



# California Statewide Trauma Plan 2014

**Emergency Medical Services Authority  
California Health and Human Services Agency**

EMSA #13-301

Second Public Comment DRAFT September 25, 2014-October 9, 2014

Revision September 25, 2014





# **California Statewide Trauma Plan 2014**

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DRAFT

## Executive Summary

The State of California has created a trauma system structure that broadly utilizes the expertise of its stakeholders and combines the strengths of regional EMS oversight with state-wide system coordination in order to improve system cohesiveness, reduce undesirable variability, and improve access to trauma care.

This is the first comprehensive trauma plan for the State of California. It is the culmination of a long process that began in 2010 and was guided by the trauma planning document (*California Statewide Trauma Planning: Assessment and Future Direction*), published in 2006. California, in addition to being the most populous state in the Union, is unique as it is the only state where the administration of the EMS system, including the trauma system, rests predominately with local EMS agencies. While there are statewide planning challenges inherent to a localized system, California's EMS System with 33 local agencies, allows a degree of local flexibility and the ability to tailor regional trauma systems to individual jurisdictional demographics and population density. ~~It is the intent of this State Trauma Plan to reduce some of the variability inherent in the current system, while allowing jurisdictional flexibility and promoting best practices throughout the state.~~

### State Trauma System Vision Statement

*The vision for California's State Trauma System is to develop a statewide inclusive trauma system that ensures rapid access to care for all individuals optimally within one hour following major injury. The system focuses on the entire spectrum from prevention, prehospital care, timely transport of appropriate patients to definitive care, quality care improvements, and rehabilitation to-return injured individuals to a productive life. The system is informed by data for policy decision-making and to demonstrate effectiveness, and is supported by ongoing funding.*

Three overall goals of the State Trauma System supported by the State Trauma Plan are:

- 1. Timely Access to Trauma Care** (*Field triage, re-triage, and interfacility transfer*)
- 2. Delivery of Optimal Trauma Care** (*Performance Improvement supported by data, acute care and rehabilitation practices, compliance assessment and professional education*)
- 3. Community Health and Wellness** (*Public education and primary prevention*)

The American College of Surgeons (ACS) Committee on Trauma, along with the Coalition for American Trauma Care, commissioned Harris Interactive to conduct a public opinion poll on the public's awareness, knowledge, and perception of the importance of trauma care and trauma systems of care. The results were released during a Congressional Briefing on March 2, 2005. Some of the key findings were as follows:

- 1
- 2 1. Almost all Americans feel it is extremely or very important to be treated at a
- 3 Trauma Center in the event of a life-threatening injury.
- 4 2. Almost all Americans feel it is extremely or very important for their state to have a
- 5 trauma system.
- 6 3. The majority of Americans feel having a Trauma Center nearby is equally as
- 7 important as or more important than having a fire department or police
- 8 department.
- 9

10 The California State Trauma Plan represents a blueprint for the structure and function of  
11 a State Trauma System. The State Trauma Plan depends on the exercise of regulatory  
12 authority by the local EMS agencies, and is not designed to interfere with or  
13 compromise this authority. The State Trauma Plan development has been preceded by  
14 and built upon a number of elements including enabling legislation, regulations, trauma  
15 planning documents, and the creation of trauma regions within the State.

16  
17 The structural elements of the State Trauma System, as outlined in this Plan include the  
18 State EMS Authority, the State Trauma Advisory Committee, the 33 local EMS agencies  
19 (LEMSA), ~~and~~ five (5) Regional Trauma Coordinating Committees (RTCC), and all  
20 hospitals receiving trauma patients.

21  
22 RTCCs, created in 2008, ~~are designed to promote regional cooperation, enhance and~~  
23 ~~develop best practices, assist with the analysis of regional data, and work~~  
24 ~~collaboratively with the State and LEMSAs to develop regional policies and protocols in~~  
25 ~~support of a State Trauma System. RTCC membership is drawn from trauma system~~  
26 ~~stakeholders within each region. function as a conduit between the regions and the~~  
27 EMSA/STAC to aid in statewide Trauma System development and standardization. The  
28 regions are a key component of the California State Trauma System and were created  
29 to leverage a broad range of expertise within five regions to facilitate communication  
30 and collaboration within and between regions, to share and support best practices, to  
31 assist with analysis of regional data, and to provide requested technical assistance to  
32 local EMS agencies and to the State EMS Authority related to the development and  
33 operation of a system of trauma care for the State of California. RTCCs may facilitate  
34 discussions related to trauma care challenges within the region working towards  
35 resolutions to minimize undesirable variations in practice. Additional regional issues  
36 may include addressing geographic isolation, coordination of resources, funding for out-  
37 of-county patients, and distribution of trauma care resources. RTCC membership is  
38 currently voluntary and is drawn from trauma system partners within each region. State  
39 level activity includes representation on the STAC, (acting as a subcommittee) reporting  
40 regional activities and issues, sharing regional work products, and relaying STAC  
41 information and decisions back to the region.

42  
43  
44

1  
2 The State EMS Authority continues its responsibility to review and approve LEMSA  
3 Trauma Plans, and with assistance from the State Trauma Advisory Committee, provide  
4 guidance and technical assistance to the LEMSA and RTCC, advancing the  
5 development of a State Trauma System.  
6

7 This Trauma Plan identifies and analyzes 15 functional components, based on an  
8 evaluation guided by the 2006 Health Resources Services Administration *Model*  
9 *Trauma System Planning and Evaluation* document and the American College of  
10 Surgeons Committee on Trauma *Regional Trauma Systems: Optimal Elements,*  
11 *Integration, and Assessment* guidance document:  
12

- 13 1. Trauma System Leadership
- 14 2. System Development Operations
- 15 3. Trauma System Finance
- 16 4. EMS System: Prehospital Care
- 17 5. EMS System: Ambulance and Non-Transporting Medical Units
- 18 6. EMS System: Communications
- 19 7. Definitive Care Facilities: Acute Care Facilities, Re-Triage/Interfacility Transfer,  
20 and Rehabilitation
- 21 8. Inter-Facility Transfer and Re-Triage
- 22 9. Rehabilitation and Trauma Recovery
- 23 10. Information Systems
- 24 11. System Evaluation and Performance Improvement
- 25 12. Education & Training
- 26 13. Trauma Systems Research
- 27 14. Injury Prevention
- 28 15. Emergency/Disaster Preparedness

29  
30 Priorities for the State Trauma Plan over the next 2-5 years include the following:  
31

- 32 1. Strengthen state trauma organizational structure and leadership to maximize  
33 the effectiveness of the unique trauma governance structure
- 34 2. Examine sustainable trauma system funding options
- 35 3. Establish a statewide Performance Improvement and Patient Safety (PIPS)  
36 Program that ensures ongoing assessment of system performance and  
37 outcomes
- 38 4. Design the-a standardized state trauma registry to support the PIPS Program and  
39 ensure consistent measurable data for trauma system evaluation across the  
40 state, region, and local areas.

1  
2 The benefits of a successful implementation of this plan with maturation of an effective  
3 trauma system include a:

- 4     ▪ Reduction in deaths caused by trauma;
- 5     ▪ Reduction in the number and severity of disabilities caused by trauma;
- 6     ▪ Increase in the number of productive working years through reduction of  
7        disability;
- 8     ▪ Decrease in the costs associated with initial treatment and continued  
9        rehabilitation of trauma victims;
- 10    ▪ Reduced burden on local communities in support of disabled trauma victims; and
- 11    ▪ Decrease in the impact of the disease on "second trauma" victims - families.
- 12    ▪ Recognition of California by Federal trauma partners as a State Trauma System

13  
14 The State Trauma Plan is considered a fluid document that will be periodically revised  
15 as new components or criteria need to be incorporated. We sincerely appreciate the  
16 assistance of all who contributed to the creation of this comprehensive State Trauma  
17 Plan. We commend their commitment to California’s trauma system and desire to  
18 improve the delivery of trauma care to the citizens and visitors of California.

## 20 Purpose of the State Trauma Plan

21 The magnitude of traumatic injury as a public health problem is enormous. In the State  
22 of California traumatic injury is the most common cause of death in persons age 1 to 44  
23 and accounts for more productive years of life lost than cancer and heart disease  
24 combined.<sup>1</sup> The cost of fatal trauma in the California is estimated at more than \$18  
25 billion each year with national data showing U.S. costs of over \$170 billion. Appendix  
26 E provides aggregate data derived from the California EMS Information System  
27 (CEMSIS).

28  
29 The Emergency Medical Services Authority and the Trauma Advisory Committee have  
30 been coordinating and evaluating trauma care in our state for over 25 years. In 2005  
31 Governor Schwarzenegger requested the following:

32  
33        *“...I am directing EMSA, informed by its Trauma Advisory Committee,*  
34        *to complete its statewide trauma care plan...”*

35  
36 The EMS Authority assessed trauma care in California and made recommendations as  
37 requested by Governor Schwarzenegger in the 2006 Report “California Statewide  
38 Trauma Planning: Assessment and Future Direction”. Guided by this 2006 planning  
39 document, this State Trauma Plan is the culmination of an extensive process that began  
40 in 2010. It is the first comprehensive State Trauma Plan for California.

41  

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<sup>1</sup> CDC Injury Response, United States, 2009 [http://www.cdc.gov/injury/overview/leading\\_cod.html](http://www.cdc.gov/injury/overview/leading_cod.html)

1  
2 California, in addition to being the most populous state in the Union, is unique as it is  
3 the only state where the statutory responsibility of the EMS system, including local  
4 trauma systems, rests predominately with local EMS agencies (LEMSA). California's 33  
5 LEMSAs provide local flexibility and allow tailoring of regional trauma systems to  
6 individual jurisdictional demographics, population density, and available resources.  
7 Using State trauma guidelines, LEMSAs design trauma systems that meet minimum  
8 state standards and regulations ~~providing some level of consistency among local~~  
9 ~~systems~~. However, some variability and challenges continue to exist in these locally-  
10 governed systems. It is the intent of this State Trauma Plan to reduce some of this  
11 unnecessary variability while allowing ample jurisdictional flexibility and promoting best  
12 practices throughout the state.

13  
14 The State Trauma Plan analyzes current trauma care in California, provides updated  
15 trauma system status and makes specific recommendations for the implementation of a  
16 State Trauma System. The Plan is not immutable and will require periodic review and  
17 revision as changes occur within the EMS and healthcare environment.

## 18 19 **History and Background**

### 20 21 **What is Trauma?**

22  
23 For the purposes of this report, the trauma patient is a  
24 seriously injured person who requires timely diagnosis  
25 and treatment of actual or potential injuries by a  
26 multidisciplinary team of health care professionals,  
27 supported by the appropriate resources, to diminish or  
28 eliminate the risk of death or permanent disability.

*Multidisciplinary Team –  
Includes an EMS  
responder, trauma  
surgeon, emergency  
physician,  
anesthesiologist, other  
medical and surgical  
specialists, nursing,  
radiology, laboratory,  
operating suites, and  
ancillary services*

29  
30 ~~The magnitude of traumatic injury as a public health~~  
31 ~~problem is enormous. In the State of California traumatic~~  
32 ~~injury is the most common cause of death in persons age~~  
33 ~~1 to 44 and accounts for more productive years of life lost than cancer and heart~~  
34 ~~disease combined.<sup>2</sup> Appendix E provides aggregate data derived from the California~~  
35 ~~EMS Information System (CEMSIS).~~

### 36 37 **What is a Trauma System?**

38  
39 A trauma system is an organized, coordinated effort in a defined geographic area that  
40 delivers the full range of care to all injured patients and is integrated with the local  
41 medical and public health systems. Trauma systems, including specialized Trauma  
42 Centers, offer a highly effective, integrated approach to ameliorating the incidence and  
43 impact of major injury to society; they exist in most states in the United States of

<sup>2</sup> CDC Injury Response, United States, 2009 [http://www.cdc.gov/injury/overview/leading\\_cod.html](http://www.cdc.gov/injury/overview/leading_cod.html)

1  
2 America.<sup>3</sup> The true value of a trauma system is derived from the coordinated transition  
3 between each phase of care (prehospital, hospital, and rehabilitation), integrating  
4 existing resources to achieve improved patient outcomes. Injuries occur across a broad  
5 spectrum and a trauma system must determine the appropriate level of care for each  
6 type of injury.<sup>4</sup>

7  
8 Trauma systems may be regionalized, making efficient use of limited health care  
9 resources. Trauma systems are based on the unique requirements of the population  
10 served, such as rural, inner-city, urban, or Native American communities, all of which  
11 are found in California. Trauma systems emphasize preventing injuries in the context of  
12 community health.

13  
14 The benefits of a successful State Trauma System include a reduction in death and  
15 disability caused by trauma, resulting in an increase in the number of productive  
16 working years. Years of potential life lost because of injury far exceed those of cancer,  
17 heart disease, or stroke.<sup>5</sup> The impact of injuries on society can be mediated by  
18 assuring that the more severely injured are treated at Trauma Centers. Opportunities  
19 exist for improving overall cost-effectiveness by assuring our systems are inclusive in  
20 their design, and that triage guidelines are effective in matching the right patient with the  
21 right facility.<sup>6</sup> In addition, being cost effective with initial treatment and continued  
22 rehabilitation of trauma victims leads to a reduced burden on local communities in  
23 support of disabled trauma victims and a decrease in the impact of the disease on  
24 "second trauma" victims - families. This is the emotional trauma/upheaval of the family  
25 when a loved one suffers a life-threatening injury or sudden illness. The first trauma is to  
26 the patient—the second trauma is to the family of the adult or pediatric patient.<sup>7</sup>

27  
28 An organized trauma system is not only essential to deliver trauma care to seriously  
29 injured patients; it is also the foundation for disaster and terrorism readiness. A State  
30 Trauma System allows for seamless-consistent and effective care of patients across  
31 political boundaries, with the ability to expand to meet the medical needs of the  
32 community from a human-made or natural disaster. Historically, the overwhelming  
33 majority of all human-made disasters or incidents of terrorism has involved explosives  
34 that resulted in large numbers of people with life and/or limb threatening injuries (multi-  
35 system trauma). Though future acts of terrorism may include the use of other less

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<sup>3</sup> “Access to Trauma Centers in the United States” Charles C. Branas, PhD; Ellen J. MacKenzie, PhD; Justin C. Williams, PhD; C. William Schwab, MD; Harry M. Teter, JD; Marie C. Flanigan, PhD; Alan J. Blatt, MS; Charles S. ReVelle, PhD, Journal of American Medical Association, Volume 293 Issue 21 pages 2626-2633, June 2005

<sup>4</sup> 2002 Trauma System Agenda for the Future. U.S. Department of Transportation, National Highway Traffic Safety Administration

<sup>5</sup> WISQARS Leading Causes of Death Reports. Available at <http://webappa.cdc.gov/sasweb/ncipc/leadcaus10.html>. Accessed May 12, 2010.

<sup>6</sup> *The Value of Trauma Center Care*, The Journal of Trauma Injury, Infection, and Critical Care, volume 69, Number 1, July 2010.

<sup>7</sup> American Trauma Society, *Second Trauma Course*, accessed at <http://www.amtrauma.org/courses/2nd-trauma1/index.aspx>

1  
2 conventional weapons of mass destruction (chemical, biological or radiological), they  
3 will most likely continue to involve the use of explosives.  
4

5 ~~In light of this experience, disaster medical response is best provided through an~~  
6 ~~extension of existing resources within a State Trauma System includes planning and~~  
7 ~~integration of trauma system resources into the local Emergency Operational Area Plan~~  
8 ~~operating within the Standardized Emergency Management System (SEMS).~~ As  
9 demonstrated by catastrophic events occurring in California such as the Northridge and  
10 Loma Prieta earthquakes, La Conchita mudslide, Chatsworth train collision, and the  
11 Asianic Airlines crash, emergency preparedness must include a strong trauma system  
12 infrastructure that will deal with daily injuries and have the capacity to rapidly expand  
13 (surge capacity) to respond to the demands of an unconventional or natural disaster  
14 that creates casualties of greater magnitude.  
15

### 16 **National Efforts in Trauma System Development**

17

18 In 1966, the National Academy of Sciences White Paper entitled “Accidental Death and  
19 Disability: The Neglected Disease of Modern Society,” identified deficiencies in  
20 providing emergency medical care in the country. This paper was the catalyst  
21 prompting federal leadership toward an organized approach to emergency medical  
22 services (EMS) and trauma care.  
23

24 The Trauma Care Systems Planning and Development Act was developed in response  
25 to a 1986 General Accounting Office Report (GAO/HRD-86-132) that found that  
26 severely injured individuals in a majority of both urban and rural areas of the United  
27 States sampled were not receiving the benefit of trauma systems, despite considerable  
28 evidence that trauma systems improve survival rates. A subsequent report in 1999 by  
29 the Institute of Medicine (IOM), "Reducing the Burden of Injury," called on Congress to  
30 "support a greater national commitment to, and support of, trauma care systems at the  
31 federal, state, and local levels." An estimated 20-40 percent of deaths due to severe  
32 injury could be prevented if all Americans lived in communities that are organized to  
33 transport severely injured patients promptly to an area hospital that is staffed and  
34 equipped to provide expert trauma care.  
35

36 While an emergency department (sometimes referred to as an  
37 emergency room) is responsible for evaluation and stabilization  
38 with definitive care in some cases, Trauma Centers maintain a  
39 higher level of service both within and beyond a basic  
40 emergency department for victims of multi-system trauma.  
41 Operating rooms, surgical intensive care units, anesthesia,  
42 surgical recovery, and a multidisciplinary team of highly trained  
43 physicians and nurses are available to respond rapidly.  
44  
45

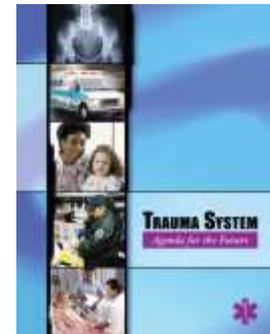
*Multi-system trauma –  
injury to more than  
one body **system**,  
(e.g. **orthopedic**,  
**cardiac**, **pulmonary**,  
**renal**, **neurologic**)  
usually deemed*

1  
2 | The American College of Surgeons (ACS) and its Committee on Trauma championed  
3 the development of Trauma Centers and trauma systems with the development of  
4 "Resources for Optimal Care of the Injured Patient". In 1976, the ACS first published  
5 this document that provided guidelines for hospital and  
6 prehospital resources necessary for optimal trauma care. Since  
7 that time, this document has gone through numerous revisions  
8 with the latest published in ~~2006-2014~~ and a new revision in  
9 ~~process~~. These guidelines describe in detail the qualifications  
10 and level of commitment required of hospitals, medical and  
11 surgical personnel, and local communities to provide high-quality  
12 trauma care. The ACS guidelines have been adopted by state  
13 and regional trauma systems throughout the nation. Studies  
14 have shown that systems employing these standards have  
15 significantly reduced preventable deaths due to injury.



16  
17 In 2002, the American Trauma Society, supported by the U.S. Department of  
18 Transportation, National Highway Traffic Safety Administration, issued the Trauma  
19 System Agenda for the Future. This report noted that:

20  
21 *Trauma systems should possess the distinct ability to identify risk factors and related*  
22 *interventions to prevent injuries in a community, and should*  
23 *maximize the integrated delivery of optimal resources for patients*  
24 *who ultimately need acute trauma care. Trauma systems should*  
25 *address the daily demands of trauma care and form the basis for*  
26 *disaster preparedness. The resources required for each*  
27 *component of a trauma system should be clearly identified,*  
28 *deployed and studied to ensure that all injured patients gain*  
29 *access to the appropriate level of care in a timely, coordinated*  
30 *and cost-effective manner.*



31  
32 The ACS Committee on Trauma, along with the Coalition for American Trauma Care,  
33 commissioned Harris Interactive to conduct a public opinion poll on the public's  
34 awareness, knowledge, and perception of the importance of trauma care and trauma  
35 systems of care. The results were released during a Congressional Briefing on March 2,  
36 2005. Some of the key findings were as follows:

- 37 • Almost all Americans feel it is extremely or very important to be treated at a  
38 Trauma Center in the event of a life-threatening injury.
- 39 • Almost all Americans feel it is extremely or very important for their state to have a  
40 trauma system.
- 41 • The majority of Americans feel having a Trauma Center nearby is equally as  
42 important as or more important than having a fire department or police  
43 department.

44  
45 A study published in the September 2010 Journal of Trauma found:

1  
2 *Triaging severely injured patients to hospitals that are incapable of providing definitive*  
3 *care is associated with increased mortality. Attempts at initial stabilization at a non-*  
4 *trauma facility may be harmful. These findings are consistent with a need for continued*  
5 *expansion of regional trauma systems.<sup>8</sup>*  
6

## 7 **Cost of Trauma Based on National Data**

8

9 The cost of fatal trauma in California is estimated at more than \$18 billion each year  
10 with national data showing U.S. costs of over \$170 billion. These costs include medical  
11 and work loss costs.<sup>9</sup> National data shows that in 2000, on the basis of Medical  
12 Expenditure Panel Survey (MEPS) estimates, \$64.7 billion was spent treating injuries  
13 among the U.S. population. When MEPS percentages were applied to annual medical-  
14 spending data provided by National Health Accounts (NHA), injury-attributable medical  
15 expenditures nearly doubled to \$117.2 billion. Injury-attributable medical expenditures  
16 were slightly higher for males (\$59.8 billion) than females (\$57.4 billion). By age group,  
17 NHA expenditures ranged from \$5.0 billion for persons aged 20--29 years to \$37.9  
18 billion for persons aged 45--64 years. The greatest injury-attributable medical  
19 expenditures (\$23.3 billion) were for women aged 45--64 years. Expenditures per capita  
20 for women were greater than for men in the same age group.<sup>10</sup>  
21

## 22 **Development of California's Trauma System**

23

24 In California, state EMS leadership began in 1980 when  
25 state law added Division 2.5 of the Health and Safety  
26 Code that established the Emergency Medical Services  
27 Authority. During this periodIn the early 1980's, some  
28 local EMS agencies such as Los Angeles, Orange, San  
29 Diego, and Santa Clara established local trauma care  
30 systems. In 1983, Article 2.5 Regional Trauma Systems  
31 was added to the Health and Safety Code to allow, but not  
32 require, development of local trauma care systems. In  
33 September 1986, trauma care regulations (California Code  
34 of Regulations, Title 22, Division 9, Chapter 7 -Trauma  
35 Care Systems) were promulgated to provide minimum standards for local trauma  
36 systems and locally designated Trauma Centers. These regulations were updated in  
37 August 1999 to reflect standards based on the American College of Surgeons 1999  
38 version of "Optimal Resources for the Care of the Injured Patient".

*The American College of Surgeons is a scientific and educational association of surgeons that was founded to improve the quality of care for the surgical patient by setting high standards for surgical education and practice.*

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<sup>8</sup> Journal of Trauma 2010, Scoop and Run to the Trauma Center or Stay and Play at the Local Hospital: Hospital Transfer's Effect on Mortality, Nirula, Ram MD, MPH, FACS; Maier, Ronald MD; Moore, Ernest MD; Sperry, Jason MD, MPH; Gentilello, Larry MD

<sup>9</sup> WISQARS™ Injury Prevention & Control: Data & Statistics 2005

<sup>10</sup> Centers for Disease Control, Morbidity & Mortality Weekly Report, January 2004; Medical Expenditures Attributable to Injuries --- United States, 2000.

1  
2 State leadership of trauma care is vested in the EMS Authority that provides statewide  
3 coordination, guidance, and technical assistance to the local EMS agencies in their  
4 development of local trauma systems. This includes:

- 5 • Reviewing and approving ~~at of~~ local trauma plans and annual Trauma System  
6 Status Reports
- 7 • Promulgating of trauma system and Trauma Center requirements
- 8 • Facilitating participation in a statewide trauma registry
- 9 • Coordinating the activities of the State Trauma Advisory Committee and its  
10 subcommittees
- 11 • Liaising with other State Departments regarding trauma system issues

12  
13 The following represent milestones in the development of California's Trauma System:

- 14  
15 • **Changes to the Health & Safety code (1983)**  
16 Changes to the Health & Safety code enabled but did not require the  
17 development of local trauma care systems. Local EMS agencies may implement  
18 a trauma care system contingent upon meeting minimum regulatory standards,  
19 and may formally designate as well as limit the number of hospitals meeting a set  
20 of specific requirements as Trauma Centers.  
21
- 22 • **The California Code of Regulations, Title 22, Division 9, Chapter 7 - Trauma**  
23 **Care Systems (1986)**  
24 Regulations for development of the trauma systems were first promulgated in  
25 1986 as part of the California Code of Regulations, Title 22, Division 9, Chapter 7  
26 (Trauma Care Systems). By this time there were already 28 Trauma Centers,  
27 designated by their local EMS agencies, throughout California.  
28
- 29 • **Trauma Regulations Updated (1999)**  
30 Trauma regulations were updated to better reflect minimum Trauma Center  
31 standards based on the American College of Surgeons 1999 edition of the  
32 "Optimal Resources for the Care of the Injured Patient". These regulations  
33 established Pediatric Trauma Centers which currently number fifteen and Level  
34 IV Trauma Center standards. As the newest edition of this document is released,  
35 California will begin to revise the trauma regulations.  
36
- 37 • **Implementation of Standardized Reporting (2003)**  
38 The implementation of standardized reporting criteria for trauma patients to local  
39 trauma registries was initiated as required in Health and Safety Code Division 2.5  
40 §1797.199 (k).

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- **Governor Schwarzenegger Trauma Directive (2005)**  
Governor Schwarzenegger issued the statement: “I am directing the EMS Authority, informed by its Trauma Advisory Committee, to complete its statewide trauma care plan.”
  - **Formal Assessment of Trauma Care in California (2006)**  
Under the direction of the EMS Authority Director, the Trauma Advisory Committee completed a formal assessment of trauma care in California, making recommendations regarding state trauma leadership, regionalization, a statewide trauma data system, trauma system funding and education. The resulting report “California Statewide Trauma Planning: Assessment and Future Direction,” was signed by Governor Schwarzenegger.
  - **Assessments Put Into Action at First State Trauma Summit (2008)**  
Following the recommendations made in the 2006 trauma care assessment, the State EMS Authority convened its first Trauma Summit for trauma stakeholders from around the state. Five Regional Trauma Coordinating Committees (RTCCs) were established based on a local EMS agency survey by the EMS Authority of transport and transfer patterns of injured patients to Trauma Centers. The RTCCs formulated their membership and preliminary goals and objectives and began to meet in late 2008. At this time there were 65 designated Trauma Centers.
  - **System Goals Developed at Second State Trauma Summit (2009)**  
Convened by the EMS Authority, the second statewide Trauma Summit identified five (5) major goals for the State Trauma System.
    1. Establish a structured relationship for the RTCCs with the local EMS agencies and the State EMS Authority
    2. Profile best practices of the RTCCs
    3. Implement a state trauma registry with all-of-participation from the local EMS agencies
    4. Write an inclusive State Trauma Plan
    5. Involve non-trauma hospitals in a statewide trauma system.
  - **Collection of Data with California EMS Information System (2009)**  
The California EMS Information System (CEMSIS) for the collection and analysis of statewide trauma registry data was established and began to collect data from Trauma Centers around the state. The data standards and inclusion criteria were vetted through a public comment process with final approval by the Commission on EMS.

1  
2 • **Forum for Regional Trauma Coordinating Committees (2010)**

3 The EMS Authority convened the third State Trauma Summit that provided a  
4 forum for the RTCCs to report on their projects. The State Trauma Advisory  
5 Committee membership was updated to include representation from the RTCCs.  
6

7 • **State Trauma Summit IV (2012)**

8 The fourth Trauma Summit was held in conjunction with the *UCSD Trauma and*  
9 *Resuscitation Conference* and presented information on Trauma System  
10 Performance Improvement, Access to Trauma Care and provided an update on  
11 RTCC activities. It concluded with an open forum: “Where Do We Go From  
12 Here”?  
13

14 • **State Trauma Summit V (2014)**

15 The fifth Trauma Summit was held in collaboration with the Stanford University  
16 Medical Center and Santa Clara Valley Medical Center Trauma Symposium.  
17 Presentations covered “State of the State”, the Affordable Health Care Act,  
18 Trauma Performance Improvement: A National Program, and Regional Best  
19 Practice presentations.  
20  
21

22 **California Trauma Center Funding**

23  
24 In 1987, the Assembly Office of Research described California’s trauma care system as  
25 being in a medical and financial emergency, pointing to financial losses experienced by  
26 Trauma Centers and a need to financially stabilize trauma care systems. Some  
27 hospitals, particularly in Los Angeles, had dropped their Trauma Center designation,  
28 citing financial losses. The closure or threatened closure of Trauma Centers in several  
29 areas of the state resulted in media attention and policy initiatives to increase state  
30 subsidies or develop alternative funding sources. Physicians and hospitals indicated  
31 that the root problem of emergency and trauma care issues was the high level of  
32 uncompensated care. They believed that appropriate funding for Trauma Centers  
33 would ensure continued operation of existing Trauma Centers and lead to the  
34 establishment of new Trauma Centers. By keeping Trauma Centers viable, stresses on  
35 emergency departments would not be exacerbated.  
36

37 Most of the effort in improving California’s trauma funding has focused on the direct  
38 reimbursement for patient care, with shortfalls in the millions of dollars for some Trauma  
39 Centers. Many local EMS agencies utilize the Maddy Fund to compensate hospitals and  
40 physicians for uninsured and under-compensated emergency services, including trauma  
41 services for adults and children. Revenues from tobacco taxes are earmarked in part for  
42 programs to provide health care services to indigent patients. Only two counties; Los  
43 Angeles and Alameda, have developed creative funding for trauma care through  
44 assessments on property value.  
45

1  
2 The Trauma Care Fund (Health and Safety Code §1797.199) was established to  
3 provide designated Trauma Center funding for trauma care to uninsured patients. The  
4 funds were passed through the local EMS agency for distribution but funds were only  
5 allocated for three years (2002-2005). The Trauma Fund has not been funded since  
6 2005. While the impact is yet to be seen, healthcare reform may result in payment shifts  
7 that may drive new care models and fiscally benefit local and state trauma system  
8 efforts.

9  
10 California statute (Health and Safety Code 1798.162-166) currently allows local trauma  
11 system development but does not create a comprehensive State Trauma System.  
12 Initial funding was allocated ~~only~~ to local EMS agencies for local trauma centers with a  
13 small amount earmarked for Trauma System development at the local level.; ~~but a~~ No  
14 funding was provided for state or regional coordination, oversight, and evaluation of  
15 statewide trauma care.

16  
17 Over the years, several legislative proposals to provide funding for trauma care have  
18 surfaced. Many failed, but some were successful in providing funding for  
19 uncompensated care or one-time funding for trauma.

20  
21 Maddy Fund: The Legislature enacted Chapter 1240, Statutes of 1987, allowing  
22 counties to establish a Maddy Emergency Medical Services Fund (Maddy Fund) to  
23 compensate health care providers (hospitals and physicians) for emergency services for  
24 the uninsured and medically indigent and to ensure the population has continued  
25 access to emergency care. Maddy Funds are financed through additional penalties  
26 assessed on certain criminal and motor vehicles fines and forfeitures. Although this  
27 funding does not specifically provide for trauma care, it can be used for uncompensated  
28 emergency care reimbursements. A charge of \$2 per \$10 is levied on applicable fines,  
29 penalties, and forfeitures. Courts collect the penalty assessments or surcharges and  
30 forward them to the County. Counties use the initial 10% of these revenues for EMS  
31 Fund administration. The remaining 90% is allocated to: 58% Physicians Services  
32 Account - payments made to physicians who care for patients who have no insurance  
33 coverage or are otherwise unable to pay for the emergency room visit; 25% Hospital  
34 Services Account - payments made to hospitals for the provision of emergency care to  
35 the homeless, uninsured, or undocumented for trauma and medical care services; 17%

36  
37 Discretionary Account - payments made for other EMS purposes, determined by each  
38 county. Physicians can receive reimbursement for up to 50% of their claims, whereas  
39 hospital and optional costs can be reimbursed up to 100%. Of the money deposited  
40 into the fund, fifteen percent shall be utilized to provide funding for pediatric trauma care  
41 (Richie's Fund<sup>11</sup>). Many local EMS agencies depend on this funding to carry out  
42 mandated statutory responsibilities.

---

<sup>11</sup> California Health and Safety Code § 1797.98a : California Code - Section 1797.98a - See more at:  
<http://codes.lp.findlaw.com/cacode/HSC/1/d2.5/2.5/s1797.98a#sthash.AhNKhS9Z.dpuf>

1  
2 AB 430: AB 430 (Cardenas, Chapter 171, Statutes of 2001), created the Trauma Care  
3 Fund and a formula for distribution of funds to local EMS agencies for designated  
4 Trauma Centers. From 2002 through 2005 a total of \$55 million was provided for  
5 Trauma Center funding and \$2.5 million was provided for planning and implementing  
6 trauma care systems for local EMS agencies without a trauma system plan. No funding  
7 has been allocated through this mechanism since 2005.

8  
9 Local Data System Funding: Limited funds were made available to local EMS agencies  
10 by EMSA as part of the Office of Traffic Safety Grant to modify their local data systems  
11 to be compliant with national standards and participate in CEMISIS. The total amount of  
12 funding provided from 2009 through 2011 was \$1,344,754. There has been no funding  
13 available from this source since 2011.

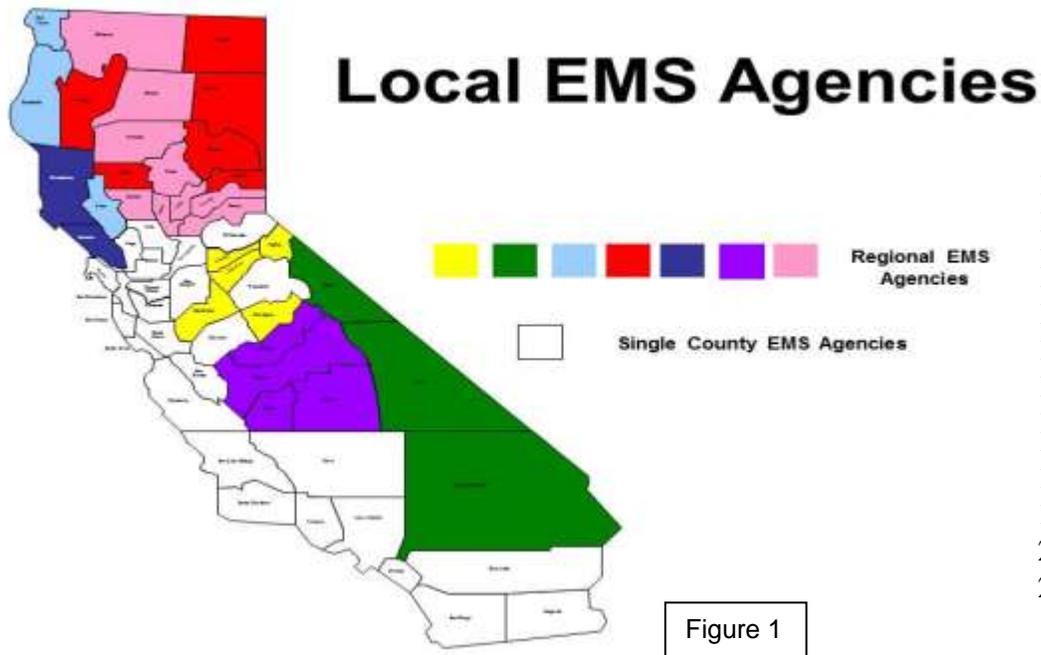
14  
15 RTCC Funding: Seed monies were provided to the RTCCs by EMSA to assist in  
16 regional summits and conference calls. These monies are no longer available due to  
17 financial constraints at the state and federal level. Each RTCC was offered \$10,000 for  
18 2010 and 2011 for regional activities. \$7,097 was expended. There has been no  
19 funding available from this source since 2011.

## 20 21 **Current Organization of Trauma Care in California**

22  
23 The EMS Authority is the state department responsible for developing statewide  
24 standards for local trauma care systems and Trauma Centers; providing coordination  
25 and leadership for the planning, development and implementation of trauma care  
26 systems; and reviewing and approving local trauma care system plans.

27  
28 The EMS Authority actively engages the State Trauma Advisory Committee (STAC) to  
29 assist in coordinating statewide activities. The STAC is comprised of physicians,  
30 nurses, administrators and other EMS providers and personnel for the purpose of  
31 advising the State EMS Authority Director on matters pertaining to the planning,  
32 development, and implementation of the State Trauma System (**Appendix B**). The  
33 Chair of the State Trauma Advisory Committee has historically been a senior practicing  
34 trauma surgeon, recognized nationally for his/her experience and knowledge of trauma  
35 care and trauma systems. In 2009, the committee was reorganized to have broad  
36 representation with term limits from the major stakeholder groups in California.  
37

1  
2 | Local EMS Agency



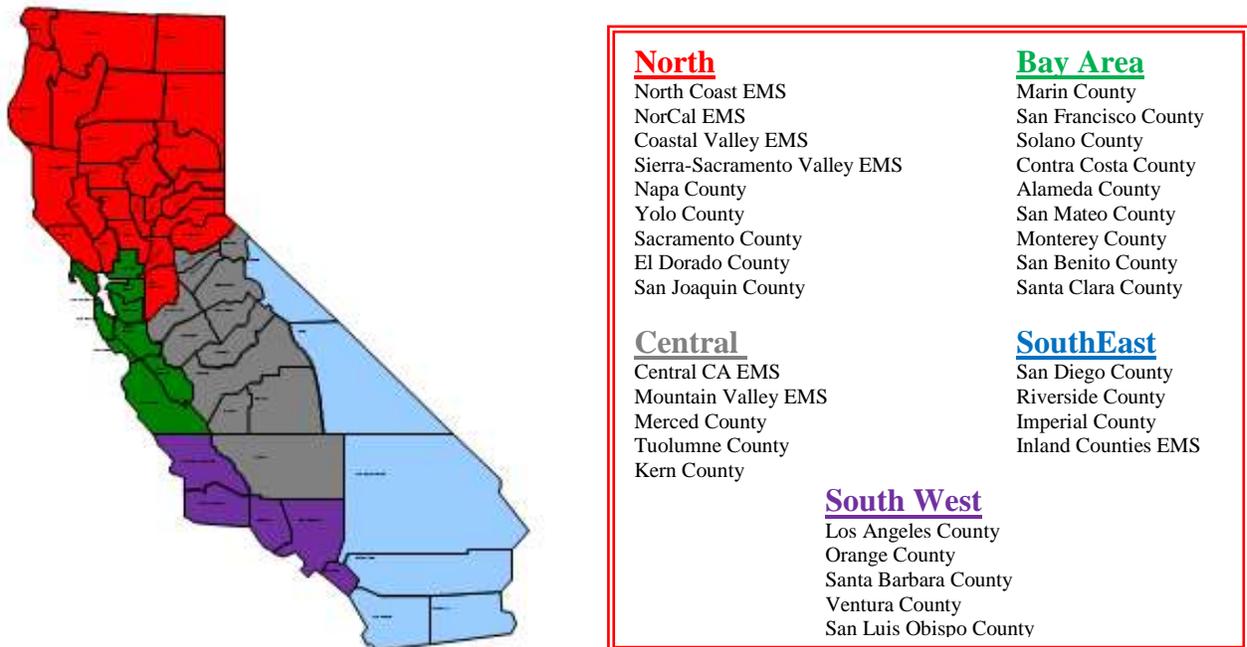
22 There are currently 33 Local EMS Agencies (Figure 1) within the State of California, 26  
23 are a single county and 7 have a multi-county jurisdiction. The local EMS agency is  
24 | charged with implementing [statuesstatute](#), regulations and local policy for trauma  
25 services in their area of jurisdiction ensuring the system components function in concert  
26 throughout the continuum of care. The local EMS agency is responsible for:

- 27
- 28 • Local trauma system plan development and implementation
- 29 • Local trauma system policy development
- 30 • Trauma Center designation
- 31 • Monitoring compliance with contractual agreements in accordance with
- 32 | California [statues](#), regulations and local policy
- 33 • Providing Performance Improvement and Patient Safety Programs (PIPS) for
- 34 ongoing review of trauma system performance and outcomes
- 35 • Facilitating a confidential and collaborative local trauma advisory committee
- 36 • Maintaining a local trauma data base and participating in the State Trauma
- 37 Registry (CEMSIS-Trauma)
- 38 • Participating in injury prevention, public and professional education
- 39

40 | [Each LEMSA with a Trauma Care System is required by statute and regulation to](#)  
41 [submit a Trauma Plan for EMSA approval followed by annual Trauma System Status](#)  
42

1  
2 Reports. This Plan is designed to meet state minimum trauma system standards and  
3 address local short and long term trauma system needs. Plans outline the number and  
4 level of Trauma Centers and patient destination, but do not necessarily address inter-  
5 county needs. All 33 local EMS agencies have approved trauma plans.

6  
7 Regional Trauma Coordinating Committees



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Figure 2

As the result of recommendations made by the STAC and the 2006 *California Statewide Trauma Planning, Assessment and Future Direction* document, five trauma regions were defined by the EMS Authority and corresponding Regional Trauma Coordinating Committees were created in 2008 (Figure 2). These committees include a voluntary membership and are comprised of trauma system providers, local EMS agency staff, and trauma system stakeholders from within each region. The RTCC's are designed to promote regional cooperation, enhance and develop best practices for regional trauma care, ~~assist with the analysis of regional data~~, and work collaboratively with the State and local EMS agencies ~~to develop regional policies and protocols~~ in support of the State Trauma System.

Trauma Centers

Trauma Centers are the key element in a trauma system and the focal point for trauma care. Many Trauma Centers participate in state and regional trauma system planning and development. Lead Trauma Centers (Level I and II) contribute administrative and medical leadership, and academic expertise to the system. Many of these lead

1  
2 Trauma Centers, in collaboration with the local EMS agency engage all other Trauma  
3 Centers (Level III and IV), and a few include other non-trauma acute care facilities, in  
4 the performance improvement process.

5  
6 As of ~~September 2013~~ August 2014 there are 76 designated Trauma Centers (Table 1)  
7 in California (**Appendix C.**) It is estimated that over 85,000 trauma patients were  
8 transported to Trauma Centers in the state for 2012.

9  
10

TOTAL TRAUMA CENTERS BY DESIGNATION	
Level I Pediatric Trauma Center Only	2
Level II Pediatric Trauma Center Only	1
Level I Trauma Center & Level I Pediatric Trauma Center	4
Level I Trauma Center & Level II Pediatric Trauma Center	4
Level II Trauma Center & Level II Pediatric Trauma Center	4
Level I Trauma Center	5
Level II Trauma Center	32
Level III Trauma Center	13
Level IV Trauma Center	11
<b>TOTAL:</b>	<b>76</b>

11 Table 1

12  
13 Local EMS agencies may designate Trauma Centers that have the capability and  
14 willingness to demonstrate a commitment to trauma care and meet state trauma  
15 regulation requirements. The designation process is locally controlled and may include  
16 a hospital site visit by the American College of Surgeon's Verification Review Team or  
17 teams developed by the local EMS agency consisting of trauma care experts.  
18 Contracts are developed between the local EMS agency and the Trauma Center and  
19 compliance is monitored by the local EMS agency periodically. Trauma Center  
20 designations include Levels I – IV and Pediatric Levels I and II. Level I and II Trauma  
21 Centers (including Pediatric Trauma Centers) have the greatest number of specialty  
22 personnel, services, and resources. Level I Trauma Centers are also research and  
23 teaching facilities. Level III Trauma Centers provide surgical service for patients with  
24 less critical injuries who may or may do not need immediate surgery. Level IV Trauma  
25  
26

Centers generally provide initial stabilization of trauma patients with secondary transfer to a higher level of Trauma Center care when appropriate.

The participation of all acute care hospitals in the trauma system, providing initial assessment and care with appropriate transfer to Trauma Centers, is also a key component of an inclusive trauma system. Hospitals that are not trauma centers will see both patients brought by private transportation as well as patients not initially identified as having severe trauma by EMS transport providers.

## **System Challenges**

There are many challenges and complexities for California related to trauma care, including the vast geographic area of the state with variation in terrain, population density, (Figure 3) diverse EMS cultures, weather, resources, hospital and health facility locations, ~~and~~ the decentralized nature of EMS in the state, including existing facilities with a commitment to trauma care.

The current trauma care delivery system is an optional, locally based, decentralized trauma system as prescribed in the Health and Safety Code. As a result, trauma care throughout the state is highly variable.

Transportation and access issues exist ~~particular~~ across political boundaries in varying degrees across the State Without a statewide system for data reporting, the amount and type of variance is unknown. The issues listed below illustrate some of the variance and transportation and access issues.

- Local System Variations

- Los Angeles and San Diego Counties have well-established trauma systems that began in the early 1980s with numerous designated Trauma Centers.
- San Mateo County has a coordinated trauma system without a designated Trauma Center, utilizing out-of-county Trauma Centers.

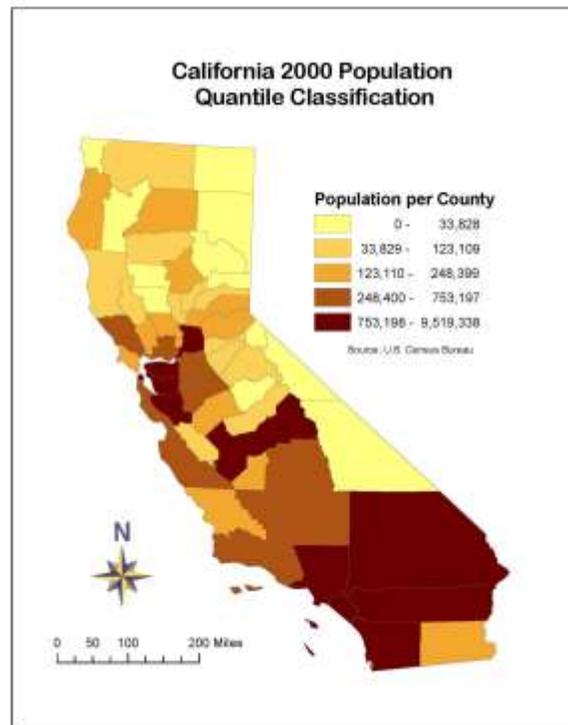


Figure 3

- Monterey County has had an approved trauma plan for many years and is just now in the final stages of Trauma Center designation.

- Rural California

- The entire northern geographic one-third of the State (counties of the North RTCC as described in figure 2) has one designated Level I Trauma Center, five Level IIs and nine Level IIIs and eight Level IVs. The higher level centers tend to be in the more populated areas, leaving vast rural and remote sections of the State with no hospitals, few designated Trauma Centers and long transport distances over difficult terrain. Large portions of these areas experience weather extremes, periodic isolation and lack immediately available medical resources.

- ~~Limited access and transportation create difficulties in obtaining trauma care, particularly in rural California.~~

- ~~The Northern Coast has transport times to a Level I/II Trauma Center ranging from minutes to hours. Air ambulances are a major tool in transporting patients in rural areas where transportation times are lengthy. The use of air transport has inherent limitations such as: safety, capacity, weather (coastal, mountains, and deserts have weather patterns that many times preclude air transport), and availability. The northern coast of California typically experiences extended patient discovery and transport times due to difficult terrain and windy roads and no air medical resources based within the region. Prompt and efficient transport of patients to higher level Trauma Centers is extended due to distance to urban centers and as a result, many cases are interfacility transfers. In the more southern portion of the north coast, air medical resources are more readily available resulting in direct transport from the scene to a higher level Trauma Center whenever possible.~~

- ~~Los Angeles County, has a mature trauma system, but does not have a designated Trauma Center located in the highly populated San Gabriel Valley. While two level II Trauma Centers served this area in the early 1980s, financial difficulties and lack of physician commitment resulted in both facilities dropping their designation. Currently, trauma patients are transported to Trauma Centers outside this geographic area.~~

- Geographic areas with gaps in trauma service include the North Coast Humboldt County, Central California (east of Interstate 5 to the Nevada border including Yosemite), and parts of the Central Coast area including the vacation and college towns of Santa Cruz and Monterey Bay. While transport to a Trauma Center ~~may occurs~~ occurs, it requires either use of limited air transport

resources or a secondary transfer resulting in delays to definitive care. In addition, these transports remove patients from their community and family support as well as placing additional burdens on the receiving Trauma Center that is already serving its own community.

## Trauma Plan: Project Approach and Methods

The State Trauma Advisory Committee (STAC) was tasked by the Director of the EMS Authority to develop a State Trauma Plan. The STAC created an expert writing group for each Plan component to assist in the Plan development. The lead for each group was chosen based on their knowledge of the assigned component. The writing groups reviewed and analyzed information related to current trauma care in the state, including statute and regulations, national standards and guidelines, trauma care costs and losses, and national trauma and emergency care reports to develop recommendations for a State Trauma System.

This plan development process included the following:

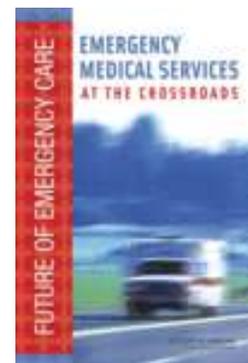
### 1. Review of Current Trauma Care in California

Regulations and statutory authority were reviewed to determine the current framework for how trauma care is delivered in California. In addition, this review considered how local optional systems for trauma care delivery in California were developed and the limitations of that approach.

**The 2008 American College of Surgeons (ACS) Committee on Trauma “Regional Trauma Systems: Optimal Elements, Integration, and Assessment** offers a guide to assist in trauma system development and implementation in line with the HRSA Model. The California State Trauma Plan is more in line with the context and substance found in the ACS document, taking into consideration HRSA’s public health conceptual Model.

### 2. Review of the 2006 IOM Report on the Future of Emergency Care in the United States Health System

The EMS Authority reviewed the 2006 Institute of Medicine (IOM) Report: “The Future of Emergency Care in the United States Health System.” The report, released in June 2006, is the first comprehensive look by the IOM at hospital based emergency and trauma care, emergency medical services, and emergency care for children. The EMS Authority used some of the report’s findings in making recommendations contained in this Plan.



1  
2 **3. Analysis of National Standards for Trauma Care Delivery Systems and How**  
3 **they Relate to California’s Trauma Care Needs**  
4

5 California’s current trauma care system was  
6 evaluated based on two nationally recognized  
7 authorities in trauma system development.  
8

9 In 2006, the Health Resources and Services  
10 Administration (HRSA) revised its previous *Model*  
11 *Trauma Care System Plan* and entitled it *Model*  
12 *Trauma System Planning and Evaluation*. This  
13 document continues to emphasize the need for a fully  
14 inclusive trauma care system, but it provides a  
15 modern system development guide using the public  
16 health approach to the development and evaluation of  
17 trauma systems. A primary strategy of the public  
18 health approach is to identify a problem based on  
19 data, devise and implement an intervention, and  
20 evaluate the outcome.<sup>12</sup>  
21

*Inclusive trauma system - uses all available hospital resources to ensure rapid access to trauma care by prehospital personnel for all injured patients regardless of their geographic location, and will increase surge capacity in a traumatic disaster. The Trauma Center remains the key component in this system; however, all facilities are matched with a patient’s needs. Other components include injury prevention, medical examiners and rehabilitation services.*

22 The American College of Surgeons’ *Regional Trauma Systems: Optimal Elements,*  
23 *Integration, and Assessment* guide takes the concepts from the HRSA document  
24 and provides a self- assessment tool for trauma system planning, development and  
25 evaluation. In addition, the American College of Surgeons Committee on Trauma’s  
26 *2006 Resources for Optimal Care of the Injured Patient* provides detailed  
27 descriptions of the organization, staffing, facilities, and equipment needed to provide  
28 state-of-the-art treatment for the injured patient at every level of trauma system  
29 participation.  
30

31 The HRSA and ACS documents were consulted in the development of the California  
32 State Trauma Plan and provided the major functional components of an inclusive  
33 statewide trauma system, which were used to develop the fifteen components in the  
34 State Trauma Plan:  
35

36 **1. Administrative Components**

- 37 A. Leadership - an identified lead agency with the authority, responsibility and  
38 resources to lead the development, operations, and evaluation of the trauma  
39 system  
40 B. System Development – a defined planning process for trauma system  
41 development, assessment, and evaluation  
42  
43

---

<sup>12</sup> **Model Trauma System Planning and Evaluation**, Health Resources and Services Administration, February 2006.

1  
2 C. Finance – financial accountability by the State, local trauma systems, and  
3 Trauma Centers  
4

5 2. Operational and Clinical Components

6 A. Prehospital Care

7 B. Ambulance and Non-Transporting Medical Unit Guidelines – regulations,  
8 medical control, and geographic boundaries for prehospital medical units

9 C. Communication System – fully integrated with EMS and emergency/disaster  
10 preparedness systems  
11

12 3. Definitive Care

13 A. Trauma Care Facilities – uniform standards for Trauma Center designation;  
14 identified role and responsibilities for other acute care facilities

15 B. Interfacility Transfer – development of policies and procedures for appropriate  
16 and expeditious transfer

17 C. Medical Rehabilitation – coordinated post-acute care for trauma patients with  
18 permanent or long-standing impairment  
19

20 4. Information System – timely collection of data from all providers in the form of  
21 consistent data sets meeting minimum established standards  
22

23 5. System Evaluation and Performance Improvement – use data to monitor the  
24 performance of the system components  
25

26 6. Education and Training – education for all levels of trauma care personnel, both  
27 hospital and prehospital as well as public education  
28

29 7. Trauma System Research – trauma related research to include epidemiologic  
30 research in prehospital care, acute care, rehabilitation and prevention  
31

32 8. Injury Prevention and Control – comprehensive and integrated approach to injury  
33 prevention  
34

35 9. Emergency/Disaster Preparedness – fully integrated with EMS system, local  
36 government, private sector and acute care facilities  
37

38 **5. HRSA Model Trauma Guidelines Assessment of California**

39  
40 The “2006 Health Resources Services Administration (HRSA) Model Trauma System  
41 Planning and Evaluation” demonstrates the interrelationship of the core functions,  
42 essential services and trauma system benchmarks. It depicts core research that drives  
43 the system, essential governance structure that supports system management, system  
44 benchmarks that circulate around the core constructs. ~~and~~ This model supports  
45 assessment, policy development and assurance representing core functions of public

1  
2 health necessary for successful trauma system development.<sup>13</sup> The document also  
3 provide~~sd~~ an assessment tool to evaluate how California's delivery of trauma care  
4 meets the national standards set forth in the document. The document was developed  
5 by a group of national experts with input from each state, including California. The  
6 intent of the tool was-is to allow an individual trauma system to identify its own strengths  
7 and weaknesses, prioritize activities, and measure progress against itself over time.  
8 Guidelines were-are designed to provide trauma care professionals and health policy  
9 experts with direction in developing integrated statewide trauma systems focused on a  
10 public health model for injury prevention and disability mitigation after injury. The  
11 document includes core functions with benchmarks and indicators for planning a  
12 statewide trauma system. Each core function in the tool (Assessment, Policy  
13 Development, and Assurance) contains a variety of benchmarks. These benchmarks  
14 are based, to the extent possible, on current literature on trauma system development.  
15 The benchmarks focus primarily on process measures. It is assumed that meeting these  
16 process measures should result in improved outcomes.

17  
18 Using the HRSA document, the Trauma Advisory Committee and The EMS Authority  
19 assessed California's current system of trauma care and identified next steps to develop  
20 an inclusive and comprehensive State Trauma System. Appendix A provides  
21 California's current status of these benchmarks based on the 2006 Trauma System  
22 Assessment Indicators. Although all components of the HRSA assessment are  
23 important, because of the nature of California's system, the State Trauma Plan  
24 configured the national indicators into fifteen (15) components allowing for a more  
25 manageable and tailored approach to the implementation of trauma care/system  
26 improvements. ~~Appendix A provides California's current status of these benchmarks~~  
27 ~~based on the 2006 Trauma System Assessment Indicators.~~

## 28 29 **6. Surge Capacity Assessment**

30  
31 The EMS Authority used the HRSA bioterrorism  
32 standards to determine California's readiness related to  
33 surge capacity for the care of critical trauma. The HRSA  
34 benchmark states that systems shall be established that  
35 at a minimum can provide triage, treatment and initial  
36 stabilization, above current daily staffed bed capacity, for  
37 adult and pediatric patients requiring burn and/or trauma  
38 care hospitalization within three hours in the wake of a  
39 terrorism incident or other public health emergency.  
40 HRSA has established an ad hoc surge capacity target of

*Surge Capacity - health care system's ability to expand quickly beyond normal services to meet an increased demand for medical care in the event of bioterrorism or other large-scale public health emergencies.*

41  
42  
43  

---

<sup>13</sup> Model Trauma System Planning and Evaluation, Health Resources and Services Administration, February 2006.

1  
2 500 extra hospital patients per million population in urban areas. To date, this  
3 benchmark has not been evaluated independent of general hospital surge capacity.<sup>14</sup>  
4

5 A trauma/burn bed is much more than an acute hospital bed as it implies that a  
6 multidisciplinary trauma team, with trauma care expertise and adequate ancillary  
7 support and facilities, is immediately available to perform emergency surgery. Multiple  
8 critical trauma and burn patients arriving at a Trauma Center create a unique surge  
9 challenge to such a system.

10  
11 **7. Incorporation of the recommendations made in the 2006 *California Statewide***  
12 ***Trauma Planning: Assessment and Future Direction***  
13

14 In addition to the findings from the HRSA assessment, there were three (3) primary  
15 recommendations that were cited for the State Trauma System in the 2006 *California*  
16 *Statewide Trauma Planning: Assessment and Future Direction* document. Progress on  
17 these recommendations was evaluated, as work continues:

18  
19 1. Strengthen State Trauma Leadership

20 The development of trauma systems is not required in statute or regulations, however  
21 all 33 LEMSAs have Trauma Plans approved by the EMS Authority. The Annual  
22 Trauma Report from each LEMSA must show that the LEMSA is in compliance with its  
23 approved Trauma Plan as well as statute and regulations. ~~In addition, s~~Since the  
24 publication of the *California Statewide Trauma Planning: Assessment and Future*  
25 *Direction* in 2006, fifteen (15) additional Trauma Centers have been designated - a 25%  
26 increase.

27  
28 In 2008, the EMS Authority established five (5) Regional Trauma Coordinating  
29 Committees as a method to address gaps and inconsistencies and improve surge  
30 capacities. ~~The RTCCs serve to break the large state into more manageable areas~~  
31 ~~while ensuring better local coordination. The RTCCs bring together system stakeholders~~  
32 ~~and member LEMSAs to facilitate communication and coordination to, Local EMS~~  
33 ~~agencies coordinate regional trauma care resources, collaborating with the RTCCs,~~  
34 ~~coordinate regional trauma care resources, improve access for underserved areas,~~  
35 ~~standardize certain aspects of trauma care~~ minimize variations in practice, and  
36 ~~establish provide for regional~~ performance improvement ~~programs activities~~ to advance  
37 the delivery of quality trauma care. ~~Interrigional s~~Standardization occurs through state  
38 coordination, collaboration between RTCCs to ~~meet support~~ state standards, sharing of  
39 best practices, and promoting uniformity of data collection. The EMS Authority  
40 participates in each RTCC by providing updates on statewide EMS issues and soliciting  
41 feedback on current projects under development. Each RTCC ~~is a subcommittee of the~~  
42 ~~is represented on the~~ State Trauma Advisory Committee (STAC) ~~and provides~~

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<sup>14</sup> Bioterrorism and Health System Preparedness. Rockville (MD): Agency for Healthcare Research and Quality; Optimizing surge capacity: regional efforts in bioterrorism readiness. Issue Brief No. 4. AHRQ Publication No. 04-P009. Also available from: URL: <http://www.ahrq.gov/news/ulp/btbriefs/btbrief4.htm>.

1  
2 representation where RTCC activities are shared and discussed. The STAC provides  
3 guidance to the RTCC as needed.  
4

### 5 2. Develop Statewide Trauma Registry

6 The California EMS Information System (CEMSIS) was developed as a demonstration  
7 project funded by the Office of Traffic Safety. Data collection at the state level is  
8 dependent on the local EMS and trauma data systems managed by the local EMS  
9 agencies. Trauma Centers send trauma data into CEMSIS – Trauma either directly or  
10 through their local EMS agency (Appendix E). From 2009 through 2012, CEMSIS has  
11 collected over 250,000 patient care records. The standards for data collection are  
12 based on national standards established by the National Trauma Data Bank. In 2013,  
13 the State migrated CEMSIS into new data system software. As a result, local EMS  
14 agencies are modifying their systems in preparation for submission to the state.  
15 Participation is gradually improving over time. **Appendix E** provides aggregate data for  
16 the system.  
17

### 18 3. Consider Trauma System Funding

19 Limited funds were made available to local EMS agencies to modify their local data  
20 systems to be compliant with national standards and participate in CEMSIS. In addition,  
21 seed monies were provided to the RTCCs to assist in regional summits and conference  
22 calls. These monies are no longer available due to financial constraints at the state and  
23 federal level. -There is no dedicated funding for state oversight of the State Trauma  
24 System.  
25  
26

## 27 **State Trauma System Strategies and Policy Directions**

28  
29 Based on the HRSA benchmarks  
30 (Figure 4) and a current evaluation of  
31 California’s trauma system, utilizing  
32 the American College of Surgeon’s  
33 trauma system guidance document,  
34 the following 15 components outline  
35 the future policy recommendations to  
36 continue the successful development  
37 and implementation of an effective  
38 State Trauma System. Details on the  
39 proposed development for each  
40 component are found in **Appendix D**.  
41

42 **1. State Leadership** – HRSA  
43 Benchmark #202 (200 series: policy  
44 development). *Trauma system*  
45

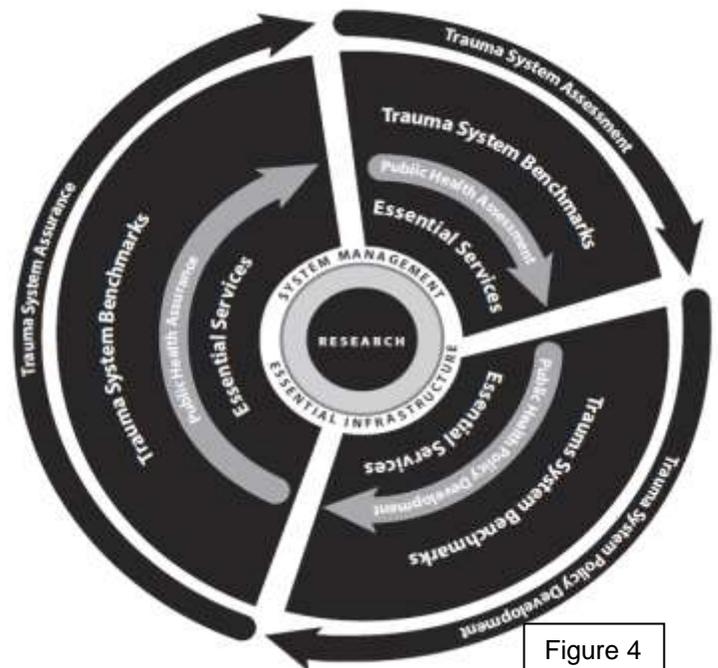


Figure 4

1  
2 *leaders use a process to establish, maintain, and constantly evaluate and improve a*  
3 *comprehensive trauma system in cooperation with medical, professional, governmental*  
4 *and citizen organizations. This requires strong state leadership.*

5  
6 **Barriers**

7 Under the current statutory and regulatory framework, trauma is an optional local  
8 program and the EMS Authority has limited authority to develop a statewide trauma  
9 system. The EMS Authority has insufficient staff or central resources to coordinate a  
10 statewide trauma system. Limited resources at the state level mean that there is limited  
11 oversight of the locally based systems including lack of comprehensive regional and  
12 statewide performance analysis to assess such issues as field triage and timely access  
13 to care. While California's decentralized approach to EMS permits flexibility and the  
14 tailoring of EMS practices to local needs, it has also led to variability in these practices  
15 in some areas of the state that can negatively affect the delivery of trauma care.

16  
17 **Opportunities**

18 Local EMS agency and State EMS Authority leadership remains essential to the overall  
19 success of the State Trauma System. The creation and development of Regional  
20 Trauma Coordinating Committees (RTCCs) represent a principal change in the  
21 structure of the trauma system, including the composition of the State Trauma Advisory  
22 Committee (STAC) that now includes regional representatives from each RTCC.

23  
24 ~~As advisory and support bodies, the RTCCs cannot do not~~ replace local EMS  
25 agencies or supplant the authority that EMS agencies currently maintain over EMS and  
26 trauma systems, but should have state support to build upon existing local EMS  
27 jurisdictions to address challenges of access, geographic isolation, coordination of  
28 resources, funding of out-of-county patients, and optimal distribution of regional trauma  
29 care resources ~~(prehospital, Trauma Centers, Pediatric Trauma Centers, acute care,~~  
30 ~~burn care, and rehabilitation).~~

31  
32 A regional structure, supported by the local EMS agencies and RTCCs encourages  
33 optimal sharing of resources and information. Patient flow patterns, provisions for  
34 uncompensated care, and quality of care are improved through optimal sharing of  
35 resources throughout the region. The State Trauma Advisory Committee and the EMS  
36 Authority promote interregional standardization.

37  
38 **Goal:** The EMS Authority provides coordination, guidance, and assistance to  
39 the local EMS agencies and RTCCs to enhance the consistency of trauma-  
40 related standards and guidelines throughout the state and improve the overall  
41 quality of trauma care  
42  
43  
44  
45

1  
2 **Objectives:**

- 3 1. The State ~~to encourage the collaborative efforts of the counties~~ , ~~LEMSAs~~  
4 ~~and RTCCs counties~~ to support and ~~obtain share~~ resources for a regionally-  
5 based trauma system.
- 6 2. The EMS Authority to work with the local EMS agencies, STAC and the  
7 RTCCs to develop a consensus compendium of trauma-related policies,  
8 procedures, and clinical guidelines that may be ~~adopted shared~~ throughout  
9 the state.
- 10 3. Local EMS agencies to ~~collaborate with RTCCs in the~~ development of local  
11 trauma plans in the context of regional trauma care with input from Trauma  
12 Centers ~~and RTCCs~~.

13  
14 **2. System Development** – HRSA Benchmark # 203 (200 series: policy development).  
15 *A State trauma system should have the necessary components to implement an*  
16 *integrated and inclusive trauma system.*

17  
18 **Barriers**

19 Since trauma system development is optional ~~and locally based~~ and the commitment to  
20 advanced trauma care by an existing facility and the population to support it is  
21 necessary , there is a wide range of trauma system models in California. The variance  
22 runs from local EMS agencies with well-established trauma systems with designated  
23 Trauma Centers at various levels, to local EMS agencies that have limited  
24 implementation of the plan and/or no designated Trauma Centers. The ability to help  
25 coordinate trauma system activity and facilitate related interactions among all the local  
26 EMS agencies by the EMS Authority and STAC has historically been limited.

27  
28 **Opportunities**

29 The ~~RTCC structure is designed to local EMS agency may~~ assist ~~both~~ the state ~~and~~  
30 ~~local EMS agencies~~ in providing for a comprehensive analysis of trauma resources  
31 throughout the state including access-to-care assessment. The STAC may provide  
32 guidance and coordination for specific RTCC activities and projects with statewide  
33 implications.

34  
35 **Goal:** Develop an inclusive statewide trauma system that assures timely access  
36 to an appropriate level of care for all individuals following major injury.

37  
38 **Objectives:**

- 39 1. Conduct a systematic review of local trauma plans in the context of this State  
40 Trauma Plan and the structures and processes it outlines.
- 41 2. ~~Analyze access to trauma care through the review of the number, level,~~  
42 ~~location, and capacity of Trauma Centers, non-trauma acute care facilities,~~  
43 ~~and rehabilitation facilities.~~

1  
2 ~~3. Review regional Trauma Center configuration, including process for~~  
3 ~~determining the need for additional Trauma Centers, and the re-designation~~  
4 ~~and de-designation of existing Trauma Centers.~~

5 4.3. Develop processes and mechanisms for ensuring optimal access and care  
6 to special populations; for example, pediatric ~~and geriatric~~ populations.  
7

8 **3. Trauma System Finance** – HRSA Benchmark #204 (200 series: policy  
9 development) and #309 (300 series: assurance). *There are sufficient resources,*  
10 *including those financial, to support system planning, implementation, and maintenance.*  
11 *Funding for improving outcomes from trauma should be considered to be in one of two*  
12 *mutually exclusive categories: reimbursement for direct patient care, and funding to*  
13 *support the successful oversight of a statewide trauma system.*  
14

### 15 Barriers

16 Currently, there is limited statewide funding to support trauma systems, Trauma Centers  
17 and/or emergency/trauma care. At times, legislation has been proposed to identify  
18 funding through levying taxes or fees on products associated with trauma, (i.e. alcohol,  
19 ammunition, fire arms). However these efforts have not been successful. The Tobacco  
20 Tax in 1990 was the last successful tax for uncompensated care. However, the majority  
21 of these funds have been redirected to other programs at the State, and the limited  
22 remaining these funds do not go to organization, coordination, and development of the  
23 system. The lack of standardized data collection across the State leads to limited  
24 assurance that trauma care is being provided in a cost effective and efficient manner.  
25

26 There are three areas where funding is needed to develop an effective State Trauma  
27 System:  
28

### 29 Support for uncompensated care

30 At this time, there are insufficient data to analyze the fiscal status of our trauma system.  
31 Trauma system providers express widespread belief that additional trauma center  
32 funding is required. However, until financial data are collected consistently statewide,  
33 no analysis can be made. Health and Safety Code §1797.199 created the Trauma Care  
34 Fund for the purposes of compensating Trauma Centers for high percentages of  
35 uninsured patients. This fund has not been appropriated since 2005. As more patients  
36 obtain coverage through the Affordable Care Act, the magnitude of uncompensated  
37 care will need to be studied under changing payment mechanisms.  
38

39 Support for state and local agency administration of the program – Under current law,  
40 local EMS agencies receive only a percentage of existing funds (Tobacco, Maddy, etc.)  
41 to support administrative, hospital and physician costs. Some LEMSAs support local  
42 trauma system administrative and data costs through Trauma Center designation fees.  
43 There are currently insufficient funds to support trauma system mandates to meet  
44

1  
2 national standards. In addition, system requirements for performance improvement and  
3 evaluation for efficiency and efficacy necessitate stable funding for ongoing efforts.  
4 Funds necessary may prove to be minimal in comparison to other business expenses  
5 and can be highly leveraged in improvement of the system and improved outcomes. In  
6 order to support a change to existing funding statute, additional analysis would be  
7 needed.

8  
9 Increase participation of community hospitals in trauma system – Funding to increase  
10 the participation of community hospitals would help develop regional trauma care  
11 capacity. Within coordinated regional trauma care systems, a portion of the amount  
12 received by the local EMS agency for trauma system management could be made  
13 available for developing system capacity and creating incentives to ensure an inclusive  
14 trauma system.

15  
16 Opportunities

17 There is a need to align the elements of the California's State Trauma System with the  
18 anticipated requirements for federal trauma funding under the Patient Protection and  
19 Affordable Care Act. The Affordable Care Act reauthorizes and improves the trauma  
20 care program by providing grants, administered by the Health and Human Services  
21 Secretary, to states and Trauma Centers to strengthen the nation's trauma system.

22  
23 The prerequisites for some of this funding may include the establishment of tracking  
24 communications systems and participation in the National Trauma Data Bank. The  
25 amount of grant funding described in the law is unknown and is likely to be very limited  
26 after distribution among 50 states.

27  
28 **Goal:** The State EMS Authority, in collaboration with the STAC, local EMS  
29 agencies, and RTCCs, to explore the feasibility of a State Trauma System  
30 Business Plan to identify the system's current financial status, perform a needs  
31 assessment to identify specific aspects of the system that need funding, and  
32 identify opportunities for future trauma system funding. It is important to  
33 recognize that dollars spent on infrastructure are paid back with high  
34 performance and quality of care.

35  
36 **Objectives:**

- 37 1. Identify critical Trauma System components and the cost to develop and  
38 maintain.  
39 2. Work with researchers and hospitals to establish the basis for estimating the  
40 actual cost for trauma care in California.  
41 3. Identify sustainable funding sources to support regional infrastructure and  
42 planning.  
43  
44

1  
2 | **4. EMS System: Prehospital Care** – HRSA Benchmark #302 ([300 series: assurance](#)).

3 *There is an integration of prehospital in the development of operational policies and*  
4 *procedures including trauma triage. A gap analysis should be performed to evaluate*  
5 *resources.*

6  
7 **Barriers**

8 Trauma triage and destination policies often reflect the availability of trauma services  
9 within a specific community. With varying availability of resources, along with dense and  
10 sparse populations there is variation in trauma triage criteria and destination  
11 determinations. The study of under and over triage has been limited due to differing  
12 triage policies and definitions.

13  
14 **Opportunities**

15 The Centers for Disease Control and Prevention and the American College of Surgeons  
16 Committee on Trauma have developed national trauma triage guidelines. These  
17 guidelines have been adopted by many of the local EMS agencies both locally and  
18 regionally through RTCC collaboration.

19  
20 **Goal:** Develop a minimal statewide standard for the triage of trauma patients to  
21 enable study of under and over triage.

22  
23 **Objectives:**

- 24 1. Utilize the most current national standard for prehospital triage as the  
25 foundation for prehospital trauma triage guidelines. Based on specific  
26 environments (e.g. urban vs. rural and presence or absence of Trauma  
27 Center resources, some local modifications may be required.
- 28 2. Develop definitions to study over and under triage with a mechanism to track  
29 on a regional basis.
- 30 3. Work with OSHPD in obtaining specified data from non-trauma facilities on  
31 major trauma patients transported to the facility and not transferred.
- 32 4. Adopt standards for transfer of documented information from field units to  
33 receiving hospitals with the goal that prehospital care reports be made  
34 available as part of the medical record for all trauma patients.
- 35 **5.** Explore the need for minimal special population field trauma triage criteria,  
36 e.g. pediatric and geriatric.

37 **5.6.** [Develop EMS protocol guidance for field trauma care](#)

38  
39 **5. EMS System: Ambulance and Non-Transporting Medical Units** – HRSA  
40 Benchmark #302 ([300 series: assurance](#)). *There are sufficient and well-coordinated*  
41 *transportation resources to ensure EMS providers arrive at the scene promptly and*  
42 *expeditiously transport the patient to the correct hospital by the correct transportation*  
43 *mode.*

1  
2 Barriers

3 Non-transporting prehospital medical units are configured in various ways throughout  
4 California. In urban regions, it's common for non-transporting units to be fire apparatus  
5 staffed by either EMT or paramedic level personnel. Rural areas (including state and  
6 federal parks, ~~and forests,~~ and beaches) may have staff cars or rescue units in various  
7 configurations and capabilities staffed with trained first responders, EMTs, or in some  
8 cases paramedics. Organized search and rescue teams also fit into the category of  
9 non-transporting EMS units. Because of the diverse population and environmental  
10 challenges in California, response and transport times for EMS units vary significantly  
11 from area to area.

12  
13 Opportunities

14 National recommendations have been developed for standards for equipment  
15 inventories of EMS resources. The EMS Authority enforces EMS Aircraft regulations  
16 and publishes statewide Prehospital EMS Aircraft Guidelines.

17  
18 **Goal:** Provide a minimum standard and align the use of ground vs. air resources  
19 for the transport of trauma patients to the appropriate level of Trauma Center  
20 throughout the state.

21 **Objectives:**

- 22  
23 1. Develop minimum prehospital equipment inventory for non-transport/transport  
24 EMS units specific to trauma needs.  
25 2. Recommend air resource utilization guidelines applicable state-wide including  
26 access to air resources.  
27

28 **6. EMS System: Communications** – HRSA Benchmark #302 (300 series: assurance).

29 *The trauma system is supported by an EMS system that includes communications,*  
30 *medical oversight, prehospital triage, and transportation; the trauma system, EMS*  
31 *system, and public health agency are well integrated.*

32  
33 Barriers

34 The current ~~state and local~~ 911 alert system has failed is slow to advance with  
35 communication technology and has limited integration with cell phones or internet-  
36 based communication methods. Many small dispatch centers and rural regions are  
37 without priority dispatch or protocols.

38  
39 Opportunities

40 Performance Improvement and Patient Safety Programs (PIPS) and processes are  
41 found in systems utilizing Emergency Medical Dispatching (EMD). Opportunities exist  
42 to expand the implementation of PIPS in dispatch centers regardless of implementation  
43 of an EMD program.  
44  
45

1  
2 **Goal:** Standardized communications to be coordinated between all EMS  
3 systems on a given incident, utilizing current technology, to notify the trauma  
4 care team of essential information on the injured patient and ensure appropriate  
5 destination decisions are made.

6  
7 **Objectives:**

- 8 1. Develop guidance for priority dispatch protocols for trauma and investigate  
9 process changes that improve dispatch effectiveness while improving  
10 outcomes.  
11 2. Study the hospital alert systems currently in place to identify hospital  
12 capability, capacity, and specialty care availability (e.g., burns, pediatrics,  
13 and complete a gap analysis.

14  
15 **7. Definitive Care: Acute Care Facilities** – HRSA Benchmark #303 (300 series:  
16 assurance). *The trauma system lead agency should ensure that the number, levels,*  
17 *and distribution of trauma centers required to meet system demand are available. In*  
18 *addition, the trauma system engages in regular evaluation of all licensed acute care*  
19 *facilities that provide trauma care to trauma patients and designated Trauma Centers.*  
20 *Such evaluation involves independent external reviews.*

21  
22 **Barriers**

23 There are currently 345 acute care facilities with emergency departments in the state of  
24 California. Of these, 76 are designated Trauma Centers. Twenty-two California  
25 counties currently have no designated Trauma Centers within county lines. The  
26 process by which a non-trauma facility applies for and achieves formal local EMS  
27 agency designation, as well as the process for re-designation varies throughout the  
28 state.

29  
30 **Opportunities**

31 The State Trauma System with respect to its acute care facilities should strive towards  
32 universal access to basic trauma care throughout the state, make every effort to ensure  
33 timely access to definitive care regardless of the type and severity of injury, ensure that  
34 designated centers maintain capabilities commensurate with their level of designation,  
35 and improve the consistency of processes related to initial and recurring designation.

36  
37 **Goal:** Develop a network of acute care facilities intended to ensure universal  
38 access to the appropriate level of trauma care.

39  
40 **Objectives**

- 41 1. ~~Periodically assess the number and level of Trauma Centers within the state~~  
42 ~~by region to evaluate access to trauma care and to identify areas of~~  
43 ~~insufficient coverage.~~

44

2. Develop guidelines outlining a process for the assessment of Trauma Center compliance with CCR Title 22, Chapter 7.
3. Outline the responsibilities and expected participation in the trauma system for non-designated acute care hospitals.

**8. Definitive Care: Re-triage<sup>15</sup> and Interfacility Transfer** – HRSA Benchmark #303 (300 series: assurance). *There are clearly defined trauma system standards for transfer guidelines with sufficient legal authority to ensure and enforce compliance. There should be an organized and regularly monitored system to ensure the patients are expeditiously transferred to the appropriate, system-defined trauma facility.*

#### Barriers

~~Based on past studies, it is estimated that approximately 30-35% of patients within the state of California who have sustained major injury and are initially transported to a non-trauma center are never transferred or re-triaged to a higher level Trauma Center.~~ The frequency, location, and severity of related injuries involved with re-triage and interfacility transfer within the state are largely unknown. Obstacles to transfer and re-triage include lack of a proximally located Trauma Center, lack of knowledge regarding the capacity and capabilities of potential receiving centers, fear regarding EMTALA violation, local geographical and climatic obstacles to transportation (e.g. remote location, mountains, fog, etc.), and/or transportation availability.

#### Opportunities

Re-triage / Interfacility Transfer (IFT) protocols have been developed in several areas in the state, but **they** are not in widespread use and their effectiveness has just begun to be monitored.

**Goal:** Develop mechanisms, processes, and guidelines that will optimize timely access to trauma care at a level commensurate with the severity of injury, regardless of geographic location.

#### **Objectives:**

1. Capture re-triage and IFT data in CEMISIS for statewide analysis and develop a map of re-triage and IFT traffic within the state.
2. Explore development of centralized re-triage/transfer coordination within the state.

---

<sup>15</sup> For purposes of this document, re-triage means the immediate evaluation, resuscitation and transport of a seriously injured patient from a lower level trauma facility or NTC to a designated Trauma Center at a higher level of care. This process involves direct ED to ED transfer of patients that have not been admitted to the hospital. Interfacility transfer (IFT) refers to the transfer of an admitted patient, under the care of an admitting physician-of-record, from one facility to another.

- 1  
2 3. Assist in the development of regional cooperative arrangements between  
3 sending and receiving centers that will facilitate re-triage, reduce delays, and  
4 ensure that patients are re-triaged to an appropriate level of care.  
5

6 | **9. Definitive Care: Rehabilitation** – HRSA Benchmark #308 ([300 series: assurance](#)).  
7 *The lead agency ensures that adequate rehabilitation facilities have been integrated into*  
8 *the trauma system and that these resources are made available to all populations*  
9 *requiring them.*  
10

#### 11 Barriers

12 California regulation Title 22 currently contains specific requirements for early  
13 rehabilitation involvement and the utilization of physical, occupational, or speech  
14 therapies for the trauma patient, some of which may be provided through a written  
15 transfer agreement. Most rehabilitation facilities are independent facilities and the  
16 degree of integration into the trauma system varies considerably. In addition, the  
17 degree of access to level-of-care post-injury rehabilitation throughout the state is  
18 unknown.  
19

#### 20 Opportunities

21 The rehabilitative needs of trauma patients in the context of a statewide system of care  
22 should be systematically addressed using acceptable standards.  
23

24 **Goal:** Develop a plan to assess the availability and capabilities of rehabilitation  
25 facilities in the state and integrate them into the regional planning and  
26 performance improvement process.  
27

#### 28 **Objectives:**

- 29 1. Improve the data collection for evaluation of rehabilitative needs and degree  
30 of access to rehabilitation throughout the state  
31 2. Adopt a standardized measure of functional recovery suitable for use  
32 throughout the trauma system  
33

34 | **10. Information System** – HRSA Benchmark #101 ([100 series: assessment](#)). *There is*  
35 *a thorough description of the epidemiology of injury in the system jurisdiction using both*  
36 *population-based data and clinical databases.*  
37

38 Development of a statewide trauma data system is imperative to improving and  
39 continuously monitoring the State Trauma System. Data is necessary to assess  
40 performance, quality, utilization and prevention, benchmark against existing national  
41 standards, and to inform future policy decisions and directions.  
42  
43  
44

1  
2 Barriers

3 With the exception of the counties included in the multi-county EMS agencies,  
4 participation in CEMSSIS by local EMS agencies is inconsistent. CCR Title 22 §100257  
5 states that “*trauma data shall be integrated into the local EMS agency and State EMS*  
6 *Authority data management system*” and “*all hospitals that receive trauma patients shall*  
7 *participate in the local EMS agency data collection effort...*” While these regulations  
8 exist, compliance with this requirement from local EMS agencies and non-trauma  
9 facilities is disparate. In addition, data elements and their definitions vary among local  
10 EMS agencies and thus interpretation of outcomes or processes is inconsistent. In the  
11 absence of statewide trauma system data, including financial data, a reliable  
12 assessment of system performance and determination of additional system resource  
13 needs is imprecise.

14  
15 Opportunities

16 ~~The creation of a permanent State Trauma Registry with mandatory participation and~~  
17 ~~standard data definitions would require statutory or regulatory change.~~—The State  
18 Trauma Registry should be linked with the EMS Data System (prehospital care data) to  
19 create a robust program in support of the EMS system core measures. In addition, the  
20 system should be expanded to include a minimal dataset data set from non-trauma  
21 facilities. There should be a process to evaluate the quality, timeliness, completeness,  
22 and confidentiality of data.

23  
24 **Goal:** Establish linkages of databases to create a complete patient record.

25  
26 **Objectives:**

- 27 1. Improve data sharing  
28 2. Improve data quality and compliance  
29 3. Evaluate data validity  
30

31 **11. System Evaluation and Performance Improvement** – HRSA Benchmark  
32 #301 (300 series: assurance). *The trauma management information system is used to*  
33 *facilitate ongoing assessment/analysis and assurance of system performance and*  
34 *outcomes and provides a basis for continuously improving the trauma system including*  
35 *a cost-benefit analysis.*

36  
37 Barriers

38 The role of the RTCCs in overall system performance improvement is still being  
39 developed. Participation by non-trauma facilities in the local trauma system  
40 Performance Improvement and Patient Safety Program is inconsistent across local EMS  
41 agencies. Without consistent metrics to measure performance across the LEMSA  
42 boundaries effectiveness of a statewide system cannot be fully demonstrated.  
43  
44

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Opportunities

In order to evaluate the State Trauma System, the continuum of care from dispatch to prehospital to hospital disposition must be connected through a data system. Only then ~~we can~~ we begin to understand how care provided translates to improved outcomes and system effectiveness.

**Goal:** A PIPS Program to be developed by The EMS Authority in collaboration with the local EMS agencies and RTCCs to evaluate statewide trauma system performance.

**Objectives:**

1. In collaboration with the local EMS agencies, and with participation from the RTCCs, formulate a statewide comprehensive Trauma Performance Improvement and Patient Safety Plan consistent with the elements of the State Trauma Plan. Utilizing State Trauma Registry data:
  - a) Measure performance and quality through the development and analysis of system wide performance improvement standards that are applicable statewide.
  - b) Develop methodologies for outcomes analysis, using both registry data and Office of Statewide Health Planning and Development hospital and emergency department discharge data and medical examiner/coroner data.
  - c) Promote case-based performance improvement whereby sentinel events relative to trauma system deficiencies are identified.
  - d) Develop methodology to assess over and under triage to support evaluation of field triage protocol.
2. Perform a comprehensive statewide assessment of the State Trauma System based on national standards and California-specific resources. One key objective is to identify opportunities for performance improvement.
3. Evaluate state data, identify regional opportunities for improvement, determine if similar opportunities are occurring in other regions, and explore mechanisms for shared resolution.
4. Create a policy regarding the sharing of data for the PI process, recognizing hospital confidentiality and HIPPA regulations.
5. Benchmark individual systems, hospitals, local EMS agencies and RTCCs to the group as a whole and to an outside standard including a comparative analysis of risk adjusted outcomes.

1  
2 | **12. Education and Training** – HRSA Benchmark #105 (100 series: assessment) and  
3 | #205 (200 series: policy development). *Education for trauma system participants is*  
4 | *developed based on a review and evaluation of trauma data. In cooperation with the*  
5 | *prehospital certification and licensure authority, set guidelines for prehospital personnel*  
6 | *for initial and ongoing trauma training including trauma-specific courses and those*  
7 | *courses that are readily available throughout the State. An assessment of the needs of*  
8 | *the general public concerning trauma system information should be conducted.*  
9

10 **Barriers**

11 No formal public education process exists for trauma systems. Private and public  
12 surveys indicate that the general public regards all hospitals as Trauma Centers and  
13 few can indicate where their closest Trauma Center is located; furthermore, many  
14 citizens are not aware that the EMS system is the best avenue to receive trauma care.  
15

16 Education and training of trauma care professionals is compartmentalized into  
17 prehospital, nursing, and physician education with limited trauma systems education.  
18

19 **Opportunities**

20 State, regional and local education needs should be identified, and resources readily  
21 available to meet those needs. Guidance for education competencies should exist **with**  
22 **and** each region's individual educational offerings should address local needs.  
23

24 **Goal:** Identify statewide educational needs through the Performance  
25 Improvement and Patient Safety Program in consultation with the community,  
26 **EMS providers,** hospitals, local EMS agencies and RTCCs.  
27

28 **Objectives:**

29 1. Develop a plan for providing information to the public regarding the structure  
30 and function of the State Trauma System.

31 **2.** Perform a needs assessment prior to developing new or additional trauma-  
32 related professional educational programs.

33 **2.3. Encourage use of the ACS Rural Trauma Team Development Course,**  
34 **video conferencing, online education, and telemedicine connections between**  
35 **non-trauma facilities and lower level Trauma Centers with higher level**  
36 **Trauma Centers.**  
37

38 | **13. Research** – HRSA Benchmark #301 (300 series: assurance). *A process is in place*  
39 | *to facilitate the access to data for evaluation and research. The trauma system has a*  
40 | *formal mechanism to discuss research results with the general medical community.*  
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**Barriers**

Most research projects are being conducted by single institutions or agencies and are not utilizing the opportunities of collaborative multidisciplinary research.

**Opportunities**

Trauma system research involving both local and state agencies should be part of local/regional trauma system.

**Goal:** The CEMSIS, local EMS agencies, and Trauma Centers should become the basis for collaborative systems research.

**Objectives:**

1. Develop research agenda (possibly through a local research committee) and collaborate with established investigators to conduct research projects.
2. Periodically review trauma system data derived from CEMSIS, OSHPD and other sources, and make recommendation to various system stakeholders regarding potential areas of research.

**14. Injury Prevention** – HRSA Benchmark #304 (300 series: assurance). *A written injury prevention and control plan is developed and coordinated with other agencies and community health programs. The injury program is data driven, and targeted programs are developed based on high injury risk areas. Specific goals with measurable objectives are incorporated into the injury plan.*

**Barriers**

Statewide injury control in California has been established primarily under the direction of the Department of Public Health; however the EMS Authority recognizes the need to interface these efforts and with ~~the~~ state trauma system objectives.

**Opportunities**

Recommend the application of the public health model in reducing trauma and subsequent injuries by applying basic public health principles and guidelines to identify risk factors and help develop and choose prevention strategies that are comprehensive. It is important to know which injury prevention strategies are proven effective, and those that are less effective, in order to have the greatest impact.

**Goal:** Improve coordination and utilization of public health and trauma systems injury prevention resources at the state, regional and local levels.

**Objectives:**

1. Develop a compendium of regional injury prevention programs.

2. Collaborate with the Department of Public Health to evaluate, implement, and determine effectiveness of initiatives to reduce intentional and unintentional injuries.

**15. Emergency/Disaster Preparedness** – HRSA Benchmark #305 (300 series: assessment). *The trauma system plan has established clearly defined methods of integrating with emergency preparedness plans (all hazards).*

#### Barriers

Funding from HRSA and FEMA is limited to assist Trauma Centers in preparing for the next inevitable event when they are already under economic duress. ~~For many local EMS agencies t~~here is inconsistent coordination of Trauma Centers with disaster response planning to utilize the specialty resources of the trauma system.

#### Opportunities

The EMS Authority and trauma system can advocate for utilizing federal hospital preparedness funds, emphasizing the integration of the trauma system into the statement of work. Funds may be used to assess the trauma system's emergency preparedness including coordination with the public health agency, EMS system, and the emergency management agency. Funding through the Affordable Care Act for States, when appropriated, can serve to improve pre-hospital and trauma care at a regional level on a day-to-day basis and could have implications for surge management and regional disaster response.

**Goal:** Ensure the State Trauma Plan is integrated with, and complementary to, the comprehensive mass casualty plan for natural and manmade incidents, including an all-hazards approach to planning and operations.

#### **Objectives:**

1. Incorporate role of the trauma system in the California Public Health and Medical Emergency Operations Manual.
2. Develop a recommended inventory for a trauma cache to be utilized at Trauma Centers in the event of a disaster.
3. Plan for trauma system surge capacity in collaboration with local Public Health and Emergency Health Management, depending on disaster risk assessment.

## Priorities for State Trauma System Objectives

The following priorities are based on the State Trauma System strategies and policy direction:

### 1. Strengthen State Trauma Organizational Structure and Leadership

*(Goal 1: State Leadership; Goal 2: System Development)*

The State should explore mechanisms within existing state rules and available funding to increase resources to support its ~~regionally-based~~ State Trauma System. The EMS Authority's infrastructure should have appropriately trained personnel in Trauma System development to provide management and evaluation of the system in collaboration with ~~itsthe~~ State Trauma Advisory Committee, LEMSAs, and Regional Trauma Coordinating Committees (RTCC).

While California's regional structure is currently not formally recognized in statute or regulations, the RTCCs are well established. They provide for regional needs assessments and set priorities based on the results that encourage optimal sharing of resources to improve access to quality trauma care throughout their regions. To move forward, the RTCCs, LEMSAs and the EMS Authority should work towards standardization within the region as well as inter-regionally were appropriate.

### 2. Examine Trauma System Funding Options

*(Goal 3: Trauma System Finance)*

There are three areas where funding is needed to develop an effective State Trauma System:

I. To provide support for state, regional, and local administration of the trauma program

Neither state nor local agencies currently receive state general funds to support administrative development and oversight of the State Trauma System. There are currently insufficient funds for most of the local agencies to meet existing trauma system requirements or the state to meet national standards. State funding is dependent in part on the Preventive Health and Health Services Block Grant, which has been targeted for elimination from the President's budget for the past three years. There are with other time-limited grants to support data and performance improvement activities. Permanent funding sources are necessary to maintain essential local programs and Permanent funding sources are necessary to maintain and advance the State Trauma System.

Local systems receive only a small percentage of existing funds (Tobacco, Maddy, Richie) to support administrative costs. The majority of these funds are applied to trauma care reimbursement. Many local EMS agencies receive designation fees from the Trauma Centers which may be applied to trauma

1 system costs. Two local EMS agencies receive monies from property taxes to  
2 support the trauma system. Permanent funding sources are also necessary at  
3 the local level to maintain essential trauma systems.  
4

5 II. To help increase system participation by community hospitals

6 An inclusive State Trauma System requires the participation of all acute care  
7 facilities to increase trauma care capacity and to collect and analyze essential  
8 data. Some hospitals have limited resources to provide the level of trauma  
9 care needed for the critically injured who arrive at their facility. Financial support  
10 for these facilities would facilitate an inclusive system and a regional approach to  
11 trauma care. Specifically it would provide for a coordinated process to stabilize  
12 and transfer trauma patients to the level of care commensurate with their injuries.  
13 The exchange of data and participation in local and regional performance  
14 improvement by all facilities that receive trauma patients advances the system  
15 and provides the tools to improve care.  
16

17 III. Support for Uncompensated Care

18 At this time there are insufficient data to determine if additional funding for  
19 indigent patient care is needed and at what level to cover uncompensated  
20 trauma care. The state should work with researchers and hospitals to establish  
21 the basis for estimating the actual cost of trauma care in California. In addition,  
22 the effect of the Affordable Care Act on trauma care reimbursement should be  
23 studied to determine the future impact of uncompensated care with payment  
24 shifts driving new care models and changing payment mechanisms. Decreasing  
25 reimbursement may cause some Trauma Centers to downgrade or de-designate.  
26 Alternatively, the formation of Medicare Accountable Care Organizations may  
27 stimulate interest in Trauma Center designation to keep patients within the  
28 service network.  
29

30 **3. Establish a Statewide Performance Improvement and Patient Safety (PIPS)**  
31 **Program** *(Goal 11: System Evaluation and Performance Improvement)*  
32

33 A PIPS Program is a structured effort by a State Trauma System to demonstrate a  
34 continuous process for improving care for injured patients. The State should provide  
35 the leadership necessary to coordinate the PIPS program supported by a reliable  
36 method of data collection that consistently obtains valid and objective information  
37 necessary to identify opportunities for improvement. The PIPS method involves  
38 guideline development, process assessment, process correction, and monitoring for  
39 improvement. The California PIPS program would be characterized by:

- 1
- 2     • Authority and accountability for the program
- 3     • A well-defined organizational structure
- 4     • Appropriate, objectively defined standards to determine quality of care
- 5     • Explicit definitions of outcomes derived from relevant standards where available
- 6

7 Patient safety is inseparable from the PIPS process and underscores an important  
8 program goal. The patient safety process will direct its efforts at the environment in  
9 which care is given, and the PIPS process will be directed at the care itself.

#### 10 **4. Design the State Trauma Registry to support the PIPS Program**

11 *(Goal 10: Information System)*

12  
13  
14 Development of a statewide trauma data system is imperative to improving and  
15 continuously monitoring the State Trauma System. Data is necessary to assess  
16 performance, quality, utilization and prevention, benchmark against existing national  
17 standards, and to inform future policy decisions and directions. ~~The creation of a~~  
18 ~~permanent State Trauma Registry with mandatory participation and standard data~~  
19 ~~definitions would likely require statutory language with supporting regulations.~~ The  
20 State Trauma Registry should be linked with the EMS Data System (prehospital care  
21 data) and hospital emergency medical record to create a robust program in support of  
22 the EMS system core measures. In addition, the system should be expanded to include  
23 a minimal data set from non-trauma facilities.

24  
25 The National Trauma Data Standard (NTDS) has served as a key mechanism to assess  
26 trauma centers. The State Trauma Registry should utilize NTDS as well as additional  
27 data elements which will serve to assess trauma system function in the state.

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## **APPENDICES**

### **Appendix A: HRSA/EMSA Benchmark Status**

*Spreadsheet showing HRSA Benchmarks from the 2006 Model Trauma System Planning and Evaluation document and how California is currently meeting each benchmark.*

### **Appendix B: State Trauma Advisory Committee Membership**

*Listing of STAC membership with associated affiliation.*

### **Appendix C: Designated Trauma Centers**

*Listing of current designated Trauma Centers with Level of designation noted.*

### **Appendix D: State Trauma Plan-Planned Development**

*The functional components of the Statewide Trauma System are divided into 15 components. Each component contains two parts: 1) Background and Current Status; a brief description of the existing component and 2) Planned Development; a listing of objectives outlining how the component is expected to develop over the next 3-5years. At the end of the Assessment there is a matrix summary of objectives per component and assigned responsibility.*

### **Appendix E: Trauma System Data Reports**

*A compendium of aggregate data reports obtained from the submitted data into CEMISIS-Trauma.*

### **Appendix F: Trauma System Research**

*A selection of trauma system articles reflecting national and California research on trauma system development.*

### **Appendix G: Scudder Oration**

*The Scudder Oration on Trauma was presented by Brent Eastman, MD, FACS at the American College of Surgeons 95<sup>th</sup> Annual Clinical Congress in Chicago, Illinois, October 2009. Much of the oration surrounds the development of trauma systems with specific reference to California.*