation

Chapter 2

Background

In order to practice as an Emergency Medical Technician (EMT) in Colorado, individuals must first be certified by the State in accordance with Section 25-3.5-203, C.R.S. The purpose of certification is to protect the public by ensuring that certificate holders are competent to carry out their duties. This is especially important for EMTs who rely on their training to provide appropriate medical care in emergency situations. The Prehospital Care program administers the EMT certification program for the State, offering three levels of certification, as shown in the following table:

EMT Certification Levels and Medical Acts Allowed

EMT Level	Number Certified [1]	Examples of Authorized Medical Acts [2]
Basic	10,886	Basic emergency medical care such as basic airway management, splinting, managing bleeding, and taking vital signs.
Intermediate	736	All acts of an EMT-Basic plus limited acts of advanced care including advanced airway care, collection of blood samples, and administration of certain emergency medications with direct supervision of a physician.
Paramedic	2,180	All acts of an EMT-Basic plus advanced emergency medical care, including advanced airway care and advanced procedures and patient assessment with both direct and indirect supervision of a physician.

Source: Information from the Department of Public Health and Environment.

[1] As of February 2002.

[2] The Colorado Board of Medical Examiners, Department of Regulatory Agencies, establishes the scope of practice, which defines the medical acts EMTs at each level are allowed to perform.

Anecdotal information from various parts of the EMS community indicate that demand for EMTs exceeds supply, particularly in rural areas.

The Department processes over 4,000 applications for certification or recertification each year. We estimate these are about evenly split between initial and recertification applications and over 75 percent are for applications at the Basic level. In Colorado, there is no charge for EMT certification.

Individuals applying for initial certification as EMT-Paramedics in Colorado must be registered with the National Registry of Emergency Medical Technicians (National Registry). The National Registry is a nonprofit organization that registers EMTs who have met the organization's requirements for training and competency, but does not issue a license or permit to work.

Individuals applying for initial certification as an EMT-Intermediate in Colorado must complete the training, exam, and application process, which includes:

- Successful completion of the required training from a state-recognized EMS Training Center.

- Successful completion of the practical skills exam, which is a six-station hands-on skills test.

- Submission of an application packet to the Department. The packet includes the application, a current CPR card from an approved program, a current motor vehicle history report, and a current criminal history report.

- Successful completion of the state written exam, which is a multiple-choice exam administered by the Prehospital Care program.

Finally, individuals wishing to practice as EMT-Basics in Colorado may either apply for legal recognition of their national registration or complete the training, exam, and application process described above.

Colorado EMT certification must be renewed every three years. EMTs may renew their certificates using a variety of methods such as completing a refresher course offered by a state-approved training program along with both a practical and written exam or completing continuing education hours throughout the three-year certification period and passing the state written exam. EMT-Basics and Paramedics also have the option of transferring their current national registration. All candidates for recertification must also

submit to the Department an application, a current motor vehicle report, and a current criminal background report. The following table illustrates the various methods of obtaining and renewing EMT certification in Colorado.

Methods to Obtain EMT Certification and Recertification in Colorado		
EMT Level	**Initial Certification**	**Recertification**
Paramedic	National Registry Required	Applicant Can Choose: • Transfer of national registration or • Continuing Education + Exams or • Refresher Course With Exams
Intermediate	State Training + State Exams Required	Applicant Can Choose: • Continuing Education + Exams or • Refresher Course With Exams
Basic	Applicant Can Choose: • Transfer of national registration or • State Training + State Exams	Applicant Can Choose: • Transfer of national registration or • Continuing Education + Exams or • Refresher Course With Exams
Source: Information from the Department of Public Health and Environment.		

Concerns Exist Regarding the Integrity of EMT Written Exams Developed by the State

The Department tests EMT applicants at all levels using internally developed written exams which are intended to test knowledge of certain emergency medical procedures and ensure that applicants are adequately prepared to carry out their EMT duties. The integrity of the exams is important because exams are the only way to test the competence of potential EMTs before they work directly with the public. However, we found there are concerns about the integrity of the State's written exams, including questions about security and validity.

First, a consultant hired by the Department in 2001 to evaluate the EMT certification process found that exam booklets with test questions had been stolen and were available in the EMT community. Exam booklets are stored in locked cabinets at the Department but in an unlocked room due to limited storage space. The consultant also found the Department does not have formal agreements with its exam proctors requiring accountability for the exam booklets and stipulating consequences if exam integrity is compromised. As a result, the consultant made an urgent recommendation to address

exam security, stating "Security risks must be minimized immediately ... there is some question about the validity of the current exam, [and] a process must be established now ... for when new exams are developed."

A second concern with the State's written exam is that the Department has not had an independent review to validate the exam. In a 1997 technical assessment of the Colorado statewide EMS program, the National Highway Traffic Safety Administration (NHTSA) noted that the State's testing program had not been validated. The validity of exam questions must be determined by testing to ensure they are related to current practices, are readable, are free of bias, and have one correct or best answer. NHTSA recommended that the Department establish a mechanism to validate instruments used for EMT testing or use services such as the National Registry of EMTs. To date, this recommendation has not been implemented.

Using the National Registry could address concerns with exam validity and security. The National Registry recognizes four levels of EMTs—EMT-Basic, two levels of EMT-Intermediate, and EMT-Paramedic, with a written exam for each level. Development of the Registry's written examination follows an extensive process that takes about a year to complete. Test questions are written by a national panel of EMS educators, physicians, and state regulators. Each question is pilot tested and rated by a Standard Setting Committee, leading to a fully standardized and nationally valid testing instrument. National Registry exam administration processes also include controls to ensure the exams are maintained securely. Furthermore, national registration is recognized and highly regarded within the EMS community. The National Registry's written exam is available in every state, and 43 states use the National Registration process for at least one EMT level.

The Department Should Move Toward Greater Use of the National Registry

As of May 2001, the Department requires national registration for individuals applying to the State for initial certification at the Paramedic level. Department staff reported that this requirement was adopted as a way to begin streamlining the Department's duties by moving toward using national registration. Staff also reported that this change has reduced their workload, since they no longer have to test these applicants. The Department also accepts national registration as a basis for certifying EMTs at the Basic level.

We believe the Department should consider expanding its use of national registration to address the concerns regarding exam validity and security and to ensure uniform services, standards, and procedures are used for all exams. This effort should include two components as described below.

Require applicants for initial EMT-Basic certification to obtain national registration. This approach could be implemented by training programs arranging for National Registry written exams to be given to their students at the conclusion of each training course. Some training programs in Colorado already use this approach, which ensures that EMT candidates take a validated exam that is handled under strict security procedures. One such training program reported that approximately 90 percent of the Basic-level course graduates opt to take the National Registry written exam so they can receive national registration.

Requiring national registration for initial Basic-level applicants, with exams being administered by some of the training programs, would reduce the Department's duties and associated costs related to directly administering all the initial Basic written exams. Although the Department does not track staff time and costs associated directly with exam administration, we roughly estimate the costs of administering the initial Basic written exams in 2001 was at least $16,000. The Department would reduce or eliminate these costs if applicants for initial EMT-Basic certification were tested through their training centers using the National Registry written exam.

Require applicants for initial EMT-Intermediate certification to obtain national registration once Colorado's requirements for Intermediates are aligned with the National Registry. At the present time, the scope of practice and training curriculum for Colorado's EMT-Intermediate level is not equivalent to the National Registry EMT-Intermediate levels. However, the Department and the Board of Medical Examiners are currently reassessing Colorado's EMT-Intermediate level and expect to align it with one of the Registry's EMT-Intermediate levels. Once they are aligned, this approach would improve the quality of the exam used to test initial EMT-Intermediate applicants and eliminate some of the costs associated with administering the written exams for such applicants. Because of the small number of EMT-Intermediates, the resource savings to the Department would be minimal.

The Department Should Consider Mechanisms to Help Offset Costs Associated With National Registration

Requiring national registration can generate additional costs to EMT applicants who currently pay no fee for Colorado certification. To obtain national registration, EMT candidates must pay an initial fee of $20 for an EMT-Basic or $45 for an EMT-Intermediate. Re-registration every two years costs $10 to $20. Second, training centers may raise their fees to cover the costs of administering National Registry exams if state testing is reduced or eliminated.

The possibility of additional costs borne by EMT applicants is one reason the Department has not required National Registry recognition in the past. The Department believes

volunteer EMTs would be disinclined to pay the extra costs associated with national registration, resulting in a reduction in the number of EMTs available in the State. However, there are indications that EMT candidates will pursue certification, even if they are required to pay for it. For example, other states, such as Nevada, Oregon, California, and Alaska, which have large rural populations, charge for EMT certification. In addition, a small number of EMT-Basics in Colorado already have National Registry recognition. Furthermore, the national registration fees are minimal compared with the cost of EMT training. We contacted several EMT-Basic training programs and found that initial EMT-Basic training courses cost, on average, about $650.

We acknowledge the Department's concerns regarding increased costs to EMTs for certification but believe the Department could pursue methods to subsidize some of the extra costs of using the National Registry. As noted above, we believe the Department could realize at least $16,000 annually in cost savings if it no longer directly administered initial Basic exams but instead worked with training centers to have them administer the National Registry exams. The Department could redirect some of these savings to:

- Provide funds through the EMS and trauma grant program, discussed in Chapter 3, to help EMS providers pay for national registration for their employees and volunteers, or

- Provide financial assistance to training programs to help cover the costs of National Registry exam administration.

Department staff also stated that the EMS account, not EMT applicants, is intended to pay for EMT certification. Section 25-3.5-603, C.R.S., states "... moneys appropriated from the emergency medical services account shall be appropriated for ... the actual direct and indirect costs incurred by the department in issuing emergency medical technician certificates and renewals ...." The Department has interpreted this language to mean that costs associated with certification should not be borne by EMTs. However, Section 25-3.5-603, C.R.S., was modified in 2002, and this language is no longer effective as of July 1, 2002.

Recommendation No. 8:

The Department of Public Health and Environment should improve the integrity and efficiency of the certification process by moving toward greater use of the National Registry, including:

a. Requiring applicants for initial EMT-Basic certification to obtain national registration.

b. Requiring applicants for initial EMT-Intermediate certification to obtain national registration once the state requirements are aligned with the National Registry requirements.

c. Considering mechanisms to help offset the added costs of requiring national registration for initial applicants.

Department of Public Health and Environment Response:

Agree.

a. This will require approval by SEMTAC and rules promulgated by the Board of Health. Additional resources will likely be necessary. The fee for the National Registry will be a challenge for some local agencies. Local agencies will have an opportunity to have input into any changes in the certification process through SEMTAC and rule making. We believe that implementation of using the National Registry of EMTs for EMT-Intermediate prior to EMT-Basic is a logical approach to phasing in these changes. Implementation for EMT-Basic with additional resources by July 2005.

b. This will require approval by SEMTAC and rules promulgated by the Board of Health. Implementation by July 2004.

c. This will add a new expense to the existing systems resources. This will be an ongoing process and issue for the recommendations above.

Information to Monitor and Analyze EMT Investigations Is Not Readily Available

The Department investigates cases in which EMT certification applicants have a criminal history and cases in which complaints such as claims of negligence, failure to follow protocol, and failure to provide care are filed against EMTs. The Department's investigation is intended to determine whether action such as suspension, revocation, or denial of a certificate is warranted. The EMS Section's investigator maintains a hard-copy

file of his investigation efforts and enters information on investigations into an Access database. However, we found the investigation records could not be used to readily determine basic information about investigations such as:

- The total number of complaints received over any period of time.
- The proportion of complaints that warranted an investigation.
- The most common types of complaints received.
- The total number of applicants for whom criminal history investigations were conducted.
- Whether complaints and investigations were handled consistently from case to case.
- Whether investigations were concluded in a timely manner.
- Details of any violations identified through the investigations.
- The number and types of criminal histories identified through the investigations.
- Whether investigations are prioritized to address more serious allegations first.

As a result, the Department cannot monitor and analyze complaints and investigations. The information listed above would be valuable to the Department in improving its operations and the EMTS system as a whole. For example, by tracking complaints by type, the Department would be able to determine if there are frequent complaints regarding EMT skills. Such information could then lead to improvements in the training provided to EMTs.

The basic information noted above is not available because, until recently, the investigations database has included only a case number, the EMT's personal information, the date the investigation was opened (which was generally the date the EMT was notified of the investigation), a general reference to any statute or rule violation identified, and the date the case was ultimately resolved. In 2000 the Department established a new database to contain a variety of information on EMTs, including information on their certification, training, and complaints. This database is capable of collecting more detailed information on investigations than was previously maintained, such as the source of the case. However, we found the database still lacks much critical information with respect to complaints and investigations.

The New Database Lacks Critical EMT Complaint and Investigation Information

The Department's new EMT database is not designed to capture all the information relevant to complaints and investigations. First, the database will not include information on inquiries. A complaint case begins as an "inquiry" and becomes a formal investigation if the Department has jurisdiction over the complaint and Department staff believe action against an EMT's certificate may be taken. For example, complaints relating to ambulances are not investigated by the Department, because counties regulate ambulance services. However, tracking these "inquiries" would allow the Department to determine trends in complaints. For example, if the Department received numerous complaints about one ambulance agency, it could work with the RETAC in which the agency is located to encourage improvements. Another option would be for the Department to flag the agency so that if a grant application were submitted by the agency, the Department could either consider withholding funds or placing stipulations on any funds awarded to promote needed changes.

Second, the database will lack specific information about investigations. The following table describes information fields that will not be included in the database and how the information could be useful to the Department.

Investigations Data Not Included In the New Database	
Type of Data	**Use of Data**
Dates of all critical events. The database will note the date a subject is notified of the investigation and the date of final action but will not specify when the complaint was received, when initial inquiry work began, when documents were forwarded to various reviewers, or when a subject's response was received.	To both track an investigation through the process and identify where any lags in the process occur.
Intermediate decision data. Information on decisions such as whether to conduct a full investigation and whether to pursue action on a certificate will not be recorded in the database; only the final action on the case will be noted.	To facilitate responding to questions on the progress or outcome of a case and ensure decisions about each case are documented.
Details of the rule or statute violated. The old database recorded the violation, but we found 87 percent of the cases in 1999 and 2000 cited only the general violation—"conviction of or plea of no contest to a felony or misdemeanor under state or federal law". Further detail on the case or the precise violation should be captured.	To allow easy sorting and querying of the database to determine trends such as frequency of violations of the scope of practice, practicing without a current certificate, or illegal acts.
Details on criminal histories, such as the types of offenses and when they were committed.	To determine how commonly EMT applicants or certificate holders have criminal histories and the types of offenses committed.
Reason for investigation. Department staff have indicated that not all criminal histories or complaints are investigated. The database does not capture the reasons an investigation is pursued.	To track investigation patterns and help ensure consistency in investigation choices.
Source: Analysis of information provided by the Department of Public Health and Environment.	

An additional problem is that the old database contains information through 2000, but data on investigations between the end of 2000 and the present have not yet been entered in the new database. Department staff indicated they do not know when or if they will have time to go back and enter the cases from 2001 and early 2002.

The kinds of data listed above are important for management to make decisions and allocate resources relating to complaints and investigations. With the establishment of the new database, the Department has the opportunity to maintain a complete, easily

accessible, electronic record of each complaint and investigation. We believe the Department should take advantage of the opportunity and ensure complete and accurate case information is documented in the database.

Recommendation No. 9:

The Department of Public Health and Environment should improve its tracking of complaint and investigation information by:

a. Expanding the database to include information on inquiries, dates for all critical events, decision points, violations, and criminal histories.

b. Entering investigation information from the past 18 months so that the database is complete.

Department of Public Health and Environment Response:

Agree.

a. Further expansion of the existing registry database will require additional resources for programming. With additional resources, this recommendation can be completed by July of 2003.

b. This recommendation was completed as of July 2002.

Processes for Obtaining Criminal History Records for EMTs Do Not Comply With Statutes

Section 25-3.5-203, C.R.S., amended in 2001, requires EMT certificate applicants to submit to specific types of criminal history checks based on factors such as how long they have lived in the State and their employment situation at the time of application. However, we found the Department's current process for obtaining criminal history checks is not consistent with statutory requirements, which are summarized in the following table.

Criminal History Check Requirements for EMTs			
Length of Residence in Colorado	**Employment Situation**		
	Government Employer	**Private Employer**	**Not Employed**
More Than Three Years	Employer to require name or fingerprint check through CBI	Employer to require name or fingerprint check through CBI	Department to require name or fingerprint check through CBI
Three Years or Less	Employer to require fingerprint check through FBI	Department to require fingerprint check through FBI	Department to require fingerprint check through FBI
Source: Section 25-3.5-203(4), C.R.S.			

Currently the Department requires individuals applying for EMT initial or renewal certification to submit a criminal history report, but the Department will accept any type of report that is less than three months old. For example, the Department accepts not only reports obtained from the Colorado Bureau of Investigation (CBI) but also reports from local law enforcement agencies which, according to a report from the State Board of Health, disclose local crime history only. The Department does not require fingerprint-based checks from any applicants nor does it mandate that applicants who have lived in the State for three or fewer years undergo an FBI check.

Consider Mechanisms to Improve and Streamline Criminal History Investigation Efforts

As noted above, both statutes and Department practice require that individuals provide criminal history checks when they apply for initial and renewal EMT certificates. Depending on the information in the criminal history records, Department staff then investigate some of the applicants further. The investigation process typically consists of requesting case information from the applicant. If the applicant fails to provide sufficient information, the Department's EMS investigator may contact local law enforcement officials and courts for detailed case dispositions and documentation. We noted two ways in which the criminal history investigation process could be improved.

First, for applicants who have resided in Colorado more than three years, requiring a fingerprint check upon initial application could be more cost-effective than conducting a CBI name check for each renewal. Using a fingerprint check provides several advantages:

- Fingerprint-based checks are more accurate than name checks, which often produce results for several people with the same name.

- The CBI's policy is to flag all fingerprint checks that are conducted pursuant to statute on behalf of state agencies. Flagging allows the CBI to be notified immediately if the person whose file is flagged is arrested in Colorado at any time subsequent to the initial check. The CBI can then notify the Department of the arrest, allowing the Department to receive current, ongoing information on arrests of EMTs in Colorado.

- EMTs would only be required to pay for one CBI check at the time of their initial application for certification, rather than paying for recurring CBI checks every three years. Fingerprint checks cost about $14, manual name checks cost $10, and Internet name checks cost $5.50.

Second, the Department could streamline its investigations of all EMT applicants with criminal histories by using the Judicial Department's Integrated Colorado On-Line Network (ICON), the official electronic courts repository of the Colorado Judicial branch. ICON contains county and district court records for criminal, civil, and traffic violations. It does not include federal or any municipal court records, including those of the City and County of Denver. Using ICON, or its publicly available component, CoCourts.com, would allow the Department to quickly determine the disposition of any criminal charges against certificate applicants or holders. The Department should consider working with the Judicial Department to access ICON or using CoCourts.com to investigate criminal histories of EMT applicants.

Recommendation No. 10:

The Department of Public Health and Environment should improve its criminal history investigation process by:

a. Requiring that applicants for EMT certification submit to criminal background checks as specified in statute.

b. Considering a statutory proposal to require fingerprint checks for all EMT applicants who have resided in the State more than three years.

c. Working with the Judicial Department to access ICON or using CoCourts.com to investigate criminal histories of EMT applicants.

Department of Public Health and Environment Response:

Partially Agree.

a. This process will include the drafting of rules that must be approved by SEMTAC and promulgated by the Board of Health. Implementation by July 2003.

b. The process used to develop consensus around the final report to the legislature on this issue was very rigorous. Many local stakeholders considered the process of using fingerprints on all applicants too arduous. The Department will present this recommendation to the appropriate SEMTAC committees for further action by January 2003.

c. The legislative report entitled, "Criminal Background Checks for Emergency Medical Technicians," submitted to the Colorado Legislature by the Colorado Board of Health on November 1, 2000, suggested the possible use of ICON. CoCourts.com is a new source of information to us. Both data sources are worthy of further investigation for possible use. Implementation by July 2003.

Some Currently Certified EMTs Have Criminal Histories of Concern to the State Board

We requested the Judicial Department to check almost 7,000 currently certified EMTs in Colorado against ICON and found that some currently certified EMTs have criminal histories that may be of concern to the State Board of Health. Specifically, 52 of the EMTs checked had been charged with felonies or serious misdemeanors such as possession of controlled substances or theft, and 31 of them had been convicted of or pled guilty to the charges. Ten individuals had committed offenses that the State Board specifically recommended in a 2000 report be considered in the certification process. These included offenses such as second-degree assault and menacing.

Section 25-3.5-203, C.R.S., states that the Department is to use criminal history records to investigate the holder of or applicant for an EMT certificate and determine their eligibility for initial or renewal EMT certification. Current State Board of Health rules stipulate causes for denying, revoking, suspending, or limiting an EMT's certificate, and state that "conviction of, or a plea of no contest to, a felony or misdemeanor under state or federal law" is cause for such actions. However, these rules are in conflict with the Department's

general policy with respect to using criminal history records to determine eligibility for certification. According to Department staff, if applicants have fulfilled their sentences and "paid their debt to society," a criminal history is not a barrier to certification. This policy is based, in part, on Section 24-5-101, C.R.S., which states:

> The fact that a person has been convicted of a felony or other offense involving moral turpitude shall not, in and of itself, prevent the person from....applying for and receiving a license, certification, permit or registration required by the laws of this state ....

According to some Department staff, because Section 24-5-101, C.R.S., states that a conviction shall not prevent a person from receiving certification, the Department is very limited in using a criminal history record to deny, revoke, or limit an EMT certificate.

Strengthen Statutes for Using Criminal Records in Certification

Unlike the statutes for some other state agencies that conduct criminal history checks, the EMS statutes do not provide specific guidance to the Department on what offenses should be of concern in granting EMT certification. For example, the child care licensing statutes at Section 26-6-108 (2), C.R.S., list specific crimes that automatically disqualify individuals from employment or licensure as child care providers, regardless of when the crime was committed. In addition, Section 27-1-110, C.R.S., prohibits the State Department of Human Services from employing an individual in a position involving direct contact with vulnerable persons if that individual has ever been convicted of specified crimes. In November 2000 the State Board of Health submitted a report to the General Assembly on "Criminal Background Checks for Emergency Medical Technicians." The report recommended that, in any model where the Department had responsibility for evaluating criminal histories for certification, a specified list of felonies, including murder, manslaughter, first- and second-degree assault, sexual assault, and robbery, should be used.

Furthermore, the statutes do not give the Department specific authority to determine the moral character of persons applying for certification. Section 24-5-101, C.R.S., appears to allow a criminal history to be considered in assessing moral character, stating:

> Whenever any ... agency is required to make a finding that an applicant for a license, certification, permit, or registration is a person of good moral character as a condition to the issuance thereof, the fact that such applicant has ...been convicted of a felony or other offense involving moral turpitude, and pertinent

> circumstances connected with such conviction, shall be given consideration in determining whether, in fact, the applicant is a person of good moral character at the time of the application.

Without clear guidance on how to use criminal histories in the certification process, the Department may fail to take appropriate action on certificates. The Department's general approach to certification and the statistics noted above both suggest that even if an applicant has a history indicating that he or she may pose a threat to patients, the Department is likely to issue an EMT certificate. Conversely, the lack of guidance could lead to the Department's denying or revoking the certificates of individuals who are eligible to hold such certificates.

We believe the Department should seek statutory guidance on the use of criminal history checks in certifying individuals as EMTs. Such guidance could be in the form of:

- Authorization for the Department to assess the moral character of applicants for EMT certification. This would allow consideration of a felony conviction and its related circumstances in accordance with Section 24-5-101, C.R.S., or

- Specific language regarding criminal offenses that will prohibit a person from being certified as an EMT. This option would be more restrictive, allowing the Department little or no discretion in using criminal history information to determine an individual's eligibility for certification.

Furthermore, the Department should draft rule changes for the State Board to reflect these statutory provisions.

Recommendation No. 11:

The Department of Public Health and Environment should strengthen its process for using criminal history checks in the certification process by:

a. Seeking statutory changes to authorize the Department to assess the moral character of applicants for EMT certification and/or statutory changes to add specific language regarding criminal offenses that will prohibit a person from being certified as an EMT.

b. Drafting rules consistent with the statutes governing the use of criminal history records in the certification process.

Department of Public Health and Environment Response:

Partially Agree.

a. The issue of determining moral character is highly desirable because EMTs are routinely placed in a position of trust with vulnerable persons. Implementation by July of 2003 if legislation is passed.

b. We believe this issue of criteria for denial of certification would be best defined in rules promulgated by the Board of Health. Implementation of rules by July 2003.

Reduce the Grace Period for EMT Recertification

EMT certificates from the State of Colorado are valid for three years. EMS rules allow EMTs to begin the process to renew their certificates up to six months prior to their expiration dates. The Department also grants EMTs a grace period of six months after their certificates have expired to complete their renewals. Anecdotal information from Department staff suggest that it is common for EMTs to wait until the last minute to renew their certification. We were unable to determine how often certified EMTs used the full grace period before recertifying because the Department's certification database does not contain previous certification dates. However, we identified two concerns with the grace period.

First, the grace period allows an EMT to reduce the frequency with which he or she undergoes training and an examination of skills. The renewal process requires that the certificate holder complete training or continuing education and pass both a practical and a written exam. This process is intended to ensure that the EMT's skills and knowledge are current. During our audit we asked Department staff their opinion about whether the three year period for certification could be extended. Staff responded that lengthening the certification period was not advisable because EMT skills deteriorate quickly if they are not used and training is not kept up to date. Further, the National Registry requires registration renewal every two years in order to ensure EMT skills are maintained. Allowing EMTs to essentially extend certification to 3½ years through the grace period means they may not receive refresher training for almost twice as long as EMTs recognized by the National Registry.

Second, the grace period may inadvertently encourage EMTs to practice when they are not actually certified. Rules state that "any individual who holds an expired EMT certificate is not classified as a state certified EMT and shall not hold themselves out as such...." Also, materials distributed to the EMT community state, "It is expected that certificate renewal is accomplished prior to the expiration date" and "Upon expiration of the certificate, the holder is no longer certified until a new certificate is issued by the Colorado Pre-Hospital Program." Although the Department has no way to monitor whether EMTs are working during the grace period, it has information from complaints received that there are EMTs who continue to practice after their certificates have expired. The six-month extension in renewing a certificate may imply that working with a recently expired certificate is acceptable.

We contacted the Colorado Department of Regulatory Agencies (DORA) to determine if other professional licenses or certifications allow grace periods for renewal. According to the Department, allowing a 30- to 60-day grace period is a common practice. However, DORA is currently working on reducing the grace periods for the few professions that currently allow renewals to occur more than 60 days after a license or certificate expires.

While we support the Department's efforts to accommodate the EMT community, the intent of requiring recertification every three years is to ensure EMTs receive training and testing to maintain and enhance their knowledge and skills. To accomplish this intent, the Department should amend the rules to reduce the grace period to no more than 60 days.

Recommendation No. 12:

The Department of Public Health and Environment should reduce the grace period for EMT certification renewal to no more than 60 days.

Department of Public Health and Environment Response:

Agree. This will require changes to the certification rules. These rules must be approved by SEMTAC and promulgated by the Board of Health. Substantial input from stakeholders is expected and will be addressed during the process. Implementation by July 2004.

The Emergency Medical and Trauma Services Grant Program

Chapter 3

Background

Section 25-3.5-601, C.R.S. was enacted to "enhance emergency medical and trauma services statewide by financially assisting local ... providers ... in their efforts to improve the quality and effectiveness of local emergency medical and trauma services...." In support of this purpose, the General Assembly established a grant program to distribute funds from the EMS account to local providers for the development, maintenance, and improvement of emergency medical and trauma services in Colorado. The Department administers the grant program, which awards about $1.6 million to EMS providers each year. The Department and the State Emergency Medical and Trauma Services Advisory Council (SEMTAC) have identified vehicles, training, equipment, and communications as program priorities, as shown in the following table.

Grant Funds Requested and Awarded for 2002 and 2001

Request Type	2002 Requested	2002 Funded	2001 Requested	2001 Funded
Vehicles	$1,817,902	$984,691	$1,523,813	$520,458
Training	$322,422	$219,398	$427,922	$354,702
Equipment	$535,060	$288,433	$714,463	$374,657
Communications	$121,397	$76,514	$1,180,237	$138,091
Data Systems	$162,363	$80,178	N/A*	N/A*
Other	$111,628	$9,164	$360,702	$189,848
Total by Year	$3,070,772	$1,658,378	$4,207,137	$1,577,756

* Not broken out by the Department into this category in 2001.

Source: Funding information from the Department of Public Health and Environment.

Any of Colorado's estimated 1,000 EMS providers, including first responders, fire agencies, and transport agencies, may apply for grants each year. Currently a grant application goes through the following steps:

1. The provider submits the completed application to its Board of County Commissioners which ranks all grant applications within the county.

2. The provider submits the application to its Regional Emergency Medical and Trauma Advisory Council (RETAC) for scoring or ranking.

3. The provider submits the application to the Department, which distributes copies to the SEMTAC members who have volunteered to serve as evaluators.

4. The Department holds six hearings around the State at which providers have the opportunity to present and discuss their applications and SEMTAC evaluators may ask questions of the provider or Department staff.

5. The Department reviews the county rankings, RETAC scores, and SEMTAC scores and makes final decisions on funding.

As the table above shows, the Department is only able to fund approximately half of the grant requests. Therefore, it is important to ensure all applications are carefully and consistently evaluated for need and for their ability to address program priorities. We identified a number of weaknesses in the program that can lead to inequity in funding grants and a failure to achieve the grant program's goals and priorities. The process for determining funding of applicants should be the most objective, needs-based process possible due to the limited funds that cannot support all EMTS needs in the State. The recommendations in this chapter focus on standardizing the grant process to help ensure grant applications receive consistent treatment while maintaining local and regional involvement in the program.

Identify and Inform Providers of Other Grant Programs

In reviewing the EMTS grant program, we found there is some overlap with the Local Government Limited Gaming Impact Fund Grant Program, administered by the Department of Local Affairs. Like the EMTS grant program, the Limited Gaming Impact Fund grants provide funding for EMS training, communications, and equipment. Gaming funds are available only to those counties affected by gaming and only for addressing needs

such as an increase in volume of ambulance calls that are directly attributable to gaming. The Department presently provides no information to potential EMTS grant applicants on any alternative funding sources that may be available to them. As a result, applicants do not apply for other grants that could meet their needs.

In the 2001 grant cycle, 22 applicants to the EMTS grant program with requests totaling over $1.3 million were eligible in terms of location and type of request for Local Government Limited Gaming Impact funds but did not apply for them; 12 of the applicants received EMTS grant funds totaling nearly $275,000. In 2002, over $800,000 was requested by applicants who were also eligible for Limited Gaming funds; the EMTS grant program funded just over $324,000 of these requests. However, out of all the applicants to the EMTS grant program in 2001 and 2002, only one also applied for a Local Government Limited Gaming Impact Fund grant. If the Department identified and informed potential applicants of other grant opportunities, it could help local providers pursue additional funding for their EMTS systems. In 2002, agencies requested a total of over $3 million in EMS grants and only $1.6 million was funded. Identifying other sources to help EMS providers can help ensure that the funding needs of more providers are met.

At the same time, the Department should have a mechanism to determine if providers applying for EMTS grants are also seeking funds from other sources for the same item or project. The Department is presently unaware when a grant applicant is applying simultaneously for both EMTS and other grants, leading to the potential for dual funding for the same project. In 2001 the one EMTS grant applicant that also applied for a Limited Gaming Impact Fund grant was not funded through the EMTS program but did receive a Limited Gaming Impact fund grant. The Department was unaware of the dual application, so there is a risk that both grant programs could fund the same project. At a minimum, the Department should ask providers to disclose in their grant applications if they are seeking funding from other sources for the same project. The Department could use this information immediately prior to making funding decisions to determine if the need is still warranted.

Recommendation No. 13:

The Department of Public Health and Environment should improve local access to grant funds that can be used to support the EMTS system by:

a. Investigating to determine overlapping state and federal grants and making this information available to EMTS grant applicants on the Web site and in the application materials.

b. Adding to the grant application a statement requesting information on other pending grant applications. The Department should use this information immediately prior to funding decisions to determine if the applicant is still in need of the EMTS grant.

Department of Public Health and Environment Response:

Agree.

a. Work to accomplish this has already begun. Implementation by November 2002.

b. This will be included in next year's (FY03-04) provider grant application and added to our web site by March 2003.

Ensure Consistency in Treatment of Grant Applications at the Local Level

As noted above, both counties and RETACs participate in the evaluation of EMTS grant applications. However, we found all applications are not treated consistently by county and regional representatives who evaluate them. As a result, the value of the RETAC and county participation in the grant program is limited.

First, the Department has traditionally allowed Boards of County Commissioners to rank grant applications to reflect where resources are needed. The ranking policy is inequitable because not all Boards of County Commissioners participate in the process and those that do, choose different approaches. Specifically:

- In 2001, grant applications were received from providers in 49 counties, but only 27 of the county boards (55 percent) provided rankings.

- In 2002, providers from 52 counties submitted applications, but only 35 county boards provided any input and only 16 (31 percent) submitted rankings for all the grants in their county.

- Some counties choose to score, prioritize, or endorse, instead of ranking grant applications.

Second, we identified a number of variations in the roles the RETACs and RETAC coordinators played in the scoring process, as follows:

- Some RETACs appear to have focused more on providing technical assistance than on evaluation. These RETACs critiqued grant applications, provided suggestions on how the applications could be improved, and allowed providers to change their applications before submitting them to the Department. As a result, these councils scored a different version of the application than was submitted for scoring by the SEMTAC evaluators. Other RETACs separated duties with the coordinator providing technical assistance to applicants as they developed their requests and the councils scoring the final applications.

- Each RETAC chose its own tool for scoring grant applications. The tools did not all score on the same elements of the grant. For example, system upgrade was an important part of 5 of the 11 RETAC tools but was not mentioned in others at all. The tools also varied in their clarity on scoring criteria and the level of guidance they offered the evaluators. Finally, five RETACs ranked instead of scoring their grants, increasing the inconsistencies.

- There is a potential for conflict of interest because council members are often providers or otherwise directly involved with applicant agencies. The RETACs used different policies to avoid conflicts of interest in scoring. For example, some RETACs relied on the individuals conducting the scoring to recuse themselves; others had their RETAC coordinators ensure that members did not score individual grants with which they might have had conflicts.

In addition, duplication of effort has resulted from having Boards of County Commissioners and RETACs independently assess the applications of EMS providers in their areas. The RETACs include at least one representative from each associated county, so the counties are able to participate in the grant process through the RETACs. During the most recent grant cycle, one county recognized this duplication and sent its grant applications directly to the RETAC for evaluation without ranking them. A potential for increased confusion and conflict also exists, with assessment of grant applications occurring at the county, regional, and state levels and grant applicants required to submit multiple copies of their applications to all three levels.

Clarify the RETAC Role in the Grant Program

Because local providers form the backbone of the EMTS system in Colorado, input from the regional level regarding the needs and deficiencies of the system is crucial.

Standardizing the role of RETACs would allow more valuable input from the regions to be used in determining which grant applications will receive funding. We believe the Department should work with the RETACs to define and standardize the present system across the 11 regions. Standardization should include four main components:

- Considering the use of the RETAC scoring in place of rankings by the counties. Since each RETAC includes county representation, county input is ensured.

- Defining the roles of the coordinator and of the council in the grant process. One option is to stipulate that RETAC coordinators provide technical assistance and RETAC council members evaluate the final grant applications. This model, which was used by some RETACs in the 2002 grant round, prevents council members from playing conflicting roles of both contributing to a grant application and then scoring the application. In addition, the RETAC coordinator could take on responsibility for ensuring that council members do not score applications with which they have a conflict of interest.

- Requiring the RETACs to forward the applications they score directly to the Department rather than having the EMS providers send copies of the applications to the Department. This would ensure that the applications scored by RETACs are the same as those scored by the SEMTAC.

- Developing a standardized scoring tool that reflects regional level concerns and guides evaluators through use of examples specific to the various types of grant requests.

Recommendation No. 14:

The Department of Public Health and Environment should work with the RETACs to formalize their participation in the EMS grant program. This effort should include:

a. Considering the use of RETAC scoring to obtain county input and discontinuing the practice of asking County Boards of Commissioners to rank all grant applications.

b. Defining the roles of the RETAC coordinator and the RETAC council members with respect to providing technical assistance, evaluating the applications, and preventing conflicts of interest.

c. Requiring the RETACs to forward the applications they score directly to the Department.

d. Developing a standardized scoring tool for all RETACs to use in evaluation of grant applications.

Department of Public Health and Environment Response:

Agree.

a. This recommendation is in the process of being implemented. The resource committee of the SEMTAC will be considering this change for the FY03-04 provider grant process. Implementation by November 2002.

b. This process will be defined for the FY04-05 grant application process with the advice of SEMTAC. Implementation by November 2003 with consensus of RETACs and SEMTAC.

c. This process will be defined for the FY03-04 grant application process with the advice of SEMTAC. Implementation by November 2002.

d. A revised evaluation process is being drafted by staff and used by RETACs and the SEMTAC with the FY04-05 grant application process. This process will include a clearly defined process to be used by the RETACs developed with the advice of SEMTAC. Implementation will be complete by November 2003.

Modify the SEMTAC Hearing Process

As mentioned previously, the Department organizes SEMTAC volunteers into small groups to review and score grant applications and then holds six regional hearings each year to allow grant applicants to discuss their requests with SEMTAC.
However, we found the hearings process is inequitable to applicants, does not allow full discussion of the grant requests, and is not cost-beneficial.

First, although applicants are not required to attend the hearings as part of the grant process, we found those who attended in 2002 appeared to have an advantage over those

who did not. During the 2002 grant hearings, 84 of the 102 applicants attended their assigned hearing and received an average SEMTAC score of 7.6 (out of 10). For the 18 applicants who did not attend a hearing, including volunteer agencies from rural areas, the average score was 6.4. This is below the benchmark score of 7 used by Department staff to make funding decisions this year.

Second, despite the fact that the regional hearings allow SEMTAC members to meet in one location, the members have limited opportunities to discuss the grants as a group. SEMTAC members represent a wide range of providers, including, for example, county emergency managers, rural paramedics and ambulance directors, and urban fire chiefs. Having the opportunity to share their knowledge and insights based on their unique backgrounds, and discuss grant requests with Department staff and applicants, adds value to the grant program. However, the current grant hearings do not encourage discussion among members.

Third, the regional hearings are not cost-effective. Between one and four SEMTAC members along with three to four Department staff attend each hearing. We estimate the cost to the Department is at least $10,000 annually for staff and SEMTAC members to travel to and participate in the hearings. We were unable to calculate a dollar cost of SEMTAC members' and applicants' time, but we estimate that, in total, they devoted over 500 hours to the hearings in 2002. Though the costs are relatively small, we believe the expense is unjustified, since the hearings do not appear to serve a beneficial purpose. In addition, the Department has had difficulties getting SEMTAC members to volunteer for the grant hearings because of the significant time commitment.

Rather than spending resources for SEMTAC members, Department staff, and applicants to travel to hearings, we believe the Department should arrange teleconferencing meetings for SEMTAC members to discuss the grant applications they are reviewing and ask questions of Department staff and applicants. This approach would reduce or eliminate the travel costs of the current process and allow all applicants to participate in discussions of their grant requests.

Recommendation No. 15:

The Department of Public Health and Environment should modify the grant hearing process by replacing the currently held meetings around the State with teleconference meetings to allow SEMTAC evaluators, grant applicants, and Department staff to discuss grant requests.

Department of Public Health and Environment Response:

Agree. Staff is drafting the proposed changes for feedback from SEMTAC. Implementation date by November 2004.

The SEMTAC Evaluation Process Should Provide Useful Applicant Feedback

Currently SEMTAC members are not charged with developing feedback to give to grant applicants. Department staff do inform applicants of the comments noted by SEMTAC members on their score sheets. However, we reviewed the evaluator comments for the 2001 grant hearings and found many contained no written remarks or had somewhat ambiguous three- or four-word comments. The written comments are often contradictory and not useful to applicants. The following table gives examples of feedback available to applicants after the 2001 grant rounds.

Examples of Comments on 2001 Grant Score Sheets

Grant	Evaluator 1	Evaluator 2	Evaluator 3
1	Poor justification. Hand written financials of concern. Significant cash reserves, high mill levy.	Very good support.	Reasonable pricing on research.
2	Lots of data.	No information.	
3	I would support this grant. Rural and needed!	Very low priority for funding.	Cost too high.

Source: Grant database for 2001 from the Department of Public Health and Environment.

As the table shows, evaluator comments currently noted on score sheets would provide confusing and contradictory information to applicants. We believe the Department should direct SEMTAC evaluators to develop useful feedback for the applicants as they evaluate the grant applications. The evaluation meetings as described in the previous recommendation would permit SEMTAC evaluators time to prepare comments for applicants to help them improve future requests. Such feedback should focus on the strengths and weaknesses of each application and include suggestions on how well the application addressed the elements being evaluated by the SEMTAC scorers.

Recommendation No. 16:

The Department of Public Health and Environment should direct SEMTAC evaluators to discuss and develop useful feedback to be provided to EMTS grant applicants.

Department of Public Health and Environment Response:

Agree. Staff is designing a method to collect and disseminate feedback to applicants. Implementation by November 2003.

The EMTS Grant Application and Score Sheet Are Not Aligned

As part of our evaluation of the EMS and trauma grant program, we reviewed the grant application form and the scoring tool. Both were changed between the 2001 and 2002 grant rounds, with the application's being expanded and the score sheet's being considerably shortened. Although the changes were intended to improve the clarity and ease of use of the application and score sheet, we found that there was confusion on the parts of both evaluators and applicants regarding the grant evaluation process.

For example, we spoke with 14 rural applicants who participated in the 2001 or 2002 grant rounds and half indicated they did not have a full understanding of what criteria their applications would be scored on or were confused about what the application should include. Beginning in the most recent grant cycle, the Department provided an instruction book that includes brief explanations of how grants would be scored. While an excellent start, the information does not provide the applicant with all the details of the scoring process. In addition, the Department has not provided sample grant applications to help providers understand how to best complete the application form. Both the score sheet and sample applications could be distributed with the application instruction booklet or made available on the Department's Web site.

In addition, there was disparity in scores between evaluators on individual applications. We reviewed SEMTAC scores for the 2001 and 2002 grant rounds and found some grants received widely varying scores from different evaluators. Furthermore, there was more disparity among the evaluator scores for individual grants using the 2002 score sheet, which was considerably less detailed than the 2001 score sheet. For example:

- Fifty-two percent of the grant requests in the 2002 grant hearings had individual evaluator scores that varied by three or more points on a 10-point scale. Thirty-one percent of the grant applications from 2001 received scores from different evaluators that varied by three or more points.

- Seventy-three percent of the grant applications from one region received scores from SEMTAC evaluators that varied by three or more points. For example, one application received a score of 9 points from one evaluator and zero from another; another had scores ranging from 5 to 10 points.

Although some variation in scores is to be expected from different grant evaluators, we believe the increase in variation when the abbreviated score sheet was used in 2002 indicates that the score sheets did not provide sufficient guidance on the evaluation criteria. The shorter scoring tool also does not provide examples of the information the evaluator should look for in the grant application and does not align with the application questions. Since Department staff use the SEMTAC scores to award grant funds to the applicants, significant variations in the scores make it difficult to decide which grants should be approved and how much funding to provide.

The Grant Score Sheet Should Reflect Multiple Requests

Grant applicants may request funds for several items or projects, such as training, data collection, vehicles, and equipment, in a single application. The application requires the provider to separately document the need and requested funding for each item or project. However, the score sheet is not broken down in a similar way to provide SEMTAC evaluators with a means to prioritize one part of a request over another. As a result, Department staff make decisions on whether to fund the entire request, or just one portion, based on rough notes from the scorers. A more detailed score sheet that breaks the scoring down to address requests for different projects within one application would both simplify and clarify the scoring process.

The Department could address the concerns we noted by creating a scoring tool that contains the following elements:

- Detailed guidance on how to assign points to each element of the application.
- Specific examples and precise questions for evaluators to consider for each grant and each element of the grant request.
- A breakdown that allows each grant application to receive an independent score for each type of request made, such as for training, equipment, etc.

We reviewed scoring tools from grant programs administered by other state agencies and included a portion of the scoring tool from the Comprehensive School Reform grant program as an example in Appendix B.

Once it has developed a comprehensive scoring tool to address all the critical priorities and elements of the grant program, the Department should use the tool to update the grant application. Revisions to the application should be made to ensure the documents are aligned, with each narrative question on the application being directly tied to points on the scoring tool.

Recommendation No. 17:

The Department of Public Health and Environment should improve the EMTS grant evaluation process by:

a. Developing a grant scoring tool that includes guidance on the number of points to assign to specific elements, precise examples of information that should be included in the applications, and a breakdown of scoring for each item or project within each application.

b. Revising the application to align with the scoring tool so that both address all the elements required to be included in the grant application.

c. Providing the scoring tool and sample grant applications to potential applicants in the application package and online.

Department of Public Health and Environment Response:

Agree.

a. Staff has initiated the process of revising the provider grant evaluation process. This process will include the development of a rubric and guidelines for use. These changes will be made with the advice of SEMTAC. These changes will be implemented by November 2004.

b. The application for the FY04-05 grants will include the evaluation tool with the application. Implementation by November 2003.

c. A sample application and scoring tools will be developed for the FY05-06 grant application process. Implementation by November 2004.

Appendix A

National Highway Traffic Safety Administration (NHTSA) Minimum Data Set Compared With the Department of Public Health and Environment Prehospital Care Data Set	
NHTSA Essential Prehospital Data Collection Elements	**Elements Included in Prehospital Care Database**
Agency/Unit Number	T
Alcohol/Drug Use	T
Cause of Injury	T
Crew Member Numbers	
Date Incident Reported	
Date of Birth	T
Destination determination	
Destination/Transferred to	T
Diastolic Blood Pressure	T
Ethnicity	
Gender	T
Glasgow Eye Opening Component	T
Glasgow Motor Component	T
Glasgow Verbal Component	T
Incident Address	
Incident City	
Incident County	T
Incident Number	T
Incident State	
Incident/Patient Disposition	T
Injury Description	
Lights and Siren to Scene	
Lights/Siren From Scene	
Location Type	T
Medication Name	T
Patient Name	
Pre-Existing Condition	
Procedure or Treatment Name	T

Appendix A

NHTSA Essential Prehospital Data Collection Elements	Elements Included in Prehospital Care Database
Provider Impression	T
Pulse Rate	T
Race	
Respiratory Rate	T
Response Number	
Safety Equipment	T
Service Type	T
Signs and Symptoms Present	
Systolic Blood Pressure	T
Time Arrival at Destination	T
Time Arrival at Scene	T
Time Back in Service	
Time Dispatch Notified	
Time Incident Reported	
Time Unit Left Scene	T
Time Unit Notified	T
Time Unit Responding	
Vehicle Type	T
Zip Code of Residence	T

Appendix A

NHTSA Desired Prehospital Data Collection Elements	Elements Included in Prehospital Care Database
Chief Complaint	
City of Residence	
County of Residence	
Date Unit Notified	T
Factors Affecting EMS Care	
Glasgow Coma Score (Total)	
Initial Cardiac Rhythm	
Injury Intent	
Onset Date	
Onset Time	
Patient Address	
Patient Care Record Number	
Procedure Attempts	
Provider of First CPR	
Respiratory Effort	
Return of Spontaneous Circulation	
Revised Trauma Score	
Rhythm At Destination	
Skin Perfusion	
Social Security Number	
State of Residence	
Telephone Number	
Time CPR Discontinued	
Time of Arrival at Patient	
Time of First CPR	
Time of First Defib Shock	
Time of Witnesses Cardiac Arrest	
Treatment Authorization	
Witness of Cardiac Arrest	

Source: Prehospital Care Data Collection Manual and the NHTSA Uniform EMS Data Element Dictionary.

Appendix B

Example of Scoring Tool Format: Comprehensive School Reform, Evaluation Rubric, 2001-2002

Part II: Demographics and Need

Provide evidence of need including number/percentages related to need categories, student performance data, and narrative description of community/educational needs. This section should also address the short and long term impact and benefits of this project. Narrative needs to include expected impact of the project on parental involvement and student achievement in basic academics as related to the CSAP results and the requirements of the Colorado Basic Literacy Act. Additionally, narrative needs to illustrate how the school is restructuring to meet the needs of *all* students.

Level 1 Basic (0-3 pts)	**Level 2 Proficient (4-7 pts)**	**Level 3 Advanced (8-10 pts)**
The proposal:	The proposal:	The proposal:
C provides little or no description of the school's vision or instruction	C provides a description of the vision of instruction and how it relates to proposed model	C provides clear and appropriate description of the vision of instruction and how it directly relates to the proposed model
C provides little or no evidence of need or evidence that is not up to date and not related to content standards	C provides evidence of need including number or percentages related to need categories, student achievement data and narrative description of community/educational needs	C provides convincing evidence of need including number and percentages related to need categories, student achievement data and narrative description of community/education needs
C provides little to no correlation between evidence and proposed model as being a viable way to address needs	C provides direct correlation between evidence and proposed model as being a viable way to address needs	C provides strong correlation between evidence and proposed model as being a viable way to address needs
C does not address meaningful short and long term impact and benefits of the model related to CSAP results and the requirements of the Colorado Basic Literacy Act	C addresses meaningful short and long term impacts and benefits of the model related to CSAP results and the requirements of the Colorado Basic Literacy Act, enabling the school to meet the needs of all students	C provides a thorough description of the meaningful short and long term impact and benefits of the model related to CSAP results and the requirements of the Colorado Basic Literacy Act, enabling the school to meet the needs of all students

Score: _ _ _ _ / 10 points

Appendix B

Part IV: Cost Effective Budget

Provide thorough budget narrative and a budget sheet that fully support and are appropriate to proposed activities. Clear budget notes are provided with clear justification for each item listed. Budget indicates financial support from other sources. Indicates that CSR dollars will be used to supplement other school funds working toward implementation of the model. An anticipated budget for years two and three need is included with an explanation of how efforts will be sustained after CSR funding is no longer available.

Level 1 Basic (0-1 pts)	Level 2 Proficient (2-3 pts)	Level 3 Advanced (4-5 pts)
The proposal:	The proposal:	The proposal:
C shows a slight correlation between the expenditures and the proposed program	C shows a direct correlation between the expenditures and the proposed program	C shows a strong correlation between the expenditures and the proposed program
C does not state how funds will be spent	C states how funds will be spent	C clearly demonstrates the cost effectiveness of the budget
C provides vague budget notes justifying items listed	C provides budget notes justifying each item listed	C provides detailed and convincing budget notes justifying each item listed
C does not indicate financial support from other sources	C indicates financial support from at least one other source	C indicates financial support from numerous sources
C provides limited or does not provide an anticipated budget for the second and third year	C provides an appropriate anticipated budget for the second and third year	C provides a detailed and appropriate anticipated budget for the second and third year
C provides evidence that CSR dollars will be used to supplement other school funds	C provides evidence that school funds will be coordinated and re-allocated to work toward successful implementation of the model	C provides convincing and well-supported evidence that school funds will be coordinated and re-allocated to work towards a successful implementation of the model
C includes a narrow explanation or no explanation for how efforts will be sustained when CSR funds are not available	C specifies roles and commitments for sustaining efforts when CSR funds are not available	C specifies roles and commitments of all stakeholders for sustaining efforts when CSR funds are not available

Score: _ _ _ _ / 5 points

Source: Comprehensive School Reform Grant Program Request for Proposal.

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