Public Health - Seattle & King County

# Division of Emergency Medical Services

# 2017 Annual Report

## to the King County Council

September 2017

Public Health
Seattle & King County

Medic One/Emergency Medical Services (EMS) serves more than 2 million people in Seattle and King County and provides life saving services on average **every 3 minutes**.

It is available to everyone, whatever and wherever the emergency.

Every year, **the Medic One/EMS System saves thousands of lives**:
In 2016, Emergency Medical Technicians (EMTs) responded to approximately 143,000 calls regionwide.
Paramedics responded to over 32,000 calls for advanced life support.

Compared to other cities, cardiac arrest victims are 2 to 3 times more likely to survive.
**Over the past year, 288 people in Seattle & King County were saved from cardiac arrest.**

***Strong, effective medicine is the hallmark of the regional Medic One/EMS system.***

# Introduction

We are pleased to present the Emergency Medical Services (EMS) Division 2017 Annual Report to the King County Council, per King County Ordinance #12849. This report highlights just some of the activities undertaken by the EMS Division and its partners over the past year to deliver better services, improve operations, and meet regional and community needs.

In stroke medicine, the right patient must be matched with the right treatment. Medical advancement in the treatment of large vessel occlusion strokes prompted the EMS Division to implement a new method for assessing severity when performing prehospital triage process in the field. EMTs and paramedics can now go beyond their F-A-S-T assessment protocol to identify severe cases, which allows them to transport patients directly to those hospitals capable of providing the new transformative therapies. EMS will continue working with King County hospitals to evaluate the efficacy of these protocols to understand where the process can be improved even further.

We are also especially proud of the steps taken to better address the rising number of lower acuity 9-1-1 calls in our region. Aligned under the umbrella term of Mobile Integrated Healthcare, the region has piloted different methods to manage these types of calls and improve response system effectiveness. The three Community Medical Technician (CMT) units operating in different areas of the county continue to assist 9-1-1 callers and connect them to the appropriate medical, social and community services for treatment. In addition, some of our partners are testing other ways to provide services ranging from low-acuity responses to proactive home visits, with the goals of best meeting client needs while managing EMS resources efficiently. The region will further refine these efforts as it identifies its potential role in the Medicaid Transformation Project and through the upcoming strategic planning process, enabling us to identify how these various efforts can be coordinated to most effectively serve the community into the future.

The process of incorporating Vashon Island's single paramedic unit into the larger scale King County Medic One program was completed on February 1, 2017. Vashon Island Fire & Rescue recognized that their paramedics would benefit greatly by being part of a larger organization and take advantage of economies of scale by transferring the management of the Vashon Island paramedic program. The seamless transition is a testament to the tremendous efforts of all involved. We are pleased to have these medics join our ranks and work side-by-side to provide Vashon residents with the best possible care.

Finally, we have made great progress with our Equity and Social Justice (ESJ) in EMS efforts to integrate ESJ values and themes into the EMS workplace and programs. Through outreach and recruitment, the EMS Division's ESJ Core Team has connected with various communities to increase interest in EMS and in joining its workforce. Now in its fifth year, the Strategic Training And Research (S.T.A.R.) Program continues to offer basic EMT training and career assistance to provide the greatest opportunity for students to thrive. In addition, standard and consistent hiring practices were developed for use throughout both the EMS Division and KCM1, helping foster an organizational culture that promotes fairness and opportunity. These policies and practices were created in consultation with Public Health–Seattle & King County, with the hope to be able to collaborate and expand across the region.

We appreciate the opportunity to share with you the excellence of the EMS system and the commitment of the people who plan and deliver it. Thank you for your continued support.

Patty Hayes, RN MN
Director, Public Health - Seattle & King County

Michele Plorde
Division Director, EMS

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**Commonly Used Acronyms**

**EMS** - Emergency Medical Services
**ALS** - Advanced Life Support
**BLS** - Basic Life Support
**EMD** - Emergency Medical Dispatch
**EMT** - Emergency Medical Technician


ACKNOWLEDGEMENTS

We would like to thank all of the individuals who contributed to the EMS 2017 Annual Report, including the staff members of the Emergency Medical Services Division, King County Medic One, the University of Washington, and our regional partners. We recognize below those who contributed in various ways to the content, writing, design, and production of this document.

CREDITS

Editors: Helen Chatalas, Tracie Jacinto
Administration Section: Felisa Azpitarte, Helen Chatalas, Cynthia Bradshaw, Becky Ellis, Bill Oung
Community Programs Section: Erik Friedrichsen, Alan Abe, Laura Miccile, Amy Warrior
King County Medic One: Keith Keller
University of Washington Faculty: Thomas Rea, Peter Kudenchuk, Mickey Eisenberg, Michael Sayre, Hendrika Meischke
Professional Standards Section: James Duren, Michelle Lightfoot
Regional Quality Improvement Section: Jennifer Blackwood, Jamie Emert, Carol Fahrenbruch, Sofia Husain, Tracie Jacinto, Dmitry Sharkov, Jenny Shin

# Executive Summary

When it comes to the EMS system of Seattle and King County, innovation runs deep. Since its creation 45 years ago, our system has pushed the envelope in testing new concepts that have enabled advancements in medical therapies, performance feedback, and even how CPR is performed. Fully realizing that innovation brings new value, the King County EMS Division has accepted the challenge that remaining the leader in emergency medical care requires -- a steadfast and unyielding commitment to never-ending improvement. This culture has led the EMS Division to making significant advances in medical technologies, methodologies, and training over the past year.

New technologies are allowing King County EMS to evaluate promising strategies to improve patient care across a wide range of critical conditions. Continued collaboration with the University of Washington will improve automatic external defibrillators and enable EMTs to continue chest compressions while at the same time monitoring oxygen flow, thus improving the probability of a successful outcome. Strides made through such innovations will provide the field of EMS with greater insights for advancing lifesaving protocols.

The EMS Division understands that some of the greatest gains in effectiveness can come not only through technology, but also in its approach to meet the needs of its diverse and disparate users. Improving the way we communicate with communities and businesses, modifying the methods by which we assist lower acuity patients, and emphasizing the perils of distracted driving all resulted in practices ultimately being changed, thereby creating better understanding and use of the system.

Over the past year, the EMS Division adjusted training strategies to better align with our community needs. The School CPR Program curriculum is now more tailored to the learning requirements of our local area students. A pilot providing shorter yet still intensive and more regular EMT training sessions is helping EMS agencies meet their hiring demands. The new BLS Training and Quality Improvement Initiative makes consistent training and improvement opportunities available to all agencies, regardless of their size or budget. And while the focus of our efforts is for our own benefit, it is gratifying that our EMS Online training was approved for national accreditation by the Commission on Accreditation for Prehospital Continuing Education (CAPCE).

From its revolutionary start - the radical idea to equip firefighters with medical skills for use in a person's home or on a street - to current-day programs outlined in this year's report, EMS in King County continues its pursuit to deliver the highest quality patient care. The result of this is saved lives, increased public confidence, a stronger EMS community, and a program second to none.

# System Overview

Any time residents of Seattle and King County call 9-1-1 for a medical emergency, they are using the Medic One/EMS system. This internationally-renowned regional system responds to an area of 2,134 square miles and serves a population of over two million. The EMS system is managed by the King County Emergency Medical Services (EMS) Division, and relies on complex partnerships with fire departments, paramedic agencies, EMS dispatch centers, and hospitals to make the program seamless and successful. The Medic One/EMS System in Seattle and King County is distinct from other systems in that it is **medically-based, regional,** and **uses a tiered out-of-hospital response.**

## Medically-Based Model

The medical model is the core of the EMS program in King County. In essence, it asserts that direction and practice must be derived from the highest standards of medical training and medical care. Accordingly, the EMS Division strives for emergency medical care that is founded on the highest standards of training, best medical practice, scientific evidence, and close supervision by physicians experienced in EMS.

The leadership of the Medical Program Director (MPD), Dr. Thomas Rea, ensures the success and the ongoing medical quality improvement of the EMS system. A Professor of Medicine at the University of Washington and Harborview Medical Center, Dr. Rea has spent the past decade working with the King County Medic One paramedics, ensuring the continued high standard of EMS care. As MPD, Dr. Rea's responsibilities include writing and approving medical protocols, approving all initial Emergency Medical Technician (EMT) and continuing EMT medical education, undertaking new and ongoing medical quality improvement activities, and initiating disciplinary actions when necessary.

To support the best possible outcomes of care, Dr. Rea oversees medical quality improvement activities, such as the review of every cardiac arrest event for more than 40 years and patient protocol compliance audits. Dr. Mickey Eisenberg, former MPD, also provides medical quality improvement direction to KC EMS. The result of this ongoing quality improvement is enhanced patient outcomes and an excellent cardiac arrest survival rate that has been among the highest reported in the nation.

## Regional Partnerships

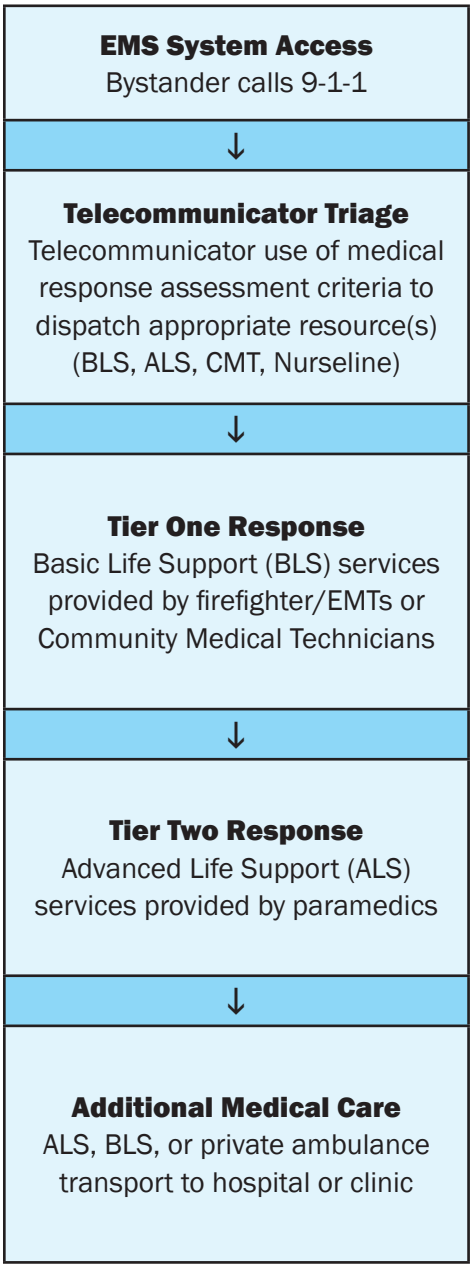
Regional partners sustain uniformity and consistency across the entire EMS system. Dr. Rea coordinates policies and procedures among the Medical Directors of the region's five paramedic programs: Dr. Michael Sayre of Seattle; Dr. Jim Boehl of Bellevue; Dr. Adrian Whorton of Redmond; Dr. Gary Somers of Shoreline; and Dr. Peter Kudenchuk for south King County.

Dr. Rea also works closely with the Central Region Trauma Council and the EMS Advisory Committee which provide key counsel to the EMS Division on regional Medic One/EMS policies and practices in King County, including major governance issues, strategic plan implementation, and other proposals.

# System Overview

## Tiered Out-Of-Hospital Response System

The Medic One/EMS system operates in a coordinated partnership among numerous stakeholders across the region to provide high quality prehospital medical care. It is this continuum of consistent, standardized medical care and collaboration that allows the system to excel and obtain the best possible patient outcomes. The use of a tiered response system ensures the most appropriate care provider responds to each 9-1-1 call. There are five major components in the tiered regional Medic One/EMS system:




**EMS System Access:** A patient or bystander accesses the Medic One/EMS system by calling 9-1-1 for medical assistance. Bystanders' reactions and rapid responses to the scene can greatly impact the chances of patient survival.

**Telecommunicator (Dispatcher) Triage:** 9-1-1 calls are received and triaged by telecommunicators at one of five dispatch centers. Following medically-approved guidelines, telecommunicators determine the most appropriate level of care needed and resource(s) (e.g., BLS, ALS) to dispatch to the scene, or refer the caller to the Nurseline. Pre-arrival instructions for most medical emergencies guide the caller through life-saving steps, including CPR and instructions to use an AED, until the Medic One/EMS provider arrives.

**Tier One Response - Basic Life Support (BLS) Services:** EMTs respond to 100% of emergency medical calls and usually arrive first on scene. Approximately 4,200 EMTs are employed by 30 fire-based agencies. BLS provides medical care (advanced first aid, CPR/AED) to stabilize the patient. BLS units arrive at the scene in 5.5 minutes, on average. EMTs are certified by the State of Washington and are required to complete initial and ongoing continuing education and training to maintain certification. In response to low-acuity calls, CMT units may be dispatched to respond.

**Tier Two Response - Advanced Life Support (ALS) Services:** Paramedics respond to about 25% of all calls and usually arrive second on scene to provide emergency care for critical or life-threatening injuries and illness. Regional paramedic services are provided by five agencies operating 26 ALS units throughout King County, including fire departments in Bellevue (4), Redmond (3), Shoreline (3), Seattle (7), and King County Medic One (9). A contract with Snohomish County Fire District 26 provides EMS services to the Skykomish and King County Fire District 50 area, from Baring to Stevens Pass. Paramedics are certified by the State of Washington and are required to complete intensive education and ongoing training to maintain certification.

**Additional Medical Care - Transport to Hospitals:** Once a patient is stabilized, EMS personnel determine whether transport to a hospital or clinic for further medical attention is needed. Transport is provided by an ALS or BLS agency, private ambulance, or taxi for lower-acuity situations.

# It takes a SYSTEM to save a victim.

In order to increase survival from out-of-hospital cardiac arrest (OHCA) and to ensure high quality patient care, King County EMS has a number of performance measures designed for continuous quality improvement. Selected 2016 performance measures are highlighted below.

## Bystander CPR

73%

73% of all out-of-hospital cardiac arrests received bystander CPR.

## Dispatch

96%

Performance measures for dispatch focus on accurate recognition of cardiac arrest.

96% of all cardiac arrests were recognized by 9-1-1 operators.

100% of these calls were assigned the correct resource level.

## Basic Life Support

5.5 min.

Average BLS response time: 5.5 minutes.

Average chest compression fraction: 86%

## Advanced Life Support

8 min.

Average ALS response time: 8 minutes.

Rate of successful first attempt intubations: 81%

## System Performance

56%

In 2016, the survival rate for witnessed VF cardiac arrest (widely recognized measure of EMS performance) in Seattle and King County was 56%. This means **288** lives were saved from OHCA in 2016!

*Cardiac Arrest survival rate data reflect King County and City of Seattle.

# EMS Division Programs Overview

## Background

The Medic One/EMS 2014-2019 Strategic Plan, approved by the King County Council and voters in 2013, is the primary policy and financial document that directs the system into the future. Built upon the system's successful medical model and regional approach, the Plan establishes policy directions, outlines the development of new or enhanced programs and initiatives, and presents a financial plan to support the Medic One/EMS system through 2019. The Plan was developed collaboratively through a regional process with stakeholders, and guides the EMS Division in managing the regional system.

## Overview

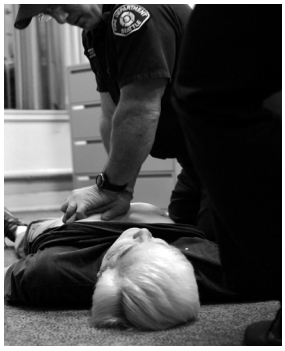
The EMS Division manages the core Regional Services and Strategic Initiatives that support the key elements of the system. These programs help tie together the regional medical model by providing consistent regional medical direction, standardized EMT training and continuing medical education, uniform EMS training for emergency dispatchers, centralized data collection and expert analysis, paramedic service planning and evaluation, and financial management of the regional EMS levy fund. Coordinating these on the regional level ensures prehospital patient care is delivered at the same standards across the system, policies and practices reflecting the diversity of needs are maintained, and local area service delivery is balanced with centralized interests. All EMS Division programs are designed to enhance the integrated Medic One/EMS services and regional approach, and are developed through strong partnerships with other regional EMS agencies and innovative leadership in the emergency medical field.

The EMS Division acknowledges the extraordinary efforts of all the EMS partners involved in implementing established programs and developing new programs. The time, expertise and collaborative efforts required of the EMS community demonstrate exactly why the EMS system in King County is so successful and serves as an international role model.

This section of the report highlights some of the Division's many successful programs and activities from the past year. For more information about other EMS regional programs, please refer to the EMS webpage: **www.kingcounty.gov/health/ems.aspx**.

# Center for the Evaluation of EMS: Grant-Funded Projects and Programs

***The Center for the Evaluation of Emergency Medical Services (CEEMS) works collaboratively with academic and clinical faculty from the University of Washington to implement and evaluate research studies. Working under the direction of King County Medical Program Director and UW Professor of Medicine, Dr. Thomas Rea, the EMS Division's Regional Quality Improvement Section's CEEMS program managers conduct studies aimed at improving the delivery of prehospital emergency services and advancing evidenced-based care and treatment.***



### Life Sciences Discovery Fund (LSDF) Matching Grant: Real-Time Compression Detection and Rhythm Identification

Current defibrillator technology requires users to stop chest compressions in order to analyze heart rhythms in the case of sudden cardiac arrest (SCA). However, multiple peer reviewed publications have shown that SCA outcomes improve when pauses in chest compressions are minimized.

Since being awarded a two-year **Life Sciences Discovery Fund (LSDF)** matching grant in 2015, researchers at King County EMS, in collaboration with the University of Washington Bioengineering Department, have been working to advance automatic external defibrillator (AED) device technology. As reported in the 2016 Annual Report, research has focused on developing algorithms that can "read through" chest compressions to obtain real time feedback and information, allowing for continued "hands on" CPR support. Ongoing work has resulted in refinements, bringing the region much closer to using this new and improved technology in the field.

### Heart Rescue Project, Medtronic Foundation

King County is one of the leaders and participants in the **Heart Rescue Project**, which is a collaborative effort to increase SCA survival rates throughout the United States. Generously funded by the Medtronic Foundation and partnering with the country's leading emergency and resuscitation experts, the project is focused on systemically expanding successful cardiac arrest systems of care to regional and statewide levels.

This is the fifth year that Washington State has participated in this data driven approach to assist in developing action plans for improving survival across the nation. With the creation of Cardiac Arrest Registry to Enhance Survival (CARES), communities have access to data to measure and report on their EMS system performance. King County has been involved in CARES since 2011 when it was invited to help initiate Washington State's data collection effort. What began as a simple statewide endeavor has now expanded to include the states of Alaska, Oregon, and Montana, creating a Pacific Northwest group that is coordinated by King County, and aimed at increasing survival throughout the larger region.

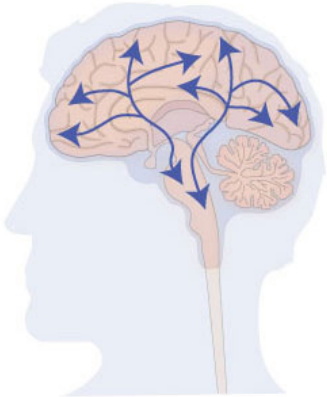
**Throughout 2016, CEEMS staff partnered with academic organizations and private agencies to enhance defibrillator software, supported communities with innovative and enhanced response models, and participated in nationwide partnerships focused on improving out-of-hospital sudden cardiac arrest survival rates.**

# Center for the Evaluation of EMS: Grant-Funded Projects and Programs

CARES and the importance of data collection is one of the principles stressed at the Resuscitation Academy. This collaboration between King County EMS and Seattle Medic One focuses on strategies to improve cardiac arrest survival. Participants are provided with resources and essential tools so that they can return to their communities and develop a concrete plan of action for increasing survival. For more information about the Resuscitation Academy, please visit its website at **http://www.resuscitationacademy.org.**

King County's ability to engage stakeholders to embrace best practices is possible due to the support of the Medtronic Foundation, which extends this opportunity to us year after year. For more information about their efforts, please visit **http://www.heartrescueproject.com.**

### Brain Oximetry during Cardiac Arrest



In many cases of out-of-hospital cardiac arrest, the arrest victim succumbs even though the heart has been successfully resuscitated. Most often these deaths are due to global anoxic brain injury (starving the brain of oxygen), which emphasizes just how important cerebral oxygenation (getting oxygen to the brain) is during CPR.

Recent advances in technology have enabled the real-time measurement of cerebral oxygenation during CPR. The King County EMS Division is using such technology to conduct the **Brain Oximetry during Cardiac Arrest** study to help optimize brain recovery during resuscitation. Using a regional oximetry sensor by Nonin to evaluate cerebral oximetry profile during cardiac arrest resuscitation, the Division specifically aims to:

1. Measure cerebral oximetry over the course of resuscitation in human cardiac arrest and determine the relationship between cerebral oximetry and oximetry of the forearm;

2. Evaluate the relationship between cerebral oximetry and specific therapies including CPR, medication administration, and endotracheal intubation; and

3. Evaluate the relationship between cerebral oximetry and clinical outcomes including heart resuscitation (return of spontaneous circulation) and brain resuscitation (survival with favorable functional status).

The January 2017 launch of the study makes King County the first agency in the United States to study brain oximetry levels in prehospital cardiac arrest. The results of the study may be used to enhance the capabilities of medical instruments used by EMS providers to provide out-of-hospital cardiac arrest care.

# Center for the Evaluation of EMS: Grant-Funded Projects and Programs

## STEMI Accelerator II: Project Update

Acute myocardial infarction (AMI), commonly known as a heart attack, results from a blockage in an artery carrying blood and oxygen to the heart. In a severe type of heart attack, the heart artery is completely blocked. The type of blockage often causes a characteristic set of changes to the heart's electrocardiogram (ECG) tracing. When these ECG change occurs, the heart attack is called an ST-Elevation Myocardial Infarction (STEMI). Unless the artery is re-opened and blood flow is restored quickly, patients can face permanent heart damage, or even death. As time ticks by, heart damage increases as do the risk of long-term complications such as heart failure and arrhythmia.

The preferred method to re-open the heart artery is primary percutaneous coronary intervention (PCI) whereby a special catheter is directed into the heart artery to remove the blockage. Rapid and effective restoration of blood flow relies not only on the patient recognizing the symptoms and seeking emergency medical treatment, but also on a coordinated system of care that involves emergency 9-1-1 dispatch, EMTs, paramedics, and hospitals. This enables the patient to move quickly and seamlessly from the field to the hospital, all the while critical information is updated between field and hospital so that hospital resources can be directed to the patient in a timely manner.

In early 2015, the EMS system received an opportunity to participate in a two-year effort to evaluate the STEMI systems of care in King and Pierce Counties through the **"STEMI Accelerator II" quality improvement project**. This project was offered by a special grant provided through a partnership between the Duke University Clinical Research Institute and the American Heart Association: Mission Lifeline. King County was one of the 12 regions in the United States selected for participation (refer to 2015 Annual Report). The specific goal is to evaluate and improve regional systems of care that connect prehospital and hospital so that STEMI patients are delivered as quickly as possible from field to hospital-based PCI. It required that EMS and hospitals strive for best practices based on evidence-based science to achieve timely diagnosis and best-practices treatment.

By the end of 2015, King and Pierce Counties met the initial Accelerator II goal for participation in that 75% of PCI-capable hospitals in the region had committed to collaborate with EMS to help improve and refine the STEMI system of care. The process required prehospital and hospital stakeholders to measure their care on a regular basis using secure and established national data registry. EMS and hospitals met routinely throughout 2016 to review data reports, collaborate with Accelerator faculty and other participating Accelerator regions, and share best practices between the region's hospitals and WA State Emergency Cardiac and Stroke System partners. For more information about their efforts, please visit its website at **http://www.doh.wa.gov/ECS**.

One of the primary Accelerator quality improvement activities was to establish rapid quality improvement (QI) feedback loops between hospitals and paramedic agencies via "STEMI Feedback" case report forms. This type of feedback can reduce treatment times for STEMI patient and improve outcomes particularly for high-risk patients.

***The early stages of this collaborative effort have resulted in incremental improvements in streamlining our regional STEMI system of care.*** As the STEMI Accelerator II project ends in 2017, the EMS Division will collaborate with hospitals and other stakeholder groups to develop sustainable methods to continue this type of data collection, data review, and QI-focused discussion. The region will use the results from this experience to refine its approach in providing the best quality care for heart attack patients through continuous quality improvement and evidence-based practices.

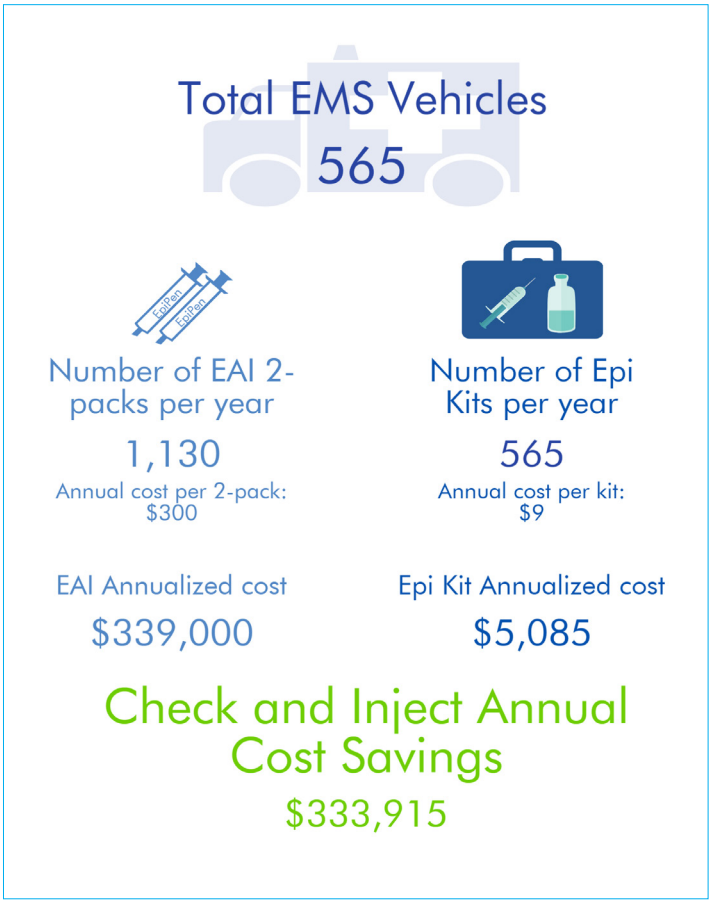
# Medical Quality Improvement

*The Medical Quality Improvement (QI) section conducts programmatic, scientific, and case-based evaluation of the EMS system to improve the quality of EMS patient care in King County. To advance the science of resuscitation and EMS care, it partners with investigators in the EMS Division and at the University of Washington on research projects. This allows for productive and unique collaboration across the academic and operational EMS community, the results of which improve care, outcomes, and subsequently, the health of King County residents.*

## QI Report: The Economics of EMT Administration of Epinephrine Intramuscularly for Anaphylaxis Treatment

As highlighted in past reports, King County's **Check and Inject Program** changed the way that EMTs deliver epinephrine to patients experiencing allergic reactions. Developed in response to the rising cost and short, two-year shelf-life of an epinephrine auto-injector, commonly referred to as an EpiPen®, the program has EMTs returning to the more traditional, and much more cost effective, method of administering epinephrine - via needle and syringe.

A vial with enough epinephrine for at least two emergency doses for either an adult or child, syringes and needles are neatly packaged in a small "Epi Kit," along with a check list for identifying when and how to administer the drug.




The total annual cost of a single Check and Inject Kit is $9. In contrast, the annual cost to maintain two doses of epinephrine autoinjectors range from $600 to $900. In King County, this amounts to a total annual cost-savings of approximately $334,000.

The program was featured in a recent edition of the Journal of Emergency Medical Services (JEMS) magazine, and praised for its success in saving lives while also saving money, improving patient care and the bottom line for all King County residents. More information can be found here: **http://www.jems.com/articles/print/volume-42/issue-6/features/king-county-wash-ems-saves-334-000-annually-by-switching-to-im-delivery-of-epi-by-emts.year=2012.html.**

# Medical Quality Improvement

## QI Report: EMT Administration of Nasal Narcan

King County is facing a public health crisis related to opioid abuse. Approximately 250 people die each year throughout the region from opioid overdose, affecting people from a wide range of ethnic and socioeconomic backgrounds and across the spectrum of rural, suburban, and urban settings.

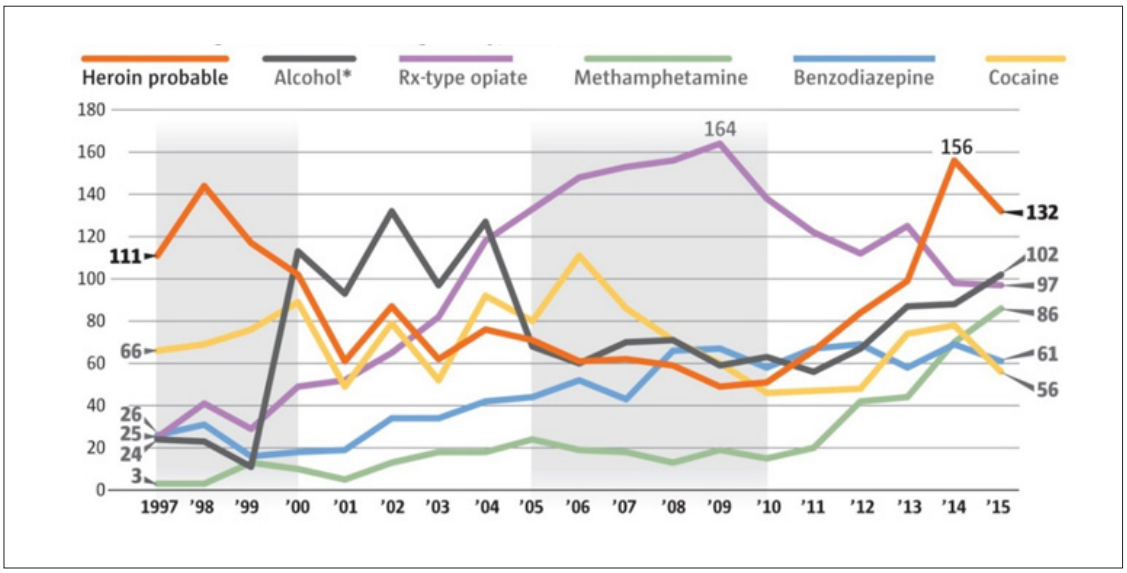
The most important immediate treatment for opioid overdose is effective bag-valve-mask ventilation, which EMTs in King County are singularly most-qualified to perform. Once on scene, paramedics can administer the opioid antagonist naloxone, more commonly known by its brand name Narcan®, to reverse the effects of opioid medication.

As part of a pilot evaluation starting late in 2016, **EMTs at six King County Fire Departments began administering nasal naloxone to patients suspected of opioid overdose**. They were trained to recognize opioid overdose, begin bag-valve-mask ventilations, and administer only one dose of nasal naloxone before returning immediately to bag-valve-mask ventilation.

Over a span of six months, EMTs administered nasal naloxone to 20 different patients. Each fire department used nasal naloxone at least two times, underscoring the widespread nature of this problem. A review of all cases indicated no safety concerns or adverse outcomes as a direct consequence of EMT use of nasal naloxone. The vital signs, exam, and circumstances supported the suspicion of opioid overdose in each case.

EMT nasal naloxone has now expanded to include almost all fire departments in King County. The EMS Division will continue to monitor and review suspected opioid overdose to determine the optimal role of EMT nasal naloxone in King County's high-functioning two-tier EMS system.

**Drug-Caused Deaths in King County, 1997-2015**
**(Source: King County Medical Examiner's Office)**



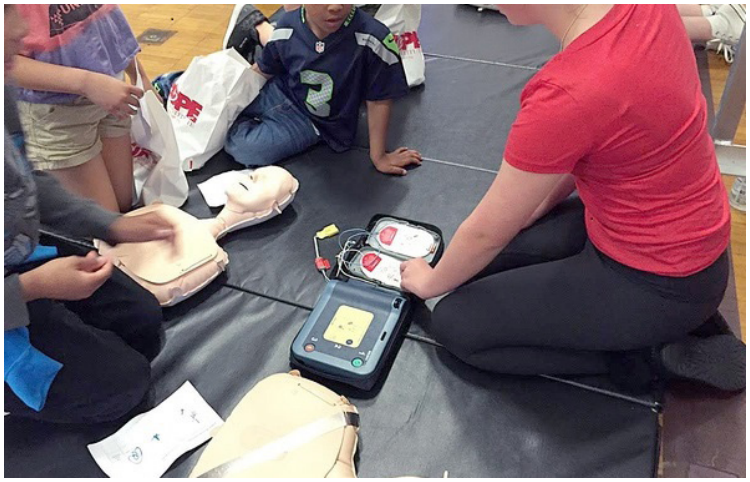
# CPR & Public Access Defibrillation

***Cardiac arrest is one of the most life-threatening of all prehospital medical emergencies. Numerous clinical studies have demonstrated that patients who receive early cardiopulmonary resuscitation (CPR) and early defibrillation have a significantly improved chance of survival from cardiac arrest. The EMS Division offers a number of programs to provide CPR and Automated External Defibrillator (AED) training to residents of King County, while also working to place these devices in public locations and encourage the public to register their AEDs.***

## School CPR Program

One of the reasons King County has a high cardiac arrest survival rate is because such a large number of King County citizens are trained in, and willing to perform, CPR – including schoolchildren. **The EMS Division works in partnership with schools to train students in CPR and AED use.** Although Washington State law requires that students receive CPR and AED training as a requirement for high school graduation, many school districts provide kids training as early as middle school.

Recognizing the diverse learning styles and needs of students, EMS developed and introduced a new CPR and AED training curriculum this past year. Core components of the program include training students on the necessary skills needed to perform CPR and how to use an AED, and participating in role-playing activities helps students understand when it is appropriate to call 9-1-1. The curriculum's five lesson plans fully meet the State's learning standards and grade-level outcomes and is available free-of-charge to King County schools. This program partners with the Tukwila School District to provide CPR/AED training within vulnerable populations in King County with limited English proficiency. EMS provides CPR training to families in multiple languages (e.g., Burmese, Nepali, Spanish, and Somali). Plans include offering CPR/AED training to other school districts to increase the chance of survival from cardiac arrest in under-served populations in our county.



**In 2016, approximately 10,100 students received CPR and AED training through the King County EMS School CPR Program.**

# Emergency Medical Dispatch

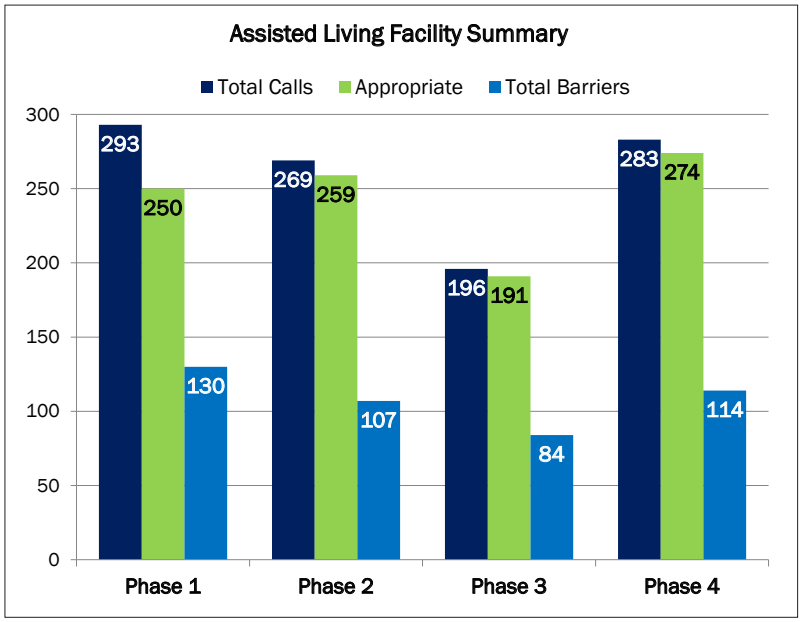
***As the first point of contact with the public, Emergency Medical Dispatchers, also referred to as "telecommunicators," play a vital role in the EMS continual "Chain of Survival." Trained by the EMS Division in Criteria Based Dispatch, dispatchers "triage" calls using specific medical criteria that are based on the signs and symptoms of the patient, to send the proper level of care with the proper urgency. Dispatchers also provide pre-arrival instructions for most medical emergencies and guide the caller through life-saving steps – including Telecommunicator CPR (T-CPR), choking, and even emergency childbirth - until the Medic One/EMS providers arrive.***

## Communities of Care Program

**Communities of Care** works with facilities that have trained care staff serving their residents or patients, such as Assisted Living Facilities, Adult Family Homes, Skilled Nursing Facilities and medical clinics. Because of the services they provide, these facilities are highly likely to access the EMS system on a regular basis. Calling for emergency services can be stressful, and the pressure of the situation can cause delays for 9-1-1- in getting critical information from the caller. The training provided by Communities of Care focuses explicitly on the 9-1-1 call and EMS response processes – the "what" that is needed, and the "why." Preparing employees to answer the critical medical questions telecommunicators ask, and to be led through pre-arrival instructions, if necessary, improves the efficiency of the 9-1-1 call and with EMS patient contact.

The program continues to deliver positive results for facilities serving these types of patients. As a result of a 16-month collaboration period with multiple assisted-living facilities, the EMS system saw a 12% improvement in appropriate use of the system through improved communication on the chief medical concern and use of appropriate resources to use on low-acuity events. The collaboration period consisted of four phases:

- Phase 1: 2 months pre-intervention;
- Phase 2: Up to 4 months post-intervention;
- Phase 3: 4 to 9 months post-intervention; and
- Phase 4: Beyond 9 months post-intervention.




After a 12-month evaluation period, overall barriers (i.e., knowing the address, identifying if the caller is with the patient) improved 13%, with a peak improvement of 36%.

One of the greatest benefits to come from this program are the solid working relationships. It has taught facility staff to be better 9-1-1 callers and users; it has strengthened relationships between service providers, fire departments and communication centers who are all working toward the shared goal of delivering quality patient care to residents; and it has provided a better understanding between each industry's expectations and protocols, allowing for a more collaborative approach to treating patients.

# Injury Prevention

***Injury is the leading cause of death for those under 45 years of age, while for the elderly, falls account for many hospitalizations. The EMS Division has invested considerable time and effort into building long term relationships with fire departments, community agencies and organizations to ensure child seats are appropriately installed, that students are educated about the dangers of distracted driving, and to mitigate potential falls amongst older adults, all in an effort to keep King County's residents healthy and safe.***

## Distracted Driving Campaign

In 2016, there were 27 fatalities and 152 serious injuries due to distracted drivers in King County (2016 WTSC Annual Traffic Safety Report). Driver distraction ranks only behind driver impairment and driver speed as a prevalent driver behavior in traffic fatalities and serious injuries (Washington Traffic Safety Commission Distracted Driving in Washington State, 2016: An Observational Survey).

**Texting while driving is like drunken driving.**

Sending messages while behind the wheel increases the risk of a car crash 23 times — similar to driving with a blood alcohol level of 0.19%, well over the legal limit of 0.08%*.

*Citation: Distracted Driving in King County November 2013: A statewide collaboration with HIPRC, UW Medicine, Public Health—Seattle & King County, King County Prosecuting Office.

The EMS Division collaborates with the King County Target Zero Task Force to support educational and enforcement campaigns to eliminate or reduce distracted driving behavior. Recent efforts have had specific focus on illegal use of cell phones while driving. The Task Force is comprised of local law enforcement, Washington State Patrol, and the Washington State Liquor Control Board. During the past six years, over 4,834 stops were made for a variety of infractions and cited 1,985 distracted driving and illegal cell phone use. Auburn, Covington, and Federal Way police departments participated in a local distracted driving campaign from April to July 2016 on Pacific Highway South in Federal Way and on Highway 167 in the Auburn area. During this campaign, 1,057 contacts were made and 681 citations were given for illegal distracted driving behaviors.

### Washington's New Distracted Driving Law

Effective on July 23, 2017, State law prohibits the use of personal electronic devices while driving except if calling for emergency services. This applies to holding a device in either hand, and also the use of a hand or finger to compose, send, read, view, access, browse, transmit, save, or retrieve email, text messages, instant messages, photographs, or other electronic data. This includes all electronic devices - even tablets, laptops, video games and cameras. For more information, please visit Target Zero - **http://wadrivetozero.com/distracted-driving/**.

***Washington State's new law, in a nutshell:***

TARGET ZERO
KING COUNTY TRAFFIC SAFETY TASK FORCE

- No hand-held cell phone use while driving - even if you are at a stoplight or stuck in traffic.
- No typing messages, accessing information, watching videos, or using cameras.
- The cost for violations increase with each infraction, beginning at $136 for a first offense, and at least $234 for the second offense (if within the five years following the first offense).
- All violations will be reported to your insurance company.
- You can be fined $99 for other types of distractions, such as grooming, smoking, eating, or reading, if the activity interferes with safe driving, and you are pulled over for another traffic offense.

# BLS Efficiencies

***Managing the rate of call growth in the EMS system is a regional priority, and has been an ongoing focus through the past three levy periods. Unmanaged growth can negatively impact fire department response times, performance standard achievement, and quality of patient care. The EMS Division has been identifying and testing strategies for serving non-emergency patients and callers to provide alternatives to dispatching a BLS unit.***

## Community Medical Technician: Bridging to the Future

King County EMS has been exploring opportunities to provide system efficiencies, particularly within the BLS level of response, for many years. While the tactics may vary, the base for BLS efficiencies has been to target aspects of low-acuity calls that might make responders unavailable or out of position for time-critical emergencies. Innovative projects include transferring very low-acuity calls to a nurse-triage service instead of dispatching a unit, providing taxi vouchers to BLS crews for select patients so crews can return to service, and developing an alternative response unit for management of low-acuity medical calls.

The region has been using the **Community Medical Technician project, or CMT**, as the alternative response to low-acuity medical calls. In the 2014-2019 Medic One/EMS levy, the CMT project is being tested in new ways, including across jurisdictional boundaries, in high-volume departments, and with more CMT units operating simultaneously across the County. Three units are currently operating in King County -- one as a partnership unit with Puget Sound Regional Fire Authority's FDCARES program; a second operating with Shoreline Fire Department as the lead in conjunction with (and responding into) Bothell Fire and EMS and Woodinville Fire and Life Safety; and a third unit co-operated and jointly staffed by Valley Regional Fire Authority and South King Fire and Rescue.

Regional EMS partners have also developed and tested methods to manage low-acuity calls to seek help for individuals who use 9-1-1 inefficiently or ineffectively. Identifying their root causes of need and helping them get access to a more appropriate healthcare setting provides greater connections to healthcare and assists individuals in receiving the help they need (i.e., physical/mental/behavioral health care visits, other services). This is done outside of an emergency response setting, allowing more time to be spent with the caller. Often times, this approach uses health and well-being providers, such as nurses and social workers, who extend their expertise into the emergency system to serve as a bridge between prehospital and traditional healthcare. These bridges are becoming increasingly crucial to develop and maintain to assist the individuals calling 9-1-1 in receiving the care they need.

In recognition that all of these approaches are also being developed in EMS agencies across the country, King County EMS is aligning the various low-acuity projects under the umbrella term of "Mobile Integrated Healthcare." Working within this framework and connecting it to a nationally recognized terminology allows King County to further develop crucial partnerships with broader healthcare entities, track data for measurement against other areas, and train and educate responders to continue providing expert care.

This work will also have a significant overlap with the Washington State Medicaid Transformation Project. In January 2017, the Centers for Medicare & Medicaid Services approved a waiver for Washington State and authorized up to $1.5 billion over five years to dramatically reshape the healthcare landscape across the state. Within the Medicaid Transformation Project, EMS has been identified as a key partner in several potential project areas that aim to improve Medicaid enrollees use of the Emergency Department, connection to care and coordination of services, among others. While aiming to have a measureable improvement in care for the Medicaid population, projects will be developed to serve all individuals in a more coordinated, effective manner.

# King County Medic One

***King County Medic One (KCM1) is one of the five Advanced Life Support (ALS) paramedic agencies in the regional EMS system. KCM1 now serves approximately 557 square miles of south King County, including Vashon Island, with a population that is now close to 750,000 people. In calendar year 2016, KCM1 responded to approximately 18,000 calls for advanced care, including cardiac emergencies, pediatric patients, mass casualty, and motor vehicle crashes.***

## Quality Workforce

As highlighted in the 2016 Annual Report, the region continues to experience a wave of retirements, and King County Medic One is no exception. With the retirement of former Administrator John Herbert, Keith Keller is now leading KCM1. This transition provides an ideal opportunity to assess the organization so it is well-positioned to meet future needs.

King County continues to evaluate the efficiency and effectiveness of its EMS services throughout South King County. Working together as part of a larger Advanced Life Support and Basic Life Support team allows for a redundancy and resilience in providing complex care. Limiting the number of paramedics, and combining that with the truly tiered system, allows for each medic to care for a large number of critically-ill and injured patients on a regular basis and maintain a very high level of competence.

In alignment with the King County Executive's Priority of Equity and Social Justice, the EMS Division and King County Medic One are dedicated to increasing diversity in its EMT and paramedic applicant pool and workforce, and bridging the gap between EMTs and paramedics by allowing equitable opportunities for all candidates. An important component of the continued success of the EMS system is to ensure that the hiring process is equitable for both people of color and women. For more information related to KC EMS Division's recruitment efforts, refer to page 27 for the Public Health Highlight: Equity and Social Justice in EMS.

## Regional Partnership: Medical Program Direction

Medicine is the foundation of the Medic One/EMS system. It is the basis for the standardized protocols and procedures that providers follow in making near-optimal decisions during incredibly stressful circumstances and working with a significant degree of autonomy under significant time pressure. It defines the tiered response system, which relies heavily on extremely competent Basic Life Support (BLS) partners to provide the first level of treatment and triage.

Since the Medic One system's creation nearly 40 years ago, the regional partnership between King County and the University Of Washington School of Medicine has ensured King County residents receive the highest quality prehospital patient care. All paramedics within the system are expected to provide the same quality and level of care as that of a well-trained physician, which is accomplished at KCM1 by involving emergency room physicians in the organization's decision-making processes. Such medical direction is provided by King County's Medical Program Director, Dr. Thomas Rea, and KCM1's Program Medical Director, Dr. Peter Kudenchuk. With both physicians being on the faculty of the University of Washington School of Medicine, KCM1's program is strongly driven by research.

# King County Medic One

### King County Medic One & Vashon Island Fire and Rescue Integration

The EMS Division and King County Medic One have worked with Vashon Island Fire and Rescue (VIFR) since early 2014 to seamlessly transition its paramedic program to KCM1. VIFR's paramedics served island residents for many years, but its program faced two significant challenges. First, paramedics that worked uniquely on Vashon Island responded to substantially fewer ALS calls per year compared to KCM1 paramedics. This in turn reduced the number of acute patient care contacts and the frequency that they were able to exercise their complex medical skills. Secondly, VIFR had limited resources due to its size compared to KCM1. The VIFR ALS operation was challenged when one or more paramedics were out on injury leave or extended vacations/sick leave because the remaining few paramedics had to then work substantial mandatory overtime to ensure complete coverage of Vashon paramedic shifts. In an effort to provide Vashon Island residents with access to the best possible medical care and access to more resources, VIFR paramedics joined the KCM1 program in February 2017, becoming part of the medic pool that serves the island and the broader area. For more information on ALS provider areas, please refer to Appendix A on page 59.

# Administration

***The Administration Section provides leadership and support to internal and external customers to ensure the integrity and transparency of the EMS system. It actively engages with regional partners to implement the EMS Strategic Plan; undertakes long-term programmatic and financial planning; prepares the annual budget, monthly monitoring, and projections, and is responsible for the continuity of business in collaboration with EMS stakeholders. Administration also provides essential support to all EMS Division sections that direct a multitude of regional programs by assisting with contract management, and support for personnel-related activities, budget preparation, and day-to-day operational activities.***

## Regional Leadership: Independent Study for the Provision of ALS/Medic One Services

The region was recently briefed on the findings of an independently-conducted study that examined whether there would be advantages to changing the current number of ALS providers. Undertaken by The Paramedic Foundation (**http://paramedicfoundation.org** ), the ALS Study reviewed whether there is an optimal number (or range) of ALS agencies in the county, and what the optimal number (or range) of units agencies should operate. It also identified a regional process to follow should changes to the current ALS agency configuration occur.

The Paramedic Foundation collected qualitative and quantitative data, interviewing local subject matter experts and considering financial, operational, clinical and demographic information. As stressed throughout the Study, as well as through the region, the intent is to identify any medical, operational, and financial advantages associated with changing the number of ALS provider agencies, not redesign the successful regional system. To that end, the Scope of Work for the Study recognizes that the current EMS system provides excellent patient care, and stipulates that any potential recommendations must ensure that:

- there is no deterioration in the provision of medical care or patient outcomes;
- the system remains tiered, integrated, and regional;
- medicine be the basis of all patient care and services; and
- the focus on operational and financial effectiveness and efficiencies be sustained.

In evaluating economy of scale, economy of scope, and alternative models, The Paramedic Foundation found the following:

1. The current system has enough ALS agencies, ALS medic units within each agency, and personnel in place to meet the medical needs of the county.
   - Paramedic agencies are meeting - and in some cases exceeding - their response time requirements throughout the county.
   - The current number of ALS units from their current locations is capable of achieving the goals of the EMS Division.

2. System costs are greatly reduced by having fewer agencies operating more units.
   - It may be unrealistic for an agency to operate fewer than three units to maintain the capacity to absorb and respond to logistical, staffing, equipment, and system demand issues.
   - It is untenable, both economically and operationally, to operate a single unit.

3. There are significant economic advantages to having one ALS provider operate all of the medic units in the county.
   - Reducing the number of ALS agencies, and increasing the number of medic units operated by each agency, will reduce redundant administration and operational support. This will lead to the most effective means of increasing the economic efficiency of the system.
   - In addition to the cost savings, most stakeholders interviewed felt there were numerous benefits to agency consolidation, although they were difficult to quantify.

4. Consolidating ALS service areas would be extremely difficult and sensitive, both organizationally and politically.
   - A process similar to the current levy planning process led by the EMS Division could be used to build consensus, elevate discussion beyond EMS operations, and move the change process forward.

5. Because consolidating into one ALS provider countywide is not likely to be politically feasible in the near future, the region should consider options to improve the operations, finances and performance of the system as a whole.
   - Options identified include increasing standardization, reducing duplication, and facilitating the portability of paramedics from one agency or area to another.
   - Consider a more acceptable short term approach, such as a move towards consolidating agencies operating in Zone 1 (Northeast King County).

6. Formal changes to the current configuration of ALS agencies should follow a process that includes a clear determination of community need, impartial facilitation and consensus.
   - Proposals must include a business case outlining costs, impacts, public value, and how the change would either improve the system, or fix an existing problem.

The Study's findings have been well-received throughout the EMS community and should help inform the next levy planning process, slated to begin in early 2018. To read the report, please visit **http://www.kingcounty.gov/depts/health/emergency-medical-services/reports.aspx/**.

# Administration

### Stakeholder Engagement: 2016 Audit

The King County Auditor has long conducted regular reviews of the EMS Division's finances and programs. While past audits have focused on practices that fall directly under the Division's purview, the assessment completed earlier this year addressed workforce issues confronting the entire EMS system, and how the EMS Division might collaborate with its partners to tackle these sizable concerns.

Working closely with stakeholders outside the County government structure, the auditors found that the EMS system faces substantial retirement and staffing challenges. Nearly 30% of the EMT and paramedic workforce will be eligible for retirement by 2019, which could have significant financial and staffing impacts. The EMS workforce is predominantly white and male, which is increasingly different from the demographics of the communities it serves. This lack of gender and racial diversity could possibly deter qualified candidates from even applying for jobs. In addition, not all agencies collect demographic information - less than half of the agencies collect data on ethnicity while about 70% collect gender data. Not having this data hampers efforts to improve diversity.

The audit recognized that individual agencies have started to address these challenges, but recommends these efforts occur at a regional level to ensure enough workers are available to meet demand. This recommendation dovetails into efforts that the EMS Division and the King County Fire Chiefs have begun to broaden recruitment, including review of current hiring practices and community outreach opportunities. (Please see page 27 for details on this multi-faceted approached to integrate Equity and Social Justice values and themes into the EMS workforce.)

In March 2017, the King County Fire Chiefs Association developed its own Workplace Diversity 2017 Work Plan. Its focus includes improving outreach and recruitment, evaluating the testing process, and developing a regional mentorship program. The King County EMS Division will continue to work with the Chiefs to implement these goals.

# Professional Standards

***The Professional Standards Section provides initial training, continuing education, instructor education and oversight of the recertification process for more than 4,200 Emergency Medical Technicians (EMTs) throughout King County. Through communication and coordination among EMS stakeholders, this section develops the curricula that ensure the training and education programs meet agencies' needs and Washington state and national requirements. As the liaison between the Washington State Department of Health and the 30 EMS/fire agencies in King County, Professional Standards relays continuing education, certification, and regulatory and policy changes to EMS agencies.***

## BLS Initial Training Initiation

Through its Initial EMT Training, the EMS Division sets the foundation for EMTs to succeed within King County's dynamic, efficient and responsive EMS system. Consisting of 132 hours of classroom and practical instruction and 10 hours of hospital observation time, the training is offered twice a year, with classes held on evening and weekends over the span of 14 weeks. Courses are based on the latest data and research so that EMTs are knowledgeable about current medical practices and measures.

Over the past year, the Division and its partners have discussed expanding the EMT training options to better meet fire departments' schedules and needs. The length and timing of the 14-week program, while comprehensive in its courses, does not accommodate the frequent and overlapping retirements impacting some agencies. They've responded to this by providing their own intensive five-week and one-week EMT courses using the County's curriculum and materials. Other agencies are interested in making these course opportunities available to their personnel, but costs are preventing such implementation.

The result of these conversations is a **new EMT Initial Training Initiative** to standardize, regionalize and coordinate these training courses. To help ensure the consistent delivery of crucial BLS skills across the many EMS agencies, the County will support and direct a new a five-week Initial EMT Training session, and a one-week "bridge" session. The five-week class covers the EMT certification basic skills and King County-specific guidelines, while the one-week session provides experienced EMTs with training on King County skills and directives.

As currently being piloted, the proposal authorizes Zone 1 and Zone 3 to each offer two five-week courses per year, and to work with the EMS Division in scheduling four one-week course per year, as needed to expedite the preparation of previously trained EMTs. These courses are offered in addition to the current 14-week option and are available across zones to all EMTs in the region. Classes are coordinated through host agencies and the EMS Division, giving departments the ability to schedule classes based on hiring demands and to select which training option best fits their new recruits. The EMS Division and fire agencies will collectively assess the skills of those EMTs that went through the various training options to evaluate the success of this new program.

# Professional Standards

### BLS Initial Training Accreditation

In 2017, the EMS Division's Professional Standards Section earned its **accreditation from the Commission on Accreditation for Prehospital Continuing Education (CAPCE) for EMS Online (http://emsonline.net)**. EMS Online is an online website that allows emergency medical providers to register to access and complete online courses to earn continuing education credits. Earning the CAPCE accreditation demonstrates the Division's commitment to excellence in EMS Continuing Education (CE) and leadership in the EMS arena by putting EMS CE on an equal footing with that of physicians and nurses.

King County ALS and BLS providers can now register for the EMS Online CAPCE accreditation. Once registered, each provider will receive a "Certificate of Completion" listing the number of Continuing Education Hours (CEH) obtained for each accredited course and exam they successfully pass on EMS Online. The CAPCE accredited CEH earned on EMS Online is approved by the state of Washington and is now eligible to meet the distributive education requirements for the National Registry of Emergency Medical Technicians (NREMT).

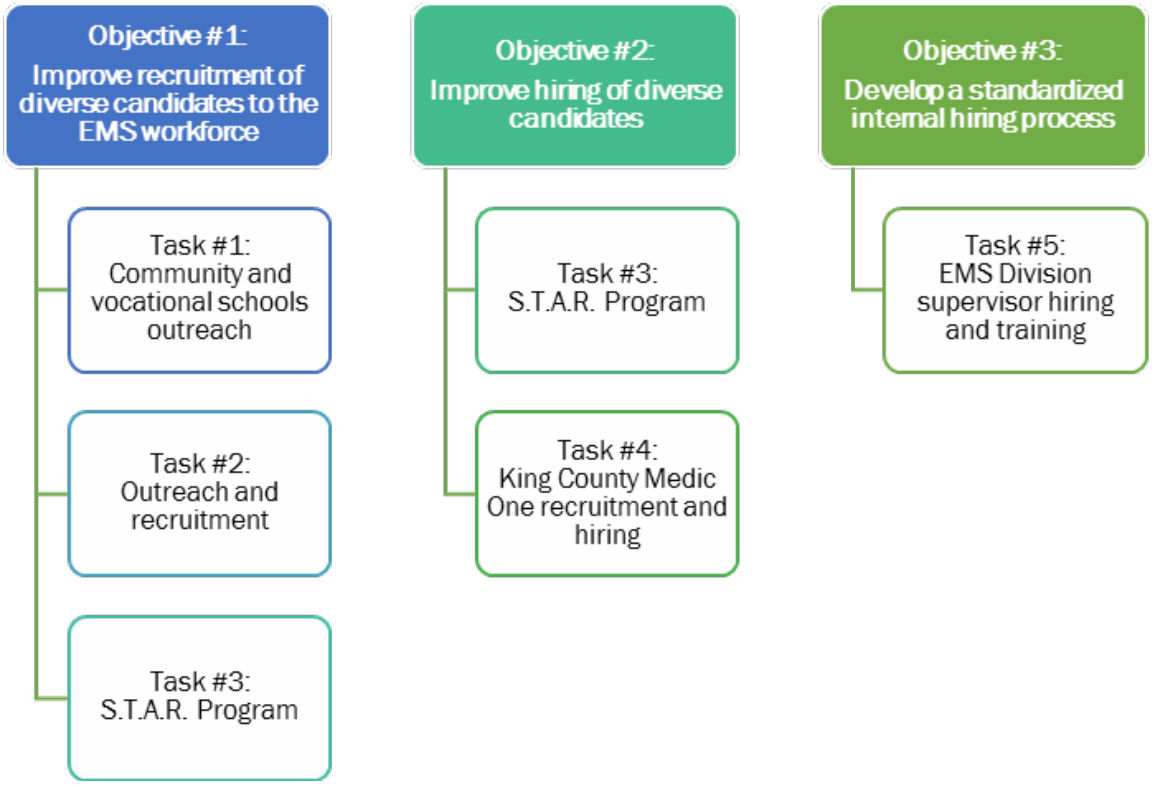
**The results of the assessment proved that online courses and curriculum developed by the Professional Standards Section are meeting, and exceeding, the national standards set forth by the Commission.**

# EMS Division Highlight: Equity and Social Justice in EMS

## Equity and Social Justice (ESJ) in EMS

The EMS Division's **Equity and Social Justice (EMS/ESJ) Diversity Project** was developed to integrate ESJ values and themes into the EMS Division workplace and programs. When compared to other divisions within Public Health–Seattle and King County, EMS ranked low in terms of gender and ethnicity diversity in its workforce and disparity in relation to pay scale. Developed in response to this, the EMS Diversity Project initiative uses a multi-faceted approach to increase the diversity in the emergency medical technician (EMT) and paramedic workforce, and within the EMS Division.

**EMS/ESJ Initiative Objectives and Supporting Tasks**



# EMS Division Highlight: Equity and Social Justice in EMS

Strategies for improving the recruitment and hiring of a diverse pool of EMTs and paramedics include increasing collaboration with ESJ communities, engaging diverse candidates, and evaluating and improving internal EMS Division hiring practices. These strategies were further refined by: gathering and analyzing new data; researching best practices; refining efforts related to the EMS Scholarship program and the Vulnerable Populations Strategic Initiative; working with private ambulance companies and fire departments to identify barriers in hiring; meeting with hiring managers, and encouraging ESJ facilitated discussions and/or training of EMS employees. Specific metrics developed to measure impacts for each of the specific strategies supplemented these efforts.

Partners and stakeholders in the Initiative include hiring managers from the EMS Division and King County Medic One, researchers from University of Washington (UW), the EMS Division's ESJ Core Team, fire departments, and private ambulance companies. Hiring managers assisted with developing a work plan for the division and with the effort to increase diversifying the workforce and integrating ESJ themes within the division. Researchers from UW will help evaluate programs and develop metrics to measure impact.

### Task #1: Community and Vocational Schools Outreach

The EMS Division's ESJ Core Team has committed to attending various educational and community outreach opportunities, such as school career days, community fairs, community festivals, vocational schools, and community college career fairs, in an effort to provide resources to improve potential candidates' qualifications.

### Task #2: Outreach and Recruitment

The ESJ Core Team reached out to events to expose under-represented groups to the EMS workforce. Potential opportunities to establish partnerships and create a pipeline to careers in EMS were explored. EMS sponsored three campers for Camp Blaze, an all-female-run fire service immersion camp whose mission is to empower, inspire, and support strong women leaders in both personal and future professional lives. Campers learned essential firefighting skills including: life fire training, search and rescue, interviewing techniques, rappelling, and team-building. Campers were strongly encouraged to apply to the S.T.A.R. program after completion of the camp.

# EMS Division Highlight: Equity and Social Justice in EMS

### Task #3: S.T.A.R. Program (formerly "the Scholarship Program")

Increasing the diversity of the EMS workforce by raising awareness and providing training opportunities for traditionally under-represented students are two goals of the Strategic Training And Research (S.T.A.R.) program. Students selected for the S.T.A.R. program enroll in a 14-week EMT training course, free of charge. Upon completion of the program, students take certification tests aligning with their desired EMS career path. Program instructors also provide mentorship to students both during and after the class for career assistance and potential job placement. Direct feedback obtained from students and instructors through each iteration continuously improves on the structure of the class and selection process for the program. In 2016, the program was evaluated by Zachary Williams, a University of Washington graduate student (at the time), to learn of the program and possible recommendations for improvement. The findings can be found on the EMS Division website: **http://kingcounty.gov/depts/health/emergency-medical-services/~/media/depts/health/emergency-medical-services/documents/vulnerable-populations/EMT-scholarship-program-evaluation.ashx.**

### Task #4: King County Medic One Recruitment and Hiring

Improving recruitment and hiring of diverse candidates for King County Medic One remains a high priority. The ESJ Core Team analyzed recruitment, testing, and hiring data for King County Medic One to identify under-represented groups in the areas served by KCM1. This involved the analysis of the demographics of the populations served by KCM1 across the South King County region. Initiatives included coordinating outreach initiatives to increase recruitment and hiring of workforce members representative of under-represented groups of the areas served.

### Task #5: EMS Division Supervisor Hiring and Training

Raising awareness of equity and social justice across EMS, in addition to building the knowledge, skills, and behaviors necessary, seeks to foster an organizational culture that promotes fairness and opportunity. In 2016, the EMS ESJ Core Team worked collaboratively with Public Health ESJ trainers and EMS leadership in developing standard and consistent hiring practices and training for the Division. For example, supervisors and managers that facilitate the hiring process will consistently require application reviewers and interview panel members to watch, then discuss, a training video that focuses on raising awareness of "implicit bias." "Implicit bias" refers to the process of associating stereotypes or attitudes toward categories of people without conscious awareness. This standard practice ensures that participants in the hiring process understand the concept of implicit bias and begin to identify and mitigate individual bias during the hiring process.

# 2014-2019 Strategic Initiatives

***The Medic One/EMS 2014-2019 Strategic Plan contains Strategic Initiatives that are designed to improve EMS services, manage growth of the EMS system and contain costs. Developed through strong partnerships with EMS agencies in the region, these innovative initiatives have allowed the Medic One/EMS program in King County to maintain its role as a national leader in its field. The following section describes the initiatives planned for the 2014-2019 levy span.***

## 1. BLS Efficiencies

The **BLS Efficiencies Strategic Initiative** focuses on monitoring BLS call growth and implementing strategies to diminish the impact of increasing call volume. This Initiative supports EMS partners in pursuing innovative strategies to manage current BLS demand, and delay future growth in the request for BLS assistance. By measuring performance, initiating pilot programs, and evaluating results, this Initiative develops approaches to improve the quality of care and gain system improvements, placing emphasis on alternatives for better serving non-emergency patients and callers, often referred to as "low-acuity."

Objectives of the Initiative include:

- Evaluating and reducing unnecessary EMT requests for medics from scene;
- Evaluating and minimizing unnecssary BLS transports;
- Studying potential to expand EMT scope of practice to accomodate emerging community needs; and
- Providing EMTs with more training and skills to make more effective, confident decisions at the scene, with a focus on minimizing unnecessary transports.

In 2016, the EMS Division and EMS agencies in King County focused their efforts on developing a regional approach to initial EMT training by standardizing and expanding the options available to EMTs. As a direct result, in addition to the traditional 14-week evening and weekend EMT training courses, options include a five-week class, and a one-week "bridge" option for new hires with some knowledge, skills, and abilities, and who did not receive King County-specific training. This option allows flexibility with Fire Department partners and ensures continued excellence in training EMTs in our County.

The EMS Division continues to oversee programs including the Taxi Transport Voucher Program and partner with community-based clinics to better incorporate patients seen by the Community Medical Technician (CMT) units. Refer to page 19 for information about the CMT Program.

# 2014-2019 Strategic Initiatives

## 2. Efficiency and Effectiveness (E&E)

**Efficiency and Effectiveness Strategic Initiative (E&E)** funds allow the EMS Division - and its numerous partners - to explore opportunities to improve EMS, system-wide. The Initiative supports a wide range of continuous improvement projects that aim to improve the quality of care, first by testing in small or limited areas, then looking to widen the benefits by taking the idea to a larger area or across the region. Each project receiving funds through the E&E Initiative adheres to a strong evaluation component in order to focus on performance measures, system outcomes, standards and other metrics.

In 2016, the following three projects were awarded funding and completed– two of which were internal projects within the King County EMS Division:

1. Bolstering the online curriculum for Paramedic Continuing Education on EMS Online,
2. Reviewing and possible expansion of BLS Medical Control, and
3. Inclusion of a Master of Social Work (MSW) within the overall structure of the Puget Sound Regional Fire Authority FDCARES program.

South King Fire and Rescue was awarded a project that works to integrate an MSW care coordinator in the Fire and EMS system that works in conjunction with St. Francis Hospital in Federal Way, identifying and engaging with individuals in the community who suffer from chronic disease and have high utilization of both the EMS system and the hospital and emergency department. Redmond Fire Department and the Redmond Medic One provider group were awarded an E&E grant to explore and develop a Mobile Integrated Healthcare program; the planning efforts include visiting and learning from both national and local efforts, data review, scope and budget development.

The Equity and Social Justice in EMS E&E continues to explore ways to integrate ESJ values and themes into the EMS Division. This multi-year project will work to develop workplace programs and policies that improve equity in EMS and has targeted efforts on inclusivity in the recruitment of new EMS professionals throughout King County. For more information on this project, refer to the EMS-ESJ Initiative on page 27.

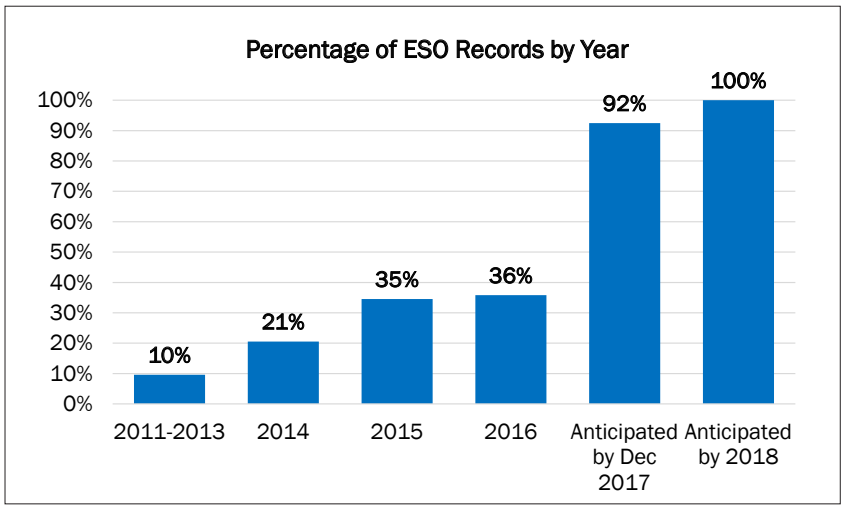
## 3. Regional Records Management System

During the Medic One/EMS 2014-2019 levy planning process, the region committed to supporting programs that specifically reduce BLS costs and improve overall EMS system effectiveness. One such project is the **Regional Records Management System (RMS) Strategic Initiative**, which reduces BLS agency costs by transferring the administrative and financial responsibility of the patient care record software to the EMS Division. This milestone was completed in late 2015 following the identification of a single software solution and the establishment of a contract (ESO Solutions) that enables all EMS agencies access to the software.

By the end of this year, 29 EMS agencies will have transitioned to the use of ESO records, benefitting our partners and patients with more complete and better access to data, increased system oversight, and ultimately, improved medical care. By January 2018, all agencies will complete the transition to ESO records. The graph on the following page depicts the tangible progress since 2011.

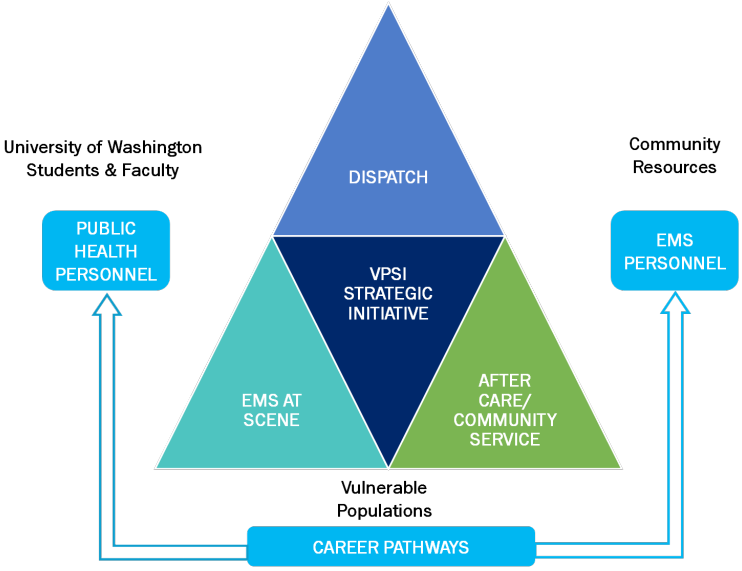
# 2014-2019 Strategic Initiatives

The regional RMS Initiative is an important penultimate step in the larger Systemwide Enhanced Network Design (SEND) effort to move EMS agencies from paper to electronic patient care records in the field and connecting to hospitals over electronic interfaces. Tangible progress has been made over the past few years, and the final step is to complete additional interfaces with local hospitals and garner a greater percentage of patient outcomes (currently about 15% of all transported patients are received electronically). This initiative benefits our partners and patients with more complete and better access to data, increased system oversight, and ultimately, improved medical care.




## 4. Vulnerable Populations

The **Vulnerable Populations Strategic Initiative (VPSI)** is a collaboration between the EMS Division, Public Health – Seattle & King County, fire departments, community-based organizations, and the University of Washington (UW). The goal of VPSI is to conduct programmatic, scientific, and case-based evaluations to ensure that the interface between EMS and vulnerable populations is of the highest quality.




The objectives of the VPSI are as follows:

1. Cultivate ongoing partnerships with existing agencies, networks, and programs that are serving vulnerable populations in King County.
2. Identify needs and develop strategies for system-wide changes that will improve EMS care for vulnerable populations.
3. Develop strong collaborative relationships between VPSI activities and the UW by connecting students to the practice community via capstone, thesis, and practicum opportunities related to VPSI.
4. Build a sustained approach to career paths in EMS for under-served, vulnerable populations.

# 2014-2019 Strategic Initiatives

## Education and Outreach to Limited English Proficient (LEP) Communities

### *Project Spotlight: Chinese Information Service Center (CISC)*

This is the third year of an ongoing partnership between the Chinese Information Service Center (CISC), VPSI and the UW to promote effective and efficiency use of 9-1-1 services. In past years, we successfully engaged Chinese, Vietnamese, Cambodian, and Korean communities. This year we expanded our presence reaching out to the Asian Indian community. Collaborating with Hindu Temple and Culture Center, UW students talked about 9-1-1 services and demonstrated hands-only CPR. Students also conducted workshops at different locations (i.e., low-income housing, meal sites, churches, clinics, temples), and participated in largescale fairs both in Seattle and the Eastside.

One of the highlights this year was the creation of a video teaching kids how to use the 9-1-1 system effectively. This video, as well as other materials developed to educate LEP Asian communities on 9-1-1 and hands-only CPR, will be available on our new website: **http://www.kingcounty.gov/depts/health/emergency-medical-services/vulnerable-populations.aspx**.

**Summary of CISC Activities (2014-2017)**

| CISC Activity Measure | 2014-2015 | 2015-2016 | 2016-June 2017 | Total |
|---|---|---|---|---|
| Number of UW students participating | 5 | 8 | 9 | **22** |
| Number of education materials (e.g., videos, brochures, presentation boards) developed | 2 | 1 | 1 | **4** |
| Number of workshops | 0 | 7 | 13 | **20** |
| Number of community fairs | 4 | 3 | 4 | **11** |
| Estimated number of materials disseminated | 200 | 250 | 950 | **1,400** |
| Estimated number of individuals reached | 700 | 776 | 2,154 | **3,621** |

### *Project Spotlight: Seattle Fire Department Outreach*

**Background**

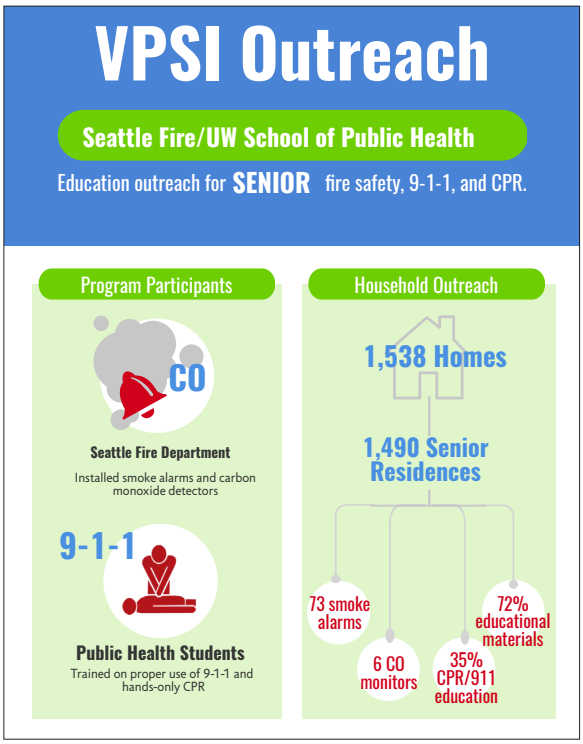
Over the past two years, UW School of Public Health capstone students, in partnership with the Seattle Fire Department, conducted outreach activities to seniors on fire safety, 9-1-1, and hands-only CPR. Educational messages included fire safety, how and when to perform bystander hands-only CPR, and how to call 9-1-1 for cardiac arrest. Seattle firefighters offered free smoke alarms and carbon monoxide detectors on selected Saturday home visit dates.

**Findings**

During the first year, outreach volunteers used CPR training manikins to teach hands-only CPR. During the second year, volunteers explained how to do hands-only CPR without using the manikin. Volunteers provided information packets containing a flyer outlining when to call 9-1-1 and non-emergency numbers, a magnet with the two steps of hands-only CPR, and fire prevention materials, to use as visual aids for the educational messages and to leave with the senior for reference and review at a later time.

# 2014-2019 Strategic Initiatives

During this two-year individual outreach period, canvassers visited 1,538 homes; 1,490 senior residences, and 42 *adjacent homes of non-seniors.* During the first year, Seattle Fire Department installed 73 smoke detectors and six (6) carbon monoxide (CO) detectors in seniors' homes. Senior education results were available for this report from 1,336 visits (87%). Outreach volunteers found someone at home in 475 (36%) of the 1,336 visits; no one was home 64% of the time. Among the 475 at home, 166 (35%) were educated on CPR/9-1-1, and 343 (72%) were interested in receiving the informational materials. Reasons offered for declining the CPR education included: already knowing CPR, not interested, too busy at the moment, and not proficient with English. This information will be used in designing future outreach efforts.




## Fire Department-Based Project

### *Project Spotlight: Evaluation of Patients with Mental Health Illness and/or Substance Use Disorder*

**Background**

Up to 30% of the U.S. population has some form of mental illness, substance use disorder, or a combination of both. When people with mental illness or substance use disorder or others perceive a need for help, a typical response is to call 9-1-1. Alang's (2015) analysis of data on 2,564 people with unmet mental health needs confirmed the perception of structural barriers (29.16%) and identified other reasons: cost/insurance (51.19%), perceived stigma (23.3%), minimization (24.94%), and low perceived effectiveness of treatment (8.51%).

As part of the Vulnerable Populations Strategic Initiatives (VPSI), the Shoreline Fire Department and the County initiated a nine-month pilot project from August 2015 to April 2016 to test a method of connecting 9-1-1 callers who have mental illness or substance use disorder to healthcare resources. The project aimed to understand if use of a dedicated social worker that has earned a Master's Degree in Social Work (commonly referred to as a "MSW"), could be effective in connecting and referring community members identified by EMS providers with mental illness and/or substance use disorder. This would require patients identified by the MSW to agree to assistance.

**Findings**

During the pilot, the MSW received 520 substance use disorder/mental health referrals, representing about 10% of the total call volume for Shoreline Fire Department. Of the 520 referrals to the MSW, 448 unique patients were identified. Of the 448 unique patients referred to the MSW, 53 (12%) were excluded because they were already in facilities that provide services, 326 (73%) were not reached by the MSW, and 69 (15%) were successfully reached by the MSW. The following table describes the responses of the 69 patients contacted by the MSW over the entire pilot period.

**Patient Responses by Evaluation Area**

| Evaluation Area | No | Yes |
|---|---|---|
| Currently enrolled in any services | 31 (45%) | 38 (55%) |
| Insurance | 61 (88%) | 8 (11%) |
| Agreed to receive services | 52 (75%) | 17 (25%) |
| Referred to services | 58 (84%) | 11 (16%) |

Of the 17 patients who agreed to receive services, 10 were already enrolled in other services when contacted by the MSW. Notably, there were a high rate of uninsured patients (88%) and the lack of enrollment in services (45%). Almost all of the 38 patients indicated that they were currently enrolled in services mentioned and were under the care of a primary care physician. Many (45%) mentioned a psychiatrist or mental health counselor.

**Discussion**

The pilot program used a social worker to engage with 9-1-1 callers who were referred by EMS providers with a primary or secondary diagnosis of mental illness and/or substance use disorder. As a result of this pilot effort, **69 patients were reached by the MSW, 17 of them agreed to receive services, and 11 patients were assessed and referred to resources for follow up**. Unfortunately, it's unknown whether these patients actually followed up for care.

Analysis of initial dispatch codes (IDCs) from dispatch and primary and secondary impressions from EMS personnel indicates that **the patients did not have behavioral/psychiatric disorder or substance/drug use disorder incidents in isolation.** In the 125 (24%) of 520 incidents where an ALS unit was also present at the scene, the patients experienced a more critical medical condition (e.g., cardiac arrest, seizure, chest pain). This indicates the patients seen by the Shoreline FD may have complex physical and behavioral needs, requiring close collaboration between the FD and local area resources.

We also learned that the **time and method of contact is directly related to the rate of patient participation – the more immediate contact by the MSW resulted in greater success of patient participation.** Patients that were not contacted immediately after the incident were often less likely to participate in the program. Additionally, the pilot indicated that the **in-person contact method is the most efficient way to connect with patients and motivate them to enroll in services.** People who usually call 9-1-1 when in need in of EMS help are generally more receptive to receiving help.

**Conclusion**

This pilot program connected 11 patients by referring them to needed services, which represents considerable success in light of the many challenges people face with mental illness and chemical dependency. The program also identified areas for improvement in order to increase engagement. Fire departments are uniquely positioned to come into contact with people in need of services, and ideally, connect them to community resources in a comprehensive and cohesive way. Refer to the following link for a complete evaluation of the pilot program: **http://kingcounty.gov/depts/health/emergency-medical-services/~/media/depts/health/emergency-medical-services/documents/vulnerable-populations/patients-mental-health-illness-chemical-dependency-disorders.ashx**.

# 2014-2019 Strategic Initiatives

**VPSI Next Steps**

Up to 30% of the U.S. population has some form of mental illness, substance use disorder, or a combination of both. When people with mental illness or substance use disorder or others perceive a need for help, a typical response is to call 9-1-1. Alang's (2015) analysis of data on 2,564 people with unmet mental health needs confirmed the perception of structural barriers (29.16%) and identified other reasons: cost/insurance (51.19%), perceived stigma (23.3%), minimization (24.94%), and low perceived effectiveness of treatment (8.51%).

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**VPSI 2017-2018 Work Plan**

| EMS Agency Projects | Community Projects | LEP Community |
|---|---|---|
| **Existing Projects:** | | |
| 1. Vulnerable Adult Expansion Project<br>2. Renton/Kent Sobering Pilot Project | 1. 9-1-1/CPR Training and Education in Senior Centers<br>2. CPR Training for LEP Youth with Tukwila School District<br>3. Seattle OEM Outreach and Education | 1. Somali Community:<br>a. At-Scene<br>b. Community Referral<br>c. Work Force<br>2. Chinese + Cambodian + Vietnamese: Dispatch, At-Scene |
| **New Projects:** | | |
| 3. Meridian Health Center Collaboration<br>4. Mental Health for EMS Providers | 4. Dispatch Training on LEP Communication<br>5. Assessment of WA State Mandatory CPR Training Policy<br>6. Text to 9-1-1 for LEP Users | |

## 5. BLS Training and Quality Improvement Strategic Initiative

The EMS Division and its regional partners meet regularly throughout the year to continue designing the **BLS Training and Quality Improvement Strategic Initiative**. Complementing the system's motto of "Measure and Improve," this Initiative provides a formal structure to more systematically and uniformly review data, and develops consistent training based on the results of the data review. More importantly, it makes these education and improvement opportunities equally available across the system. During the development of this Initiative, the region collectively agreed to concentrate on strategies to ensure the system provides the best possible prehospital patient care. Regional partners identified the following four existing tools that, once better linked and synchronized, will help the region continue to meet that goal:

1. **High quality BLS initial training for EMTs in King County**
   The EMS Division will continue to provide initial, basic, EMT training on a regional level to ensure that the medical triage and delivery is the same across King County. During consideration of this Initiative, the EMS Division committed to working with its regional partners to pilot condensed initial training courses to better accommodate growing workforce requirements (refer to page 25).

2. **Consistently conducted "run reviews" across King County**
   "Run reviews" are critical to improving EMT performance by examining medical performance, decision making and EMT understanding of current education concepts. Many BLS agencies conduct their own evaluations of medical incidents after the fact, with the help of training instructors or paramedics. Due to the limited resources, the level of review, including the types of calls reviewed, is not consistent across all agencies. This Initiative develops a consistent run review program and provides agencies with resources to conduct an expected level of standard case review and subsequent training.

3. **Coordinated supplemental EMT training**
   EMTs receive supplemental training and instruction beyond the state-mandated continuing medical education requirements to ensure that they are maintaining critical skills. This ancillary training is offered and managed at the local level, on an agency by agency basis, depending on availability and funding. This Initiative provides funding and oversight so that all agencies can receive supplemental training led by trainers with complementary skills, and focuses on the same topics or trends of other agencies. This will help eliminate training inconsistencies and positively impact overall system performance.

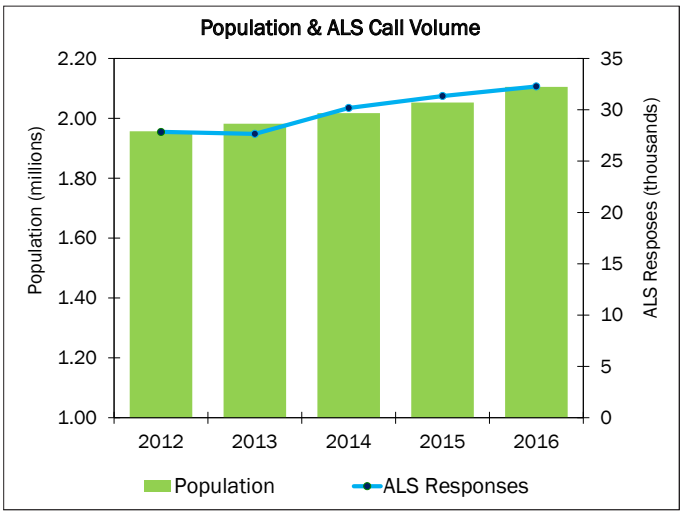
4. **Targeted data-driven reports on BLS performance to help inform training at both the local and regional levels**
   The EMS Division frequently evaluates BLS medical performance to determine if critical skills are being maintained and if protocols are being appropriately followed. These evaluations may be conducted regionally, or may focus on one or more agencies, per a recent occurrence, or agency request. This provides oversight to help ensure that these reviews are focused on the same topic and are coordinated with other agencies within the system.

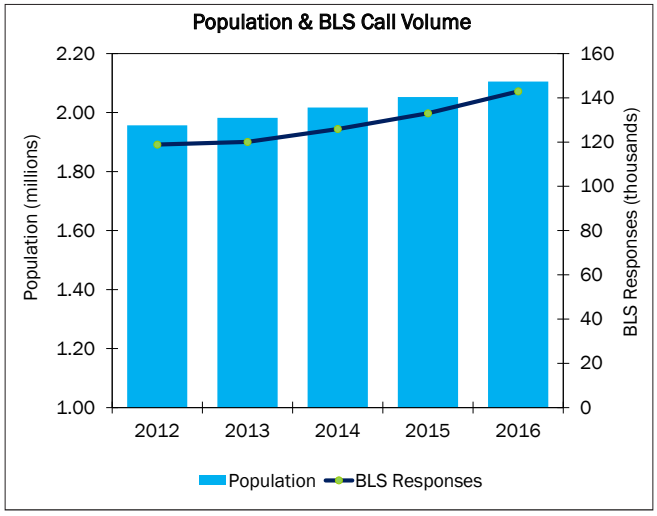
The key to maintaining any high quality Medic One/EMS system is measuring its practices and improving its skills. The BLS Training and Quality Improvement Strategic Initiative builds upon the system's commitments to continually learning and advancing so that the region can continue to expect and receive the best possible patient care.

# Summary of 2016 EMS Statistics (King County)*

| Population | Seattle-King County | % Growth (Annualized) |
|---|---|---|
| 1980 | 1,269,898 | |
| 1990 | 1,507,305 | 1.87% |
| 2000 | 1,737,034 | 1.52% |
| 2010 | 1,931,249 | 1.12% |
| 2016 | 2,105,100 | 1.50% |

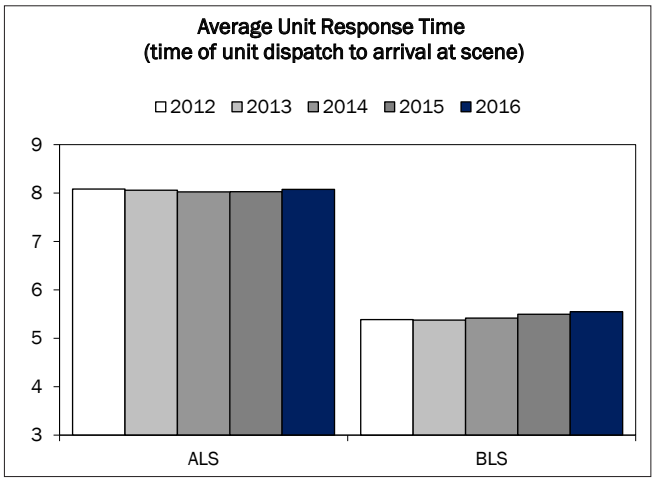
Population has historically been closely correlated to EMS growth. The rate of population growth in King County continues to recover from the recessional decline as indicated in the table to the left. The two graphs below depict population growth relative to both ALS and BLS call volume patterns and reflect call volumes starting to respond to the increased population. The scales for population and call volumes are different in the tables below.




**EMS System Key Performance Indicators**

Response times (RT) represent a key performance indicator of the EMS system. The "total response time" is calculated as the time of the call received at a 9-1-1 dispatch center to the time of the EMS unit arrival at the scene. Whereas, the "unit response time" is calculated as the time of the unit dispatch time to the aid car arrival at the scene. The figure to the right depicts the average unit response time across a five-year period.



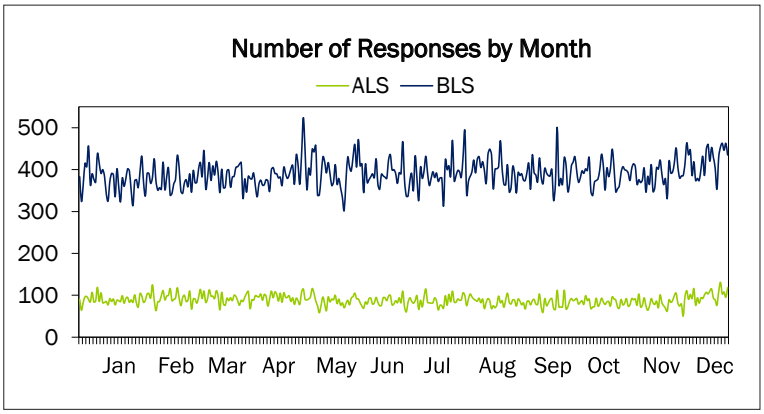

*The 2016 Summary of Statistics section includes only King County data outside the Clty of Seattle (except where noted) due to the Seattle Fire Department transition to a new records management system.

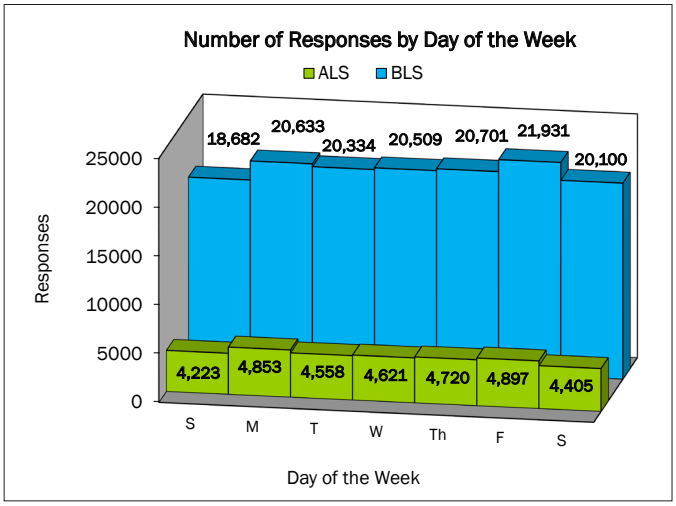
# Characteristics of Responses

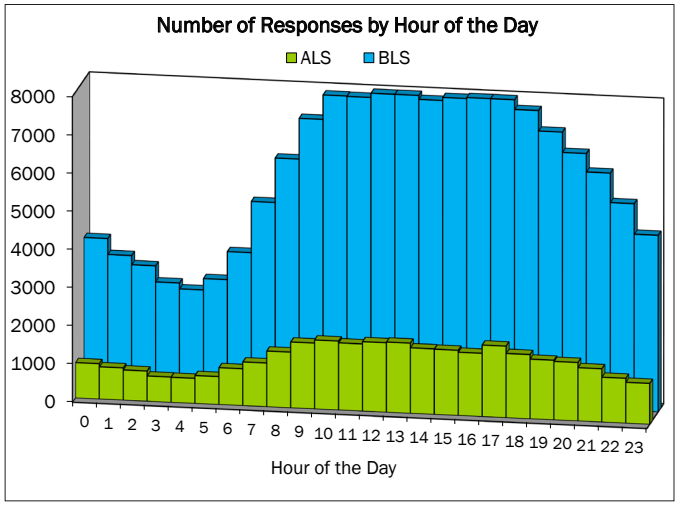
## Operations

| Service | ALS | | BLS | |
|---|---|---|---|---|
| **Number of Responses** | 32,277 | | 142,890 | |
| | **Total RT** | **Unit RT** | **Total RT** | **Unit RT** |
| **Average Response Time (RT)** | 12.7 | 8.1 | 6.8 | 5.5 |
| **6 minutes or less** | | | 50.7% | 67.4% |
| **8 minutes or less** | 27.4% | 57.0% | | |
| **10 minutes or less** | 45.6% | 76.9% | | |
| **12 minutes or less** | 60.0% | 88.2% | | |
| **14 minutes or less** | 69.8% | 93.5% | | |
| **Cancelled Enroute Calls** | 7,286 (22.6%) | | 6,505 (4.6%) | |

The average unit response time for BLS and ALS has remained stable over time. The three graphs located to the right and below reflect the patterns of ALS and BLS response during the month, day of the week, and hour of the day throughout the year. As indicated in the Number of Responses by Day of the Week graph, there is a notable difference in range of BLS responses per day over time (~300-475 calls) in comparison to ALS responses (~25-125 calls).



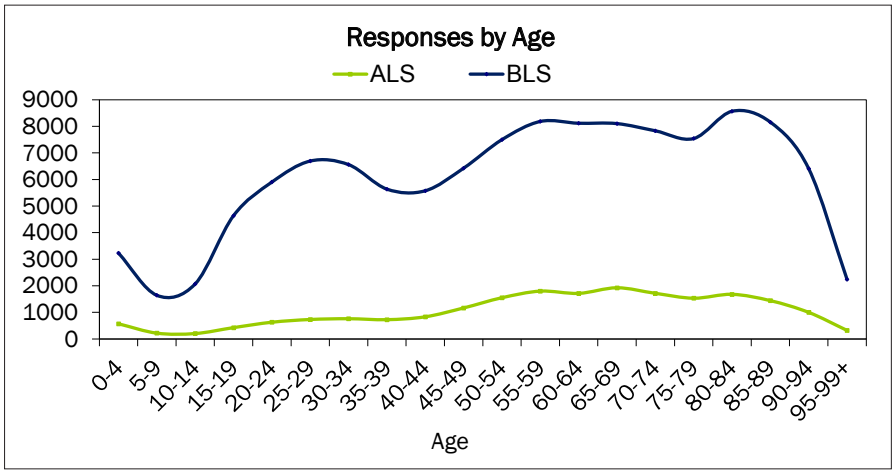



# Characteristics of Responses

The following information reflects a variety of statistics that characterize the types of both BLS and ALS calls, including a comparison of age groups, types of medical complaints, where incidents take place, and patient transport information. Paramedics providing advanced life support are more likely to attend to older patients for cardiac conditions, while EMTs often attend to trauma in young adults.

## Responses by Age Group

| | ALS | | BLS | |
|---|---|---|---|---|
| **0-4 yrs.** | 570 | (2.7%) | 3,229 | (2.7%) |
| **5-9 yrs.** | 218 | (1.0%) | 1,642 | (1.4%) |
| **10-17 yrs.** | 463 | (2.2%) | 4,567 | (3.7%) |
| **18-24 yrs.** | 795 | (3.8%) | 8,048 | (6.6%) |
| **25-44 yrs.** | 3,051 | (14.6%) | 24,467 | (20.2%) |
| **45-64 yrs.** | 6,231 | (29.8%) | 30,226 | (25.0%) |
| **65-84 yrs.** | 6,854 | (32.7%) | 32,043 | (26.5%) |
| **85+ yrs.** | 2,761 | (13.2%) | 16,800 | (13.9%) |
| **Total** | **20,943** | | **121,022** | |

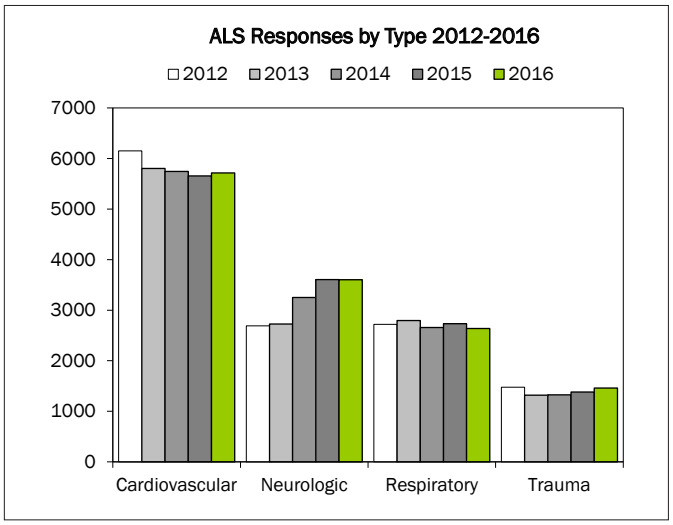


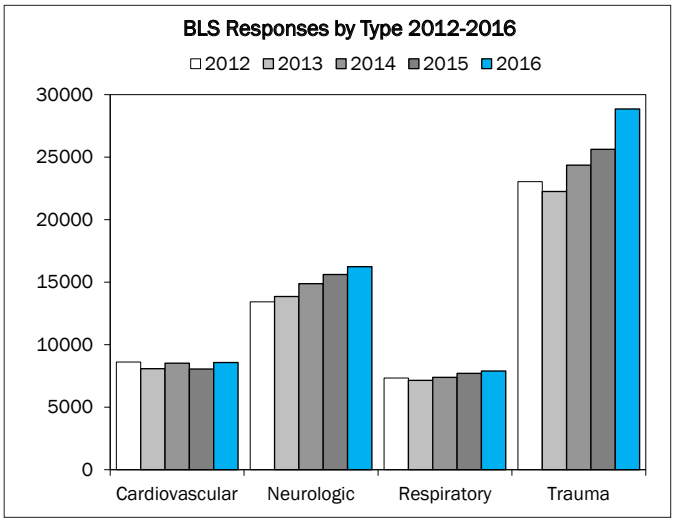
# Characteristics of Responses

Although ALS and BLS personnel each respond more frequently to particular types of calls (i.e., cardiac calls for ALS and trauma for BLS), the EMS community serves a wide variety of medical emergencies. This requires not only an in-depth knowledge of specific invasive medical procedures but also requires a considerable breadth of knowledge and skills for diagnosis and management.

## Responses by Medical Type

| Medical Type | ALS | BLS |
|---|---|---|
| Cardiovascular | 5,715 (28.2%) | 8,574 (8.0%) |
| Neurologic | 3,600 (17.8%) | 16,243 (15.1%) |
| Respiratory | 2,639 (13.0%) | 7,896 (7.3%) |
| Trauma | 1,414 (7.0%) | 28,856 (26.9%) |
| Metabolic/Endocrine | 836 (4.1%) | 2,690 (2.5%) |
| Alcohol/Drug | 751 (3.7%) | 6,231 (5.8%) |
| Abdominal/Genito-Urinary | 732 (3.6%) | 5,247 (4.9%) |
| Psychiatric | 409 (2.0%) | 6,069 (5.7%) |
| Anaphylaxis/Allergy | 328 (1.6%) | 1,072 (1.0%) |
| Obstetric/Gynecological | 146 (0.7%) | 722 (0.7%) |
| Other Illness | 3,714 (18.3%) | 23,705 (22.1%) |
| **Total Responses** | **20,284** | **107,305** |



# Characteristics of Responses

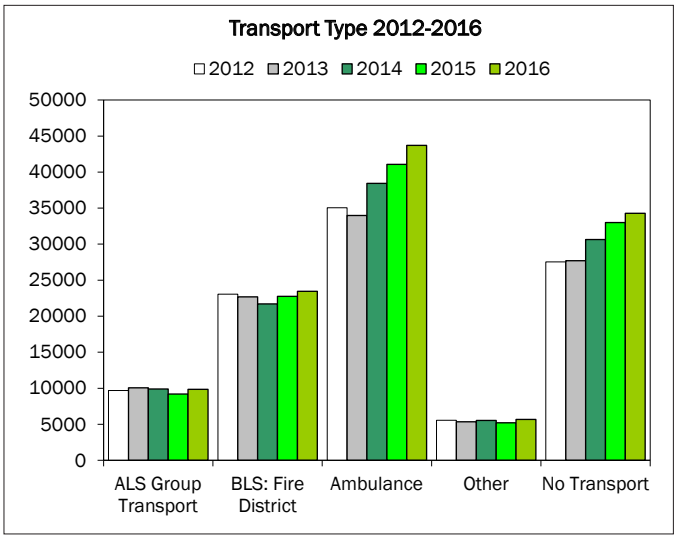
Similar to the variation reflected in the types of responses EMS agencies provide, EMS personnel respond to a variety of physical settings, again requiring a versatility of skills. For example, providers may respond to settings where they need to interact with other medical professionals or need to deliver patient care on a busy street or highway. Alternatively, EMS personnel respond to public settings where they may need to not only deal with the patient but also the public. This response sometimes requires cooperation and collaboration with other public safety personnel such as police officers and security guards.

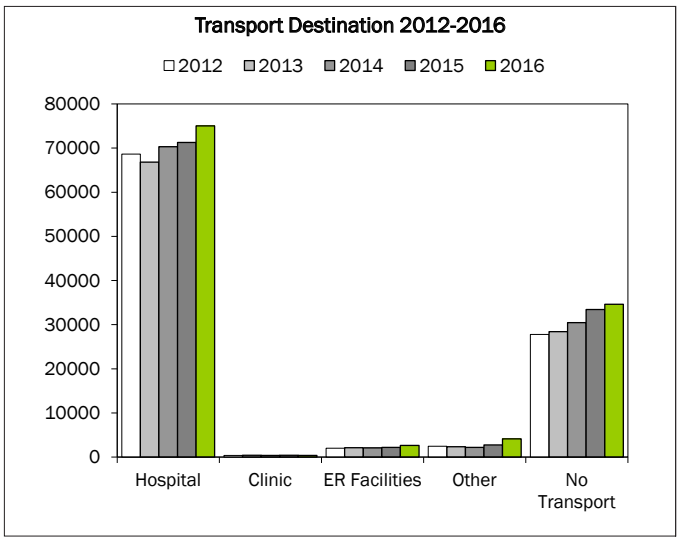
## Incident Locations

| Incident Locations | ALS | BLS |
|---|---|---|
| Home/Residence | 9,838 (36.0%) | 57,970 (45.9%) |
| Nursing Home/Adult Family Home | 1,439 (5.3%) | 8,949 (7.1%) |
| Clinic/MD Office | 945 (3.4%) | 3,333 (2.6%) |
| Other/Unknown Location | 15,100 (55.3%) | 56,176 (44.4%) |
| **Total** | **27,322** | **126,428** |

## Transport Type and Destinations

An important component of providing EMS care is appropriate triage. EMS personnel use their skills and knowledge to match the clinical need of the patient with the most appropriate transport and destination plan. The figures below reflect the transport trends over the past five years.

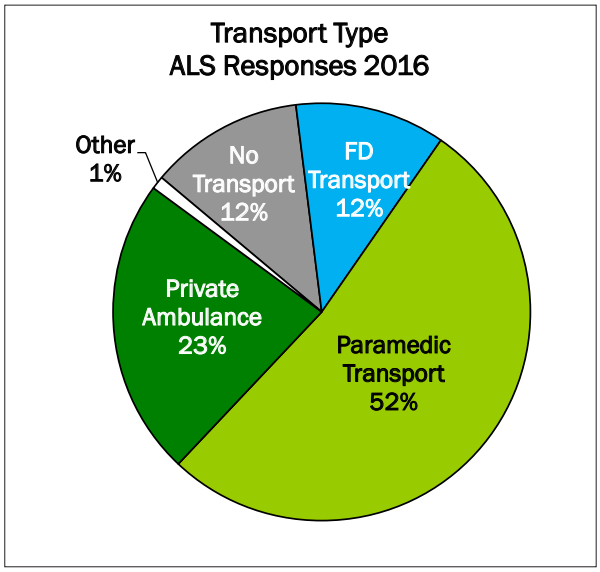


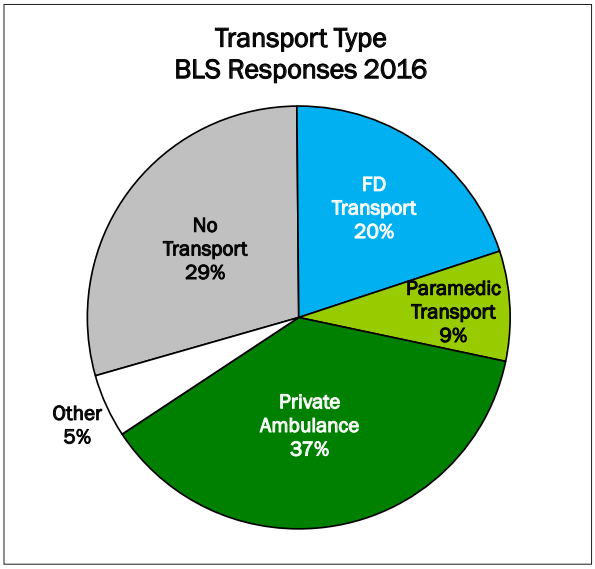



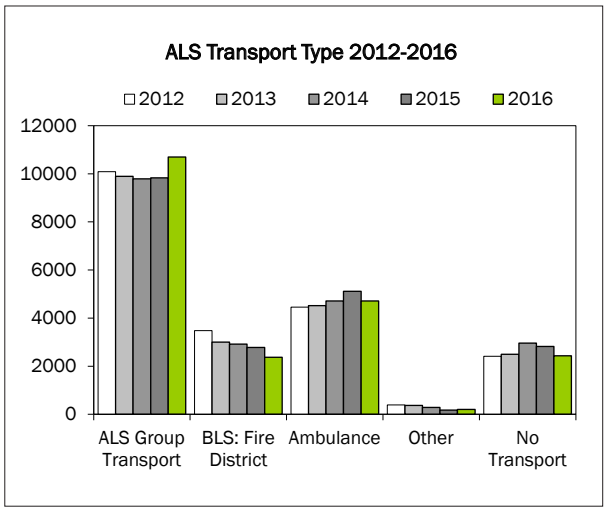
# Characteristics of Responses

| ALS Transport Type | # of Transports |
|---|---|
| ALS Transport | 10,669 (52.3%) |
| ALS Air | 30 (0.2%) |
| BLS - Fire District | 2,372 (11.6%) |
| BLS - Ambulance | 4,709 (23.1%) |
| Other | 205 (1.0%) |
| No Transport | 2,433 (11.9%) |
| **Total** | **20,418** |

| BLS Transport Type | # of Transports |
|---|---|
| ALS Transport | 9,823 (8.4%) |
| ALS Air | 27 (0.0%) |
| BLS - Fire District | 23,454 (20.0%) |
| BLS - Ambulance | 43,713 (37.4%) |
| Other | 5,675 (4.9%) |
| No Transport | 34,290 (29.3%) |
| **Total** | **116,982** |




| BLS Transport Destination | # of Transports |
|---|---|
| Hospital | 75,029 (64.2%) |
| Clinic | 380 (0.3%) |
| ER Facility | 2,634 (2.3%) |
| Other | 4,145 (3.5%) |
| No Transport | 34,602 (29.6%) |
| **Total** | **116,790** |

# Cardiac Arrest Statistics

## Background

Cardiac arrest is a condition where the heart suddenly stops working. The victim collapses and becomes unconscious and death is imminent without fast action. Successful resuscitation from cardiac arrest requires a highly coordinated system of care that involves early recognition, early CPR (chest compressions), early defibrillation (shock to the heart using an automated external defibrillator (AED) device), early advanced care by paramedics, and expert hospital care. Successful resuscitation to ultimately be discharged from the hospital is an important metric of a community or regional EMS system and involves action by bystanders, dispatch, law enforcement, EMS professionals (EMTs, paramedics), and hospitals. Cardiac arrest continues to be an important public health challenge. The EMS system strives not only to successfully care for the patient but also works to assure comprehensive surveillance of each instance where cardiac arrest occurs.

## Cardiac Arrest Data Reporting

The EMS system reports on cardiac arrest data each year, providing a snapshot of outcomes and treatment for two specific groups:

1. All treated patients, and
2. The Utstein subset. These are patients who are witnessed by bystanders to collapse and have an initial heart rhythm that requires a defibrillator shock. The "Utstein" subset provides a closer look at a subgroup of cardiac arrest patients for whom each link in the chain of survival has special importance.

Performance measures associated with each group provide benchmarks, which serves as indicators of overall public health impact and can be used to relate to other systems. Cardiac arrest resuscitation is a benchmark condition for EMS because it tests all aspects of emergency response. Survival following cardiac arrest requires a coordinated, time-sensitive response that involves multiple stakeholders and tests communications, hands-on technical skills, critical decision-making, and teamwork. The outcome depends on a synergy where each stakeholder achieves individual excellence and seamlessly coordinate across teams. Overall survival in Seattle and King County continues to be about double what is observed among "performance-minded" communities that make a real effort to monitor care and measure performance.

Comprehensive evaluation of each cardiac arrest case in Seattle and King County has been in place for over 40 years and has enabled the region to carefully innovate and implement improvements. These efforts have resulted in exceptional care and outcome, highlighting the commitment of each stakeholder to work together to achieve better public health in Seattle and King County.

The following page presents combined data from both Seattle and King County registries for 2016 as well as for the cumulative years 2012-2016. The five-year average is a measure which helps gauge the true average given the potential for year-to-year variation that can randomly occur. Collectively, the information provides the most useful assessment and can help inform the regional approach to improve cardiac arrest response and care. A cardiac arrest is defined as a pulseless, breathless state for which cardiopulmonary resuscitation (CPR) is required. The data reflect EMS-treated cardiac arrests for patients two (2) years of age and older due to all causes except trauma. Survival is defined as discharge from the hospital alive.

# Cardiac Arrest Statistics

1. **All Patients: Total Number of Cardiac Arrests for which resuscitation was attempted:**

| Year | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| Cardiac arrests | 1,134 | 1,135 | 1,246 | 1,114 | 1,228 |

2. **All-Patients: 2016 Highlight - Survival to Hospital Discharge Based on Arrest Before or After Arrival of EMS Personnel and Initially Monitored Cardiac Arrest Rhythm:**

| | Number Treated | Number Survived To Hospital Discharge | Percent Survived |
|---|---|---|---|
| **Arrest Before Arrival of EMS** | **1,086** | **233** | **22%** |
| Ventricular Fibrillation/ Tachycardia (VF/VT) | 284 | 143 | 50% |
| Asystole | 472 | 15 | 3% |
| PEA | 303 | 66 | 22% |
| Not Shockable, but unknown if PEA or asystole | 14 | 1 | 7% |
| Unknown | 13 | 8 | 62% |
| **Arrest After Arrival of EMS** | **142** | **55** | **39%** |
| Ventricular Fibrillation/Tachycardia (VF/VT) | 34 | 22 | 65% |
| Asystole | 24 | 6 | 25% |
| PEA | 79 | 27 | 34% |
| Not Shockable, but unknown if PEA or asystole | 1 | 0 | 0% |
| Unknown | 4 | 0 | 0% |
| **Total** | **1,228** | **288** | **24%** |

3. **Utstein Sub-Set: Survival to Hospital Discharge for Arrests due to Heart Disease, Witnessed by Bystanders (excludes EMS-witnessed), with an Initial Rhythm of VF:**

| Year | 2016 | 2012-2016 |
|---|---|---|
| Survival Rate | 111/197 (56%) | 520/947 (55%) |

4. **Utstein Sub-Set: CPR Initiated by Bystanders, Limited to Arrest Before Arrival of EMS Personnel:**

| Year | 2012* | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| Bystander CPR | 662/982 (67%) | 657/998 (66%) | 734/1,093 (67%) | 666/985 (68%) | 791/1,086 (73%) |

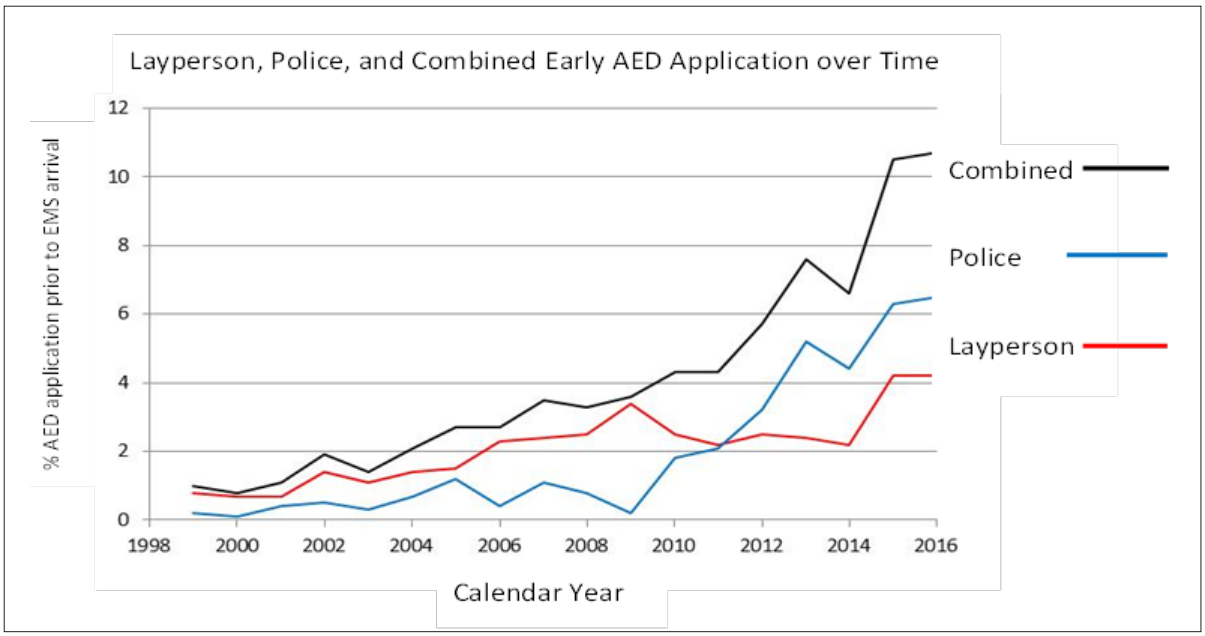
## Summary of Key Points for 2016

- The EMS system successfully resuscitated 24% of EMS-treated cardiac arrest victims in Seattle and King County, WA -- a success rate of two to three times higher than most communities.
- This 24% represents 288 lives saved by the EMS system, most to return home to resume normal lives with loved ones, friends, and colleagues.
- Survival to hospital discharge was 56% for arrests among benchmark group (arrests due to heart disease and witnessed by bystanders for initial rhythm of ventricular fibrillation) that benefits most from an early shock. This is an achievement that is rivaled by only a handful of exceptionally proficient EMS systems from around the world.
- Positive efforts were highlighted by a bystander CPR rate of 73%, one of the highest ever reported in the nation.
- This resuscitation success is a tribute to the immense dedication and efforts by all the stakeholders involved in the EMS system, a system that continues to strive to do more regardless of the challenge.

# Cardiac Arrest Highlight:
# Community Programs to Achieve Early Defibrillation for Cardiac Arrest

## Background

Sudden cardiac arrest is a leading cause of death in the United States and here in King County. It can happen anywhere to anyone, at any time; even to those with optimal heart health. And when it occurs, assistance during those immediate first few minutes is the most critical. This quick and coordinated action has been described by the "links in the chain of survival" such that the arrest is identified quickly and emergency 9-1-1 response is activated. Key treatments involve early CPR where a layperson rescuer provides lifesaving chest compressions and early defibrillation where a shock can be applied to reset the heart beat using an automated external defibrillator or "AED." These time-dependent treatments are essential. For each minute that goes by without care, the chances of survival decline by up to 10%. Thus, early treatment gives the patient the best chance of survival.




## Strategies

Given this understanding, there have been a number of innovative approaches to try to deliver the AED to the patient as quickly as possible, even before EMS arrives to the scene. One strategy is to make AEDs available in public places such as airports, recreation centers, or shopping areas so that people can access the AED after calling 9-1-1 and potentially deliver a lifesaving shock before EMS arrives. The EMS Division and the region's Fire Departments support layperson AED installation, training, and use through the **Shockingly Simple AED Program** (**http://www.kingcounty.gov/depts/health/emergency-medical-services/communityaed.aspx**).

# Cardiac Arrest Highlight: Community Programs to Achieve Early Defibrillation for Cardiac Arrest

Another strategy is to equip police with AEDs, making them "first responders" to cardiac arrests. In March 2010, the EMS Division partnered with two police departments, their local fire departments, and dispatch agencies to initiate a two-year AED program, in which police would also respond to cardiac arrest/CPR calls to provide CPR and AED treatment. Patients benefitted from that collaboration, and it established infrastructure that allowed expansion to additional police departments. Today, many King County law enforcement agencies have trained in CPR and equipped vehicles with AEDs in order to accelerate early AED treatment in patients with suspected cardiac arrest. Dispatch, EMS, and law enforcement have collaborated effectively as part of a system effort to improve cardiac arrest resuscitation.

As part of programmatic efforts to increase early AED application, EMS reviews each case of cardiac arrest to determine if a layperson or law enforcement may have first applied an AED prior to EMS arrival. In 1999, AED application by laypersons or police occurred in less than 1% of all arrests. Over time, with exceptional efforts by many community and law enforcement groups, there has been a steady and important increase such that early AED application by laypersons or law enforcement now occurs in over 10% of cardiac arrests.

These efforts contribute importantly to the region's efforts to care for the sickest emergency patients and are in part responsible for the Countywide success in resuscitation. For more information, refer to the Community Programs School CPR Program on page 16.

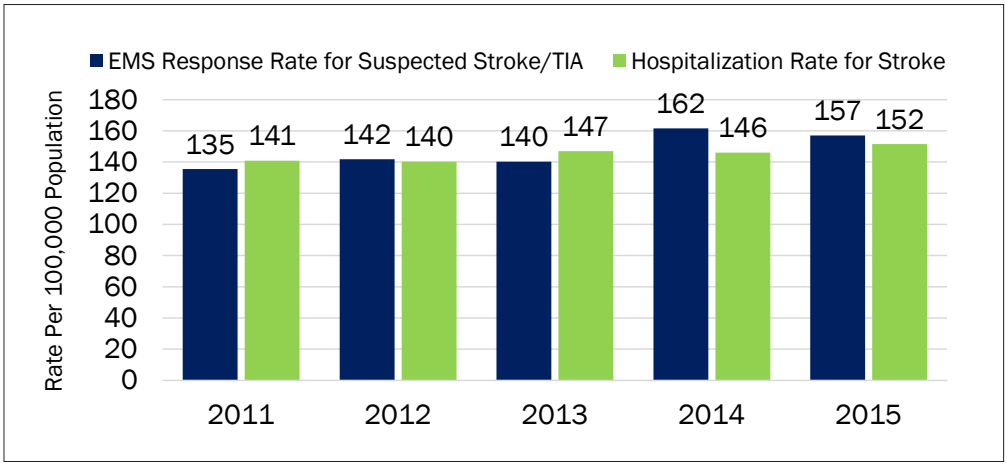
# Public Health Highlight:
# Seattle & King County Stroke Initiative

## Background

Stroke is a medical emergency caused by an acute disruption to the blood flow within the brain. Unless stroke is treated promptly, patients can face permanent neurological impairment or even death. In a transient ischemic attack (TIA), symptoms are similar to stroke, though resolve within an hour without treatment. TIA is a powerful risk factor for a future stroke, so is also considered a medical emergency.

According to data from Public Health-Seattle & King County, stroke is the 5th leading cause of death and 10th leading cause of hospitalizations in King County. Data from the Washington (WA) State Department of Health show a gradual increase in the rate of King County residents with a hospital stroke diagnosis between years 2011 to 2015. Concurrently, EMS responses in King County for suspected stroke and TIA have also seen modest increases over the same five-year period. Refer to the figure below.

**EMS Response Rate for Suspected Stroke/TIA vs. Hospitalization Rate for Stroke per 100,000 Population, King County, Years 2011-2015**




## Characteristics of EMS Responses for Suspected Stroke/TIA

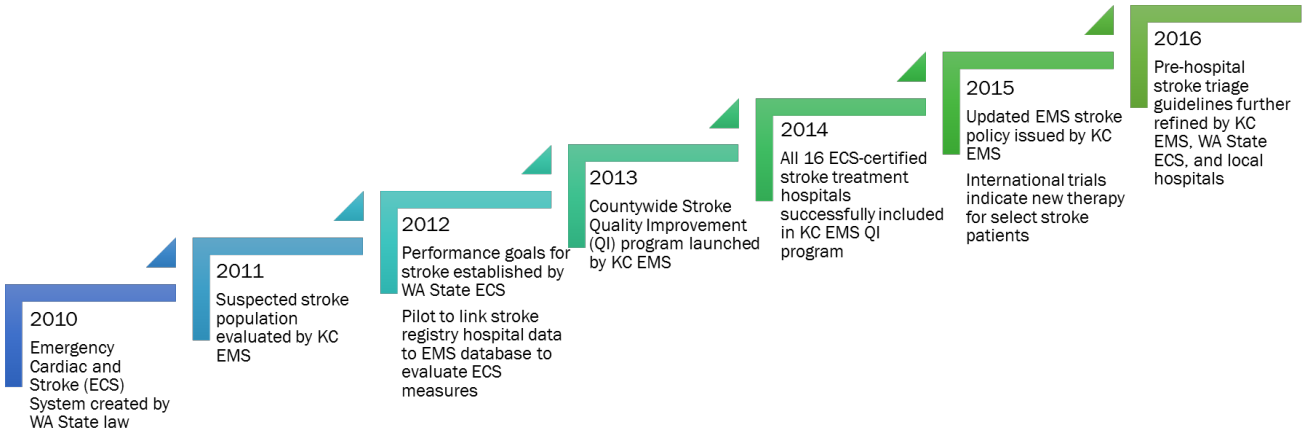
Early recognition and rapid treatment are essential to optimizing a patient's recovery from stroke. An important foundation is to understand what symptoms and signs characterize stroke patients so that EMS can make an accurate and timely assessment. Currently, EMS relies on stroke assessment tools based on the patient's presenting signs and symptoms to identify a potential stroke. However, definitive diagnosis of both presence and type of stroke requires special brain imaging (e.g., computed tomography (CT) scan) at a hospital. Thus, the EMS Division has partnered with all of King County's hospitals to evaluate the EMS stroke assessment tool to understand how identification and triage can be improved.

# Public Health Highlight:
# Seattle & King County Stroke Initiative

A lot has been learned about stroke in King County based on this work. Among EMS-suspected stroke or TIA, patient median age is 77, and over half are women. Among hospital-confirmed stroke and TIA patients in years 2014-2015, 47% presented to EMS with signs of unilateral weakness, tingling, numbness; 16% with confusion; 11% with headache; and 8% with sudden onset of vision problems. Additionally, 12% reported a fall with possible injury related to the event. Among patients able to comply with EMS assessments, 33% demonstrated facial droop, 38% arm drift, and 48% speech difficulty. Only about 33% of patients called within the first hour of the onset of symptoms. Median time from when the patient was last seen normal until 9-1-1 call was about 3½ hours.

## Regional Collaboration to Improve the System of Care

An efficient and effective stroke system of care relies on seamless coordination between 9-1-1 dispatch centers, EMS agencies, and hospitals. The EMS Division in coordination with WA State Department of Health and hospitals in King County have developed programs designed to evaluate and improve the system of care for stroke patients. The following figure presents a timeline of major events in building a regional collaboration to improve the system of care in King County.




## King County Stroke Quality Initiative: Improving Treatment for Stroke

Treatment of acute ischemic stroke is evolving. What was once a condition where all medicine could offer was to "hospitalize and hope for the best," stroke treatments and medications are available to re-open the blocked vessel, which can help stroke patients regain function and independence. For the past two decades, ischemic stroke patients, within a few hours of the onset of symptoms, have been eligible for clot dissolving drugs (fibrinolytics). Since initiating the King County quality improvement program in 2013, there have been increases in early hospital alerts from EMS, improvements in prehospital and hospital process times, and consequently an increase in the number of patients treated with fibrinolytic therapy.

More recently, a new interventional treatment–mechanical thrombectomy– emonstrated to substantially improve function in a subset of patients where the blockage occurs in a large blood vessel in the brain. In mechanical thrombectomy, a catheter is directed to the blockage, and the clot is removed. Stroke patients with large vessel occlusion may suffer more severe deficits, greater decline in function, and an increased risk of death. The benefits of stroke treatments decline over time from the onset of stroke, so the patient experiences the most benefit when the procedure is performed sooner after the onset of symptoms.

# Public Health Highlight:
# Seattle & King County Stroke Initiative

Determining if a patient has a large vessel occlusion can be challenging. Ideally, a simple test could be administered by EMTs and paramedics to accurately identify if a patient has a large vessel occlusion. The patient could then be directed to the most appropriate hospital, as only a handful of the region's hospitals can provide this highly specialized treatment. EMS agencies and the region's hospitals work together in an ongoing quality initiative to try to accurately identify potential stroke patients early on in the field. In 2010, EMS providers began using the Face-Arm-Speech-Time (FAST) screening tool to assess patients for stroke. In 2017, if the F-A-S-T screening result is positive, EMS providers also apply a stroke severity measure to identify potential large vessel occlusion stroke.

Other critical factors that can help direct hospital treatment may include information about when the patient was last known to be well, what medication treatments the patient receives regularly, current blood sugar levels, and the phone contact for the patient's next-of-kin. The ability to match the patient with the right destination hospital and treatment is not simple but one that can make an enormously positive difference in the patient's outcome.

Rigorous evaluation of the program involves EMS providers, the EMS Division, and regional hospitals who monitor each phase of care to understand where the process works well, and where it can be improved. The collaboration is critical and requires extra effort to measure care and communicate to gain a comprehensive understanding of whether optimal treatment is being achieved. Quality improvement efforts to evaluate system response for severe strokes began in early 2017. Although there have been remarkable case reports since implementation of this work, these results are preliminary, and require more systematic and comprehensive assessment to understand where the process can improve. KC EMS and regional hospitals are committed to rigorous and critical review of care for persons with acute stroke.

According to King County Medical Program Director Thomas Rea, mechanical thrombectomy for large vessel occlusive stroke is a transformational treatment. "Historically persons with large vessel occlusion stroke could expect a future of dependence where they would often require help with even the most basic activities. Now with successful thrombectomy, these persons can return home, return to work, and resume a normal life, often within days. We need to work as a team with hospitals to assure these patients are correctly aligned with this new treatment while also assuring that other less-severe stroke patients receive optimal therapy. This is an exciting time for stroke treatment but we have a lot to learn as we strive to match the right patient with the right treatment. Success starts with our citizens – when new neurological symptoms occur, do not delay medical care, but instead, activate 9-1-1 for emergency assessment."

# EMS Funding and 2017 Financial Plan

## EMS Levy Structure Overview

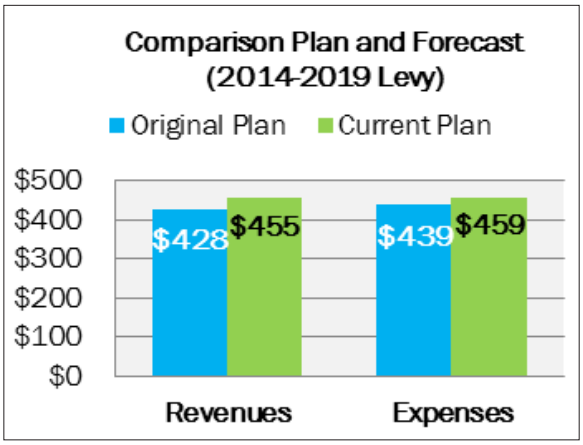
*The Medic One/EMS system is funded by a regular property tax levy, subject to the limitations contained in Chapter 84.55.010 Revised Code of Washington (RCW). Levy funds are restricted by RCW and can only be spent on EMS-related activities. The annual levy growth is limited to a 1% increase for existing properties, plus assessment on new construction.*

*EMS levy funds are collected throughout King County and managed regionally by the EMS Division, in accordance with RCW 84.52.069 Emergency Medical Care and Service levies, 2014-2019 Medic One/EMS Strategic Plan policies and guidelines, and recommendations from the EMS Advisory Committee (EMSAC). King County EMS funds are spent on four main areas: 1) Advanced Life Support (ALS), 2) Basic Life Support (BLS), 3) Regional Support Services, and 4) Strategic Initiatives.*

*Per an agreement with King County in place since the creation of the countywide EMS Levy, Seattle receives all Medic One/EMS levy funds collected within the city limits. As such, the Finance section of the Annual Report, excluding the City of Seattle, pertains only to the EMS fund within the remainder of King County (referred to as the KC EMS Fund). In previous reports, the Financial Plan showed EMS grants, donations, and entrepreneurial projects in the Public Health Fund. In compliance with newly-enacted King County financial policies, the Financial Plan on page 64 now shows these non-levy funds in the EMS fund. This 2017 Report includes this change, and also updates the 2016 report to include non-levy funds transferred to the EMS Fund.*

## Summary

Four years into the current levy, revenues and expenditures are both forecasted to be higher than anticipated in the original plan - revenues are up by $27.6 million, and expenditures by $20 million. Both revenue and expenditure increases are related to using conservative financial modeling when developing the 2014-2019 Financial Plan. The conservative revenue forecast used when developing the current levy, coupled with the experience of the economic downturn led to decisions to tighten both the Advanced Life Support Services (ALS) and Regional Support Services (RSS) allocations. Because these reduced allocations have left little room for programs to adapt to expenditure challenges, both programs have needed to access reserves to cover costs.




Although authorized at 33.5 cents per 1,000 Assessed Valuation, the levy rate for 2017 is 26.31 cents per $1,000 Assessed Valuation (AV) - down from 28.2 cents per $1,000 AV in 2016. ***This rate means that a homeowner with a house valued at the 2017 median value of $450,000 will pay just over $118 a year in 2017 for highly trained medical personnel to arrive within minutes of an emergency, any time of day or night, no matter where in King County.***

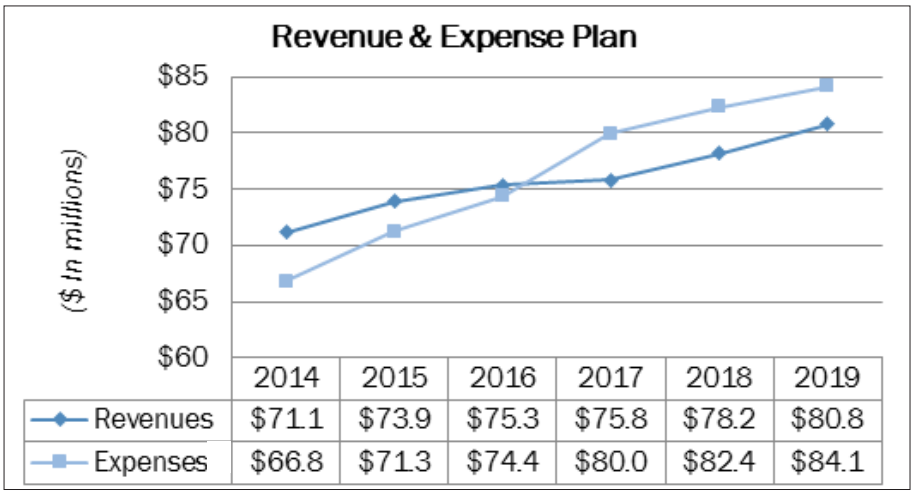
# EMS Funding and 2017 Financial Plan

## Revenues

Approximately 97% of revenue for the EMS levy comes from taxes and income related to property taxes based on assessed valuations. The EMS levy is structured so that property taxes collected early in the levy period are planned to cover expenditures in the later years of the levy.

**Assessed Valuations (AV)**

The economic downturn and depressed Assessed Valuations (AV) from the previous levy span led the 2014-2019 levy rate to begin at 33.5 cents. Per RCW, the total amount collected per year by the levy is limited to 1% plus new construction. When AV grows at a rate higher than 1%, the levy rate reduces to not exceed the total amount allowed (1% + new construction). The decreases in levy rate shown on the following chart are proportionate to the increase in assessed valuation. Since AV is projected to increase at a rate higher than the limit factor of 1% throughout the levy period, the levy rate is projected to decrease from 33.5 cents/$1,000 AV to 24.4 cents/$1,000 AV in 2019.

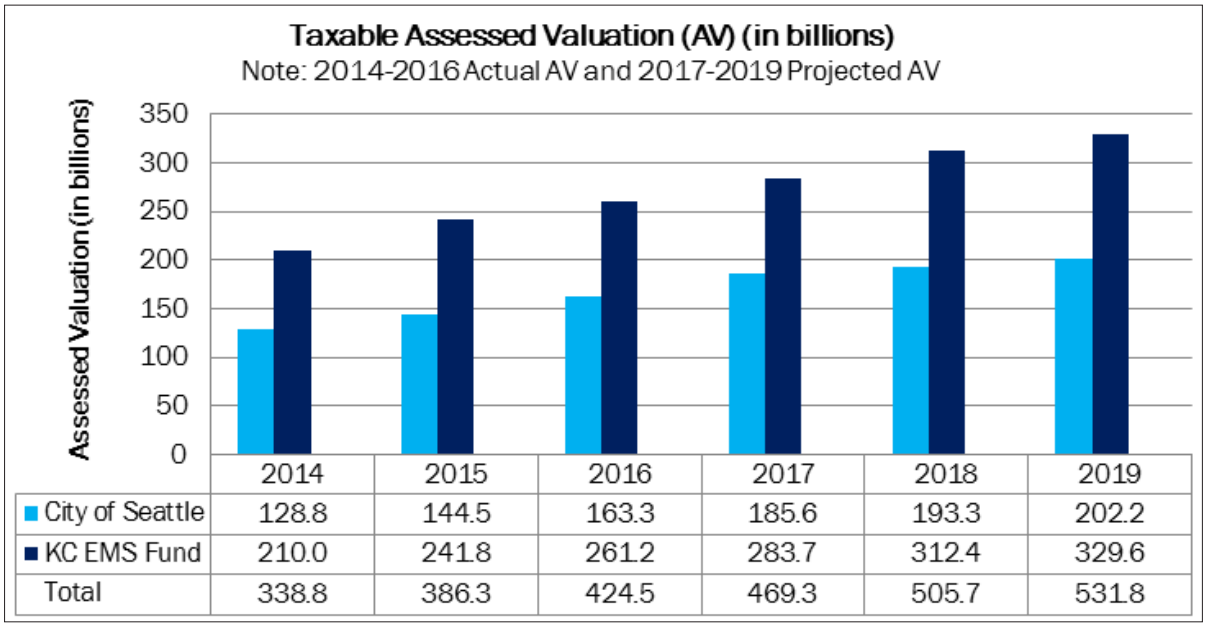



| Revenues | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|
| **Property Taxes** | $70.30 | $72.89 | $73.38 | $73.96 | $76.33 | $78.78 | **$445.64** |
| **Interest/Other Income** | $0.59 | $0.55 | $0.66 | $0.51 | $0.53 | $0.61 | **$3.45** |
| **Charges for Services** | $0.25 | $0.50 | $0.70 | $0.78 | $0.79 | $0.80 | **$3.82** |
| **Grants** | $0.0 | $0.0 | $0.60 | $0.56 | $0.57 | $0.59 | **$2.32** |
| **Total** | **$71.14** | **$73.94** | **$75.34** | **$75.81** | **$78.22** | **$80.78** | **$455.23** |

Note: Dollars in millions; Grants and EMS Online income added to EMS Fund from Public Health Fund in 2016.

# EMS Funding and 2017 Financial Plan

As the region transitions from the previous economic downturn, Assessed Valuation (AV) has continued to grow with 2017 AV 10.6% higher than that in 2016. The percentage of the levy to the King County EMS Fund (based on AV outside the City of Seattle) decreased in 2016 and is projected to continue to decrease in 2017 as AV in Seattle has increased at a higher rate than the rest of the county. King County AV outside of the City of Seattle is projected to increase at a slow rate through the remainder of the levy period – from 60.4% in 2017 to 62.0% in 2019.




Note: The KC EMS Fund taxable AV does not include AV related to Milton (Milton receives taxes directly from the County.)

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| **% KC EMS Fund** | 62.0% | 62.6% | 61.5% | 60.4% | 61.8% | 62.0% |
| **% City of Seattle** | 38.0% | 37.4% | 38.5% | 39.6% | 38.2% | 38.0% |
| **Change in AV** | | 14.0% | 9.9% | 10.6% | 7.7% | 5.2% |

# EMS Funding and 2017 Financial Plan

## Expenditures

EMS levy revenues support EMS activities related to direct service delivery or support programs:

**Advanced Life Support (ALS) Services (paramedics):**

- Uses a standard unit cost allocation consisting of an operating and equipment allocation
- Allocations increased by a compound inflator that considers the different inflators for labor, pharmaceuticals, equipment and benefits
- Eligible for use of reserves

**Basic Life Support (BLS) Services (EMTs):**

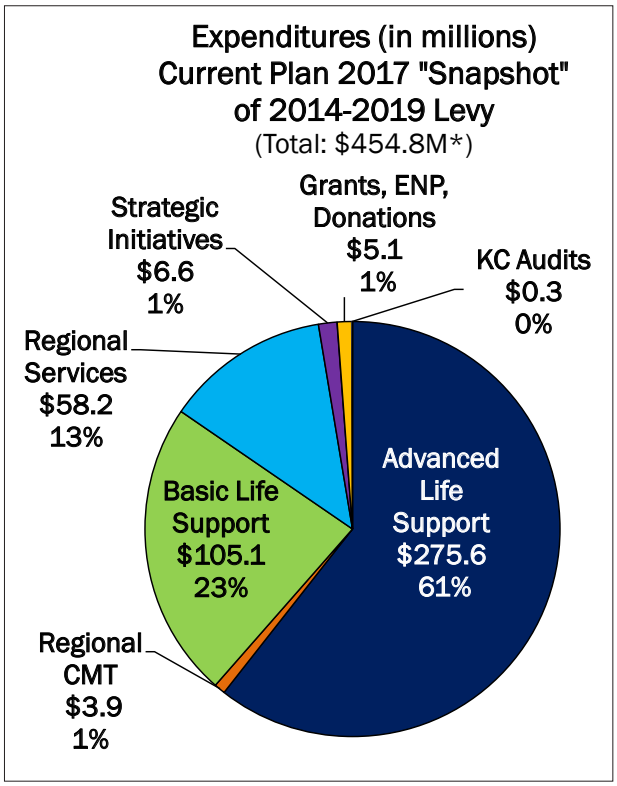
- Distributed to individual agencies based on an allocation that includes the assessed valuation of the district and demand for services (call volume)
- Allocation increased by consumer price index (CPI) inflator
- Includes the addition of a BLS Core Services Program beginning in 2015

**Regional Support Programs:**

- Supports eight major areas - Professional Standards, Community Programs, Emergency Medical Dispatch, Operations, Regional Medical Control/QI, Management & Finance, Infrastructure, and Overhead and Indirect costs
- Allocation increased by CPI inflator
- Eligible for use of reserves

**Strategic Initiatives:**

- Funded with lifetime budgets (budgeted amount by year is adjusted to reflect changing cashflows based on project needs
- Includes carryover of SEND, and Emergency Medical Dispatch initiatives from the 2008-2013 levy period




*Expenditures do not include $4M of forecasted Use of Reserves, Designations, and Program Balances, which are included as Forecasted Expenses on the chart on page 51. Please refer to page 57 for more information about Reserves and Designations.

In addition to these four main areas, other important line items are:

**Community Medical Technician (CMT) Units:**

- New for 2014-2019 levy period

**Audits:**

- Financial review and audits by the King County Auditor's office complement and augment the oversight and accountability of the King County EMS Fund.

**Grants, Entrepreneurial, and Donations:**

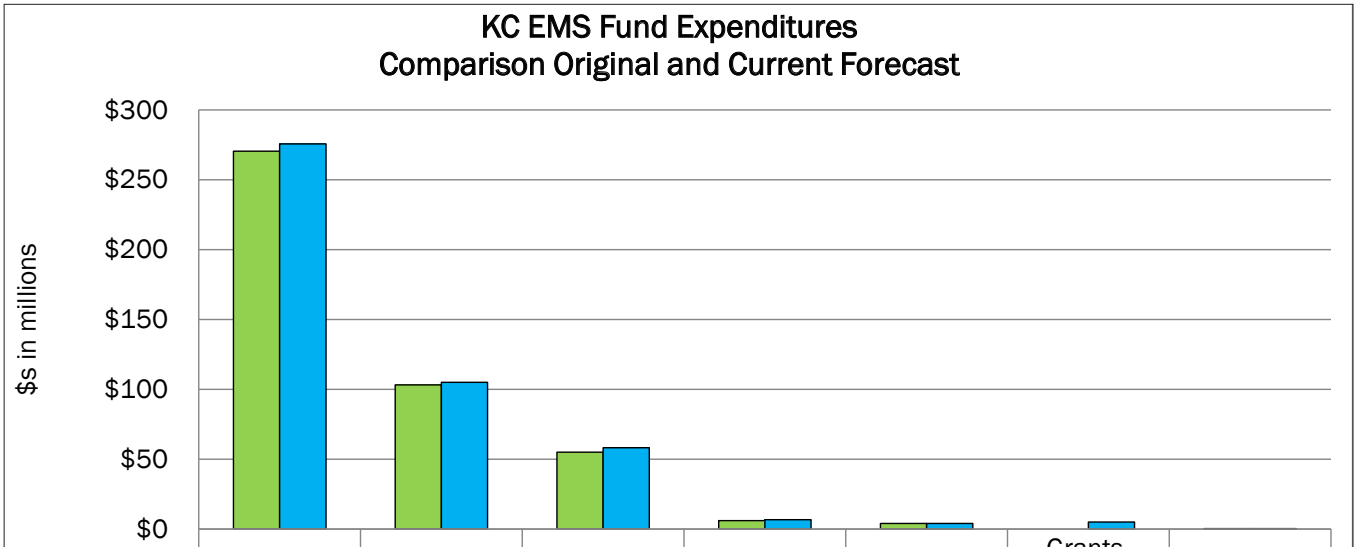
- Grants supporting the Center for Evaluation of EMS projects (moved from Public Health Fund to EMS Fund)
- Entrepreneurial programs sharing EMS products with other agencies
- Donations

# EMS Funding and 2017 Financial Plan

**Expenditure Trends**

Major expenditure trends from the original Financial Plan to now include:

- Baseline ALS and BLS allocations decreased due to economic indices, such as CPI, being less than projected. These indices are used to calculate yearly increases in allocations.
- Reduced allocations and increased costs led ALS providers to access reserve funding in order to cover costs above the allocation. Areas requiring the use of reserves include paid time off above planned, additional paramedic student costs and additional costs related to power stretchers (see Use of Reserves table for more detailed information). In 2017, the EMS Advisory Committee recommended a mid-levy allocation adjustment be implemented This is estimated to provide ALS providers approximately $8.4 million through the end of the 2014-2019 levy.
- The BLS allocation was supplemented in 2014 by $219,144 so that the 2014 allocations were not less than those in 2013. The BLS Core Services Program was added to help agencies with unanticipated costs (funded at $3.7 million for the levy period).
- The Regional Services allocation was supplemented by reserves to cover additional King County central rate costs (see Use of Reserves table for more detailed information).
- Strategic Initiatives supporting the System-wide Enhanced Network Design (SEND) project and Emergency Medical Dispatch were carried over from the 2008-2013 levy to the current levy.




| | Advanced Life Support | Basic Life Support | Regional Services | Strategic Initiatives | Regional CMT Units | Grants, ENP, Donations | KC Auditor's Office |
|---|---|---|---|---|---|---|---|
| Original Plan | $270.3 | $103.2 | $55.1 | $6.1 | $3.9 | $0.0 | $0.3 |
| Current Plan | $275.6 | $105.1 | $58.2 | $6.6 | $3.9 | $5.1 | $0.3 |

# EMS Funding and 2017 Financial Plan

**Strategic Initiatives (SIs)**

The 2014-2019 Strategic Plan contains five Strategic Initiatives. Three are newly initiated SIs - the Regional Records Management System, BLS Training and Quality Improvement (formerly titled "BLS Lead Agency"), and Vulnerable Populations – and two are revised versions from the previous levy – BLS Efficiencies and the EMS Efficiency & Effectiveness Studies. Funding from the 2008-2013 SEND and Emergency Medical Dispatch Initiatives is included below.

In order to implement the Regionalization of Initial EMT Training Strategic Initiative (see page 25), $450,000 was moved from the Efficiency & Effectiveness (E&E) Initiative into the BLS Efficiency Initiative. Over one million dollars remains available for spending in the E&E initiative.

| | 2014 Actuals | 2015 Actuals | 2016 Forecast | 2017 Forecast | 2018 Forecast | 2019 Forecast | Total Life-time Fore-cast |
|---|---|---|---|---|---|---|---|
| **STRATEGIC INITIATIVES: 2014-2019** | | | | | | | |
| **Regional Records Mgmt. System** | 33,750 | 162,719 | 203,445 | 162,756 | 162,756 | 129,285 | **854,711** |
| **BLS Training & QI** | | | | 492,000 | 493,500 | 495,378 | **1,480,878** |
| **Vulnerable Populations** | 80,148 | 188,956 | 220,383 | 345,850 | 346,229 | 352,083 | **1,533,649** |
| **BLS Efficiencies** | 8,389 | 17,521 | 29,359 | 316,795 | 250,000 | 250,000 | **872,064** |
| **Efficiency & Evaluation Studies** | 42,472 | 99,115 | 180,277 | 231,047 | 340,000 | 440,000 | **1,332,911** |
| **TOTAL SIs 2014-2019** | **164,759** | **468,311** | **633,464** | **1,548,448** | **1,592,485** | **1,666,746** | **6,074,213** |
| **STRATEGIC INITIATIVES: 2008-2013** | | | | | | | |
| **Emergency Medical Dispatch (EMD)** | 77,523 | (111,249) | 18,804 | 96,000 | 273,984 | 40,272 | **395,334** |
| **Enhanced Network Design (SEND)** | 68,960 | 30,183 | 8,943 | 61,744 | | | **169,860** |
| **TOTAL SIs 2008-2013** | **146,483** | **(81,066)** | **27,747** | **157,774** | **273,984** | **40,272** | **565,194** |
| **TOTAL STRATEGIC INITIATIVES** | **311,242** | **387,245** | **661,211** | **1,706,222** | **1,866,469** | **1,707,018** | **6,639,407** |

# EMS Funding and 2017 Financial Plan

**Reserves**

The 2014-2019 Strategic Plan establishes four reserve categories focused on ALS - ALS Capacity, ALS Equipment, ALS Operational, and ALS Risk Abatement Reserves – and creates a Community Medical Technician (CMT) Reserve and a KC Required Fund Balance Reserve. The Strategic Plan also specifies that Regional Services may access the ALS Operational Reserve to cover specific expenses which may be higher than anticipated.

In 2014, the EMS Advisory Committee recommended that a Rate Stabilization reserve, similar to the millage reduction reserve in the previous levy, be developed. At the same, time the Fund Balance reserve was converted to a Cash Flow reserve to be consistent with King County Reserve policies. An increase in Cash Flow Reserves reflects a decision to increase ALS allocation and projected increased cashflow through the end of the levy. All use of reserves are reviewed and recommended by the EMS Advisory Committee Financial Subcommittee and reviewed by the EMS Advisory Committee.

| 2014-2019 Reserves | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| **ALS Capacity** | 1,067,700 | 1,067,700 | 1,067,700 | 1,067,700 | 1,985,700 | 3,358,700 |
| **ALS Equipment** | 488,900 | 488,900 | 488,900 | 488,900 | 488,900 | 488,900 |
| **ALS Operating*** | 981,900 | 1,019,415 | 1,094,948 | 1,094,948 | 1,094,948 | 1,094,948 |
| **ALS Risk Abatement** | 1,510,000 | 1,510,000 | 1,510,000 | 1,510,000 | 1,510,000 | 1,510,000 |
| **CMT Unit** | 0 | 363,546 | 388,424 | 739,897 | 1,519,484 | 1,519,484 |
| **Cash Flow** | 9,945,412 | 10,262,581 | 12,042,578 | 6,362,655 | 7,733,961 | 7,733,961 |
| **Rate Stabilization**** | 5,114,510 | 5,114,510 | 5,114,510 | 5,114,510 | 5,114,510 | 5,114,510 |
| **TOTAL RESERVES** | **19,108,422** | **19,826,652** | **21,707,060** | **16,378,610** | **19,447,503** | **20,820,503** |

*Can also be used by Regional Services to cover increased infrastructure, indirect, and overhead costs.

** Similar to Millage Reduction Reserve in 2008-2013 levy.

# EMS Funding and 2017 Financial Plan

**Use of Reserves**

Several uses of reserves have been approved to date. The following table shows actual amounts used through the end of 2016. Additional use of reserves has been approved with "not-to-exceed" amounts for power stretchers and risk abatement, and ongoing support for paramedic services and regional services. Regional Services is using existing program balances to cover a portion of the amount eligible for use of reserves.

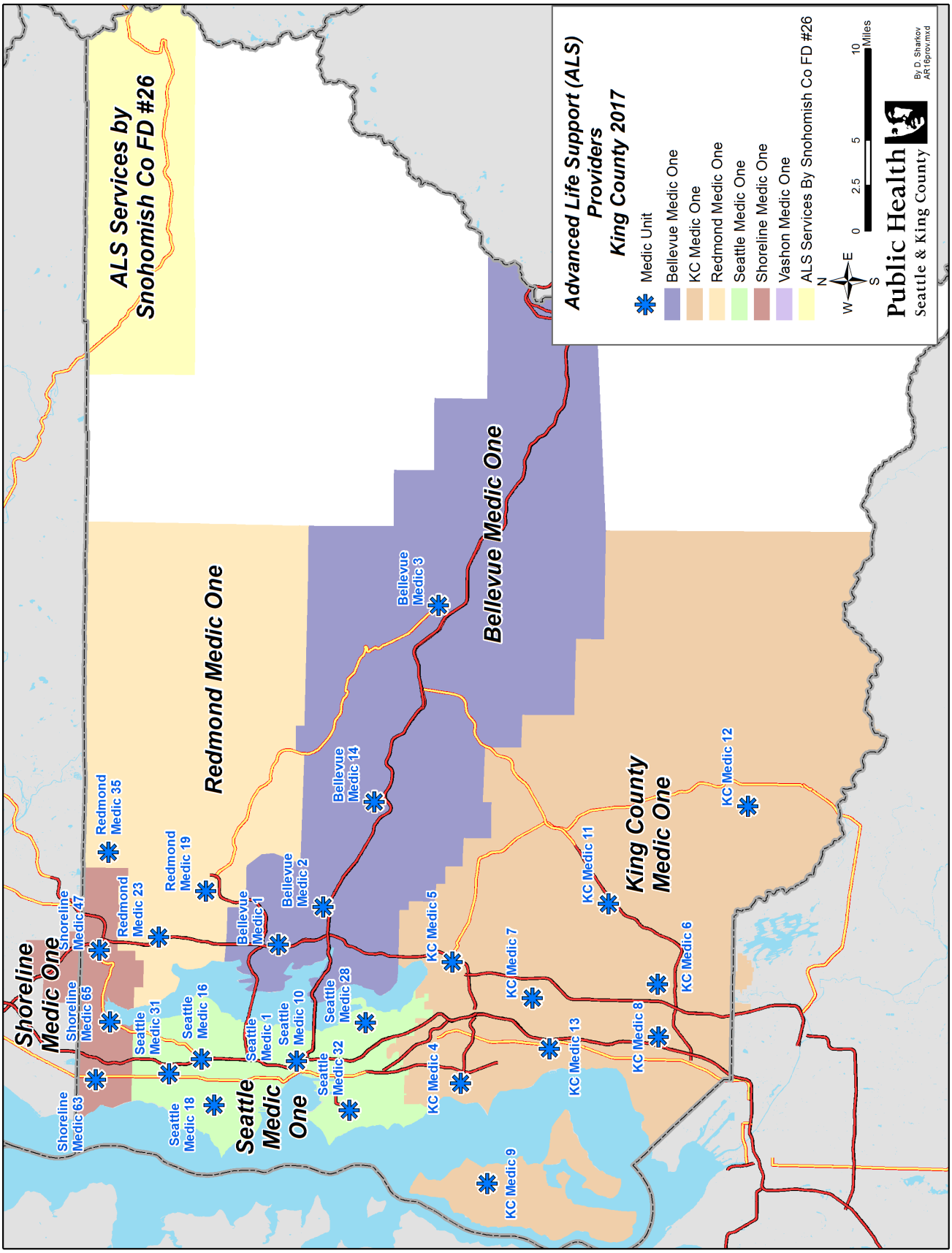
| Use of Reserves/Designations | 2014 | 2015 | 2016 | Total |
|---|---|---|---|---|
| **ALS Operating Reserve:** | | | | |
| Excess Paid Time Off (PTO) | 214,000 | 25,689 | 243,741 | **483,430** |
| Regional Services | 306,261 | 925,922 | 579,148 | **1,811,331** |
| Paramedic Students | 271,648 | 407,012 | 414,645 | **1,093,305** |
| Dispatch Costs | 133,893 | 169,629 | 157,683 | **461,205** |
| ALS Mid-Levy Allocation Adjustment | 0 | 0 | 1,989,324 | **1,989,324** |
| **ALS Equipment Reserve** - Power Stretchers | 0 | 434,562 | 174,333 | **608,895** |
| **ALS Risk Abatement Reserve*** | 0 | 649,672 | 161,885 | **811,557** |
| **Reserves Sub-Total** | **925,802** | **2,612,486** | **3,720,759** | **7,259,047** |
| **Designations** - Supplement BLS Allocation | 219,144 | 0 | 0 | **219,144** |
| **TOTAL** | **1,144,946** | **2,612,486** | **3,720,759** | **7,478,191** |

* Actual Use of Risk Abatement Reserve in 2015 updated.

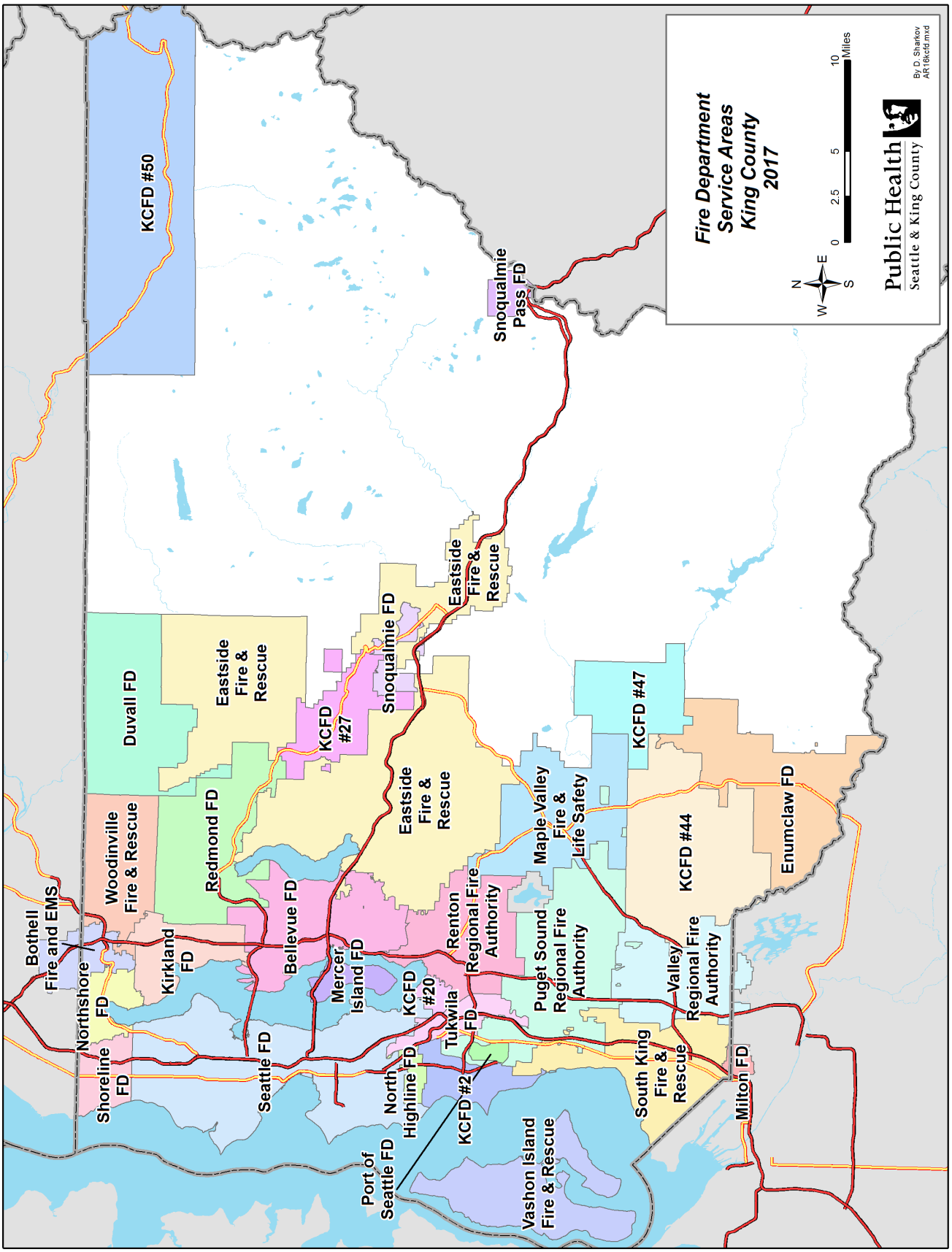
## Conclusions

Expenses are continuing to increase at a rate greater than anticipated at the time that the region developed the Financial Plan. To help address these additional costs, the ALS and Regional Services programs have accessed reserves, and the BLS agencies have received limited support from the BLS Core Services program. It is anticipated that this trend will continue for the remaining years of the levy. Revenues, primarily property taxes due to new construction, are higher than anticipated in the original plan. The region is collaboratively managing system expenses and overseeing the use of reserves to ensure the overall health of the EMS Fund.

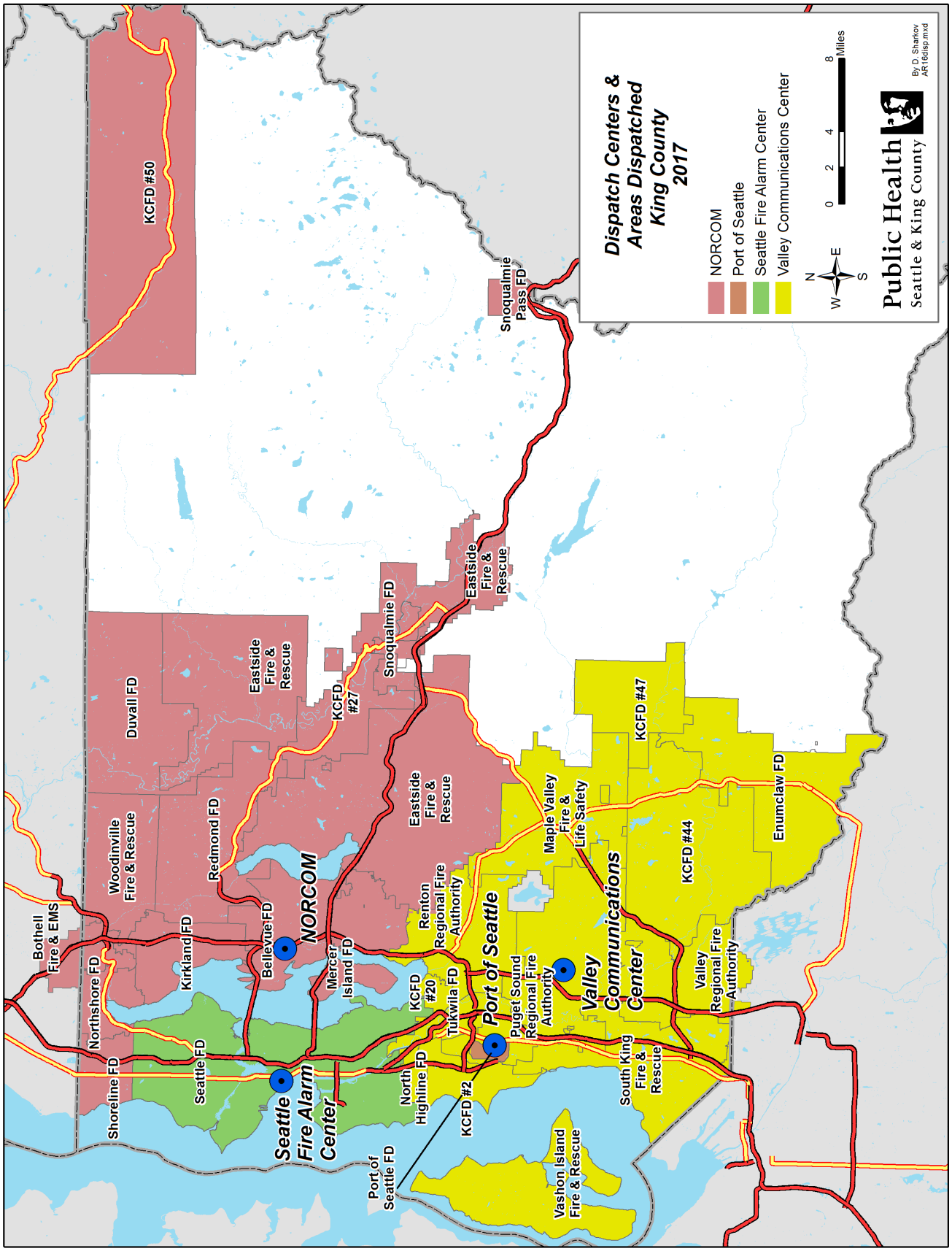
# Appendix A: Regional Map of ALS Provider Areas



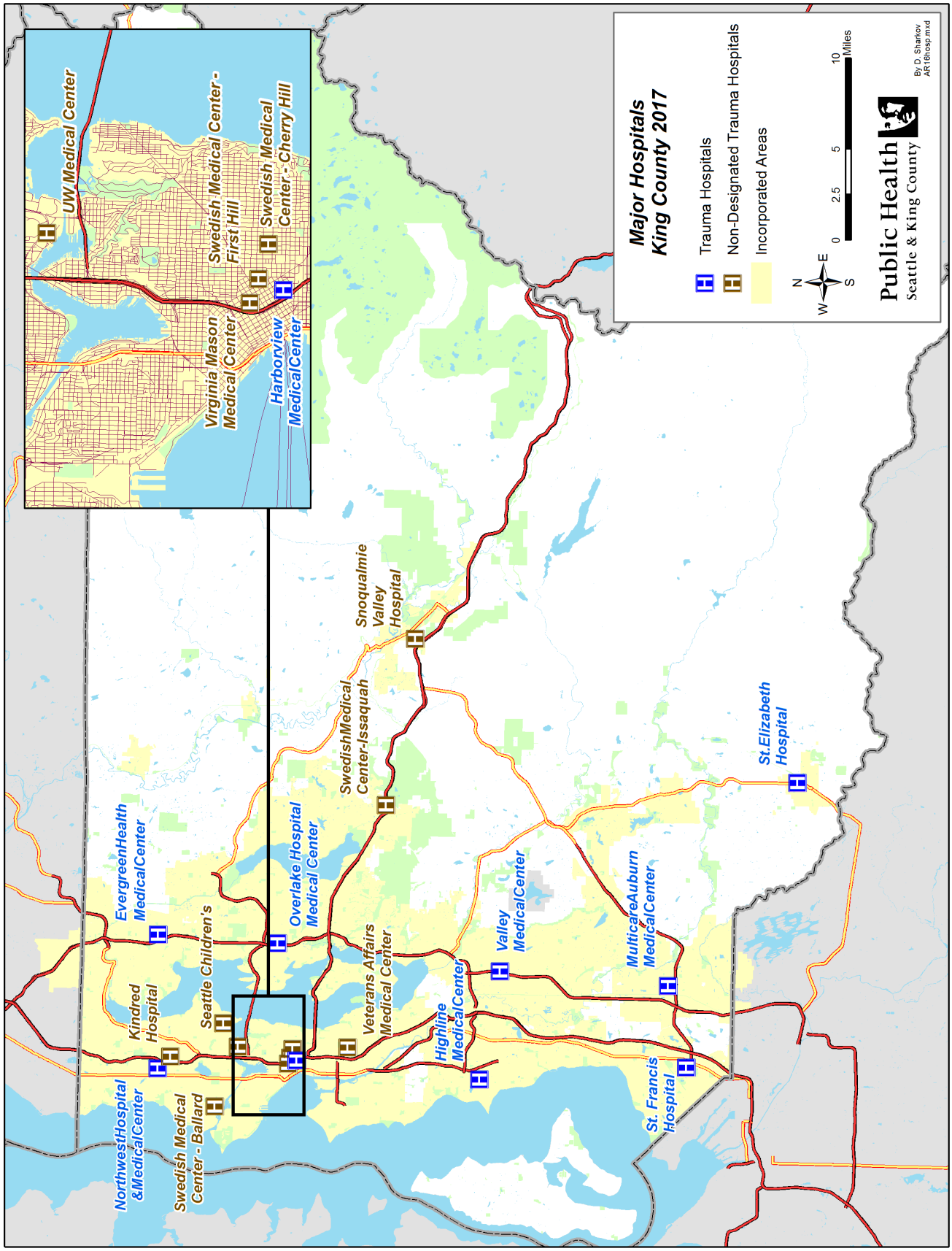
# Appendix B: Regional Map of BLS Provider Areas



# Appendix C: Regional Map of Dispatch Center Service Areas



# Appendix D: Regional Map of EMS Hospitals



# Appendix E: EMS Advisory Committee Listing

The EMS Advisory Committee provides key counsel to the EMS Division on regional Medic One/EMS policies and practices in King County, including major governance issues, strategic plan implementation, and other proposals. The following table lists the EMS Advisory Committee members:

| Name | Representation | Title/ Organization |
|---|---|---|
| Michele Plorde, Chair | KC Emergency Medical Services | Director, KC EMS Division |
| Patty Hayes | Public Health – Seattle & King County | Director, Public Health |
| Mark Risen | ALS Providers – Bellevue | Chief, Bellevue Fire Department |
| Keith Keller | ALS Providers – KC Medic One | Medical Services Administrator (MSA), King County Medic One |
| Tommy Smith | ALS Providers – Redmond | Chief, Redmond Fire Department |
| Harold Scoggins | ALS Providers – Seattle | Chief, Seattle Fire Department |
| Matt Cowan | ALS Providers – Shoreline | Chief, Shoreline Fire Department |
| Jeff Clark | BLS in Cities > 50,000 | Chief, Eastside Fire & Rescue-Sammamish |
| Joe Sanford | BLS in Cities > 50,000 | Chief, Kirkland Fire Department |
| Jim Schneider | BLS in Cities > 50,000 | Chief, Puget Sound Regional Fire Authority |
| Rick Marshall | BLS in Cities > 50,000 | Chief, Renton Regional Fire Authority |
| Al Church | BLS in Cities > 50,000 | Chief, South King Fire & Rescue |
| Brent Swearingen | BLS in Cities > 50,000 | Chief, Valley Regional Fire Authority |
| Dr. Thomas Rea | King County Medical Program Director | Medical Program Director |
| Dr. Peter Kudenchuk | Chair, Medical Directors' Committee | Medical Director, King County Medic One |
| Dr. Michael Sayre | Seattle Medical Program Director | Medical Program Director, Seattle |
| Vacant | King County Fire Commissioner's Association - Rural | Fire Commissioner |
| John Rickert | King County Fire Commissioner's Association - Urban | Fire Commissioner, South King Fire & Rescue |
| Doug McDonald | Labor - BLS | EMT, Renton Regional Fire Authority |
| Eric Timm | Labor - ALS | Paramedic, King County Medic One |
| Lora Ueland | Dispatch | Director, Valley Communications Center |
| Brandt Butte | Ambulance, General Manager | American Medical Response, Seattle |
| Vacant | Citizen Representative | |

# Appendix F: EMS Fund 1190 Financial Plan

*In previous reports, the Financial Plan showed EMS grants, donations, and entrepreneurial projects in the Public Health Fund. In compliance with newly-enacted King County financial policies, these non-levy funds are now shown in the EMS fund. This 2017 Plan includes this change, and also updates the 2016 report to include non-levy funds transferred to the EMS Fund.*

| EMS FUND 1190 FINANCIAL PLAN | 2016 Actuals | 2017 Estimate | 2018 Estimate |
|---|---|---|---|
| **BEGINNING FUND BALANCE (A)** | **42,142,020** | **43,064,555** | **38,924,150** |
| **REVENUES** | | | |
| Property Taxes | 73,383,453 | 73,960,603 | 76,327,145 |
| Grants | 601,219 | 560,096 | 572,227 |
| Charges for Services | 695,583 | 779,780 | 790,587 |
| Interest Earnings/Miscellaneous Revenue | 618,437 | 500,200 | 514,200 |
| Other Financing Sources | 46,370 | 12,000 | 12,000 |
| **TOTAL REVENUES (B)** | **75,345,062** | **75,812,679** | **78,216,159** |
| **EXPENDITURES** | | | |
| Advanced Life Support Services | 43,840,401 | 46,689,179 | 48,640,580 |
| Basic Life Support Services | 16,493,517 | 16,986,673 | 17,615,180 |
| Regional Services | 9,842,690 | 10,134,745 | 10,041,231 |
| Strategic Initiatives | 661,211 | 1,706,222 | 1,866,469 |
| Regional CMT Units | 1,086,034 | 1,477,626 | 1,085,002 |
| King County Auditor's Office | 158,384 | 0 | 122,703 |
| Use of Designations/Program Balances[1] | 0 | 550,000 | 550,000 |
| Use of Reserves[1] | 0 | 400,000 | 400,000 |
| BLS Core Services Support | 1,079,912 | 750,000 | 750,000 |
| Grants, Entrepreneurial, Donations[2] | 1,226,788 | 1,258,639 | 1,280,394 |
| **TOTAL EXPENDITURES (C)** | **74,388,937** | **79,953,084** | **82,351,559** |
| ***TOTAL REVENUES LESS TOTAL EXPENDITURES (D)*** | ***956,125*** | ***(4,140,405)*** | ***(4,135,400)*** |
| Other Fund Transactions (E) | (33,590) | 0 | 0 |
| **ENDING FUND BALANCE (A+D+E=F)** | **43,064,555** | **38,924,150** | **34,788,750** |
| **RESERVES AND DESIGNATIONS** | | | |
| Designations (including Program Balances) | (11,375,233) | (10,332,526) | (9,582,526) |
| Reserves[3] | (22,838,120) | (18,303,697) | (20,820,503) |
| **TOTAL RESERVES AND DESIGNATIONS (G)** | **(34,213,353)** | **(28,636,223)** | **(30,403,029)** |
| **ENDING UNDESIGNATED FUND BALANCE[4] (F+G)** | **8,851,202** | **10,287,927** | **4,385,721** |

[1] Estimated Use of Designations/Program Balances & Reserves included in line items for 2017 and 2018

[2] Prior to 2016, these projects were included in PH Fund 1800 and were transferred to the EMS Fund 1190 in 2016

[3] For detail on reserves, refer to page 57: EMS Funding and 2017 Financial Plan

[4] 2019 end-of-levy undesignated fund balance currently estimated at $1.5 million

### Donations

EMS accepts gifts, bequests and donations in accordance with King County Ordinance 18254 in support of the EMS mission to provide high quality prehospital emergency care.

| KING COUNTY MEDIC ONE DONATIONS | 2014 | 2015 | 2016 |
|---|---|---|---|
| **BEGINNING BALANCE (A)** | **52,835** | **94,713** | **143,008** |
| Donations (B) | 41,878 | 50,40 | 4,853 |
| Expenditures (C) | | 2,112 | 4,272 |
| **ENDING BALANCE (A+B+C)** | **94,713** | **143,008** | **143,589** |

# Appendix G: Publications

The Regional QI Section collaborates with our Medical Program Directors, EMS providers, and University of Washington faculty and student researchers to conduct research and analyses. In 2016, King County EMS disseminated research findings to wider national and international audiences through the following publications in peer-reviewed scientific and trade journals:


1. Bobrow BJ, Eisenberg MS, Panczyk M. The Institute of Medicine Says Time to Act to Improve Cardiac Arrest Survival: Here's How. Ann Emerg Med. 2016 Apr;67(4):492-5.

2. Brooks IA, Sayre MR, Spencer C, Archer FL. An Historical Examination of the Development of Emergency Medical Services Education in the US through Key Reports (1966-2014). Prehosp Disaster Med. 2016 Feb;31(1):90-7.

3. Calkins MM, Isaksen TB, Stubbs BA, Yost MG, Fenske RA. Impacts of extreme heat on emergency medical service calls in King County, Washington, 2007-2012: relative risk and time series analyses of basic and advanced life support. Environ Health. 2016 Jan 28;15:13.

4. Conway AB, McDavid A, Emert JM, Kudenchuk PJ, Stubbs BA, Rea TD, Yin L, Olsufka M, McCoy AM, Sayre MR. Impact of Building Height and Volume on Cardiac Arrest Response Time. Prehosp Emerg Care. 2016;20(2):212-9.

5. Coult J, Sherman L, Kwok H, Blackwood J, Kudenchuk PJ, Rea TD. Short ECG segments predict defibrillation outcome using quantitative waveform measures. Resuscitation. 2016 Dec;109:16-20.

6. Eisenberg D, Seino L, Meischke H, Tu SP, Turner AM, Ike B, Painter I, Yip MP. Development of a Culturally-Adapted Graphic Novella about Emergency Communication: Collaborations with a Limited English Speaking Chinese Immigrant Community. J Health Care Poor Underserved. 2016;27(3):1199-210.

7. Elmer J, Torres C, Aufderheide TP, Austin MA, Callaway CW, Golan E, Herren H, Jasti J, Kudenchuk PJ, Scales DC, Stub D, Richardson DK, Zive DM; Resuscitation Outcomes Consortium. Association of early withdrawal of life-sustaining therapy for perceived neurological prognosis with mortality after cardiac arrest. Resuscitation. 2016 May;102:127-35.

8. Ghobrial J, Heckbert SR, Bartz TM, Lovasi G, Wallace E, Lemaitre RN, Mohanty AF, Rea TD, Siscovick DS, Yee J, Lentz MS, Sotoodehnia N. Ethnic differences in sudden cardiac arrest resuscitation. Heart. 2016 Sep 1;102(17):1363-70.

9. Hidano D, Coult J, Blackwood J, Fahrenbruch C, Kwok H, Kudenchuk P, Rea T. Ventricular fibrillation waveform measures and the etiology of cardiac arrest. Resuscitation. 2016 Dec;109:71-75.

10. Husain S, Lyons B, Hanson K, Whorton A. Medical Control for EMTs: King County, Wash., Program Offers Safety Net for Patients, EMTs and the EMS System. JEMS. 2016 Feb;41(2):34-6.

11. Jabre P, Bougouin W, Dumas F, Carli P, Antoine C, Jacob L, Dahan B, Beganton F, Empana JP, Marijon E, Karam N, Loupy A, Lefaucheur C, Jost D, Cariou A, Adnet F, Rea TD, Jouven X. Early Identification of Patients With Out-of-Hospital Cardiac Arrest With No Chance of Survival and Consideration for Organ Donation. Ann Intern Med. 2016 Dec 6;165(11):770-778.

12. Kudenchuk PJ. Antiarrhythmic drugs in out-of-hospital cardiac arrest: What counts and what doesn't? Resuscitation. 2016 Dec;109:A5-A7.

13. Kudenchuk PJ. Can resuscitation run like a fine Swiss timepiece? Europace. 2016 Mar;18(3):318-9.

# Appendix G: Publications


14. Kudenchuk PJ. Erythropoietin for Out-of-Hospital Cardiac Arrest: Growing Together or Apart? J Am Coll Cardiol. 2016 Jul 5;68(1):50-2.

15. Kudenchuk PJ, Brown SP, Daya M, Rea T, Nichol G, Morrison LJ, Leroux B, Vaillancourt C, Wittwer L, Callaway CW, Christenson J, Egan D, Ornato JP, Weisfeldt ML, Stiell IG, Idris AH, Aufderheide TP, Dunford JV, Colella MR, Vilke GM, Brienza AM, Desvigne-Nickens P, Gray PC, Gray R, Seals N, Straight R, Dorian P; Resuscitation Outcomes Consortium Investigators. Amiodarone, Lidocaine, or Placebo in Out-of-Hospital Cardiac Arrest. N Engl J Med. 2016 May 5;374(18):1711-22.

16. Kudenchuk PJ, Daya M, Dorian P; Resuscitation Outcomes Consortium Investigators. Amiodarone, Lidocaine, or Placebo in Out-of-Hospital Cardiac Arrest. N Engl J Med. 2016 Aug 25;375(8):802-3.

17. Kwok H, Coult J, Liu C, Blackwood J, Kudenchuk PJ, Rea TD, Sherman L. An accurate method for real-time chest compression detection from the impedance signal. Resuscitation. 2016 Aug;105:22-8.

18. Lemaitre RN, Bartz TM, King IB, Brody JA, McKnight B, Sotoodehnia N, Rea TD, Johnson CO, Mozaffarian D, Hesselson S, Kwok PY, Siscovick DS. Circulating n-3 fatty acids and trans-fatty acids, PLA2G2A gene variation and sudden cardiac arrest. J Nutr Sci. 2016 Mar 1;5:e12.

19. Lewis MM, Stubbs BA, Eisenberg MS. Determining witnessed status for out-of-hospital cardiac arrest. Resuscitation. 2016 Dec;109:133-137.

20. Meischke H, Painter I, Turner AM, Weaver MR, Fahrenbruch CE, Ike BR, Stangenes S. Protocol: simulation training to improve 9-1-1 dispatcher identification of cardiac arrest. BMC Emerg Med. 2016 Feb 1;16:9.

21. Michiels E, Quan L, Dumas F, Rea T. Long-term neurologic outcomes following paediatric out-of-hospital cardiac arrest. Resuscitation. 2016 May;102:122-6.

22. Mooney SJ, Grady ST, Sotoodehnia N, Lemaitre RN, Wallace ER, Mohanty AF, Yee J, Siscovick DS, Rea TD, McKnight B, Kwok PY, Mak AC, Hesselson S, Lovasi GS. In the Wrong Place with the Wrong SNP: The Association Between Stressful Neighborhoods and Cardiac Arrest Within Beta-2-adrenergic Receptor Variants. Epidemiology. 2016 Sep;27(5):656-62.

23. Newgard CD, Yang Z, Nishijima D, McConnell KJ, Trent SA, Holmes JF, Daya M, Mann NC, Hsia RY, Rea TD, Wang NE, Staudenmayer K, Delgado MK; Western Emergency Services Translational Research Network Investigators. Cost-Effectiveness of Field Trauma Triage among Injured Adults Served by Emergency Medical Services. J Am Coll Surg. 2016 Jun;222(6):1125-37.

24. Nichol G, Brown SP, Perkins GD, Kim F, Sterz F, Broeckel Elrod JA, Mentzelopoulos S, Lyon R, Arabi Y, Castren M, Larsen P, Valenzuela T, Graesner JT, Youngquist S, Khunkhlai N, Wang HE, Ondrej F, Sastrias JM, Barasa A, Sayre MR. What change in outcomes after cardiac arrest is necessary to change practice? Results of an international survey. Resuscitation. 2016 Oct;107:115-20.

25. Nichol G, Cobb LA, Yin L, Maynard C, Olsufka M, Larsen J, McCoy AM, Sayre MR. Briefer activation time is associated with better outcomes after out-of-hospital cardiac arrest. Resuscitation. 2016 Oct;107:139-44. doi: 10.1016/j.resuscitation.2016.06.040. Epub 2016 Jul 21.

# Appendix G: Publications


26. Peltan ID, Rowhani-Rahbar A, Vande Vusse LK, Caldwell E, Rea TD, Maier RV, Watkins TR. Development and validation of a prehospital prediction model for acute traumatic coagulopathy. Crit Care. 2016 Nov 16;20(1):371.

27. Petek BJ, Bravo PE, Kim F, de Boer IH, Kudenchuk PJ, Shuman WP, Gunn ML, Carlbom DJ, Gill EA, Maynard C, Branch KR. Incidence and Risk Factors for Postcontrast Acute Kidney Injury in Survivors of Sudden Cardiac Arrest. Ann Emerg Med. 2016 Apr;67(4):469-476.e1.

28. Phelan EA, Herbert J, Fahrenbruch C, Stubbs BA, Meischke H. Coordinating Care for Falls via Emergency Responders: A Feasibility Study of a Brief At-Scene Intervention. Front Public Health. 2016 Dec 1;4:266.

29. Piccini JP Sr, Allen LA, Kudenchuk PJ, Page RL, Patel MR, Turakhia MP; American Heart Association Electrocardiography and Arrhythmias Committee of the Council on Clinical Cardiology and Council on Cardiovascular and Stroke Nursing. Wearable Cardioverter-Defibrillator Therapy for the Prevention of Sudden Cardiac Death: A Science Advisory From the American Heart Association. Circulation. 2016 Apr 26;133(17):1715-27.

30. Prekker ME, Carlbom D, King MA, Rea TD. In reply. Ann Emerg Med. 2016 Jul;68(1):130-1.

31. Prekker ME, Delgado F, Shin J, Kwok H, Johnson NJ, Carlbom D, Grabinsky A, Brogan TV, King MA, Rea TD. Pediatric Intubation by Paramedics in a Large Emergency Medical Services System: Process, Challenges, and Outcomes. Ann Emerg Med. 2016 Jan;67(1):20-29.e4.

32. Rea TD. Not just lip service: The lifesaving role of telephone CPR. Resuscitation. 2016 Dec;109:A2-A3.

33. Sayre MR. REVISING PROTOCOLS. A back-to-basics training approach to comply with the AHA Guidelines Update. JEMS. 2016 Mar;41(3):46-7.

34. Seymour CW, Liu VX, Iwashyna TJ, Brunkhorst FM, Rea TD, Scherag A, Rubenfeld G, Kahn JM, Shankar-Hari M, Singer M, Deutschman CS, Escobar GJ, Angus DC. Assessment of Clinical Criteria for Sepsis: For the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA. 2016 Feb 23;315(8):762-74.

35. Stubbs BA, Culley L, Eisenberg MS. Dispatch-assisted CPR instructions: Time to measure and improve. Resuscitation. 2016 May;102:e5.

36. Wander PL, Enquobahrie DA, Pritchard CC, McKnight B, Rice K, Christiansen M, Lemaitre RN, Rea T, Siscovick D, Sotoodehnia N. Circulating microRNAs and sudden cardiac arrest outcomes. Resuscitation. 2016 Sep;106:96-101.

37. Wells DM, White LL, Fahrenbruch CE, Rea TD. Socioeconomic status and survival from ventricular fibrillation out-of-hospital cardiac arrest. Ann Epidemiol. 2016 Jun;26(6):418-423.e1.

38. Willcox ME, Kudenchuk PJ, Prutkin JM. Very abnormal T waves in a 37-year-old man. Heart. 2016 Jan;102(2):163-4.

39. Wolfe H, Morgan RW, Donoghue A, Niles DE, Kudenchuk P, Berg RA, Nadkarni VM, Sutton RM. Quantitative analysis of duty cycle in pediatric and adolescent in-hospital cardiac arrest. Resuscitation. 2016 Sep;106:65-9.

# Appendix H: EMS Performance Measures

| Resource Category | Performance Measure | Definition | 2016 Results |
|---|---|---|---|
| **SYSTEMWIDE** | Rate of cardiac arrest survival | % discharge from hospital for all witnessed cardiac arrests due to cardiac etiology in VF/VT. Includes only circulatory arrests of non-traumatic etiology receiving ALS care in patients > 2 years old | 56%* |
| **BYSTANDER** | Rate of bystander CPR in cases of cardiac arrest | % of bystander CPR provided for all cases of cardiac arrest. Includes only circulatory arrests of non-traumatic etiology that received ALS care in patients aged > 2 years old | 73% |
| **DISPATCH** | Rate of correctly identified cardiac arrest by telecommunicator | % of confirmed cardiac arrest cases that were correctly identified by dispatcher when provided opportunity to assess | 96% |
| | Rate of correctly identified resource used by telecommunicator | % of total number of reviewed calls that received correct EMS resource | 91% |
| | Rate of correctly transferred T-IDC calls | % of T-IDC calls that were sent to the Nurseline vs received a BLS response | "T" IDC calls sent to the Nurseline: 68% |
| **BASIC LIFE SUPPORT** | % that response time standards are met for emergency BLS calls | Urban response areas: 10 minutes or less 80% of the time; Suburban response areas: 20 minutes or less, 80% of the time; Rural response areas: 45 minutes or less, 80% of the time; Wilderness response areas: As soon as possible | Urban: 100%<br>Suburban 100%<br>Rural: 100%<br>Wilderness: 100% |
| | Rate of EMTs documenting FAST and glucometry in stroke patients | % of hospital- and prehospital-diagnosed stroke patients for whom FAST exam and glucometry were documented by EMTs on MIRFs | Not available |
| | Rate that "on scene time" standards are met | % of suspected CVA and suspected TIA patients with < 15-minute BLS scene time | 60% |
| | Rate of taxi transported patients | % of taxi transports of all BLS transports | 0.9% |
| | Compression fraction during resuscitation attempts | % of time that compressions are actively applied to the chest during the first 20 minutes of the case, until efforts are ceased, or until sustained ROSC is achieved (whichever event comes earliest) | 86% |
| **PARAMEDICS** | % that response time standards are met | Respond on average < 10 minutes, and <= 14 min 80% of the time | <=10 = 76.8%<br><=14 = 93.4%<br>MEAN = 8.1 min. |
| | Rate of paramedics documenting use of a 12-lead ECG for STEMI patients | % of suspected STEMI cases where paramedics documented the use of a 12-lead ECG | 68% |
| | Rate that "on scene time" standards are met | % of suspected STEMI patients with < 15 minute on scene time | 44% |
| | Rate of paramedics documenting Glasgow Coma Scale (GCS) for trauma patients | % of trauma patients transported to HMC by paramedics where GCS was documented | 57% |
| | Rate of scene time for trauma patients | % of trauma patients taken to HMC by paramedics with < 15 minute ALS scene time | 44% |
| | Rate of successful first attempt intubations | % of successful first attempt intubations | 81% |
| **REGIONAL** | Rate of cancelled enroute ALS calls | % of calls cancelled enroute ALS calls to all ALS calls | 22.6% |
| | % of calls where no upgrade or downgrade was needed | % of calls where ALS was not cancelled and not requested from scene | 62.5% |
| | Rate of ALS requests from scene | % of BLS request for ALS from scene of all ALS calls | 16.7% |
| | # of paramedic hours above planned 2PM unit staffing | # of paramedic hours above planned two (2) paramedic unit staffing | 481 hrs. |
| | Rate of satisfied customers | % satisfied or very satisfied with service as reflected in survey results | Not available |

*Cardiac arrest survival rate data reflect King County and City of Seattle

# Appendix I: EMS Division Contact Information

| | |
|---|---|
| **King County Medic One**<br>20811 84th Ave S., Suite 102<br>Kent, WA 98032<br>Phone: (206) 296-8550<br>Fax: (206) 296-0515 | |
| **Emergency Medical Services Division**<br>Public Health - Seattle & King County<br>401 5th Avenue, Suite 1200<br>Seattle, WA 98104<br>Phone: (206) 296-4693<br>Fax: (206) 296-4866<br>Website: **http://www.kingcounty.gov/health/ems.aspx** | |
| **Administration:**<br>- Contracts<br>- Finance<br>- Strategic Planning | (206) 263-8549 |
| **Community Programs:**<br>- BLS Efficiencies<br>- Communities of Care Program<br>- CPR/AED Training Programs<br>- Emergency Medical Dispatch (EMD)<br>- Injury Prevention and Public Education Programs (Fall Prevention, Child Passenger Seat, Exercise - Shape Up for Seniors, Fire Department Small Grant Program) | (206) 263-1457<br>(206) 263-1542<br>(206) 477-8664<br>(206) 263-8636<br>(206) 263-8544 |
| **Professional Standards:**<br>- EMS Online<br>- Basic and Advanced Life Support Training | (206) 263-8054 |
| **Regional Quality Improvement:**<br>- Center for the Evaluation of EMS (CEEMS)<br>- Regional Medical Control and Quality Improvement<br>- Data Collection & Data Analysis | (206) 263-8057 |