

Quality and Productivity Commission
31st Annual Productivity and Quality Awards Program
“Celebrating Quality Service”

2017 APPLICATION

Title of Project (Limited to 50 characters, including spaces, using Arial 12 point font):

NAME OF PROJECT: Fire/EMS Cardiac Arrest Quality Improvement

DATE OF IMPLEMENTATION/ADOPTION: JULY 1, 2015
(Must have been implemented at least one year - on or before July 1, 2016)

PROJECT STATUS: Ongoing One-time only

HAS YOUR DEPARTMENT PREVIOUSLY SUBMITTED THIS PROJECT? Yes No

EXECUTIVE SUMMARY: Describe the project in 15 lines or less using Arial 12 point font. State clearly and concisely what difference the project has made.

1 Implementing the new Zoll X-series monitor and the Zoll Case Review Software
 2 has allowed Los Angeles County Fire to do in-depth analysis of the quality of
 3 resuscitation that our paramedics have been performing on our sickest patient
 4 populations. Recent medical studies have shown that the quality of CPR performed
 5 during cardiac arrest significantly affects the patient’s chance for survival and recovery.
 6 Using the software, the Emergency Medical Services (EMS) Quality Improvement team
 7 has been able to provide education and new feedback tools that have drastically
 8 improved our resuscitation efforts.

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BENEFITS TO THE COUNTY

(1) ACTUAL/ESTIMATED ANNUAL COST AVOIDANCE	(2) ACTUAL/ESTIMATED ANNUAL COST SAVINGS	(3) ACTUAL/ESTIMATED ANNUAL REVENUE	(1) + (2) + (3) = TOTAL ANNUAL ACTUAL/ESTIMATED BENEFIT	SERVICE ENHANCEMENT PROJECT
\$	\$	\$	\$	<input checked="" type="checkbox"/>

ANNUAL = 12 MONTHS ONLY

SUBMITTING DEPARTMENT NAME AND COMPLETE ADDRESS County of Los Angeles Fire Department 1320 N. Eastern Ave., Los Angeles, CA 91730	TELEPHONE NUMBER (323) 881-6180
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PROGRAM MANAGER’S NAME Nicole Steeneken	TELEPHONE NUMBER (323) 838-2254 EMAIL Nicole.Steeneken@fire.lacounty.gov
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PRODUCTIVITY MANAGER’S NAME AND SIGNATURE <small>(PLEASE CALL (213) 893-0322 IF YOU DO NOT KNOW YOUR PRODUCTIVITY MANAGER’S NAME)</small>	DATE
DEPARTMENT HEAD’S NAME AND SIGNATURE Daryl L. Osby	DATE

DEPARTMENT HEAD’S NAME AND SIGNATURE Daryl L. Osby	TELEPHONE NUMBER (323) 881-6180
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1st FACT SHEET – LIMITED UP TO 3 PAGES ONLY: Describe the **challenge(s), solution(s), and benefit(s)** of the project. What quality and/or productivity-related outcome(s) has the project achieved? Provide measures of success. Use Arial 12 point font.

Cardiac arrest patients are the sickest medical patients that an Emergency Medical Services (EMS) provider can encounter. Since the advent of CPR and its widespread adoption in the 1970's and 1980's, little attention was paid to the quality of CPR performed, and there was little recognition of the impact of that quality on patient outcomes. Over the past 10-15 years, there has been an explosion of research in resuscitation science demonstrating that high quality CPR is associated with a higher rate of cardiac patients being discharged from the hospital neurologically intact. According to the American Heart Association 2015 Advanced Cardiac Life Support (ACLS) update, high quality CPR consists of compressions that are performed at the right rate (100-120), the right depth (average 2-2.4 inches), and with as few pauses as possible (compression fraction greater than 60 percent).

Cardiac arrest data is relatively easy to capture in a hospital or simulation laboratory, because the equipment and patients are housed in a single location. The County of Los Angeles Fire Department (Fire) is the third largest fire department in North America, with 174 fire stations, 73 paramedic units, and more than four million residents served over 2,300 square miles. The previous generation cardiac monitor/defibrillator that Fire had been using had the ability to collect data, but the process of retrieving the data was cumbersome, the compliance was low, and little was being done with the data collected. The only way that data could be transmitted wirelessly was through a bluetooth connection to a department flip-phone. The Zoll X-series monitors, deployed in July 2015, are equipped with a Verizon connection and Wi-Fi, which enabled them to connect directly to Verizon or through the fire station's Wi-Fi network.

Early on, we were collecting data, but we lacked the full software sophistication to process such large amounts of data. Fire responds to approximately 350 cardiac arrests each month, and we needed software capable of handling that volume. In November 2015, Fire made the decision to purchase and activate Zoll's Case Review Premium Software, which enabled us to do more detailed data management. In December 2015, we did our first summary of approximately 110 cardiac arrest calls to determine our baseline cardiac arrest resuscitation data. Our expectations were low because we knew that, while the EMS providers were trying to perform high quality CPR, they lacked the tools and training necessary to be successful.

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As expected, the average depth of compression was 1.77 inches, the average rate of compressions was 129 compressions/minute, and we had many calls with a compression fraction less than 60 percent. Now we had the data, but, with a department as large as Fire, it is hard to know where to begin on such a massive Quality Improvement project.

In February 2016, the EMS Bureau performed a pilot study. Five paramedic squads were chosen based on geography and volume of cardiac arrest. Their monitors were reconfigured to activate a CPR metronome and voice prompting for compressions that were too shallow. Each of the three shifts at the five stations was given a 15 minute tabletop training with either the medical director or their nurse educator, explaining why we were making the changes and how they would be measured. The pilot study ran for 30 days. During that time, the compliance with compression depth more than doubled, the compliance with CPR rate more than tripled, and virtually all cardiac arrest patients received a compression fraction over 60 percent. The next question was how could we deliver the same training to all shifts at all paramedic stations, and how to reconfigure 100 monitors spread all over the County?

In March 2016, Zoll came to do their annual maintenance on the monitors, which gave us the opportunity to reconfigure all monitors for voice prompting and metronomes. Our nurse educators were deployed to teach the paramedics how high quality CPR can be achieved and how the monitors support that. The Medical Director made a video reinforcing the importance of the CPR quality measures that was sent to all paramedics and viewed more than 500 times. In the summer of 2016, we filled two vacancies in our Quality Improvement section, which enabled us to have more focus on the data coming in. In February 2017, Zoll and the Journal of EMS (JEMS) invited Fire to give an international Webinar outlining our use of technology in Cardiac Arrest Quality Improvement. We continue to work with Zoll to refine their software. Many of the fire stations have begun to compete to see who can outperform the others. Our hope in the near future is that the CPR performance summaries from the Zoll software can be emailed to the stations directly whenever a new cardiac arrest case hits the Zoll cloud. This will enable the station to get real time feedback, which we believe is the final tool to bring our cardiac arrest resuscitation to the pinnacle of the industry.

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Linkage to the County Strategic Plan – 1 page only. Which County Strategic Plan goal(s) does this project address? Explain how. Use Arial 12 point font.

This project meets the County Strategic Plan Goal 1 – Make Investments That Transform Lives

In the medical world, there is nothing more powerful than saving a life and returning them to their family and community. The ripple effect of this is felt by families for generations, as their presence influences those around them. There is no question that the commitment to high quality CPR and the Zoll X-series technology that facilitates training and Quality Improvement will save countless lives in Los Angeles County that would otherwise have been lost.

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COST AVOIDANCE, COST SAVINGS, AND REVENUE GENERATED (ESTIMATED BENEFITS TO THE COUNTY): If you are claiming cost benefits, include a calculation on this page. Please indicate whether these benefits apply in total or on a per unit basis, e.g., per capita, per transaction, per case, etc. You must include an explanation of the County cost savings, cost avoidance or new revenue that matches the numbers in the box. Remember to keep your supporting documentation. Use Arial 12 point font

Cost Avoidance: Costs that are eliminated or not incurred as a result of program outcomes. Please indicate whether these are costs to the County or to other entities.

Cost Savings: A reduction or lessening of expenditures as a result of program outcomes. Please indicate whether these were expenditures by the County or by other entities.

Revenue: Increases in existing revenue streams or new revenue sources to the County as a result of program outcomes.

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FOR COLLABORATING DEPARTMENTS ONLY

(For single department submissions, do not include this page)

DEPARTMENT NO. 2 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 3 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 4 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 5 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 6 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 7 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____