

ALAMEDA COUNTY TRAUMA SYSTEM RECOMMENDATIONS

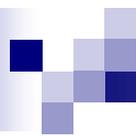
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Bishop+Associates

April 26, 2022

Bishop+Associates Qualifications

- 37 years developing trauma centers and systems
- Founded U.S. Trauma Center Economic Study (1993)
- Founded Trauma Resource Network (1996)
- Founded Trauma Center Association of America (2003)
- System assessments/state funding for Texas, Arizona, South Carolina, Georgia, Washington, New Mexico, Oklahoma, and Illinois
- Major innovator for trauma care and injury prevention



Project Description

Objective:

Provide an expert, independent assessment on:

1. Alameda County's current trauma system
2. The need for additional trauma center(s) in the future

Steps:

- Obtain collaborative input from all stakeholders
- Assess population growth, trauma market, hospital finances, medical staff, and facilities of current and potential trauma centers
- Delineate trauma service areas and assess trauma volume
- Make other recommendations to improve the trauma system

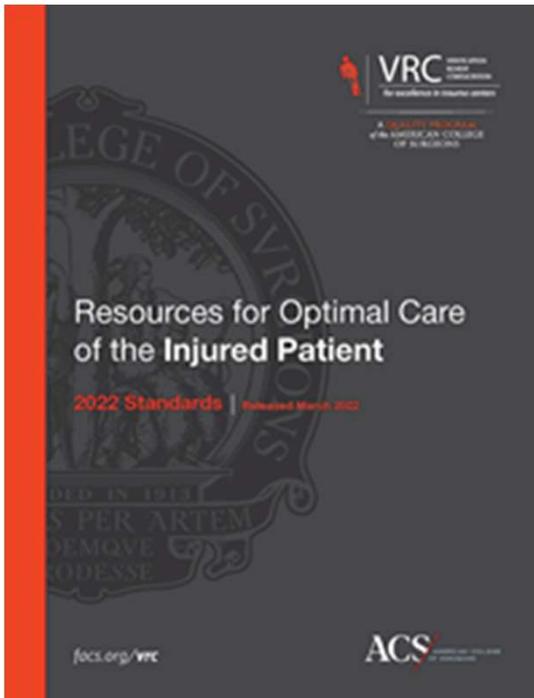
The Alameda County Trauma System is Strong

- Alameda County has a robust and mature trauma system that began in 1987
 - Highland Hospital: Level I adult trauma center
 - Eden Medical Center: Level II adult trauma center
 - UCSF Benioff Children's Hospital: Level I pediatric trauma center
- All trauma centers reverified by the American College of Surgeons in 2021
- At present, Alameda County is well served by current trauma centers
 - No evidence that patients lack access to trauma care
 - 99% of residents live within 30 miles of a trauma center

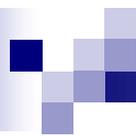
Alameda County Trauma Centers Care for Thousands of Injured Patients

| | | | Mechanism of Injury | | |
|-----------------------------|--------------|-------------------|---------------------|--------------------------|---------|
| | All Patients | Admitted Patients | Falls | Transportation Accidents | Assault |
| Benioff Children's Hospital | 1007 | 761 | 45% | 32% | 3% |
| Highland Hospital | 2856 | 1351 | 34% | 38% | 23% |
| Eden Medical Center | 2413 | 1680 | 54% | 39% | 9% |
| TOTAL | 6276 | 3792 | | | |

Trauma Centers Must Meet Stringent Criteria



- Level II Adult Trauma Center
 - 15 surgical specialists on call panel
 - 24/7 availability of operating room, blood bank, and radiology
 - Injury prevention and ongoing clinical education
- Level I Adult Trauma Center
 - Same as above, plus
 - At least 1200 admitted patients annually for quality
 - Surgery residency program
 - Research program
- Level I Pediatric Trauma Center
 - Same as LI adult trauma center except 200+ minimum volume (age < 15 years) and additional pediatric specialty services



California Law

CA Health & Safety Code § 1798.165 (2016)

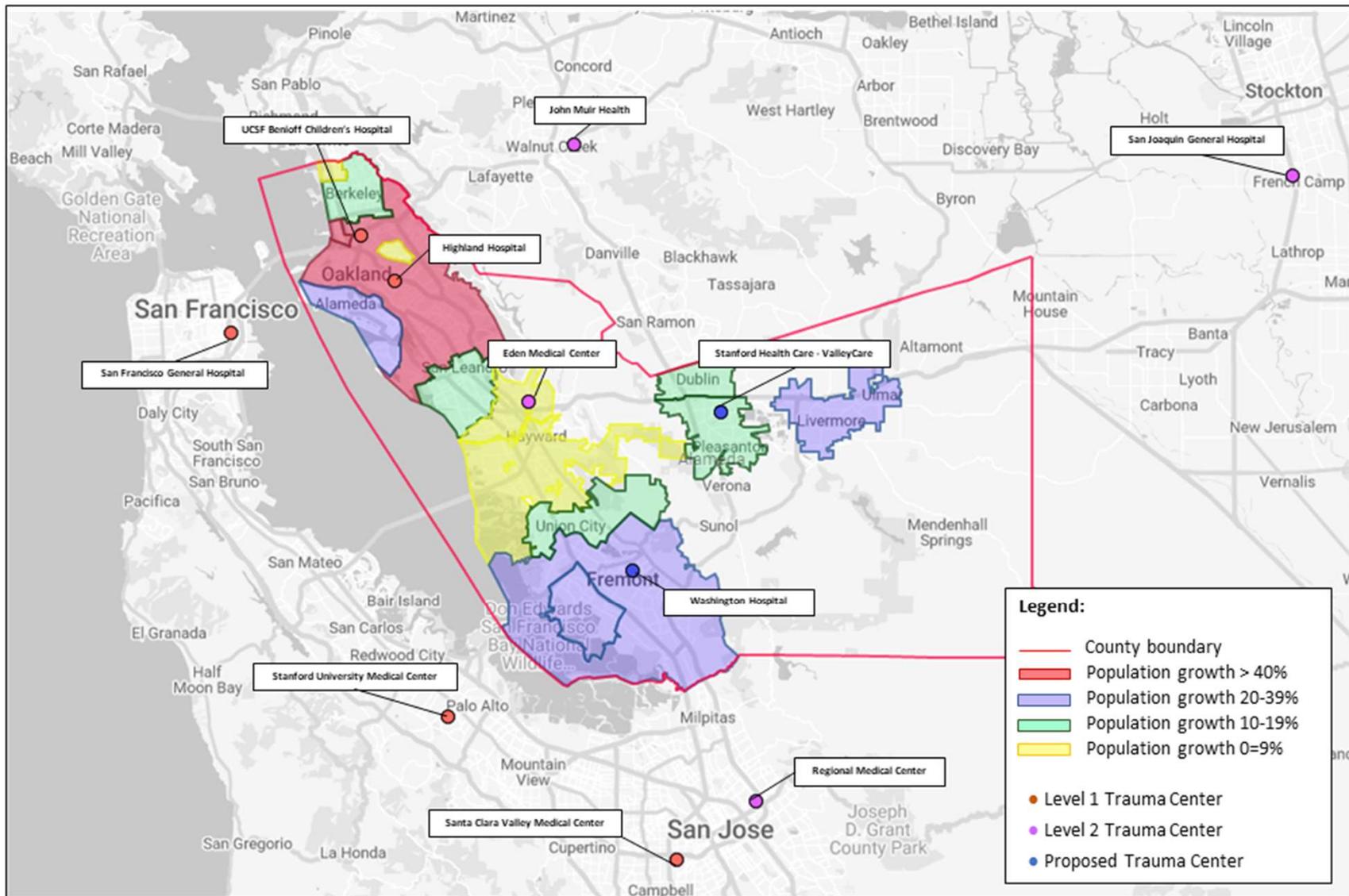
- (a) **Local emergency medical services agencies may designate trauma facilities as part of their trauma care system** pursuant to the regulations promulgated by the authority.
- (b) The health facility shall only be designated to provide the level of trauma care and service for which it is qualified and which is included within the system implemented by the agency.
- (c) No health care provider shall use the terms trauma facility, trauma hospital, trauma center, trauma care provider, trauma vehicle, or similar terminology in its signs or advertisements, or in printed materials and information it furnishes to the general public, unless the use is authorized by the local EMS agency.

Trauma Centers Per Population

- 1.68 million people in Alameda County
- 841,000 population per adult trauma center
- Adding 1 or 2 trauma centers would put Alameda County well below other urban counties in California

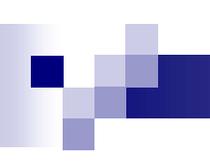
| County | Population (in thousands) | Adult Trauma Centers | Average per Trauma Center (in thousands) |
|--------------------------------|------------------------------|-------------------------|---|
| Contra Costa | 1,166 | 1 | 1,166 |
| Orange | 3,187 | 3 | 1,062 |
| Santa Clara/San Mateo | 2,701 | 3 | 900 |
| Alameda | 1,682 | 2 | 841 |
| Los Angeles | 10,014 | 15 | 668 |
| San Diego | 3,299 | 5 | 660 |
| Total/Average | 22,049 | 29 | 760 |
| Alameda (add 1 Trauma Center) | 1,682 | 3 | 561 |
| Alameda (add 2 Trauma Centers) | 1,682 | 4 | 420 |

Projected Population Growth in Alameda County (2020 to 2040)



A New Trauma Center Must Enhance (Not Destabilize) Current Trauma System

- American College of Surgeons (2021):
“Some urban and suburban areas have a plethora of trauma centers that raises costs and dilutes the patient volumes.”
- Brown et al. (2017):
“Volume siphoning through unregulated growth of unnecessary trauma centers can have a profound detrimental impact on outcomes.”
- Truong et al. (2021):
“Adding trauma centers in areas without access issues may lead to dilution of expertise and lower patient volumes for those centers.”



Considerations for New Trauma Center(s)

Saving Lives:

- Are lives lost due to lack of trauma access?

Providing Access:

- Are patients and families required to travel far from home for trauma care and follow-up?
- Are patients leaving Alameda County for trauma care?

Supporting the System:

- Are EMS transport times excessively long?
- Will the existing trauma centers lack capacity in the future?
- Will a new trauma center negatively impact existing trauma centers?

Preparing for the Future:

- Is the region experiencing population growth?
- Will the trauma service area have adequate patient volume?

Minimum Level II Trauma Volumes

- We were asked to provide analyses on a minimum volume for a Level II trauma center in Alameda County
 - ACS has no minimum volume for Level II trauma centers
 - Pennsylvania has a minimum volume of 600+ trauma patients
 - California law requires population of 350,000 per trauma service area [Equates to 700 admissions (2.0 per 1000 population)]
- Trauma centers require sufficient patient volumes to provide high quality care
- California trauma centers have very high readiness costs which require higher volumes to support the trauma center economically
- We recommend a minimum volume of 750 admissions

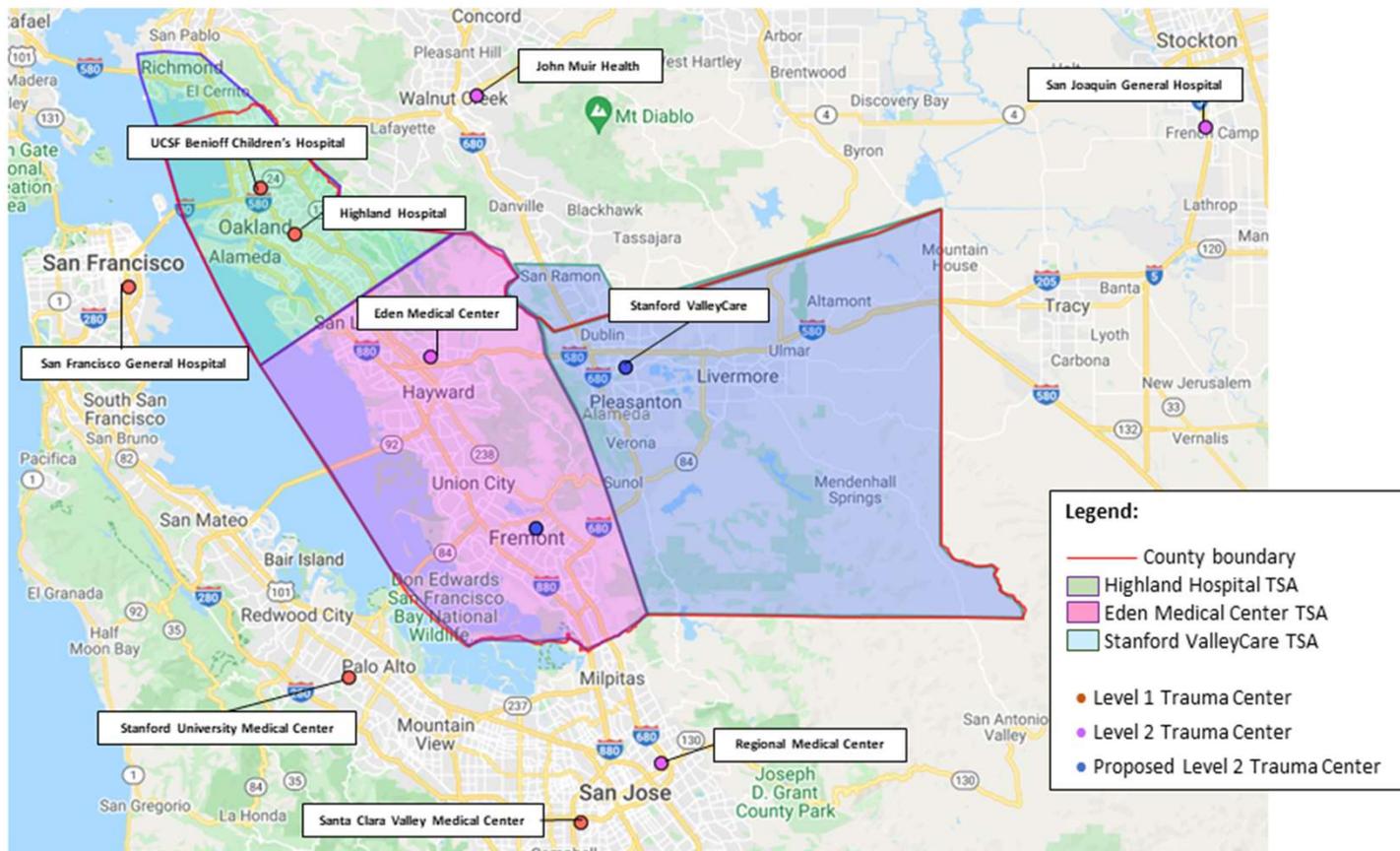


ValleyCare

- Located on Pleasanton campus
- ED volume of 36,000 visits in 2019 (pre-pandemic)
- 167 staffed beds
- 14 miles from Eden Medical Center
- Strong leadership and administrative commitment
- Valuable support and mentorship from Stanford Level I trauma program in Palo Alto

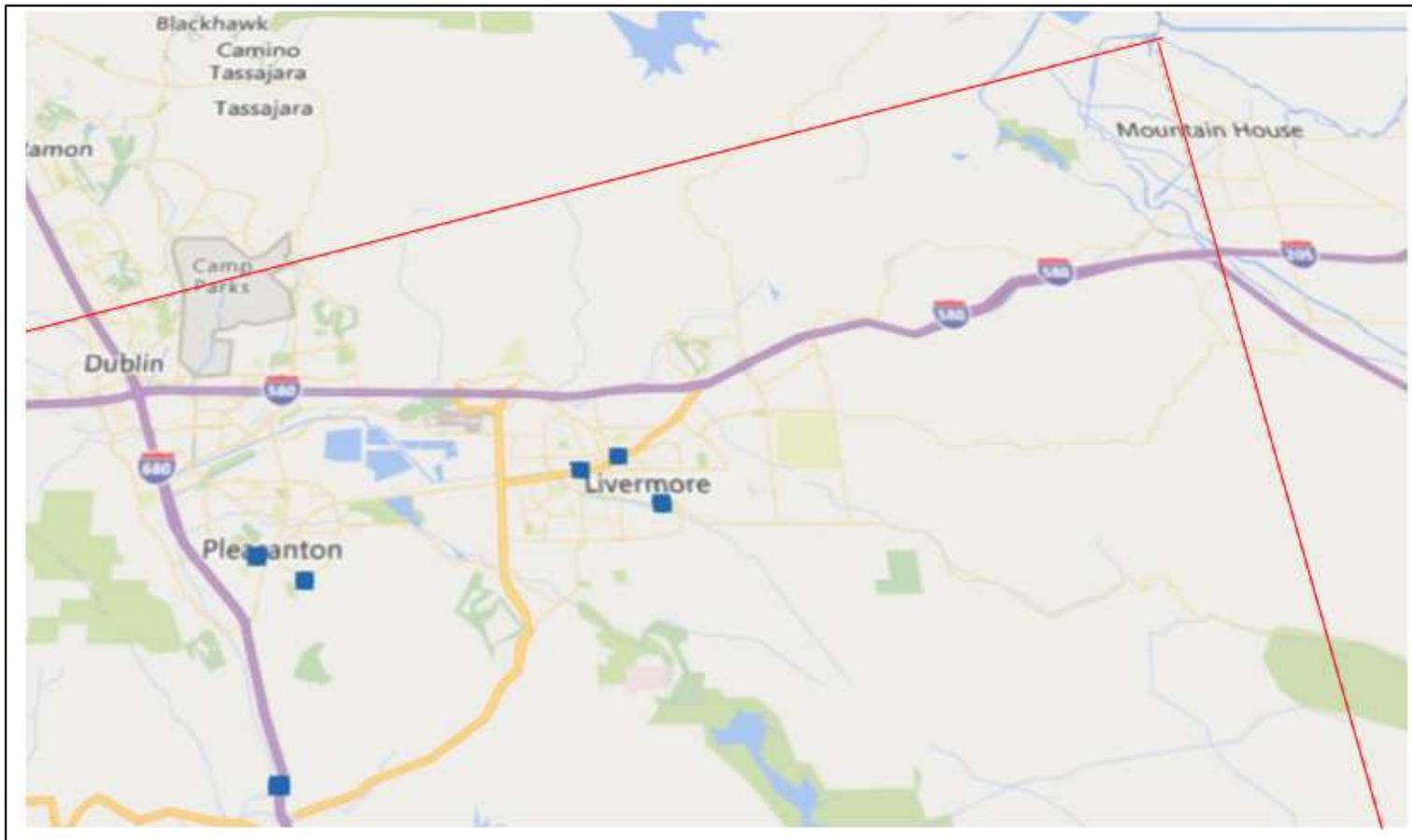
Stanford Health Care - ValleyCare

- Trauma service area has a current population of 350,118
- Includes San Ramon in Contra Costa County



East County Trauma Leaving ALCO

- In 2019, 6 patients transported by EMS from Alameda County to a trauma center in Contra Costa County



Stanford Health Care - ValleyCare

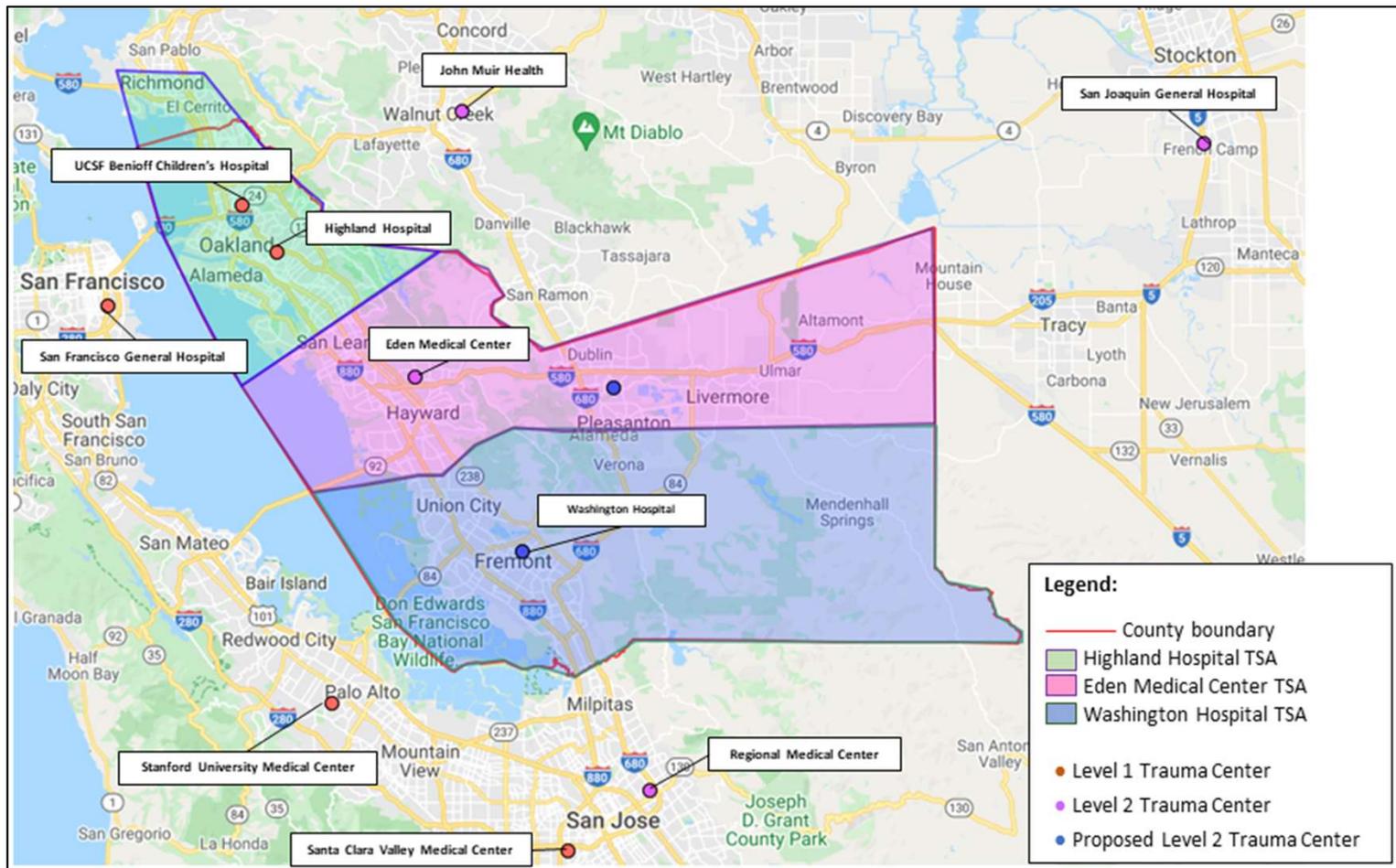
| | Total |
|--|------------|
| Alameda County Trauma Volume (From Eden) | 394 |
| Contra Costa County Volume (From John Muir) | 80 |
| Local Hospital Volume | 12 |
| SHC-VC Volume | 70 |
| Projected Admitted Volume | 556 |
| | |
| 2020 TSA Population: 350,118 | |
| 2040 TSA Population: 409,353 | |
| % Change: 17% | |
| Projected 2040 Admitted Volume | 651 |



- Located in Fremont
- ED volume of 53,000 visits in 2019 (pre-pandemic)
- 250 staffed beds
- 14 miles from Eden Medical Center
- Strong leadership and administrative commitment
- Years of investment and preparation to be trauma center

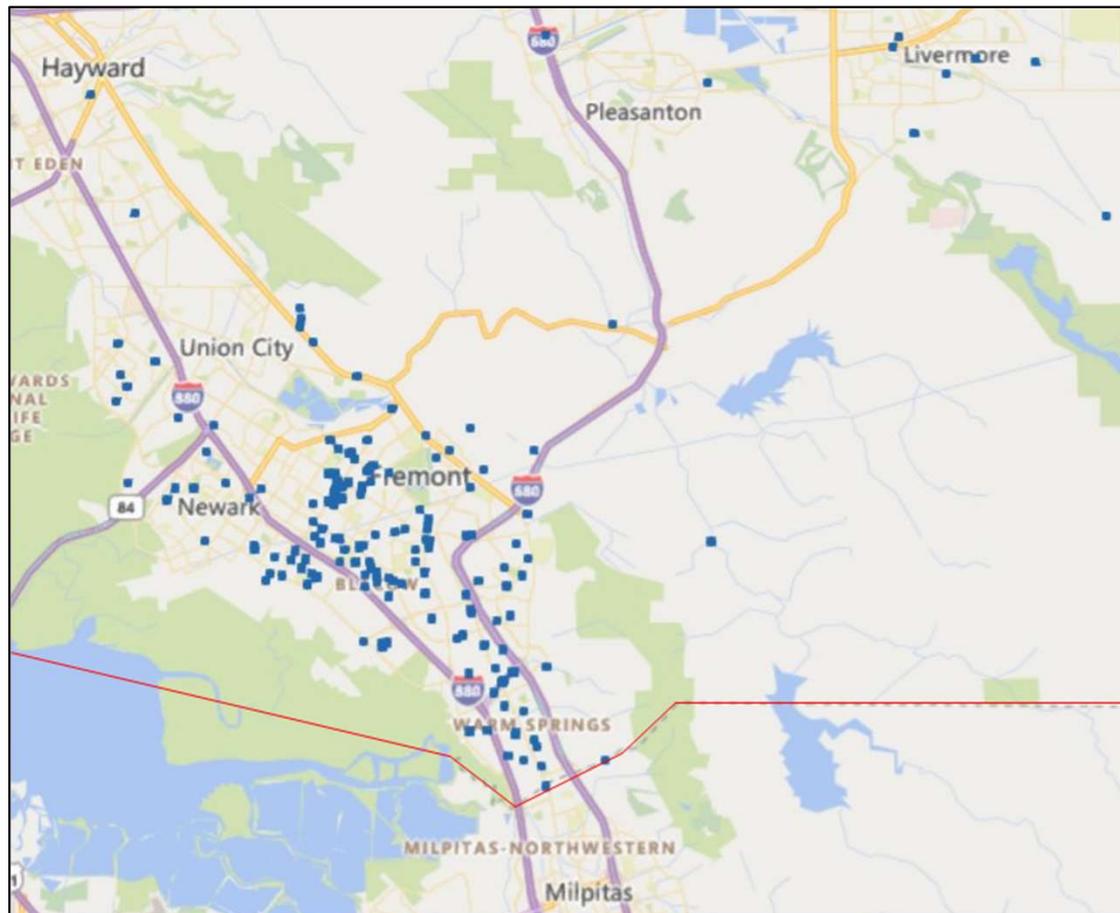
Washington Hospital Healthcare System

- Trauma service area has a current population of 415,231



South County Trauma Leaving ALCO

- In 2019, 272 patients transported by EMS from Alameda County to a trauma center in Santa Clara County



Washington Hospital Healthcare System

| | Total |
|--|--------------|
| Alameda County Trauma Volume (From Eden) | 350 |
| Alameda County Volume (From Santa Clara County) | 180 |
| Local Hospital Volume | 61 |
| WH Volume | 131 |
| Projected Admitted Volume | 722 |
| | |
| 2020 TSA Population: 415,231 | |
| 2040 TSA Population: 493,176 | |
| % Change: 19% | |
| Projected 2040 Admitted Volume | 859 |

Findings & Recommendations

Bishop+Associates make the following recommendations to the Alameda County EMS Agency:

1. Alameda County will need one additional Level II trauma center in the next 5 years.
2. Washington Hospital Healthcare District is equipped to meet the needs of more Alameda County residents and will meet the minimum trauma volume recommendation.
3. Stanford Health Care – ValleyCare could be considered as a trauma center in the next 10-20 years.