



EMS System Assessment Summary Briefing Report

Prepared for the Contra Costa County Board of Supervisors December 2023

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About Fitch & Associates

We've designed, developed, and managed some of the world's most innovative EMS systems, and we bring the energy, focus, and experience that drive decision-making and action.





We seek to partner with communities willing to ask the tough questions, that seek transparency and public input, and are interested in planning for the future in a sustainable manner aligned with community expectations.



Forty years of experience implementing innovative, customized solutions in the public safety and healthcare arenas, providing consulting services in thousands of communities in all 50 states, every Canadian province, and 12 other countries.

Project Background



Competitive RFP

California State statutes require the County to administer and oversee the EMS system through its local Emergency Medical Services Agency. Contra Costa County Health Services conducted a competitive RFP process from May - June 2022, for Consulting Services for the Assessment of the County's EMS System and for the Development and Management of a Request for Proposal for Ambulance Services for the next competitive cycle of emergency ambulance provider selection for ERA's I, II, and V.



Project Subject Areas

Specific areas of emphasis included clinical quality, operational efficiency, technology utilization, emergency medical dispatch, Medical Priority Dispatch System® use, response time performance, response time standards, contract compliance and oversight, and system revenues and expenses.



Consultant Selected

Fitch & Associates was selected to conduct a three-phase project that is projected to conclude before the current emergency ambulance contract expires on December 31, 2025.

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Project Phases



New Contract Begins January 1, 2026

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Summary Definitions

Contractor – the Contra Costa County Fire Protection District (CCCFPD), and the ambulance subcontractor American Medical Response (AMR), also known as the "Alliance," the current provider of emergency medical services for CCCEMS Response Zones A, B, C, and D.

Emergency Medical Dispatch – a medically directed system of protocolbased medical dispatch and communications designed logically and does not delay the activation of medical resources.

International Academies of Emergency Dispatch (IAED ™) – a universal standard establishing body for emergency responders to ensure consistent, high-quality care worldwide.

Local Emergency Medical Services Agency – an agency established according to the California Health and Safety Code to provide regulatory oversight of the EMS system, which includes coordinating activities, communications, quality improvement, and quality assurance activities, developing policies, protocols and providing medical direction for the agencies that provide EMS.

Medical Priority Dispatch System (MPDS ™) – a universal standard for emergency medical dispatchers for a broad range of field and triage responses—all while the first responders are on their way to the call location.

Project Subject Areas FITCH was tasked with nineteen "Project Subject Areas," lettered A – R, to evaluate as part of this assessment. Those subject areas were distilled into five key focus areas FITCH used to conduct the EMS System assessment.



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- Conduct Stakeholder Interviews
- 2 Identify Efficiencies of Services Provided
- **3** Obtain Detailed Impression of EMS Delivery
- 4 Conduct Analysis of Current Resource Use
- **5** Complete Commensurate Risk Analysis
 - Analyze Historical Response Data
- 7 Review System Finances

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Provide Executive Summary Report





Engage

Contra Costa County EMS Agency, EMS service providers, fire protection districts, first responder organizations, receiving facilities, and the community.



Model

Profile

The EMS system to understand the communications environment, performance requirements, and administrative procedures.



Evaluate

The service delivery model in use, current efficiencies, and opportunities.



Identify

Methods to improve 911 communications, clinical care, operational efficiency, contractual and EMS system oversight, and overall service delivery.



Approach

FITCH used a mixed-methods approach—using both quantitative and qualitative data collection and analysis—to triangulate findings across data sources for each assessment subject area and to provide multiple perspectives on the multi-dimensional opportunities explored in the report.



Approach to

ollection

Data

Quantitative

Quantitative data included publicly available data, aggregate response, transport, receiving facility, billing, collections, revenue, and expense data collected from the Contra Costa County EMS Agency, Contra Costa County Fire Protection District, and American Medical Response.



Qualitative

Qualitative data included interviews with EMS system participants and health system stakeholders to understand the current communications and EMS environment.



Time Period

Generally, data were sought for January 1, 2017, through December 31, 2022.

Project Service Area

Contra Costa County Ambulance Response Zones





EMS System Providers

Contra Costa County Fire Protection District (CCCFPD), with their ambulance subcontractor American Medical Response (AMR), also known as the "Alliance," provides emergency medical services to residents and visitors in the remaining portions of the county (Ambulance Response Zones A, B, C, and D).

Moraga-Orinda Fire District (MOFD) provides emergency medical services to residents and visitors in the Moraga-Orinda Ambulance Response Zone.

San Ramon Valley Fire Protection District (SRVFPD) provides emergency medical services to residents and visitors in the San Ramon Ambulance Response Zone.

The geographical focus area of this EMS System Assessment comprises the Ambulance Response Zones A, B, C, and D.

Executive Summary

- This Summary Briefing Report outlines findings and recommendations for how Contra Costa County can most effectively approach the provision of emergency medical services (EMS). This includes adopting policies and implementing contracts with the utmost confidence to meet community expectations with transparency and sustainability.
- The findings presented throughout this report were driven by comprehensive data analyses and guided by evidence-based best practices available in the industry literature, standards from accrediting bodies, and FITCH's forty years of EMS system review and design experience.
- Importantly, recommendations for system change toward optimization of the project focus areas were developed to facilitate a system that aligns with the six guiding principles of the EMS Agenda 2050.
- Overall, the firm's strategy is to provide the County with sufficient objective data to establish direction for the future of the EMS system. Therefore, all alternatives and recommendations are grounded in the data analysis and best practices, insulating the process from potential biases.

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911 Communications



Subject Area A.

Use of the Medical Priority Dispatch System (MPDS®) for a prioritized and tiered response.

Subject Area **B**.

Use of communications system, including dispatch and communications practices and configuration.



911 Communications



Strengths

Communications System Configuration

All ambulance resources are dispatched through the Contra Costa Regional Fire Communications Center (CCRFCC). The Richmond Police Department Communications Center (RPDCC) handles emergency medical dispatch for their response area. A direct CAD-to-CAD connection between CCRFCC and RPDCC allows for a bi-directional flow of call data for ambulance response.

Medical Priority Dispatch System (MPDS®)

Both communications centers use EMD-certified personnel and ProQA[™] software containing MPDS[™] protocols. In 2022, the CCRFCC achieved the Accredited Center of Excellence (ACE) designation from the IAED[™]. RPDCC achieved ACE designation in 2023.

Call Prioritization

CCCEMSA policy contains a minimum response matrix to dispatch ambulances based on the prospective priority (priority 1 or 3) assigned at dispatch (life-threatening responses, non-life-threatening responses, and non-life-threatening/non-urgent responses). Priority Interventions and a Minimum Response Matrix were developed by CCCEMSA medical director Senai Kidane, M.D., that guide communications activities.

Communications Systems

CentralSquare® Computer Aided Dispatch (CAD), Global Positioning System (GPS), and Automatic Vehicle Location (AVL) technology are utilized. The CCRFCC has invested in technology to ensure software and programs keep up with EMS system demands.

911 Communications



Recommendations

Communications System Configuration

Both communications centers should work with CentralSquare to identify how the call/nature code and time synchronization challenges can be corrected.

Medical Priority Dispatch System (MPDS®)

All 911 system participants should consider working with the CCRFCC and other PSAPs to implement the Advanced SEND Protocol from the IAED. The MPDS® Advanced SEND protocol guides EMDs to a more efficient and effective evaluation to record a reporting officer's on-scene assessment and send the most appropriate resources to them. It is designed to help answer calls for medical assistance from non-medical officers. This would have to be accomplished through collaborative efforts from CCRFCC, the other PSAPs, and law enforcement agencies. The Advanced SEND Protocol is used throughout the country.

Call Prioritization

The next contract should ensure that priority 2 responses are utilized and measured according to industry standards.

Communications Systems

When the Online Compliance Utility (OCU) monitoring system was implemented, there was no distinction made in the system for ALS and BLS units. CCCEMSA worked with FirstWatch to ensure that the OCU data monitoring capabilities allow for ALS / BLS tiered response system compliance monitoring. Once this is implemented, CCCEMSA and CCRFCC should work together to ensure the OCU is appropriately measuring EMD and response time compliance for the ALS / BLS tiered system.

EMS System Design



Subject Area C.

Response time and outlier performance standards, including ambulance response and density zone analysis.

Subject Area D.

Clinical oversight and performance measures.

Subject Area F.

Integration of non-emergency ambulance service providers into the system during disasters and low-level events.

Subject Area G.

Evaluation of a tiered BLS and ALS emergency ambulance response.

Subject Area N.

Options for sanctions/incentive structures to compel and encourage compliance with contractual standards.

Subject Area O.

Evaluation of the establishment of an EMS fund for fines and penalties to be used for EMS system improvements as identified by the EMS Agency.

Subject Area P.

Data and performance reporting requirements.



Historical Volume

Response & Transport Volume 2017 - 2022



Findings

- In 2022, the EMS service provider responded to 104,148 calls, which increased by 7.1% compared to 2021.
- From 2017 through 2022, the Compound Annual Growth Rate (CAGR) for responses was 4.6%.
- Responses that resulted in a transport accounted for 77% of the total responses.

EITC

System Volume Distribution



Geographic Distribution of EMS Volume 2022



Findings

FITCH utilized heat mapping to evaluate call activity and the current response density levels. This model allows for informed decisions on performance levels of response.

Color coding indicates various levels of responses within the service area.

- Red: these areas indicate a "hot spot" and a high number of responses.
- Blue: these areas indicate a mostly rural response and a lower number of responses.
- No Color: these areas received no requests for service or are not included in the zones that comprise this assessment.

From year to year, geographic volume distribution remained stable, and there were no identifiable shifts in patterns of demand.

EMS System Design



Strengths

Response Time Standards

The contract contains response time requirements, and our evaluation indicated all required elements are being measured and reported. From 2017 – 2021, the Contractor achieved the contractually required 90% response time compliance across all measured priority levels and in all zones. In 2022, the Contractor struggled to achieve 90% response time compliance. CCCEMSA waived nine of twelve months of penalties associated with instances of non-compliance.

Response Density Zones

CCCEMSA utilizes a comprehensive methodology that organizes response areas into Emergency Response Zones with high and lowdensity zones to develop total response time standards and measure response time compliance.

Clinical Performance & Measurement

The contract contains clinical performance measures, and the EPCR system allows for measuring clinical services in a performanceoriented manner. EMS providers transmit 12-Lead ECGs and send "STEMI Alerts" and "Stroke Alerts" to activate emergency departments. CCCEMSA and the Contractor participate in quality assurance activities and medical quality improvement committees.

ALS / BLS Contract Language & Efforts

The contract allows the Contractor to send BLS ambulances to requests for calls that meet specific EMD criteria and if CCCEMA policy supports the response model. In 2021, CCCEMSA allowed the contractor to utilize BLS resources to provide limited additional response resources at a critical time in the system. Nationally, this has occurred in several large EMS systems in the wake of similar issues.

Response Time Compliance Penalty Structure

The contract contains penalties if the response time standards are not met and for other instances of non-compliance.

EMS System Design



Recommendations

Response Zone Redesign

The current response density zone structure should be adjusted to reflect call density (to be conducted during phase 2).

Ambulance Patient Offload Time Strategies

The Alliance should continue working on an incremental time-based escalation process to ensure there is active communication and partnership to transfer patients. This includes patients being placed in the waiting room if the patient is stable at the 60 min time interval.

Clinical Performance Measures

The next contract's clinical performance measures should be updated to include an analysis of medical interventions provided to ensure compliance with established medical guidelines, provider skill performance benchmarking, documentation quality evaluation, and reported patient outcome data, and reviewed and adjusted on an annual basis.

ALS / BLS Model Evaluation

FITCH reviewed the 911 response review methodology utilized in the 2022 CCCEMSA EMD Study, and it aligns with methods used in comparable-sized EMS Systems with a tiered ALS / BLS response system. This methodology can guide the evolution of a tiered ALS / BLS response model in the County. The total number of BLS ambulances depends on the Minimum Response Requirement Plan implemented and developed in concert with Physician Medical Direction.

Response Time Compliance Penalty Structure & EMS System Enhancement Fund

The penalty structure should be revised in the next contract to include incentives and penalty forgiveness if certain clinical performance measures are met. The next contract should also contain an EMS Enhancement Fund, as previously described. This fund could be used to pay for enhancements such as HIE.

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EMS System Management

Subject Area E.

Deployment of ambulance response resources.

Subject Area I.

Recruitment and retention of highly trained and skilled paramedics and EMTs.

Subject Area J.

Disaster response capabilities, utilization, and training of ambulance strike teams.

Subject Area K.

Deployment model evaluation based on call volume patterns and receiving facility locations, including specialty service providers.

Subject Area L.

Air ambulance utilization.







10 – Minute Travel Time Staffing vs. Demand Analysis At 100% Staffing



10 – Minute Travel Time Staffing vs. Demand Analysis At 85% Staffing



Findings

Geo - Demand

Staffing

Demand - Below Standard Staffing

Demand - Needs Attention Staffing

Demand - Optimal Staffing

- The analysis evaluates demand by day of the week, beginning on Sunday and ending on Saturday (green and yellow bar graphs).
- The geographic requirement to meet the desired response time of 10-minutes (light blue), and then finally, the current staffing (red line).
- The system is under-resourced whenever the staffing line (red) is below the required demand (blue).
- At 100% staffing, the Contractor is adequatelyresourced throughout the day, although close to being under-resourced at 8:00 AM if the desired outcome is a 10-minute travel time.
- At 85% staffing, the Contractor is underresourced at 8:00 AM and 9:00 AM if the desired outcome is a 10-minute travel time.

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EMS System Management



Strengths

Ambulance Deployment

FITCH evaluated alternative deployment locations for an optimized configuration if the Contractor relocated deployment locations. This was done to determine whether the Contractor's deployment plans could be optimized to meet the response time performance requirements. Our GIS analysis of the distribution and concentration of response resources determined that the current strategic deployment locations can cover the historical demand within the specified travel time performance for each priority level. Current response time performance is monitored using the FirstWatch Online Compliance Utility (OCU) ™ response time performance monitoring and reporting system.

Recruitment & Retention of EMS Professionals

AMR has increased the amount it spends on crew wages per unit hour every year since 2018. Our analysis illustrated an increase of \$32.63 per hour, or a 44% increase when comparing 2022 to 2018, crew wages per unit hour. The Alliance developed a partnership with the county's workforce development board to actively recruit from underserved areas in the community.

Disaster Response Capabilities

The service area has a Multi-Casualty Incident Plan that establishes a standardized organization, management, and structure to coordinate emergency response to MCIs. Stakeholders reported that community planning events for emergency evacuations and disaster planning exercises were conducted regularly before the pandemic and have recently started again. The responsibility areas for mutual and automatic aid are identified and documented, and the Alliance maintains an active relationship with the surrounding agencies.

Air Medical Provider Utilization

Data reviewed indicated air medical use is appropriate and used to minimize the time interval to initiate critical care or time-sensitive procedures provided at the receiving healthcare facility. In the most recent three-year period, annual transport volume averaged less than 140 transports. CCCEMSA staff routinely evaluate air medical transport.

EMS System Management



Recommendations

Ambulance Deployment

The Contractor should analyze the effectiveness of its deployment plan at least quarterly to ensure move-up strategies are adequately covering the volume demands. Additionally, the Contractor should develop a separate BLS unit deployment plan to ensure adequate BLS resource distribution.

Surge Capacity Strategies

Future efforts to reduce instances of low resource availability should include considering the use of CCCFPD personnel to staff ambulances when the system status reaches a defined threshold. Considerations, if implemented, would include methods to cover backfill, CCCFPD minimum staffing, policies for direct overtime, unit hour costs, and additional liability-related concerns.

Recruitment & Retention of EMS Professionals

The Contractor should continue to explore grant opportunities and tuition support programs to supplement sign-on bonuses, relocation bonuses, and referral bonuses to support business and workforce planning initiatives.

Disaster Response Capabilities

Continue to conduct exercises to evaluate the EMS System participants' ability to respond to a large-scale event.

Air Medical Provider Utilization

Continue to evaluate whether air medical use is appropriate and used to minimize the time interval to initiate critical care or time-sensitive procedures provided at the receiving healthcare facility.

EMS System Evolution



Subject Area M.

Options for transport or diversion of ambulance transport of 5150 patients.

Subject Area H.

Integration of bidirectional health exchange between prehospital providers and receiving facilities

Subject Area Q.

Assess the feasibility of future community paramedic and mobile healthcare demands, including efficacy of on-scene treat and release models, alternate destinations and 911 nurse navigation.



EMS System Evolution

Strengths

Transport Alternatives for Behavioral Health Patients

The Contractor expressed their willingness to participate in experimental programs and processes that will ensure the safe and appropriate transport of 5150 patients and patients experiencing behavioral health emergencies.

Integration of a Health Information Exchange

The Contractor and hospital representatives that we spoke with indicated their willingness to participate in data exchange and the desire for a bidirectional health exchange between prehospital providers and receiving facilities. Three of nine EMS service providers or first responder organizations are currently using or transitioning to the same EPCR system, which will allow for an easier HIE setup in the long run.

Community Paramedic Feasibility

The Contractor expressed their willingness to participate in a community paramedic program or programs targeted to specific patient populations, and CCCEMSA indicated their support of these programs.

On-Scene Treat and Release Models

An increase in response and transport volume, overcapacity of emergency departments, staffing challenges, and lengthy ambulance patient off-load times (APOT) made ambulance availability a challenge. As a result, CCCEMSA and the Contractor implemented a treat and refer model.

Nurse Navigation

The Contractor expressed willingness to participate in a nurse navigation system.

EMS System Evolution



Recommendations

Transport Alternatives for Behavioral Health Patients

The County should explore appropriate non-EMS transport alternatives for behavioral health patients without medical complaints..

Integration of a Health Information Exchange

The County should explore funding opportunities to implement an HIE. The benefit for the EMS agencies participating (and the CCCEMSA and Medical Director) is that bi-directional exchange allows for the review of outcome information from patients encountered by the EMS system. EMS agencies across California and the United States are implementing connectivity with hospital EMRs and Health Information Exchanges to enable better care and coordination of patients served by the systems.

Community Paramedic Feasibility

As staffing improves, consideration can be given to implementing a community paramedic program. Legislation was passed in 2022 that allows specially trained paramedics to transport specific patients by ambulance to authorized mental health facilities, sobering centers, and veteran's administration emergency departments. Despite these allowances, the current regulations are extensively prescriptive, and currently, there are few counties that have undertaken measures to develop policies around this model.

On-Scene Treat and Release Models

Continue to monitor the efficacy of the current treat and refer program.

Nurse Navigation

The CCRFCC should consider having the IAED conduct an Emergency Communication Nurse System™ (ECNS™) eligibility assessment. The IAED will provide the top ten eligible ECNS codes and the percentage of total calls they believe would be eligible for nurse navigation.

EMS System Finances



Subject Area R.

EMS system financial analysis, including gross revenue, net revenue, payer mix, intergovernmental transfer supplemental payment programs, and EMS transport rates.





Charge & Collections Analysis



Findings

FITCH analyzed the gross and net charges, contractual adjustments, net collections, and net collection rate for 2019 -2022.

- The average net cash per trip was \$700.
- The average net charge per trip was \$1,128.
- The average gross charge per trip was \$2,887 (not pictured) .
- The average net collection rate was 62%.



Transport Rate Analysis

Ambulance Chargemaster Comparable Analysis Percentile Rank

Department	ALSE Base Rate	Percentile Rank of Field	Mileage	Percentile Rank of Field	BLSE Base Rate	Percentile Rank of Field
Contra Costa County	\$ 2,700.95	50%	\$65.29	59%	\$2,700.95	81%
El Dorado Co East	\$ 2,517.00	42%	\$63.00	50%		
San Fransico	\$ 2,405.00	25%	\$46.00	25%	\$2,405.00	67%
Berkley	\$ 3,331.40	92%	\$75.17	75%	\$3,331.40	89%
Alameda County	\$ 2,295.00	17%	\$51.78	33%	\$2,295.00	56%
Sacramento City	\$ 2,275.00	8%	\$41.00	17%	\$2,068.00	22%
Napa County	\$ 2,997.00	58%	\$97.00	100%		
Butte County	\$ 3,060.29	67%	\$69.72	67%	\$2,068.00	22%
Alpine County	\$ 3,191.89	83%	\$89.90	92%	\$2,263.74	44%
Santa Barbara	\$ 3,163.16	75%	\$61.80	42%	\$2,055.96	11%
Monterey County	\$ 4,128.49	100%	\$89.05	83%	\$3,990.00	100%
Ventura County	\$ 2,433.25	33%	\$64.75	58%	\$2,433.25	78%
Los Angeles County	\$ 2,710.00	50%	\$23.00	0%	\$1,687.00	

Findings

FITCH reviewed and compared Contra Costa County's EMS transport rates to twelve California municipalities with published rate data.

Overall, the current rates compare favorably when compared to other EMS transport agencies in California included in this analysis.

- The ALS Emergency rate ranked at the 50th percentile.
- The BLS emergency rate ranked at the 81st percentile.
- The Mileage rate ranked at the 59th percentile.



Payer Mix Analysis



Findings

- Medicare comprises 46% of transport volume and 34% of net collections.
- Medicaid comprises 26% of transport volume and 12% of net collections.
- Commercial Insurance comprises 14% of transport volume and 50% of net collections.
- Private Pay comprises 12% of transport volume and 2% of net collections.
- Other Government comprises 1% of transport volume and 3% of net collections.

EMS System Finances



Strengths

Gross & Net Charges

The gross and net charges increased year-over-year in three of the four years evaluated, with the exception being 2020, which aligns with what we have observed in comparable-sized systems due to transport volume decreases at the beginning of the pandemic. Gross and net charges averaged \$237,112 and \$92,670, respectively.

Net Collections & Supplemental Funding

The net collections increased year-over-year in three of the four years evaluated, with the exception being 2020, which aligns with what we have observed in comparable-sized systems, averaging \$58,318. The Contractor is a participant in the supplemental payment programs for which they are eligible.

Transport Rates

Emergency Ambulance rates are set and approved by the governing bodies of the participating fire districts in accordance with written agreements approved by the Contra Costa County Board of Supervisors. CCCEMSA monitors EMS reimbursement as the local authority regulating emergency and non-emergency care and transport services throughout the County. The rates are favorable compared to agencies we evaluated throughout the state.

Payer Mix

The percentage of net collections that comes from commercial insurance has remained steady, averaging 50%.

System Expenses

The subcontractor has increased the amount it spends on crew wages per unit hour every year since 2018. This is one of many contributing factors that have significantly increased operating expenses to provide emergency medical services in the past twelve months.

EMS System Finances



Recommendations

Gross & Net Charges

Continue to monitor contracted billing revenue cycle performance.

Net Collections & Supplemental Funding

The Contractor should monitor changes to their reimbursement for VA patients and for any changes in government supplemental funding.

Transport Rates

Continue to evaluate Emergency Ambulance rates on an annual basis.

Payer Mix

None.

System Expenses

If a Contractor-Subcontractor arrangement with a leased unit hour rate payment schedule is selected for the next contract cycle, the unit hour rate paid to the subcontractor should be reviewed on a quarterly basis to ensure expenses do not outpace collections from transport activities.



Draft RFP Developed – 8/23



- 2 Draft RFP Reviewed & Approved by BOS 3/24
- **3** Draft RFP Reviewed & Approved by EMSA 4/24
- RFP Released 5/24
- **5** Pre-Proposer's Conference 5/24
- 6 Q & A Period 6/24
- **7** RFP Proposal Responses Evaluated 8/24
- 8 Contract Awarded 9/24
- 9 Contract Negotiations 9/24
- **10** Contract Begins 1/26



FITCH A ASSOCIATES

Thank You

FITCH wishes to thank all those who contributed to the Contra Costa County EMS System Assessment. EMS System participants spent countless hours engaging with our team, providing valuable insight into the local emergency medical services environment, and this report would not be possible without their time, energy, and thoughtful efforts.

We appreciated the collaborative spirit of everyone who participated and applaud their endeavors to improve healthcare throughout the County. We also extend our sincere gratitude to the EMS providers, firefighters, law enforcement officers, telecommunicators, and all the public safety agency support staff serving the citizens of Contra Costa County each day.