

DRAFT REPORT – ALS FIRST RESPONDERS FEASIBILITY STUDY

APRIL 14, 2025

RICHMOND, CALIFORNIA



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INTRODUCTION AND EXECUTIVE SUMMARY

INTRODUCTION

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The City of Richmond retained Matrix Consulting Group Ltd. to conduct a feasibility study on becoming an advanced life support (ALS) first responder in the Contra Costa County emergency medical services (EMS) response system. This report includes the project team's research and analysis of the Richmond Fire Department (RFD), the Contra Costa County EMS Authority (CCEMSA), and the requirements for transitioning from a basic life support (BLS) first responder to an ALS first responder.

SCOPE OF WORK

The study included the project team obtaining additional information from the Richmond Fire Department to update our understanding of their staffing, deployment, and performance since completing the Public Safety Services Study conducted in 2022. This project focused on several key elements, including:

- Reviewing relevant data and statistics
- Analyzing options for providing ALS/Paramedic First Responder services
- Developing implementation timelines
- Developing financial estimates
- Developing draft and final reports

The project team utilized several approaches to complete this study. These are described in the next section.

APPROACHES UTILIZED IN THE STUDY

The project team used several approaches to fully understand the current service environment, what options were available to the City, and the current requirements if it were to become an ALS First Response agency. These included, but were not limited to:

- Interviews with Fire Department leadership, Contra Costa County EMS Authority personnel, Contra Costa County Fire Protection District leadership, and others involved in the oversight, delivery of EMS services, and EMS training in the County.
- Data was collected from the City, Department, County, CCCEMSA, and other sources to understand, document, and forecast service needs and costs for transitioning from a BLS to ALS First Responder.

- Data was initially summarized into a descriptive profile of the Richmond Fire Department, which was submitted and reviewed to ensure the project team had a factual understanding of the current state of services provided.
- Additional data was requested, reviewed, and analyzed during the study to answer questions regarding EMS service delivery options.

Throughout the process, findings were reviewed with Department staff.

EXECUTIVE SUMMARY

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The Fire Department serves the City of Richmond, in northwest Contra Costa County along the San Francisco Bay, from seven (7) fire stations. It uses a combination of staffed command, engine, and truck companies. Specialty services are staffed by personnel from the engine and truck companies who cross-staff specialty apparatuses when needed.

The City encompasses nearly 56 square miles, of which 22.2 are water and the remaining 33.8 are land. Based on the 2020 population of 116,448 and 33.8 square miles of land, the overall population density for the city is approximately 3,425 people per square mile. Richmond has a Chevron Oil refinery, an Amtrak station, and the Port of Richmond, a deep-water port. The City also has interstate highway and railroad systems.

OVERVIEW OF CURRENT SERVICES

Richmond is the only BLS First Responder service agency in Contra Costa County. All other fire and EMS service providers provide advanced life support services. American Medical Response (AMR) provides ALS transport services through a contract with the Contra Costa County Fire Protection District.

According to estimates from the United States Census Bureau, the City's population has increased by approximately 14% since 2010. This includes a significant increase in residents in the over-60 age group (5.1%). This age group is typically a substantial user of prehospital care due to declining health and other medical conditions. While the current model of EMS service delivery has historically met service expectations, the City is facing significant challenges that make transitioning to an ALS First Responder service provider a viable option for the long-term success of the emergency medical services response system. These include:

- Increased EMS call volume
- Long ambulance response times
- Community expectations and patient outcomes

These issues make exploring the feasibility of becoming an ALS service provider a vital consideration for the City.

KEY FINDINGS RELATED TO ALS FIRST RESPONDER SERVICES

The project team concluded that implementing an ALS first responder program within the Richmond Fire Department is feasible and beneficial for the City. Several key findings illustrate the potential service improvement, outcomes, and system efficiency that led to this conclusion.

- Faster delivery of critical care Equipping RFD apparatus with paramedics allows for delivering essential patient care. This includes cardiac monitoring, airway management, intravenous (IV) therapy, and medication administration.
- Improved patient outcomes National studies show that ALS-level care provided early in the treatment of patients correlates with higher survival rates and better long-term recovery, particularly for cardiac arrest, respiratory failure, and trauma cases.
- Enhanced operational flexibility Providing ALS first responder services allows the Richmond Fire Department to manage high-acuity incidents more independently by reducing reliance on the availability of external partners to deliver critical care. It improves system resilience during times of high surge demand or disasters.
- Increased public trust and service equity Residents and visitors to the City will have greater confidence that advanced medical care will arrive quickly, regardless of the service area or time of day.

IMPLEMENTATION AND COST CONSIDERATIONS

The project team recommends the following implementation steps over a 67-month timeframe and the cost of becoming an ALS first responder service provider.

- Quick Response Vehicles (QRV) The initial delivery of ALS services should begin with the deployment of QRVs, allowing ALS service delivery while existing firefighters are trained as paramedics.
- ALS deployment As paramedics are trained, engine companies at the stations with the highest EMS call demand should be staffed initially, followed by stations with longer response times.
- Personnel Paramedic training, recruitment, and retention will be critical factors to the success of the ALS delivery system.
- Medical Oversight—Robust clinical oversight, including a designated medical director and quality assurance processes, will be required. The current medical director will continue to serve as the medical director, but the city will need to create an EMS supervisor position.

The following table illustrates the total costs over the 67-month implementation timeline.

Total ALS first responder transition cost

Timeframe	Cost
Months 1 - 18	\$5,515,470
Months 19 - 36	\$971,846
Months 37 - 54	\$1,020,438
Month 55 - 67	\$273,905
Total Transition Cost	\$7,781,659

TOTAL ALS FIRST RESPONDER TRANSITION COSTS

As illustrated above, the total estimated cost to transition from a BLS first responder agency to an ALS first responder is \$7,781,659.

ONGOING COST CONSIDERATIONS

Once all the implementation costs have been incurred, there will be ongoing costs associated with being an ALS First Response agency. These costs include increased paramedic salaries, medical equipment and supplies costs, and QRV replacement costs.

The following table illustrates the annual cost estimates for each of these categories.

Item	Cost
EMS Supplies and Equipment	\$36,000
Salary Increases	\$541,000
QRV Replacement Avg Cost	\$33,000
Total Annual Cost Increases	\$610,000

TOTAL ONGOING ANNUAL COST INCREASES

As illustrated above, the total annual cost increase for providing ALS First Responder services is estimated to be \$610,000.

REVENUE OPPORTUNITIES

As stated earlier in the report, Measure H's estimated annual revenue for Richmond is \$215,586. This is \$394,000 less than the anticipated annual costs to provide ALS First Responder Services.

In California, there is also the opportunity to bill for first responder ALS services. For example, in Sonoma County, insurance companies are billed either fully or partially for first responder medical services, even if no patient transport occurs. The exact financial impact to Richmond would depend on several factors related to billing for the service, these include:

- First Responder Fee This is a fee charged for responding to 9-1-1 calls, performing medical assessments, and providing care, even if no patient transport occurs.
- Insurance Coverage Charging insurance coverage for first responder services, fully or partially. Some communities choose to accept payment for residents only in the amount insurance will pay as they support the EMS system through tax dollars. Non-residents are expected to pay the full amount.
- Medicare and Medi-Cal Medicare and Medi-Cal generally do not cover First Responder Benefits, and unpaid balances must be waived.
- Billing Procedures Billing can either be done as an internal City service or through a designated third-party billing agency. Due to the complexity of medical billing and frequently changing regulations, most communities choose to use a 3rd-party billing service specializing in medical billing.

PROJECT RECOMMENDATIONS

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The following recommendations, resulting from this study, allow the City to move forward with implementing ALS First Responder in the Fire Department.

Work with Local 188 to allow staffing of QRVs with stand-alone paramedics who are not part of the firefighter's bargaining unit.

Work with Local 188 to develop a pay scale for paramedics. Based on comparative research, the project team recommends incentive pay of 11.5% of base pay for personnel in the Fire Department licensed as paramedics.

Work with the CCCEMSA to finalize the agreement to be an EMS first responder in the County and develop a plan for using Measure H funds to assist in funding the required equipment, supplies, and training needed for transitioning from a BLS to ALS first responder.

Create and hire an EMS Supervisor position in the Fire Department.

Once ALS First Responder services begin, develop a plan for billing for ALS services.

CONCLUSION

Investing in an ALS First Responder program will position the City of Richmond to deliver faster, more effective emergency medical care in the community. This will align the city with other communities in Contra Costa County in terms of EMS service delivery and reinforce RFD's critical role in providing frontline emergency services.

This investment by the City Council, City Administration, and Fire Department leadership will not only provide operational enhancements but also show a strategic commitment to improving health outcomes and life-saving efforts in the City.

OVERVIEW OF CURRENT SERVICES

OVERVIEW

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This chapter provides an overview of the Richmond Fire Department (RFD) 's current operations and the major services, staffing, and deployment of the department's operations division. The information was developed from data provided by the Fire Department for analysis by the project team.

BACKGROUND

In 1901, after a significant fire event, it was decided that the community needed fire protection, and a volunteer fire service was created. 1902 brought about the purchase of the first fire engine, a chemical fire engine. This type of engine was purchased because water supply had not yet been established in the city. Eventually, there were a total of five volunteer departments created to serve the city. After functioning as a volunteer department for over a decade, the Richmond Fire Department became a full-time fire department in 1915.

The Fire Department serves the City of Richmond in northwest Contra Costa County along the San Francisco Bay. The city encompasses nearly 56 square miles, of which 22.2 square miles are water and the remaining 33.8 land. The city's overall population density is approximately 3,425 people per square mile based on the 2020 population of 116,448 and 33.8 square miles of land. Within Richmond resides a Chevron Oil refinery, an Amtrak station, and the Port of Richmond, a deep-water port. The city is also well served by both interstate highway and railroad systems.

The city is governed by six (6) elected Council members and a separately elected Mayor who is also a council member. The City also has a City Manager, selected by the Council, who oversees city operations and department heads. The Fire Chief and staff are responsible for the day-to-day operations of the Fire Department.

DEMOGRAPHIC PROFILE

The following table illustrates the demographic profile of the City of Richmond and the changes that have occurred since the 2010 Census.

CITY OF RICHMOND DEMOGRAPHICS

U.S. Census Bureau	2010	2015	2020	
Estimated Richmond Population	102,264	107,597	116,448	
Median Age	34.5	35.2	37.2	
Children Under Age 5	7.2%	7.2%	5.6%	
Children Ages 5 to 19 years	21.5%	18.7%	18.3%	
Persons Age 20 to 59 years	56.8%	57.3%	56.4%	
Persons Age 60 and Over	14.5%	16.7%	19.6%	
Median Income	\$27,646	\$26,335	\$32,714	
Employn	nent Sectors:			
Education, Health Care, Soc. Svc.	21.8%	20.7%	22.8%	
Retail Trade	10.8%	11.8%	9.4%	
Professional, Scientific, Mgmt.	11.1%	13.5%	14.9%	
Finance, Insurance, Real Estate	7.2%	5.1%	4.0%	
Entertainment, Recreation, Food	10.1%	12.0%	11.7%	
Construction	8.5%	9.2%	9.4%	
Manufacturing	7.1%	5.7%	4.8%	
Transportation, Warehousing, Util.	7.1%	5.5%	7.5%	
Public Administration	4.4%	4.0%	3.7%	
Other Services	5.7%	6.9%	6.5%	
Wholesale	2.9%	2.7%	2.7%	
Information	2.7%	1.9%	2.2%	
Agriculture, Forestry, Fishing	0.5%	1.1%	0.6%	

The city's population has increased approximately 14% since 2010, adding an estimated 14,184 residents. The largest change between the age groups is the over-60 age group, with a 5.1% increase. Additionally, there was a 4.8% decrease in the combined categories under 20 years of age. The city's median age has risen to 37.2 years, which is an increase of 2.7 for the past nineteen years.

The following map provides a view of population density by census blocks.

US CENSUS 2020 POPULATION DENSITY MAP



Population densities are significantly higher in the areas west of I-80 and more evenly dispersed in the east. The greatest density is in the center of the incorporated area bordered by I-80 and Richmond Pkwy. A few pockets of higher density exist throughout the eastern portion of the City.

FIRE DEPARTMENT ORGANIZATION

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The RFD operates with a Fire Chief, Deputy Chief, and three Battalion Chiefs as the department's command officers. The Battalion Chiefs, who report directly to the Deputy Chief, manage three shifts that work a 48-hour on and 96-hour off schedule. Shifts begin and end at 0730 hours. Each shift is made up of one Battalion Chief, eight Captains, eight Engineers, and ten Firefighters.

The Department provides Basic Life Support (BLS) First Responder services from each of the city's fire stations. Advanced Life Support (ALS) transport services in Richmond are provided by American Medical Response (AMR), West, Inc. through a contract with the Contra Costa County Fire Protection District. This ensures paramedic-level care can be provided to patients with life-threatening emergencies. It is important to note that Richmond is currently the only agency in Contra Costa County that does not provide ALS first responder services to support the ALS transport system.

The Richmond Fire Department currently has ten (10) personnel certified as paramedics. This includes 1 Battalion Chief, 4 Captains, 3 Engineers and 2 Firefighters.

Other ground transport service providers in the County include Moraga-Orinda Fire and San Ramon Valley Fire Protection District.

RFD MISSION STATEMENT

The Richmond Fire Department is a dedicated workforce of highly motivated and technically skilled professionals of rapid response. It is our purpose to protect life and preserve property. We are a profession that knows no limit to what we will respond to, and we prepare without constraint to meet the challenges of our chosen profession. The citizens, businesses, and visitors to the City of Richmond can expect a caring, courteous, and competent response when rendered our aid.

The organizational chart that follows illustrates the current Fire Department organization.

RICHMOND FIRE DEPARMENT ORGANIZATIONAL CHART



OPERATIONS

This section provides an overview of the emergency operations of the Richmond Fire Department.

PHYSICAL RESOURCES

Service to the City is provided from seven (7) fire stations located throughout the incorporated city limits. The following map illustrates the location of the fire stations serving the City.



The fire department is authorized to employ 89 personnel, of which 86 positions are currently filled. Each operational shift staffs seven engine companies and one truck company, with a minimum of 3 personnel on each apparatus. Including the Battalion Chief, each shift has a minimum staffing of 25 personnel. In addition to fire suppression, the department provides hazardous materials response, technical rescue, BLS medical first responder, marine response, fire prevention, and fire investigations. The fire department utilizes both automatic and mutual aid. The primary automatic aid departments are El Cerrito, south of the city, and Contra Costa County Fire, in the north. The City of Berkeley and the City of Albany provide mutual aid when called.

The tables that follow outline the apparatus and staffing for the station.

RICHMOND FIRE DEPARTMENT STATION DETAIL

Station 61

140 West Richmor	nd Avenue			
	Staf	fing		
Unit ID	Resource Description	Scheduled Minin		
Engine 61	2008 - Spartan Gladiator Type 1 Engine	3	3	
BA 61	2004 – Spartan Metro Breathing Support		Cross Staffed	
Fire Boat	2013 – Moose Vessel M2-37		Cross Staffed	
Marine Truck	2008 – Ford F-150		Cross Staffed	
	2008 – Spartan Gladiator Type 1 Engine	R	eserve Engine	

Station 62

1065 7th Street			
	Assigned Apparatus	Staf	fing
Unit ID	Resource Description	Scheduled	Minimum
Engine 62	2020 - Spartan Gladiator Type 1 Engine	3	3
Brush 62	2001 – Chevrolet 3500 Type 6 Engine		Cross Staffed
	2008 – Spartan Gladiator Type 1 Engine	R	eserve Engine

Station 63

5201 Valley View R	oad		
	Assigned Apparatus	Staf	fing
Unit ID	Resource Description	Scheduled	Minimum
Engine 63	2012 - Spartan Metro Star Type 1 Engine	3	3
Brush 63	2009 – Ford F-450 Type 6 Engine		Cross Staffed

140 Richmond Avenue				
	Assigned Apparatus	Staf	fing	
Unit ID	Resource Description	Scheduled	Minimum	
Engine 64	2020 - Spartan Gladiator Type 1 Engine	3	3	
Truck 64	2008 – Spartan Gladiator Aerial Ladder	3	3	
Battalion 64	2015 – Ford Explorer Command Vehicle	1	1	
Haz-Mat 64	2005 – Spartan Metro Star Haz-Mat		Cross Staffed	
Notes	Houses the on-duty Battalion Chief			

Station 64

Station 66

4100 Clinton Avenue

Assigned Apparatus		Sta	ffing
Unit ID	Resource Description	Scheduled	Minimum
Engine 66	2020 - Spartan Gladiator Type 1 Engine	3	3
Brush 66	2021 – Chevrolet 3500 Type 6 Engine		Cross Staffed

Station 67

1131 Cutting Road Assigned Apparatus St Unit ID Resource Description Scheduled Engine 67 2019 - Spartan Gladiator Type 1 Scheduled Engine 2015 - Spartan Metro Star Heavy Star Heavy

 Rescue 67
 2015 – Spartan Metro Star Heavy Rescue
 Cross Staffed

 2008 – Spartan Gladiator Type 1 Engine
 Reserve Engine

Station 68

2904 Hilltop Road			
Assigned Apparatus		Staf	fing
Unit ID	Resource Description	Scheduled	Minimum
Engine 68	2019 - Spartan Gladiator Type 1 Engine	3	3
Brush 68	2009 – Ford F-450 Type 6 Engine		Cross Staffed
Rescue 68	1999 – Navistar Rescue Ambulance		Cross Staffed
Truck 68	2001 – Spartan Gladiator Aerial Ladder		Cross Staffed

Staffing

3

Minimum

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HISTORICAL EMS WORKLOAD

The Richmond Fire Department responds to emergency and non-emergency medical calls for service. The following table illustrates the RFD's emergency medical workload over the last three years related to EMS call demand.

EMS RELATED CALLS FOR SERVICE

Call Type	2021	2022	2023	Total	Pct.
Auto Accident	772	779	785	2,336	7.9%
Medical Calls	7,573	9,414	10,015	27,002	91.9%
Total Medical and Auto Accidents	8,345	10,193	10,800	29,362	99.8%
Rescue Calls	40	11	6	57	0.2%
All Rescue Calls	40	11	6	57	0.2%
Total EMS Calls for Service	8,385	10,204	10,806	29,395	100%

Overall, medical calls combined with auto accidents represent 99.8% of the total call volume related to emergency medical calls. Rescue calls account for the other 0.2%.

The following table displays the total number of EMS-related calls for service handled by the Richmond Fire Department by each hour and day of the week for the past two years. Both emergency and nonemergency calls were included to provide an overall view of demand on the emergency services system.

Day/Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
12a	120	91	88	87	85	88	100	659
la	121	77	80	77	80	85	78	598
2a	89	76	76	75	66	73	80	535
3a	71	62	73	64	73	67	77	487
4a	62	62	60	73	60	61	54	432
5a	72	66	72	65	64	72	66	477
6a	80	85	87	76	72	80	75	555
7a	82	101	110	106	93	94	88	674
8a	90	145	138	117	124	117	106	837
9a	125	132	160	140	158	168	122	1,005
10a	140	165	165	183	154	155	143	1,105
11a	151	176	152	146	179	183	150	1,137
12p	164	177	188	165	157	160	147	1,158
lp	179	162	147	148	185	178	164	1,163
2р	166	178	173	151	157	164	145	1,134
3р	149	155	161	155	155	179	173	1,127
4р	172	169	154	126	151	167	172	1,111
5p	149	188	156	132	179	172	158	1,134

2022 - 2023 EMS CALLS FOR SERVICE BY HOUR AND WEEKDAY

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Day/Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
6р	160	157	148	151	176	155	135	1,082
7p	154	144	150	149	145	142	157	1,041
8p	145	160	146	130	138	158	152	1,029
9p	120	133	145	149	146	134	161	988
10p	115	107	117	118	112	143	138	850
11p	113	102	84	102	99	103	113	716
Total	2,989	3,070	3,030	2,885	3,008	3,098	2,954	21,034

The following chart further illustrates the demand for service for EMS calls by hour of the day.



As illustrated above, calls continue to increase through the morning hours and remain steady throughout the day, peaking at 1 pm. The calls begin to decline at the 7 pm hour and sharply decline at the 11 pm hour. Calls then continue to decline, with 4 am being the slowest hour of the day.

ANALYSIS OF ALS FEASIBILITY

Nationally, there has been considerable effort in data collection, analysis, and the eventual development of performance objectives for delivering emergency medical services. This effort is critical for local governments to decide on the deployment, level of service provided, and location of emergency resources. The objectives promoted for Fire/Rescue and EMS providers have their basis derived from research that has been conducted on two critical issues:

- What is the impact of the passage of time on survivability for victims of cardiac arrest?
- What is the crucial point in a fire's "life" for gaining control of the blaze while minimizing the impact on the structure of origin and those around it?

For this study, the impact of time of survivability for victims of cardiac arrest is the most critical component in the City of Richmond, determining whether the implementation of ALS first responder services in the City will improve the potential outcome of critical medical and traumatic events occurring in the community.

EMERGENCY MEDICAL SERVICES

The delivery of emergency medical services is a function of the emergency services system that must be considered. Emergency medical calls are rising, and the types of calls are wide-ranging. However, as a part of a community's healthcare system, one of the primary factors in the design of the emergency medical response is the ability to deliver basic CPR and defibrillation to victims of cardiac arrest.

CARDIAC ARREST

A recent study involving 7,623 out-of-hospital cardiac arrest patients examined survival rates based on bystander CPR and ambulance response times¹. The study reinforces community-based CPR training and the response time for emergency services. The following chart illustrates the abrupt reduction in survival rates for each delayed minute.

¹<u>https://www.ahajournals.org/doi/full/10.1161/circulationaha.116.024400#:~:text=The%20contrast%20in%2030</u> %2Dday,higher%20associated%20with%20bystander%20CPR.



The importance of rapid response times in emergency medical services (EMS), particularly in cases of sudden cardiac arrest, includes the following key points:

- Survival rates for cardiac arrest decrease by approximately 10% for each minute that passes before CPR and/or defibrillation is initiated.
- The recommended response times are within 4 minutes for basic life support (BLS) and 8 minutes for advanced life support (ALS).
- EMS aims to provide BLS within 6 minutes and ALS within 10 minutes of an incident, including detection, dispatch, and travel time. This forms the basis for a two-tier system where fire resources act as first responders, with additional ALS assistance provided by ambulance units. If ALS response is delayed and ALS services cannot be delivered within 8 minutes of notification, the City should consider implementing ALS first responder services to improve the delivery of rapid advanced life support treatment in the community.
- Recent research shows the significant impact of rapidly deploying automatic defibrillators (AEDs) to cardiac arrests, especially when combined with early CPR.
- However, these studies focus on a small fraction of EMS responses, as non-cardiac events make up most calls. The research on cardiac arrest survival does not address the need for rapid intervention in these cases.

STROKE

According to the American Stroke Association (ASA)², it is critical to get medical attention "right away" to minimize the long-term effects of a stroke and prevent death. Acute stroke care begins before arrival to the hospital, and according to the National Library of Medicine in a 2022 article³, several prehospital factors are critical in influencing overall patient care and poststroke outcomes; these include:

- Recognition of stroke symptoms
- Activation of emergency medical services (EMS)
- EMS practitioner stroke identification
- Subsequent decision-making by EMS is related to patient care.

The first point of contact between a layperson and the pre-hospital care system is typically a calltaker/emergency medical dispatcher. The dispatcher has a condensed period to gather information, determine the type of emergency, and dispatch the appropriate response units. It is recommended that these events occur within one minute of the emergency call being received.

The following key factor is the responding personnel identifying the medical issue as a stroke and transporting the patient to an appropriate hospital capable of providing appropriate stroke care. Research shows that up to one in three strokes diagnosed in the emergency department were not recognized in the prehospital setting. This illustrates the importance of appropriately trained prehospital care providers recognizing the symptoms of a stroke and ensuring transport to the most appropriate hospital for immediate treatment.

TRAUMATIC EVENTS

According to the National Institute for Health, most prehospital emergency systems have historically relied on providing trauma care through input and experiences from military medicine and have modeled treatment after existing military procedures.⁴

Trauma is the leading cause of death for persons under the age of 40. Therefore, it is essential to optimize trauma care in the field when a patient encounters medical care providers. Prehospital treatment can significantly alter patient outcomes. As advances in therapy and management of trauma patients are developed in the hospital setting, this information and treatment advances are provided to EMS personnel.

² https://www.stroke.org/en/about-stroke/types-of-stroke/is-getting-quick-stroke-treatment-important

³ https://pmc.ncbi.nlm.nih.gov/articles/PMC11050637/

⁴ https://pmc.ncbi.nlm.nih.gov/articles/PMC3209988/

While there are many different patterns in trauma patients, loss of airway or breathing is the most rapid form of death. The airways of severely injured patients need to be secured as soon as possible. Advanced airway management in the prehospital setting, such as intubation, is typically limited to personnel certified in advanced life support. The next critical need for many patients of a traumatic event is the need to provide intravenous access due to blood loss. This is a standard treatment in the prehospital environment but is limited to paramedics and advanced life support personnel.

The critical establishment of airway management and intravenous therapy in the prehospital setting justifies the investment in ALS first responder services.

CRITICAL TASKS IN PATIENT CARE

Several tasks must occur simultaneously to treat persons experiencing severe traumatic or medical events effectively. A task analysis for emergency medical calls analyzes three types of calls or patient conditions. These three types of calls usually require the most effort from the response team. Other calls or patient types can generally be handled with two or three personnel. Many times, especially in trauma calls, there are multiple patients. The following table outlines the tasks for assisting these critical patients and the number of responders required for a successful outcome. It is important to note that the same personnel accomplish some tasks, so the total is not a simple addition to the positions stated.

Critical Task	Cardiac Arrest	Cardiac Stroke Arrest	
Patient Assessment	2 per patient	2 per patient	2 per patient
Airway	2 per	2 per	2 per
Management/Intubation	patient	patient	patient
Cardiac Defibrillation	1	N/A	N/A
CPR	1	N/A	N/A
EKG Monitoring	1	1	1
IV/Pharmacology	1	1	1
Splint/Bandage/Immobilization	N/A	N/A	1
Patient Lifting/Packaging	2-4	2 – 4	2-4
Medical Information Collection	1	۰ T	1
Total per Patient	6 - 8	5 - 7	6 - 8

CRITICAL TASKS FOR EFFECTIVE PATIENT CARE

As illustrated above, it takes up to eight (8) personnel to effectively perform the functions needed to treat persons experiencing cardiac arrest, stroke, or serious traumatic events. Several of these, including intubation, EKG monitoring, and IV/pharmacology therapy, required ALS-trained personnel to deliver.

INTEGRATION OF ALS FIRST RESPONSE

This chapter examines the options for integrating ALS First Response services into the Richmond Fire Department's operations.

CURRENT SERVICES

As illustrated earlier in the report, the Richmond Fire Department currently provides Basic Life Support (BLS) first responder services by personnel assigned to operations. They are the only agency in Contra Costa County that does not provide Advanced Life Support (ALS) services by using engine companies staffed with paramedics to provide ALS first responder service delivery consistently. ALS transport services are provided through the Contra Costa County Fire Protection District (CCCFPD) under a contract with American Medical Response, West, Inc. (AMR) for paramedic-level care and hospital transport service as needed. The Moraga-Orinda Fire District and San Ramon Valley Fire Protection District also provide ALS transport services using cross-trained firefighter-paramedics.

OVERVIEW OF PREHOSPITAL SERVICES IN CONTRA COSTA COUNTY

Richmond is located on the western shore of Contra Costa County and is the largest city in the county's western portion. Currently, eight (8) fire departments and fire protection districts provide ALS first responder services. The following table illustrates the service providers, population served, number of stations, and EMS service level.

Fire Department/District	Number of Stations	ALS/BLS	Approximate Population Served
Contra Costa County Fire Protection District	32	ALS	700,000
San Ramon Valley Fire Protection District	10	ALS	193,000
Richmond Fire Department	7	BLS	113,000
Moraga-Orinda Fire District	. 4	ALS	39,000
Rodeo-Hercules Fire Protection District	2	ALS	35,000
El Cerrito Fire Department	3	ALS	25,000
Albany Fire Department	1	ALS	19,000
Kensington Fire Protection District	1	ALS	5,000
Total	60		1,129,000

As illustrated, all service providers, except Richmond, provide ALS service delivery as part of the county's first response system. First responder services are provided from 60 fire stations and serve approximately 1.13 million residents.

It is also important to note that the Contra Costa County Fire Protection District provides fire and EMS first responder services to San Pablo and Pinole. The Rodeo-Hercules Fire Protection District has begun the annexation process to become part of the CCCFPD as part of Resolution 2024-18 adopted by the District. This annexation is expected to be completed in July 2025.

ALS STAFFING OPTIONS

Staffing adjustments that may include hiring and training personnel at the paramedic level will need to be considered. These positions can be dual-role firefighters that provide both firefighting and ALS first responder services or single-role paramedics hired primarily for ALS first responder response services but can assist in fire response when a medical sector needs to be established. The choice of which system is best for the City of Richmond will impact staffing levels, pay, retirement benefits, and the overall financial impact on the City.

For an ALS first responder system to be effective, supervisor oversight will be required to coordinate the EMS program. Key duties for the EMS supervisor will include managing and overseeing continuous quality assurance and quality improvement (CQI/CQA) programs and processes, ordering EMS supplies, and ensuring compliance with United States Drug Enforcement Agency (DEA) requirements related to narcotics purchasing, storage, use, and disposal.

DUAL-ROLE FIREFIGHTER/PARAMEDIC

The Richmond Fire Department currently employs eight (8) personnel certified at the paramedic level and capable of providing ALS-level patient care. The following table illustrates the positions, station assignments, and shifts these personnel are assigned to:

Rank	Station	Shift
Captain	63	A
Captain	64	A
Captain	67	С
Engineer	64	A
Engineer	66	В
Engineer	67	В
Firefighter	62	A
Firefighter	Floater	С

As illustrated above, there are three (3) Captains, three (3) Engineers, and two (2) Firefighters in the Richmond Fire Department currently certified as paramedics. These personnel are assigned to each of the three shifts and operate from stations 62, 63, 64, 66, and 67. One is a floater on C shift and can be assigned to any station depending on daily staffing needs.

To effectively serve the City as an ALS first responder, the City must ensure appropriate paramedic staffing at each of the seven (7) fire stations. This will require a minimum staffing of one (1) paramedic on duty at each station daily to ensure a timely response from the ALS personnel.

The following table illustrates the average leave used in the Fire Department over four (4) years.

RICHMOND FD'S AVERAGE YEARLY LEAVE USAGE

Type of Leave	Avg. Annual Hours
Worker's Compensation	209.5
Vàcation	184.1
Sick	143.0
Compensatory Time	67.7
Unpaid Leave	27.8
Leave Without Pay	35.5
Death in Family	7.5
Administrative Leave (Paid)	6.2
Other Leave Types	6.3
Total Scheduled Hours per Position	2,920.0
Total Average Leave per Position	687.6
Total Average Hours Available per Position	2,232.4
Total Number of Positions Needed per Position due to	1.3
Leave	

As illustrated, the average number of staff required to ensure appropriate staffing is 1.3. This would require each shift to be staffed with a total of 9.1 paramedics per day, which will require a total of 27 paramedics to ensure paramedics are available to backfill engine companies when there is a vacancy on shift due to vacations, sick leave, compensatory time usage, turnover, and other leave in the Department. This means the Department will need an additional 19 paramedics to operate as an ALS first response agency fully.

An additional 19 paramedic positions are needed to fully staff ALS first responder services. Based on the current staffing of 10 firefighters on shift per day, the project team would recommend working toward having all firefighters assigned to operations eventually become certified as paramedics if this staffing model was chosen.

SINGLE ROLE PARAMEDICS

This option would require hiring personnel trained at the paramedic level but not dual-certified as firefighters. These firefighters could be housed strategically in stations in the busiest EMS response areas and respond to emergency incidents in quick response vehicles specifically outfitted for response to EMS incidents. This model ensures rapid ALS intervention to medical incidents and keeps fire apparatus available for other emergency calls for service.

The four years of call data analyzed by the project team showed that approximately 58% of calls for service by the Fire Department are either Auto Accidents or Medical Calls.

The following table illustrates the call demand by station for auto accident and emergency medical calls for service by station over the past four years:

		Auto			Avg./Year
	Station	Accident	Medical Calls	Total	
61		213	2,643	2,856	714
62		488	4,590	5,078	1,270
63		100	1,793	1,893	473
64		908	5,698	6,606	1,652
66		780	4,677	5,457	1,364
67		539	7,376	7,915	1,979
68		698	6,064	6,762	1,691

AUTO ACCIDENT AND MEDICAL CALLS BY STATION

As illustrated above, stations 67, 68, 64, 66, and 62 are the busiest stations in terms of EMS call demand.

The following map shows the projected four-minute travel time coverage from the existing stations in Richmond:



As shown above, the existing stations would not effectively cover the response areas of stations 61, 62, or 63 in four minutes if single-role ALS units were stationed at the four (4) busiest stations. Based on this analysis, a single-role paramedic model would require staffing single-role paramedics at each station.

HYBRID MODEL

This model would use a combination of engine companies staffed with firefighter paramedics and quick response EMS vehicles (QRV) either staffed with firefighter paramedics or single-role paramedics. The typical model for this approach is to dispatch the QRV on ALS-level emergencies such as cardiac events, severe trauma, stroke, or other life-threatening emergencies. These non-transport vehicles stabilize the patient and prepare them for immediate transport upon arrival of the ALS transport unit. Several agencies have successfully used this model as it frees up engine companies sooner, the vehicles cost less than engine or ladder trucks, the vehicles provide a faster

travel time due to their size and maneuverability, and they can provide additional ALS- units in highdemand areas.

To determine if a hybrid approach for ALS first responder services would benefit Richmond, the project team examined the current utilization rates and call concurrence issues impacting the current response system. The following table illustrates the average utilization rates and average scene time on emergency calls of current apparatus over the past four years.

Unit	4-Yr. Avg.	4-Yr. Avg.
	Utilization	Scene Time
E67	9.6%	16:22
E64	8.6%	17:35
E62	8.3%	18:26
E66	8.1%	15:32
E68	8.1%	17:13
E61	5 .1%	20:33
E63	2.9%	19:46
T64	3.2%	18:12

RICHMOND FIRE DEPARTMENT UTILIZATION RATES

As illustrated above, the utilization rates of emergency apparatus range from a high of 9.6% to a low of 2.9%. Current research shows that utilization rates between 25% do not cause system strain, and there is no need for additional emergency response apparatus to cover the response area.

The following table illustrates call concurrence over the past four years to show how often multiple calls occur during the same time period. This is important as it shows if the system depth can handle the workload during peak call demand periods.

# of Calls	% of Events
1	43.4%
2	33.8%
3	15.0%
4	5.2%
5	1.6%
6+	1.1%

RICHMOND FIRE DEPARMENT CALL CONCURRENCE

As illustrated above, approximately 92.2% of emergency incidents occur with three or fewer incidents co-occurring. With seven stations available for emergency response, call concurrence is not currently an issue in Richmond.

Since neither unit utilization nor call concurrence is an issue in Richmond, the hybrid approach would work as an initial staffing model where the City uses QRV in the stations based on call demand, call concurrence, and response area coverage. To maximize this approach, three QRVs would be needed. The QRVs should be located at stations 62, 64, and 68. This provides two (2) QRVs in the busiest service area and one (1) QRV to cover the northern portions of the City. These vehicles would also respond to areas staffed with BLS engine companies to provide more immediate ALS response times and improve potential patient outcomes. As paramedics are trained to staff engine companies, the impacts of using QRVs can be evaluated to determine if the hybrid model should continue or if deploying all ALS engine companies provides a reliable ALS response system.

TRAINING AND CERTIFICATION REQUIREMENTS

Paramedic training hours and requirements are established by the California Emergency Medical Services Authority (EMSA) and are set forth in Title 22 of the California Code of Regulations, Chapter 4. The following is a summary of the paramedic training requirements.

- The total paramedic training program shall consist of not less than 1,094 hours. The hours are divided as follows:
 - A minimum of 454 hours of didactic instruction
 - A minimum of 160 hours of hospital clinical training
 - A minimum of 480 hours of field internship training under the supervision of experienced paramedics
- Students are also required to have a minimum of 40 documented ALS patient contacts during the field internship
- Successfully passing the National Registry of Emergency Medical Technicians (NREMT) Paramedic Examination.

LOCAL PARAMEDIC TRAINING PROGRAM

Contra Costa County Health is the local emergency medical authority in Contra Costa County. They have the authority to approve paramedic training programs in the County. The current local authorized training program is Contra Costa College for initial and continuing paramedic education. Contra Costa College recently collaborated with the Contra Costa Fire Prevention District to provide paramedic training that supports the 48/96 hour shift currently worked by most fire departments in the County.

The program is a two-day per-week, 16-month program that begins in the fall and concludes at the end of the following fall semester. It includes at least 1,290 hours of lecture, lab, clinical, and field internship content, exceeding California State training requirements.

Upon successful completion, graduates earn 31+ units of college credit and a Certificate of Achievement in Paramedic Studies. Graduates can also take the NREMT paramedic certification exam and apply for California paramedic licensure. While the program is structured to accommodate the 48/96 schedule, the schedule is subject to change depending on interest and demand for this type of schedule.

Prerequisites for the paramedic program include a high school diploma (or equivalent), a valid California EMT certificate, American Heart Association BLS certification, at least six (6) months of EMT experience, college-level anatomy and physiology course, and successful completion of a paramedic entrance exam.

The current tuition cost for the paramedic training is \$7,500.

After certification as a paramedic, California requires a minimum of 48 hours of continuing education every two (2) years to remain certified.

REQUIRED EQUIPMENT AND SUPPLIES

Moving forward as an ALS first responder will require investment in equipment and supplies beyond those required of BLS first response agencies.

The following is a summary of the equipment and supplies needed for each ALS first response vehicle deployed by the Fire Department.

- Cardiac Monitor/Defibrillator
- Airway Management Equipment (laryngoscopes, endotracheal tubes, and bag-valve masks)
- Intravenous (IV) therapy supplies
- ALS Medications
- ALS Trauma Equipment
- Personnel Protective Equipment
- Communications and Navigation Equipment

Documents

FINANCIAL PROJECTIONS

This report chapter focuses on the financial projections for implementing ALS first responder services in the Richmond Fire Department. The projections are based on the FY 2024 – 2025 Fire Department budget. A 5% annual increase is used in developing the projections for future cost calculations.

THE CURRENT FIRE DEPARTMENT BUDGET

The following tables illustrate the current and previous two fiscal year budget allocations for the Richmond Fire Department.

FIRE DEPARTMENT EXPENDITURES BY FUND

Fund	FY2023 Actual	FY2024 Adopted	FY2025 Adopted	FY24 v. FY25 Change
Ceneral Fund	\$77.978.823	\$41228708	\$44264133	7.4%
	\$33,370,023	\$41,220,700	φ ++ ,20 + ,155	7.470
Capital Improvement (Impact Fees)	\$86,154	\$117,000	\$65,000	-44.4%
SPEC	IAL REVENUE	FUNDS		
Emergency Medical Services Fund	\$198,075	\$215,586	\$215,586	0%
Chevron Modernization Project Fund	\$0	\$140,000	\$200,000	42.9%
Emergency Ops & Disaster Recovery	\$4,801	\$0	\$0	0%
Fund				
Total Special Revenue	\$202,876	\$355,586	\$415,586	16.9%
Total All Funds	\$34,267,854	\$41,701,294	\$44,744,719	7.3%

FIRE DEPARTMENT EXPENDITURES BY FUNCTION

Expenditure	FY2023	FY2024	FY2025	FY24 v. FY25
	Actual	Adopted	Adopted	Change
Fire Administration	\$2,277,350	\$2,570,722	\$3,536,472	37.6%
Fire Suppression	\$29,053,939	\$31,794,303	\$34,994,508	10.1%
Fire Prevention	\$1,388,938	\$2,399,570	\$2,567,325	7%
Fire Prevention / Chevron Inspection	\$620,870	\$794,022	\$912,987	15%
Fire Support	\$366,977	\$2,884,410	\$1,541,203	-46.6%
Fire Training	\$261,963	\$546,154	\$460,428	-15.7%
Fire EMS Division	\$8,787	\$239,528	\$251,211	4.9%
Fire Office of Emergency Services	\$198,075	\$215,586	\$215,586	0%
Chevron ECIA Fire Department	\$0	\$140,000	\$200,000	42.9%
Emergency Operations and Disaster	\$4,801	\$0	\$0	0%
Impact Fees	\$86,154	\$117,000	\$65,000	0%
Total Expenditures	\$34,267,854	\$41,701,294	\$44,744,719	7.3%

FIRE DEPARTMENT EXPENDITURES BY TYPE

Expense Type	F'Y2023 Actual	FY2024 Adopted	FY2025 Adopted	FY24 v. FY25 Change
Salaries and Wages	\$17,418,087	\$19,716,627	\$21,141,346	7.2%
Fringe Benefits	\$14,343,561	\$15,085,269	\$17,196,840	14%
Professional Services & Admin	\$340,745	\$2,053,871	\$886,365	-56.8%
Other Operating	\$320,352	\$1,256,180	\$957,010	-23.8%
Utilities	\$21,516	\$33,500	\$33,500	0%
Equipment & Contract Services	\$133,026	\$499,913	\$500,950	0.2%
Provision for Insurance Loss	\$23,411	\$27,000	\$27,000	0%
Cost Pool	\$1,214,448	\$2,507,975	\$3,482,115	38.8%
Asset/Capital Outlay	\$12,004	\$80,500	\$80,500	0%
Debt Services	\$114,656	\$114,442	\$113,074	-1.2%
Operations Transfers Out	\$326,018	\$326,018	\$326,019	0%
Total Expenses	\$34,267,854	\$41,701,294	\$44,744,719	7.3%

ALS TRANSITION COSTS

REQUIRED EQUIPMENT AND SUPPLIES

Numerous required equipment and supplies would need to be acquired to provide ALS First Responder services that are not part of the necessary equipment for BLS First Responder Services. The following table illustrates the additional equipment and supplies needed for ALS service and the estimated cost to outfit seven (7) ALS engine companies.

ESTIMATED COST FOR REQUIRED ALS EQUIPMENT AND SUPPLIES

	Unit	Number		Total	Total
Equipment/Supplies	Cost	Required	Unit	Needed	Cost
Defibrillator pads (adult & pediatric)	\$50	1	Each	7	\$350
Monitor/defibrillator (portable)	\$40,00	1	Each	7	\$280,000
	0				
Extra charged batteries for	\$300	1	Each	7	\$2,100
monitor/defibrillator					
Electrodes	\$15	20	Each	140	\$2,100
Laryngoscope handle	\$150	1	Each	7	\$1,050
Non-invasive End-Tidal CO2 (cannula)	\$20	2	Each	14	\$280
Non-invasive End-Tidal CO2 adapter	\$30	1	Each	7	\$210
(ETT)					
Laryngoscope blades: 0, 1, 2, 3 & 4 (Miller)	\$50	1	Each	7	\$350
Laryngoscope blades: 2, 3 & 4 (Macintosh)	\$50	1	Each	7	\$350
Endotracheal tubes: 6.0, 7.0, 8.0, 9.0	\$10	1	Each	7	\$70
cuffed					
Endotracheal tube introducer (Bougie)	\$15	1	Each	7	\$105
Stylet	\$10	1	Each	7	\$70
ETT securing device	\$10	2	Each	14	\$140
Batteries for laryngoscope	\$5	1	Set	7	\$35
Bulbs for laryngoscope	\$15	1	Each	7	\$105

	Unit	Number		Total	Total
Equipment/Supplies	Cost	Required	Unit	Needed	Cost
Magill forceps (adult & pediatric)	\$50	1	Each	7	\$350
iGel S.A.D. Kit (Size 3, 4 & 5)	\$50	1	Each	7	\$350
Pleural Decompression/Needle	\$30	2	Set	14	\$420
Thoracostomy kit					
Thoracostomy needle – 14g 3.25 inch	\$15	2	Each	14	\$210
Continuous Positive Airway Pressure	\$150	1	Each	7	\$1,050
(CPAP) device (small, medium & large)					
Acetaminophen (10mg/10cc)	\$0.50	1000	mg	7000	\$3,500
Adenosine	\$1.10	18	mg	126	\$139
Albuterol (2.5mg/3ml unit dose ampule)	\$5	4	Each	28	\$140
Amiodarone (150mg/3ml ampule)	\$30	3	Each	21	\$630
Atropine (Img preload)	\$15	2	each	14	\$210
Calcium Chloride	\$15		gm	./	\$105
Dextrose IU% (250 ml)	\$15	2	eacn	14	\$210 ¢70
Dipnennyaramine (Benadryi)	\$0.10	100	mg	700	\$70
Epinephrine 1:1,000 (Img/ICC)	\$10		each	14	\$140
Epinephine 1.10,000 (Img/10cc)	\$10	200	each	42	\$420 ¢290
	\$U.20	200	mcg	1400	\$280 \$750
Kotamina (E0mg/mL vial)	\$⊃U ¢7	500	each	7500	\$35U
Lidocaino 2%	د ر ¢1 50	100	mg	3300	\$10,500
Midazolam (Versed) (ampule)	\$1.30	100	ma	700	050,1چ ۸۲¢
Naloxone (Narcan) (ampule)	\$20		ma	28	\$560
Nitroglycerin (0.4 mg/tab or multidose	\$5		ma	14	\$70
sprav)	φ5	2	mg	1-1	\$70
Ondansetron (Zofran) (ODT)	\$1.50	8	ma	56	\$84
Ondansetron (Zofran) (vial)	\$1.50	8	ma	56	\$84
Saline solution (normal) (100cc)	\$10	2	Each	14	\$140
Sodium Bicarbonate (50mEg/50cc)	\$15	1	Each	7	\$105
Tranexamic Acid (1g/10ml)	\$50	2	Each	14	\$700
Pedi-Tape®	\$30	1	Each	7	\$210
IV catheters: 16g, 18g, 20g, 22g, 24g	\$15	2	Fach	14	\$210
Saline lock with extension tubing	\$5	2	Each	14	\$70
IV tubing: macro-drip (10/15att)	\$5	2	Each	14	\$70
IV tubina: mini drip (60att)	\$5	2	Each	14	\$70
IV extension tubing	\$3	2	Each	14	\$42
IV tubing with vented port	\$7 50	2	Each	14	\$105
FTT Nebulizer Adapter	\$15	2	Each	14	\$210
Syringes' loc 3cc 5cc 10cc 20cc	\$2.50	2	Each	14	\$35
Needles: 18a 20a 22a 24 or 25a	\$2.90 \$3	2	Each	14	\$42
Universal vial adapter/dispensing pin	\$5	2	Fach	14	\$70
Wristbands - green (Tranexamic Acid)	\$2	5	Each	35	\$70
Labels: Medication Added	\$20	2	Each	14	\$280
Elastic tourniquet band	φ <u>2</u> 0 ¢z	2	Each	14	\$42
Hand-held nebulizer for inhalation	φυ ¢ι⊑	2	Each	14	4-2 Φ-1-0
Nobulizor mode (adult 9 podiatric)	¢η ΕΛ	2	Each	14	φ21U ¢105
In contrast (addit a period) IO insertion device (F7-IO)	97.50 \$750	∠ ۱	Each	14 7	¢ε σε0
	Ψ/30	1	Lacii	/	Ψ0,200

Equipment/Supplies	Unit Cost	Number Required	Unit	Total Needed	Total Cost
Intraosseous needle – 15mm (pink);	\$300	1	Each	7	\$2,100
25mm (blue); 45mm (yellow)					
IO-Stabilizer	\$30	1	Each	7	\$210
Pressure bag for adult IO	\$50	2	Each	14	\$700
Arm board(s) (adaptable for infant, child	\$15	1	Each	7	\$105
& adult)					
Total Cost					\$319,402

As illustrated above, the estimated cost to purchase the required ALS supplies, equipment, and medications for seven ALS vehicles to begin ALS first responder services is approximately \$319,400. The majority of this is the estimated \$280,000 for the cardiac monitors.

To implement ALS first responder services using Quick Response Vehicles, the estimated cost to purchase and outfit these vehicles is \$75,00 each.

TRAINING AND EDUCATION

Training existing firefighters to the paramedic level will require additional training and education to obtain the required certifications to operate as a paramedic in the Contra Costa County EMS system. As stated earlier, the current program cost for paramedic training is \$7,500. The following table illustrates the overall training costs for the remaining firefighters at the paramedic level.

PARAMEDIC TRAINING COST

Tuition	Overtime Hours	Overtime Cost	Students	Total Cost
\$7,500	1,290	\$183,366	19	\$3,693,954

As illustrated, the total cost of sending 19 personnel through paramedic school to pay for tuition and shift coverage is estimated to cost approximately \$3,693,954.

EMS OVERSIGHT

The ALS First Responder program will require effective supervisor oversight to serve as liaison to the Contra Costa County EMS Authority, ensure effective deployment, patient care, and system effectiveness, manage the quality assurance program, training, and ordering supplies and equipment needed for response apparatus. The project team recommends this be a 40-hour position. The city would need to create an EMS supervisor position to serve in this role. This can be a civilian position that is a licensed paramedic or a dual-certified firefighter paramedic, and it can be equivalent to the sworn captain rank in the organizational structure. For costing purposes, the current Captain mid-point salary with paramedic incentive pay was used for calculations. This position should be hired before the first ALS unit goes into service to manage the implementation process of the ALS first responder program.

SALARY ASSUMPTIONS

Upon assuming paramedic-level certification, a new pay grade for firefighter paramedics will need to be created. Assuming ALS Quick Response Vehicles would be staffed with single-role paramedics during the transition period, the following assumptions regarding costs associated with paramedic pay and single-role paramedics are used in calculations.

The following table illustrates the current pay ranges for both positions in other cities in Contra Costa County.

Agency	FF/EMT Start	FF/EMT Top Out	FF/EMT- P Start	FF/EMT-P Top Out	Single-Role Paramedic Start	Single-Role Paramedic Top Out	EMT vs EMT-P
Albany FD	\$101,687	\$136,311	\$113,381	\$151,987	N/A	N/A	11.50%
AMR County Ambulance	N/A	N/A	N/A	N/A	\$77,040	\$116,376	
Contra Costa County FPD	\$101,970	\$136,640	\$112,138	\$150,275		~	9.98%
El Cerrito FD	\$110,172	\$133,908	\$121,188	\$147,312			10.01%
Moraga-Orinda FD	\$108,756	\$132,180	\$119,580	\$145,344			9.96%
Richmond FD	\$110,544	\$133,944		7			
Rodeo-Hercules FPD	\$85,512	\$125,760	\$94,068	\$138,300			9.97%
San Ramon Valley FPD	\$111,387	\$132,928	\$132,031	\$153,527	\$116,169	\$141,204	15.50%
Average	\$104,290	\$133,096	\$115,398	\$147,791	\$96,605	\$128,790	11.15%

CONTRA COSTA COUNTY PAY RANGES

As illustrated above, the average pay for a Firefighter/Paramedic in the comparison agencies is \$115,398 - \$147,791. This is 4.39% higher than starting Firefighter pay in Richmond and 10.34% higher than Firefighter top-out pay. For agencies with both firefighter/EMT and Firefighter/Paramedic salary schedules, the average difference in pay between the two salaries is 11.15%. The pay difference varied from incentive pay to a separate salary schedule for paramedic-level employees.

The average pay for single-role Paramedics ranged from \$96,605 to \$128,790. This is slightly less than the Richmond Firefighter/EMT pay range of \$110,544 - \$133,944.

TOTAL TRANSITION COSTS

The following table illustrates the total transition costs for moving from a BLS first responder to an ALS first responder organization.

TOTAL ALS TRANSITION COSTS

Item	Cost
Equipment and supplies	\$319,400
Training	\$3,693,954
First Year EMS Supervisor Salary and Benefits	\$197,680
QRV Option – 3 Vehicles	\$225,000
Total Cost	\$4,436,034

As illustrated above, the total transition cost will be approximately \$4,436,034 if the City uses three (3) Quick Response Vehicles to begin the ALS response. The most significant single cost will be training existing personnel to the paramedic level and paying for overtime to backfill positions while personnel are in training. There would also be transition costs related to the pay scale for paramedics, which the City agrees to with Local 188.

ONGOING COST CONSIDERATIONS

Once all the implementation costs have been incurred, there will be ongoing costs associated with being an ALS First Response agency. These costs include increased paramedic salaries, medical equipment and supplies costs, and QRV replacement costs.

The following table illustrates the annual cost estimates for each of these categories.

Item	Cost
EMS Supplies and Equipment	\$36,000
Salary Increases	\$541,000
QRV Replacement Avg Cost	\$33,000
Total Annual Cost Increases	\$610,000

TOTAL ONGOING ANNUAL COST INCREASES

As illustrated above, the total annual cost increase for providing ALS First Responder services is estimated to be \$610,000.

POTENTIAL REVENUE OPPORTUNITIES

In 1989, the County Board of Supervisors established a County Service Area (CSA) for emergency medical services after an advisory measure (Measure H) was passed by voters in the November 1988 countywide ballot. This allowed an annual assessment to be placed on real property, known as the EMS benefit assessment, to fund the cost of improvements to the emergency medical services system in the County. One of the focuses of this funding was to finance improvements in the EMS system, including county-wide paramedic coverage., improved medical communication, improved dispatcher training, enhanced medical equipment and supplies, training firefighter first responders, including training and equipment for the fire service agencies electing to undertake a specialized program of advanced cardiac care (defibrillation).

The benefit assessment is limited to a maximum assessment on real property of ten dollars annually for each single-family residence or benefit unit. The following table illustrates the participating fire agencies that have entered Fire First Responder contracts to receive Measure H funds for July 1, 2022 – June 30, 2025 and the amounts of the current agreements.

Agency	Annual Funding	Total Funding
Contra Costa County FPD	\$1,792,123	\$5,376,369
Crocket-Carquinez FPD	\$6,478	\$19,434
El Cerrito Fire Departmen	t \$77,142	\$231,426
Moraga/Orinda FPD	\$73,234 - \$97,645	\$268,524
Rodeo/Hercules FPD	\$89,508	\$268,524

MEASURE H PARTICIPATING AGENCIES

As illustrated above, agencies receiving annual Measure H payments receive between \$6,478 and \$1,792,123 annually.

In California, there is also the opportunity to bill for first responder ALS services. For example, in Sonoma County, insurance companies are billed either fully or partially for first responder medical services, even if no patient transport occurs. The exact financial impact to Richmond would depend on several factors related to billing for the service, these include:

- First Responder Fee This is a fee charged for responding to 9-1-1 calls, performing medical assessments, and providing care, even if no patient transport occurs.
- Insurance Coverage Charging insurance coverage for first responder services, fully or partially. Some
 communities choose to accept payment for residents only in the amount insurance will pay as they
 support the EMS system through tax dollars. Non-residents are expected to pay the full amount.
- Medicare and Medi-Cal Medicare and Medi-Cal generally do not cover First Responder Benefits, and unpaid balances must be waived.
- Billing Procedures Billing can either be done as an internal City service or through a designated thirdparty billing agency. Due to the complexity of medical billing and frequently changing regulations, most communities choose to use a 3rd-party billing service specializing in medical billing.

These agreements allow the funds to be used for costs associated with acquiring or contracting equipment, services, or technology that directly benefit the fire agency. If the Contra Costa County EMS Authority (CCCEMSA) purchases equipment, services, or technology that directly benefits the agency during the agreement period, that amount can be deducted from the annual payment.

The City of Richmond is working toward becoming a participation agency to receive Measure H funds from the CCCEMSA. During these discussions and contract development, the City should determine to what degree the cost of cardiac equipment and ALS equipment, supplies, and training can be funded as they work toward becoming an ALS First Responder. Budgeted estimates related to Measure H funding for FY 25 are \$215,586.

There are requirements to receive the Measure H funds as either a BLS or ALS first responder agency in the County. These are as follows:

SCOPE OF SERVICES

- The agency is required to provide prehospital emergency first responder services within its service area until patient care is assumed by the county-contracted ambulance provider.
- If the patient refuses medical care or transportation to a hospital, first responder services can cease.
- Services shall be provided in accordance with requirements of Health and Safety Code Section 1797, the County's Emergency Medical Service and Ambulance Ordinance Code (Chapter 48), and CCCEMSA's medical treatment protocols and policies.

BASIC SERVICES FOR BASIC LIFE SUPPORT (BLS) AGENCIES

- The agency shall provide EMT (BLS) prehospital emergency first responder services 24 hours a day, seven days a week.
- The agency shall ensure that all its personnel are oriented to CCCEMSA policies, medical treatment guidelines, the Multi-casualty Incident Plan, medical radio communications, medical equipment utilization and maintenance, and the Paramedic and EMT local and statewide scope of practice.
- The agency shall submit the training curriculum to CCCEMSA for approval within 60 days after the date the contract has been executed by both parties and provide the CCCEMSA-approved training to prepare non-paramedic responders to assist a first responder paramedic in providing patient care.
- The agency shall perform services under the Contract in compliance with CCCEMSA policies, medical treatment guidelines, and state and federal laws and regulations applicable to prehospital EMS responders.
- The agency shall designate one staff member with overall responsibility for EMS program coordination and notify CCCEMSA in writing within 10 days of any change in the designation.

BASIC SERVICES FOR ADVANCED LIFE SUPPORT (ALS) AGENCIES

• The agency shall provide paramedic (ALS) prehospital emergency first responder services 24 hours a day, seven days a week. If an agency increases its service level from BLS to ALS, a new contract or mutually agreed-upon amendments for the new services are required.

- The agency shall ensure that all its personnel are oriented to CCCEMSA policies, medical treatment guidelines, the Multi-casualty Incident Plan, medical radio communications, medical equipment utilization and maintenance, and the Paramedic and EMT local and statewide scope of practice.
- The agency shall submit the training curriculum to CCCEMSA for approval within 60 days after the date the contract has been executed by both parties and provide the CCCEMSA-approved training to prepare non-paramedic responders to assist a first responder paramedic in providing patient care.
- The agency shall perform services under the Contract in compliance with CCCEMSA policies, medical treatment guidelines, and state and federal laws and regulations applicable to prehospital EMS responders.
- The agency shall designate one staff member with overall responsibility for EMS program coordination and notify CCCEMSA in writing within 10 days of any change in the designation.
- ALS vehicles must be staffed with at least one (1) fully licensed paramedic at all times.

There are also requirements related to performance standards and reporting requirements for EMS First Responder agencies receiving Measure H funds.

RECOMMENDATIONS AND IMPLEMENTATION PLAN

RECOMMENDED ALS FIRST RESPONDER APPROACH

After evaluation of the ALS First Responder delivery options available to Richmond, the project team recommends the City utilize the hybrid approach as it will allow a quicker transition to providing the service at the same time existing personnel are trained to the paramedic level or firefighter/paramedics are hired due to vacancies occurring in the Department. There are several considerations the City will need to work through to establish the hybrid staffing model using Quick Response Vehicles staffed with stand-alone paramedics and training existing firefighter/EMTs to the paramedic level to begin providing ALS engine company first responder services.

This proven model serves communities well and ensures engine and truck companies can remain available to respond to other critical non-medical events that may co-occur with medical calls. For example, the City of Santa Rosa, California Fire Department operates 11 fire stations and serves as an ALS first responder in the Sonoma County EMS system. Their staffing model includes 11 ALS engine companies, two (2) truck companies, and two (2) ALS Squads (QRVs) operating from specially equipped pickup trucks. The City is evaluating whether adding a 3rd QRV would enhance ALS first responder and community paramedicine effectiveness.

RECOMMENDATIONS

Work with Local 188 to allow staffing of QRV's with stand-alone paramedics that are not part of the firefighter's bargaining unit.

Work with Local 188 to develop a pay scale for paramedics. Based on comparative research, the project team recommends incentive pay of 11.5% of base pay for personnel in the Fire Department licensed as paramedics.

Work with the CCCEMSA to finalize the agreement to be an EMS first responder in the County and develop a plan for using Measure H funds to assist in funding the required equipment, supplies, and training needed for transitioning from a BLS to ALS first responder.

Create and hire an EMS Supervisor position in the Fire Department.

IMPLEMENTATION PLAN

To implement the transition from a BLS to an ALS first responder agency, there will need to be a multiyear approach to allow ALS first responder services to be fully implemented using a combination of QRVs and paramedic engine companies. Stand-alone paramedic salary and benefit costs are calculated at the recommended starting salary plus a benefit factor of 81% of salaries. Paramedic incentive pay is estimated at 11.5% of Step 3 of Firefighter, Engineer, and Captain pay for the currently certified paramedics in the Department. It is assumed these will be implemented at month 6 of the transition.

MONTHS 1 - 18

The first 18 months will focus on working with the CCCEMSA on the exact parameters for the transition from BLS to ALS, acquiring the needed apparatus, equipment, and supplies, hiring single-role paramedics, and sending the first four (4) firefighters to paramedic school.

Specific tasks to accomplish during this period include:

- Negotiate with the fire union (Local 188) regarding adding a firefighter paramedic position and the pay rate for paramedics.
- Negotiate with the fire union (Local 188) regarding using stand-alone paramedics to staff the QRVs.
- Develop the job description and pay schedule for the stand-alone paramedic position.
- Specify and order the QRVs.
- Hire 18 paramedics to staff the QRVs.
- Purchase the required equipment and supplies for the QRVs upon delivery.
- Register and send four (4) existing firefighters to paramedic school.
- File for approval and certification to operate as an ALS first responder.
- Update the medical oversight (medical control) system with the current licensed physician serving as the medical director for the ALS and BLS first responders.
- Develop the Advanced Life Support protocols to define standing orders and those requiring online medical control approval.
- Train staff on the new equipment and protocols before the system is operational.
- Before becoming operational, update the department's insurance coverage to cover medical liability resulting from the delivery of advanced care.
- Purchase the required equipment and supplies to outfit Engine 67 as an ALS engine company prior to the first paramedics' graduation from training.
- Upon completion of paramedic licensure, assign six (6) licensed paramedics to Station 67 to operate Engine 67 as an ALS engine company.

The following table illustrates the costs associated with the first 18 months of the implementation plan.

MONTHS 1 – 18 TRANSITION COSTS

Item	Cost
Stand-alone Paramedics (18) Salaries and Benefits	\$4,195,978
QRV's (3)	\$225,000
Equipment and Supplies	\$182,514
Paramedic School (4)	\$30,000
Paramedic Incentive Pay	\$137,714
Paramedic Uniforms (54)	\$10,800
Backfill Overtime	\$733,464
Total Cost Months 1-18	\$5,515,470

As illustrated above, the costs for the first 18 months of transitioning to an ALS first responder service will be approximately \$5,515,470.

MONTHS 19 - 36

This section focuses on the costs for months 19-36 of the transition to the ALS response system. Costs previously accounted for in the first 18 months are not included in these calculations as those should now be part of the regular budget of the Fire Department. For example, paramedic incentive pay is only calculated for four (4) recently licensed paramedics and not the exiting firefighters, engineers, and captains who were factored in the first 18-month calculations. These months will focus on training an additional four (4) personnel as paramedics and incentive pay for the paramedics who graduated from paramedic school. If turnover occurs during this period, the Department should attempt to fill those positions with personnel certified as Firefighter/Paramedics to reduce the costs of sending personnel to paramedic school. All costs calculated are for the entire 18-month period.

Specific steps to accomplish during this period include:

- Sending four (4) existing Firefighters to paramedic school
- · Purchasing the equipment and supplies needed to outfit an additional ALS engine company.
- Upon completion of paramedic training, assign six (6) licensed paramedics to Station 63 to staff Engine 63 as an ALS engine company and improve ALS coverage in the northern portion of the city.

The following table illustrates the months 19 – 36 costs of transitioning from a BLS to an ALS first responder agency. A 5% increase in initial cost estimates was included in developing the approximate costs for these calculations.

Item	Cost
Equipment and Supplies	\$47,910
Paramedic School (4)	\$31,500
Paramedic Incentive Pay	\$122,299
Backfill Overtime	\$770,137
Total Cost Months 19 - 36	\$971,846

MONTHS 19 - 36 TRANSITION COSTS

As illustrated above, the transition costs for months 19 – 36 will be approximately \$971,846.

MONTHS 37 - 54

Months 37 – 54 will focus on sending an additional four (4) firefighters to paramedic school, outfitting and staffing the 3rd ALS engine company in the City, and paying incentive pay for the recently licensed paramedics.

Specific steps to accomplish during this period include:

- Sending four (4) existing Firefighters to paramedic school.
- Purchasing the equipment and supplies needed to outfit an additional ALS engine company.
- Upon completion of paramedic school, assigning six licensed paramedics to Station 66 to staff Engine 66 as an ALS engine company.

The following table illustrates the costs of months 37 - 54 transitioning from a BLS to ALS first responder agency. A 5% cost increase was factored into the 19 – 36 months calculations for these calculations.

MONTHS 37 – 54 TRANSITION COSTS

Item	Cost
Equipment and Supplies	\$50,306
Paramedic School (4)	\$33,075
Paramedic Incentive Pay	\$128,414
Backfill Overtime	\$808,644
Total Cost Months 37 - 54	\$1,020,438

As illustrated above, the transition costs for months 37 - 54 will be approximately \$1,020,438.

MONTHS 55 - 67

Months 55 – 67 will focus on finalizing the ALS first responder implementation. It is assumed at this point that natural turnover will have resulted in hiring the remaining personnel required to staff Engine 61 as an ALS engine company. By this point, the warranties on current QVRs will expire, so the City will need to acquire an additional QRV to replace the heaviest utilized QRV and transition that QRV to a reserve apparatus status. The City should also include the QRVs in any long-term capital or vehicle and apparatus replacement schedules. Initial planning should focus on these vehicles having an estimated seven (7) year life span.

Specific steps to accomplish during this period include:

- Purchasing the equipment and supplies needed to outfit an additional ALS engine company.
- Purchasing a QRV and placing the heaviest utilized QRV in reserve status.
- Assigning six (6) licensed paramedics to Station 61 to staff Engine 61 as an ALS engine company.