Alameda County EMS Trauma System Assessment Report

December 2024

Alameda County EMS Agency

Bishop + Associates

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Foreword

The Alameda County EMS Agency is committed to ensuring the highest level of trauma care for our communities. As part of this commitment, we engaged Bishop + Associates (B + A) to conduct a comprehensive Trauma System Assessment to evaluate current system performance, anticipate future demands, and develop strategic recommendations for sustainability and optimization.

With nearly 40 years of experience working with over 200 hospitals and trauma systems, B + A brings a wealth of expertise in trauma system development, assessment, and enhancement. Their deep familiarity with the Alameda County Trauma System, gained through prior consulting work in 2021-2022, provides invaluable insight into the unique characteristics and needs of our region. During that engagement, B + A conducted a thorough evaluation of the existing trauma centers and prospective facilities, assessing system functionality, patient population trends, financial considerations, and the potential impact of new trauma centers. Their findings played a critical role in shaping trauma system decisions, including authorizing Washington Hospital to begin the process of establishing trauma services.

Building upon this foundation, B + A was well-positioned to deliver an objective, data-driven assessment that will guide our trauma system's evolution. Their analysis will help ensure that Alameda County continues to provide timely, high-quality trauma care while maintaining system efficiency and financial sustainability.

We extend our gratitude to B + A for their expertise and dedication, and we will utilize their findings as the foundation as we work toward a stronger, more resilient trauma system for Alameda County.

Alameda County Trauma Centers

Alameda County is served by four distinguished trauma centers, each providing critical emergency services to the community:

Wilma Chan Highland Hospital

Located in Oakland, this 236-bed facility serves as Alameda Health System's flagship hospital and is the East Bay's only adult Level I Trauma Center. Renowned for its trauma care even external of the SF Bay Area, Highland Hospital has been an anchor of the trauma system in Alameda County since its inception.

UCSF Benioff Children's Hospital Oakland

As a 191-bed pediatric acute care hospital, it is affiliated with the University of California, San Francisco. The hospital provides comprehensive pediatric specialties and subspecialties to infants, children, teens, and young adults throughout Northern California. Notably, it features a Level I Pediatric Trauma Center, one of only six in the state, ensuring the highest level of emergency care for young patients.

Eden Medical Center

A Sutter Health facility with 155-beds, situated in Castro Valley, Eden Medical Center is designated as an Adult Level II Trauma Center. It plays a vital role in the county's trauma system, providing essential emergency services to the surrounding communities.

Washington Hospital

Located in Fremont, Washington Hospital has been provisionally designated as an Adult Level II Trauma Center, pending initial verification by the American College of Surgeons. This addition to the trauma system aims to enhance access to critical trauma services for residents in the southern region of Alameda County.

Each of these institutions plays a crucial role in delivering timely and specialized trauma care, collectively strengthening the emergency medical services available to Alameda County residents

Alameda County Trauma Volumes

As listed previously, there are currently four trauma centers caring for the injured residents and visitors of Alameda County. The tables below show 2023 trauma volumes for the three current trauma centers and compare those volumes to the previous analysis (conducted in 2022 using 2020 data that is referenced below).

Injury Severity Score (ISS)

The Injury Severity Score (ISS) is a medical scoring system used to assess the overall severity of a patient's traumatic injuries. It is calculated by assigning scores to the three most severely injured body regions, squaring these values, and summing them to produce a final score ranging from 1 to 75. A score of 16 or greater is considered significant because it indicates major trauma, often requiring specialized trauma care, intensive monitoring, and potential surgical intervention. Patients with an ISS of ≥16 have a higher risk of mortality and complications, making access to well-equipped trauma centers and timely, coordinated care essential for improving outcomes. This threshold is commonly used in trauma system planning and research to evaluate resource needs and patient outcomes.

Wilma Chan Highland Hospital

Highland Hospital (Level I Trauma Center) admitted 1698 patients to the hospital in 2023. The volumes are shown in the table below.

Highland Hospital Trauma Center Patients			
Admission Status	**2023 Total**	**# with ISS≥16**	**% Δ from 2020**
Admitted to Hospital	1698	360	+ 36%
ED Discharge (Includes Mortality)	2022	27	+ 48%
Transfer Out	153	8	+ 37%
TOTAL	**3873**	**395**	**+ 42%**

Eden Medical Center

Eden Medical Center (Level II Trauma Center) admitted 1604 patients to the hospital in 2023. The volumes are shown in the table below. The opening of a trauma center at Washington Hospital is projected to reduce Eden's trauma volume in 2024-2025 by an estimated 20%.

Eden Medical Center Trauma Center Patients			
Admission Status	**2023 Total**	**# with ISS≥16**	**% Δ from 2020**
Admitted to Hospital	1604	261	+ 11%
ED Discharge (Includes Mortality)	967	12	+ 43%
Transfer Out	59	3	+ 7%
TOTAL	**2630**	**276**	**+ 21%**

UCSF Benioff Children's Hospital Oakland

UCSF Benioff Children's Hospital (Level I Pediatric Trauma Center) admitted 669 patients to the hospital in 2023. The volumes are shown in the table below.

UCSF Benioff Children's Hospital Trauma Center Patients			
Admission Status	**2023 Total**	**# with ISS≥16**	**% Δ from 2020**
Admitted to Hospital	669	85	- 21%
ED Discharge (Includes Mortality)	430	0	+ 165%
Transfer Out	22	0	+ 10%
TOTAL	**1121**	**85**	**+ 9%**

Washington Hospital

Washington Hospital opened as a provisional Level II trauma center on July 1, 2024. In the table below, we show trauma volumes from the first four months of operations, as well as annualized projections. Washington's projected admitted trauma volume appears to be 52% higher than projected in the 2022 analysis (722 admissions).

Washington Hospital Trauma Center Patients						
Admission Status	**Jul**	**Aug**	**Sep**	**Oct**	**4-Mo Total**	**Annualized for 12 Months**
Admitted to Hospital	88	92	87	99	366	1098
ED Discharge (Includes Mortality)	56	79	78	113	326	978
Transfer Out	7	7	7	6	27	81
TOTAL	**151**	**178**	**172**	**218**	**719**	**2157**

Alameda County Trauma Fund

Background

In 1982, Alameda County voters approved a property tax assessment to fund trauma services among other services. When the Alameda County trauma system began in 1987, a "Trauma Fund" was created to support the three trauma centers in providing optimal care for injured patients in the region. In 1997, the EMS District went to the voters to continue support of the EMS System as a special tax and that measure (Measure C) passed by 81%. The language of that 1997 measure stated: *The distribution of funds generated through this measure is defined as "solely for the purposes of raising revenue for the operation of Emergency Medical Services District, County Services Area EM-1983-1, for providing ambulance, paramedic, trauma center, and related services."* Alameda County and Los Angeles County are the only two LEMSAs in the state of California that provide funds to trauma centers. It is expected that the Trauma Fund is used to optimize and enhance trauma care at each trauma center. The original allocation formula for the Alameda County Trauma Fund is unknown.

Current Allocations

In 2024, the Trauma Fund provided $9,231,343 to the three Alameda County trauma centers as noted in the table below. These funds are distributed annually and amounts have not changed since the inception of the fund. When Washington Hospital joined the trauma system in 2024, funds were given to the new trauma center without reducing the contributions to the three existing trauma centers.

Alameda County Trauma Fund Allocations			
Trauma Center	**Type**	**Trauma Funding**	**Percent**
Highland Hospital	Level I Adult	$5,266,383	57.0%
Children's Hospital	Level I Pediatric	$1,982,480	21.5%
Eden Medical Center	Level II Adult	$1,982,480	21.5%
	TOTAL	**$9,231,343**	**100%**
Washington Hospital	Level II Adult (Provisional)	$1,950,000	--

Trauma Center Fund Use

Hospitals have the opportunity to utilize the funds from Alameda County EMS to draw down their share of the intergovernmental transfer (IGT) program match for Medicaid shortfalls. This can be accomplished by using Alameda County EMS funds for the Trauma State Plan Amendment (SPA) to cover Medicaid shortfalls specific to trauma, or for the

Managed Care Rate Range to enhance managed care rates on a range of services, not just trauma. The Trauma Fund dollars, plus the opportunity to match those dollars, are both considered to be funding for the four hospitals and are included in financial assessment of the trauma centers.

Future Fund Allocations

Beginning with the new trauma contracts (2027), Alameda County EMS will utilize an allocation formula to determine how the funds will be distributed among the trauma centers. The formula will be modified from the allocation formula used in Los Angeles County, which is the only other county in California that uses tax dollars to pay trauma centers. In addition to a base allocation given equally to all four trauma centers, the formula will attach different weights to categories of priority and concern, including poor payer mix, low trauma volumes, and uncompensated care. This formula, to be codified in administrative policy, will be shared with the trauma centers, with opportunities for comment, prior to enactment in the next contract.

Trauma Center Aggregate Financial Performance

Financial analyses were conducted for each hospital utilizing trauma registry data matched with hospital billing data. Hospitals were also asked to provide trauma readiness cost estimates (described below). All information was assessed in comparison to national trauma center and regional trauma system norms to assure validity and comparability across centers.

Readiness Costs

Trauma centers incur substantial costs over and above patient treatment costs that are not normally allocated to trauma care by hospital cost allocation formulas. These estimates reflect the approximate cost of personnel and services to meet the minimum standards as an American College of Surgeons (ACS) verified trauma center, excluding medical or department staff coverage for non-trauma services, costs recovered through indirect and direct costs (e.g. radiologist time interpreting images is revenue generating), and revenue kept by the hospital as part of professional fee billing.

Unfortunately, it is impossible to derive exact costs attributable to trauma since most medical and departmental staff provide care to both trauma and non-trauma patients during their shifts. In some cases, B+A has reduced the medical staff and department readiness costs submitted by the hospitals to be consistent with general hospital service market norms among Alameda County trauma centers.

Readiness costs fall into four categories:

Program Management

This includes the salary and benefits for the trauma program staff, including trauma medical director (stipend), trauma program director/manager, Process Improvement coordinators, injury prevention and/or outreach coordinators, and trauma registry staff.

Department Readiness

This includes the infrastructure and support costs required to provide the 24/7 required ancillary service staffing for the laboratory, blood bank, and operating room.

Medical Staff

There are significant medical staff support costs to cover the salaries and call payments for trauma surgeons, advanced trauma practice providers, and specialists from the 23 surgical and medical services required by the ACS for 24/7 availability.

Education and Program

This includes the costs of continuing medical and professional education, travel to professional conferences, costs for trauma registry software, and fees paid to the ACS on an annual basis for trauma verification and Trauma Quality Improvement Program (TQIP) participation.

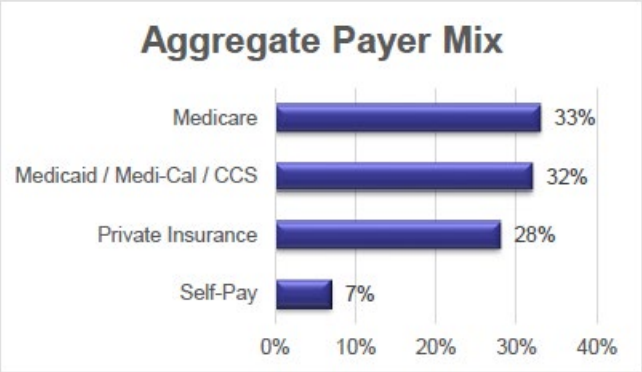
Aggregate Readiness Costs

Trauma care is expensive, especially in urban areas of California, and there are substantial costs for medical staff support and call coverage for required specialists. Trauma centers offer high-quality medical care 24/7, but these costs can only be supported by high-volume trauma centers.

In 2020, the Alameda County trauma centers averaged $14 million in trauma readiness costs; in this current analysis, the Alameda County trauma centers averaged nearly $17 million in trauma readiness costs. The costs for the four Alameda County trauma centers are reported below as aggregates and averages to protect the proprietary information of the individual hospitals.

Alameda County Trauma Center Aggregate Costs		
Cost Category	**Total**	**Average**
Trauma Program	$7,882,078	$1,970,520
Department Readiness	$12,238,380	$3,059,595
Medical Staff	$45,548,613	$11,387,153
Education and Program	$1,951,816	$487,954
TOTAL	**$67,260,887**	**$16,905,222**

Payer Mix



Payer mix for trauma patients is an important component of overall financial health. Trauma centers attract a disproportionate share of patients unable to pay for their care, including the young, uninsured, or underinsured. Trauma centers also attract the sickest and the most expensive patients, and centers may struggle financially when a high proportion of uninsured patients leads to low reimbursement rates and high levels of uncompensated care. The overall distribution of payers in Alameda County is shown in the chart above. This is the aggregate of the four trauma centers, including 2023 data for the three ACS trauma centers and annualized 2024 data for the provisional trauma center.

Financial Performance

Using data from the three verified trauma centers (2023), along with data annualized from Washington's first four months of operations, the table below shows that the trauma centers collected $276 million in annual revenue on injured patients. After accounting for direct costs, indirect costs, and trauma readiness costs, the trauma centers operate at an aggregated $7 million annual loss. The Alameda County EMS Trauma Fund and the opportunity to match those funds are critical to keeping the Alameda County trauma centers financially viable to cover their costs and maintain high trauma centers. Each trauma center has been provided with a confidential financial analysis of their trauma finances.

Alameda County Trauma Center Aggregate Profit/Loss Totals	
Category	**$**
Direct Costs	$139,305,687
Readiness Costs	$67,621,272
SubTotal Direct Costs	**$206,926,959**
Total Indirect Costs (Less Program Admin)	$76,597,433
TOTAL COSTS	**$283,524,392**
TOTAL PATIENT REVENUE	**$276,480,324**
PROFIT/LOSS	**($7,044,068)**
Alameda County Trauma Funds + Match	$21,945,166
TOTAL PROFIT/LOSS	**$14,901,098**

Annual Accountability

In California, LEMSAs are designating bodies for trauma centers. LEMSAs vary, however, in their level of involvement with the trauma centers. Alameda County EMS is unique in that leadership is actively involved in trauma center operations and performance improvement. Guided in part by the trauma contract between Alameda County EMS and each trauma center, as well as the allocation of trauma funds described above, Alameda County EMS regularly meets with its four trauma centers to discuss performance improvement, share successes, and identify opportunities for improvement.

Moving forward, Alameda County EMS will begin to require an annual assessment where the trauma centers will submit 5-10 key metrics and affirm that the hospital has a continuing commitment to ensuring appropriate resources are in place for trauma center operations. These metrics will be key indicators of trauma center stability, such as number of days without continuous call coverage, percentage of registry charts completed within 60 days, and staff vacancies.

Trauma centers will be engaged in this process as Alameda County EMS unveils and finalizes the annual assessment to roll out with new trauma contracts and reallocation of trauma funds in 2027.

Summary

Alameda County has committed to supporting its trauma centers since the late 1980s. Utilization of ACS standards and process for verification are considered the gold standard for trauma center designation, and EMS leadership also set additional criteria to ensure the trauma centers exceed minimum criteria. A strong trauma system and ongoing collaboration between the trauma centers and EMS is essential for ensuring patients can be evaluated and treated as quickly as possible. This collaboration will serve injured residents and visitors to the East Bay now and in the decades to come.