

Public Health - Seattle & King County

 **Division of**
Emergency
Medical Services

2016 Annual Report

to the King County Council

September 2016

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

Each year, approximately **1 out of 10** of our residents will use our Medic One/EMS system.

Every year **the Medic One/EMS System saves thousands of lives:**

In 2015, firefighters responded to more than 100,000 calls in King County alone.

Paramedics responded to over 19,000 calls for advanced life support in King County.

Compared to other cities, cardiac arrest victims are 4 to 5 times more likely to survive.

Over the past year, 221 people in Seattle & King County were saved from cardiac arrest.

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

Introduction

We are pleased to present the 2016 Emergency Medical Services Annual Report, as required by King County Ordinance #12849.

2016 is the third year, and the mid-point, of the current six year levy span. As such, it provides the ideal vantage point to see where we are with implementing the EMS Strategic Plan, and also reflect on those things that we – and the region – expect to accomplish in the remaining years of the levy.

We have remained true to our commitment to continually improve an already excellent system. To test more effective responses to low-acuity 9-1-1 calls, we launched three pilot Community Medical Technician (CMT) units in diverse locations throughout the county. And the Vulnerable Populations Strategic Initiative evolved from a conceptual model into a multi-faceted, cross-sector effort that is revealing to us the specific needs of immigrant and elderly populations in an emergency. The region’s sustained commitment to identify areas for quality improvement has resulted in greater opportunities to enhance patient care and develop a more effective and informed EMS system.

The region is experiencing a wave of retirements that is unprecedented in recent times. The EMS Division is no exception, with the retirement of Dr. Mickey Eisenberg, Medical Program Director, and Jim Fogarty, Division Director. We are excited to work with Dr. Tom Rea in his role as the new Medical Program Director. Although change can produce anxiety, we hope to find a way to view it as a great opportunity to shape our organization to meet our future needs.

Looking forward, we will continue to pursue strategies so that our EMS system remains responsive and relevant to our community for the rest of this levy span and into the next. An important component of this vision is to ensure hiring process is equitable for both people of color and women. The region will begin the critical work of renewing the EMS levy, with the Division and its partners preparing to provide strategic direction and financial support for our internationally recognized regional EMS system.

While we have steadfastly embraced our mission to provide high quality pre-hospital emergency care that is known the world over, it is the collective efforts of our providers that make it possible for this regional system to achieve such impressive, sustained and recognized accomplishments. Thank you all for your continued support of the EMS system’s commitment to excellence.



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



Michele Plorde
Division Director
Emergency Medical Services

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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

The Emergency Medical Services (EMS) Division would like to thank all of the individuals who contributed to the EMS 2016 Annual Report, including managers of the various EMS projects and programs included in the report, and the EMS Division data analysis team of **Carol Fahrenbruch, Jamie Emert, Dan Henwood, Dmitry Sharkov** and **Ben Stubbs**.

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Executive Summary

The 2016 report documents the cooperative nature and strong regional effort of all the partners throughout the EMS system. As with past reports, this year's review features projects and programs that thoroughly embody the components that have contributed to the system's success - medicine, innovation, effectiveness and regionalism. However, it is the theme of teamwork and cooperation that truly echoes throughout the text.

Collaborations with research experts reinforced the treatment strategies that have been the trademark of King County EMS, and will help make data driven decisions about the services the system provides. Technological alliances developed software applications that will improve one of our greatest tools in treating cardiac arrest - the AED. Public safety agencies teamed up to help combat drug overdoses and extend the reach of medical expertise into remote locations.

The Resuscitation Academy went global to assist communities world-wide to implement EMS best practices. EMS regional partners continued exploring and carrying out strategies to address specific populations and needs that will improve EMS clinical and operational performance, system-wide.

Under the umbrella of the King County Equity and Social Justice initiative, the EMS Division is strategizing internally with other Public Health divisions and externally with EMS agencies to improve its hiring practices to provide better opportunities for people of color and women. A concrete plan has been developed that should result in real changes to the current pattern of hiring in both the EMT/paramedic area as well as within the EMS Division.

This year's report continues to convey the quality of that service and the high level of dedication by the people who plan for and deliver it. The strength of these partnerships is the cornerstone of the EMS system that King County has depended on for over forty years.

System Overview

Any time you call 9-1-1 for a medical emergency, you are using the Medic One/EMS system. This internationally-renowned regional system provides service to the residents of Seattle and King County, responding to an area of 2,134 square miles and serving a population over two million. The 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 King County is distinctive from other systems in that it **(a) is medically based, (b) is regional, and (c) uses tiered out-of-hospital response.**

(a) 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) ensures the success and the ongoing medical quality improvement of the EMS system. This year, Dr. Thomas Rea was appointed MPD, replacing Mickey Eisenberg, MD, PhD, who filled this role for more than a decade. Dr. Rea is a Professor of Medicine at the University of Washington and Harborview Medical Center. He has spent the past decade working with the King County Medic One Paramedic group, ensuring the continued high standard of EMS care. As MPD, Dr. Rea's substantial 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 continual medical quality improvement activities, such as the review of every cardiac arrest event for the past 35+ years and patient protocol compliance audits. The result of this ongoing quality improvement is enhanced patient outcomes and an excellent cardiac arrest survival rate, which has been among the highest reported in the nation.

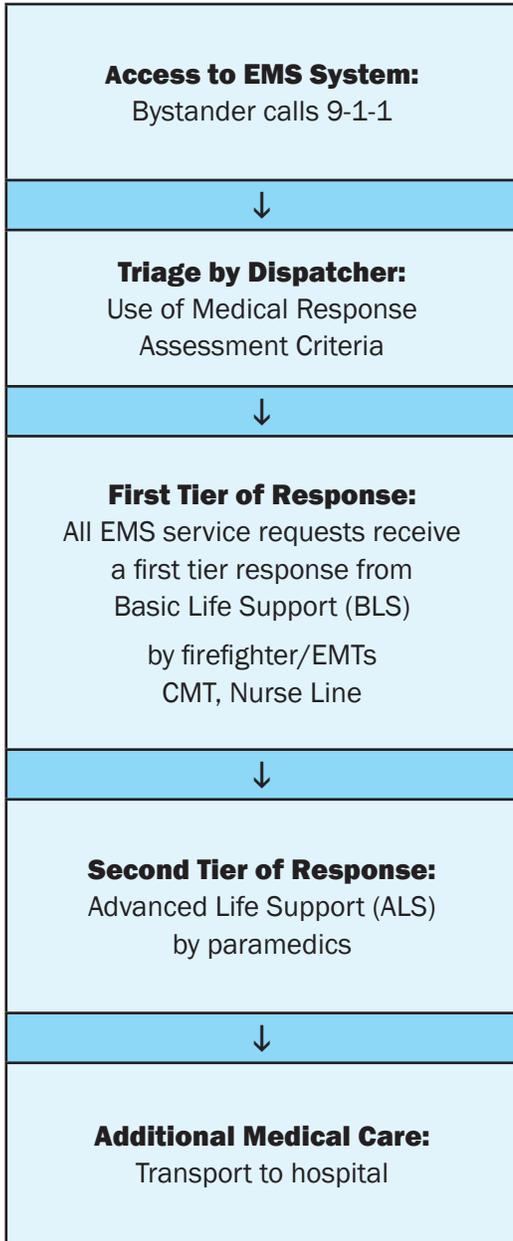
(b) Regional partners sustain uniformity and consistency across the entire EMS system. Dr. Rea coordinates policies and procedures among the Medical Directors of the region's six paramedic programs: Dr. Michael Sayre of Seattle; Dr. Jim Boehl of Bellevue; Dr. Adrian Whorton of Redmond; Dr. Gary Somers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

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.

(c) A tiered response system in King County ensures the most appropriate care provider responds to each 9-1-1 call.

System Overview

EMS Tiered Response System



There are five major components in the tiered regional Medic One/EMS system:

Universal 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.

Dispatcher Triage: Calls to 9-1-1 are received and triaged by professional dispatchers who determine the most appropriate level of care needed. Dispatchers are trained to provide pre-arrival instructions for most medical emergencies and guide the caller through life-saving steps, including Cardiopulmonary Resuscitation (CPR) and Automated External Defibrillator (AED) instructions, until the Medic One/EMS provider arrives.

Basic Life Support (BLS) Services: BLS personnel are the “first responders” to an incident and provide immediate medical care, such as advanced first aid and CPR/AED to stabilize the patient. Staffed by firefighters trained as Emergency Medical Technicians (EMTs), BLS units arrive at the scene in about five minutes (on average). It handles 100% of the service requests and contributes significantly to the success of the Medic One/EMS system.

Advanced Life Support (ALS) Services: Paramedics provide out-of-hospital emergency medical care for critical or life-threatening injuries and illness. Paramedics respond on average to about a quarter of all Medic One/EMS calls.

Transport to Hospitals: Once a patient is stabilized, it is determined whether transport to a hospital or clinic for further medical attention is needed. Transport is most often provided by an ALS agency, BLS agency or private ambulance.

System Overview

The Medic One/EMS system operates in a coordinated partnership among numerous stakeholders across King County to provide high quality pre-hospital 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.

Dispatch 9-1-1 calls are received by one of five dispatch centers in Seattle and throughout King County. Following medically approved emergency dispatch triage guidelines, dispatchers determine the level of care needed.

Basic Life Support (BLS), or first-on-scene medical care, is provided by over 4,200 Emergency Medical Technicians (EMTs) employed by 29 fire-based agencies throughout King County. EMTs receive more than 140 hours of basic training and hospital experience with additional training in cardiac defibrillation (electrical shocks) given to restore a heart rhythm. EMTs are certified by the State of Washington and are required to complete ongoing continuing education to maintain certification.

Advanced Life Support (ALS) services, or regional paramedic services, are provided by six agencies operating 26 ALS units throughout King County: Bellevue Fire Department (4 units), Redmond Fire Department (3 units), Seattle Fire Department (7 units), Shoreline Fire Department (3 units), King County Medic One (8 units) and Vashon Island Fire & Rescue (1 unit). In addition, a contract with Snohomish County Fire District 26 brings ALS services to the Skykomish/King County Fire District 50 area, from Baring to Stevens Pass. Paramedics usually arrive second on the scene and provide emergency care for serious or life-threatening injuries and illness. Examples include airway control, heart pacing and dispensing of medicine. Paramedics receive over 2,500 hours of intensive training through the University of Washington/Harborview Medical Center Paramedic Training Program and must complete continuing medical education to maintain certification.

The EMS Division manages the core Regional Services that support the key elements of the system. They are essential to providing the highest quality out-of-hospital emergency care available. Regional coordination ensures pre-hospital patient care is delivered at the same standards across the region, regional policies and practices that reflect the diversity of needs are maintained, and local area service delivery is balanced with centralized interests.

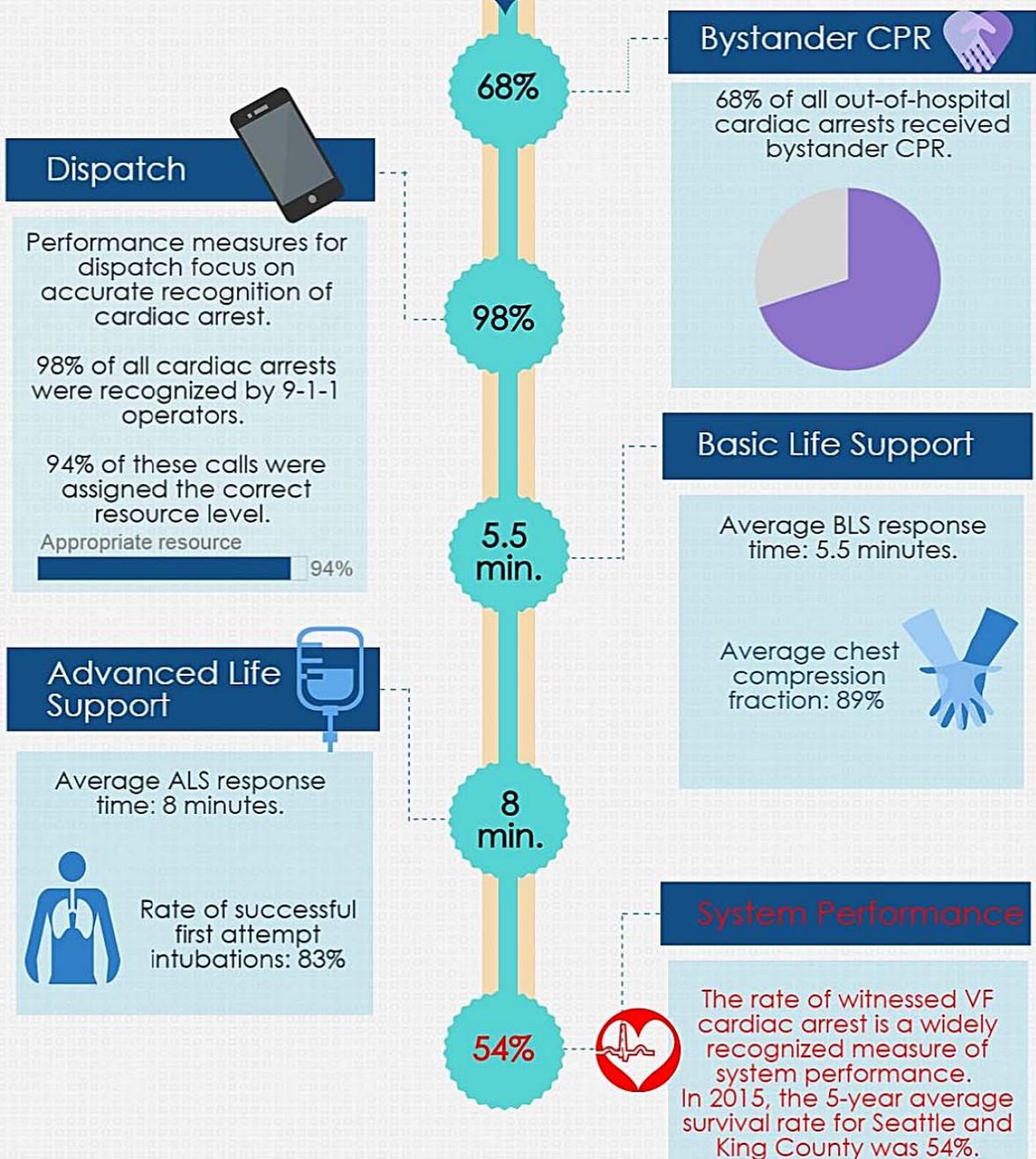
Examples of Regional Service include:

- Uniform training of EMTs and dispatchers
- Regional medical control and quality improvement
- Injury prevention programs
- Regional data collection and analysis
- Regional planning for the EMS system
- Financial/administrative management

The EMS Division also manages innovative projects and operations called Strategic Initiatives, which are designed to improve the quality of Medic One/EMS services and manage the growth and costs of the system. Regional Strategic Initiatives have allowed the Medic One/EMS program in King County to maintain its role as a national leader in the field and have been key in the system's ability to manage its costs.

It takes a SYSTEM to save a victim.

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



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

EMS Division Programs Overview

The Emergency Medical Services (EMS) Division of Public Health - Seattle & King County is dedicated to increasing survival and reducing disability from out-of-hospital emergencies in the county by providing the highest quality patient care in the pre-hospital setting. To accomplish this, the Division adheres to a medical model of integrated regional Medic One/EMS services, a philosophy of cooperative decision making, and the development of innovative strategic initiatives that address the demand for services and encourage system efficiencies. All EMS Division programs are designed to enhance these efforts and are developed through strong partnerships with other regional EMS agencies and innovative leadership in the emergency medical field.

Directing the EMS Division in managing the regional system is the Medic One/EMS 2014-2019 Strategic Plan, approved by the King County Council in June 2013, and voters in November 2013. 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 the span of the levy period.

The EMS Division plays a significant role in developing, administering and evaluating critical EMS system activities. It provides the core support functions that emphasize the uniformity and standardization of direct services provided by the system's partners. These programs help tie the regional medical model together by providing consistent regional medical direction, standardized EMT training and continuing medical education, standard EMS training for emergency dispatchers, centralized data collection, paramedic service planning and analysis, along with financial management of the regional EMS levy fund. It is far more medically effective and cost efficient for the EMS Division to manage these functions than to have each local response agency develop, implement and administer its own such programs.

This report offers highlights from the past year on some of the Division's many successful programs and activities. The rest of the program descriptions are posted on the EMS webpage.

www.kingcounty.gov/healthservices/health/ems.aspx

It is well known that the regional system depends on a complex partnership of providers, all of whom recognize the strong value for residents in maintaining the tiered response system. 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.

The EMS Division adheres to a medical model of integrated regional EMS services, cooperative decision making, and the development of strategies to encourage system efficiencies and effectiveness.

Center for the Evaluation of EMS

The Center for the Evaluation of Emergency Medical Services (CEEMS) receives funding from private, state and federal agencies to conduct studies aimed at improving the delivery of pre-hospital emergency services and advancing evidenced-based care and treatment. The EMS Division works collaboratively with academic and clinical faculty from the University of Washington to implement and evaluate research studies.

Resuscitation Outcomes Consortium (ROC): Conclusion

King County EMS recently completed two North American-wide landmark trials in out-of-hospital cardiac arrest. Both trials were part of the Resuscitation Outcomes Consortium (ROC), a National Institutes of Health-sponsored network in which King County EMS has participated for the past 10 years.

The first trial, called CCC for “Continuous Chest Compressions,” focused specifically on BLS, and was the largest trial of out-of-hospital cardiac arrest ever performed, with a total of 23,711 patients. It compared “traditional” CPR (during which 30 chest compressions were briefly interrupted for 2 breaths, which is also known as 30:2 CPR) against “new” CPR (during which breaths were given concurrently with chest compressions with every 10th compression).

The trial found no significant difference in survival to hospital discharge or neurological outcome between the two approaches to CPR, proving in this instance that performance (doing high quality CPR) is more important than mere protocol (the exact type of CPR being performed). **These results reinforce that while Seattle (continual compressional CPR with a break at the 10th compression) and King County (30:2) perform CPR differently, they are both providing equal, high-quality care.**



The second trial, called ALPS for “Amiodarone, Lidocaine or Placebo Study”, was ALS-focused and equally a landmark trial. It determined whether giving the antiarrhythmic drugs amiodarone versus lidocaine versus neither (a placebo) improved survival to hospital discharge in patients in cardiac arrest due to ventricular fibrillation that failed to respond to shock. Although these drugs have been used for many years, their effect on survival has never been proven.

ALPS randomized 3,026 patients (approximately 1,000 patients to each treatment), making it the largest drug study in out-of-hospital cardiac arrest ever performed. The study found that patients who received amiodarone had a slightly better survival than placebo recipients, a trend that approached but did not achieve statistical significance. However, both amiodarone and lidocaine were found to significantly improve survival to hospital discharge when the cardiac arrest was witnessed by a bystander – suggesting that the benefit of these drugs is understandably linked to how quickly such events are recognized and drug treatment is started. **The survival benefit observed with these drugs in this study means 1,800 more lives could potentially be saved each year from shock-resistant cardiac arrest in the United States.**

Taken together, these trials reinforce the treatment strategies and emphasis on high performance CPR that have been the trademark of King County EMS. The results also add solid proof that these measures truly save lives.

Center for the Evaluation of EMS

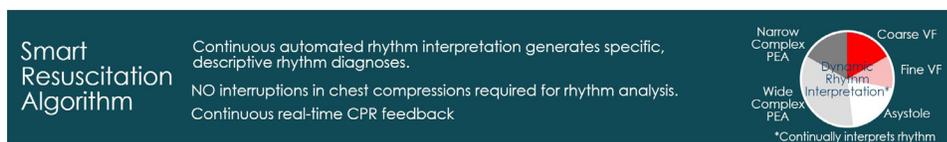
Life Science Discovery Fund (LSDF) Matching Grant: Real-time compression detection and rhythm identification

When it comes to treating sudden cardiac arrest, (SCA), one size does not fit all. However, current defibrillator technology requires that nearly all SCA patients be treated in the same manner. Among other things, this involves stopping chest compressions so that heart rhythms can be analyzed. Multiple peer reviewed publications have shown that outcomes improve when chest compressions pauses are minimized, reiterating the need to find an alternative to this standard procedure.

In 2015, King County Medical Program Director and UW Professor of Medicine Dr. Thomas Rea was awarded a two-year Life Sciences Discovery Fund (LSDF) matching grant to expand upon defibrillator technology. As reported last year (see page 12 of the 2015 Annual Report), the EMS Division partnered with the University of Washington Departments of Medicine and Bioengineering and Phillips Healthcare to enhance software that allows for continuous CPR support with current automatic external defibrillators (AEDs).

Over the past year, this team has developed two technological advancements to reduce pauses during chest compressions in the hopes of increasing survival from sudden cardiac arrest.

One algorithm uses technology in the AED pad to detect and accurately determine chest compressions. This eliminates the current limitation of needing to purchase additional equipment for use with the AED to receive such real time feedback.



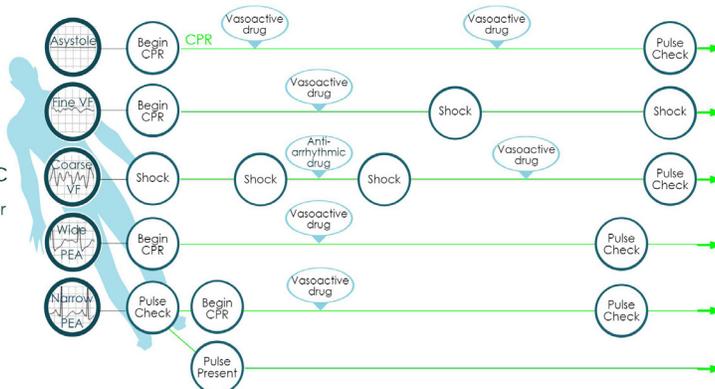
User Interface

Examples of smart defibrillator screen visible to Provider



Machine Logic

Not visible to Provider



Another algorithm eliminates the need to stop chest compressions and wait for the AED to determine whether a defibrillatory shock should be delivered. The software can “read through” chest compressions and differentiate between shockable and non-shockable rhythms, saving anywhere from 6 to 15 seconds of critical “hands on” time.

Medical Quality Improvement

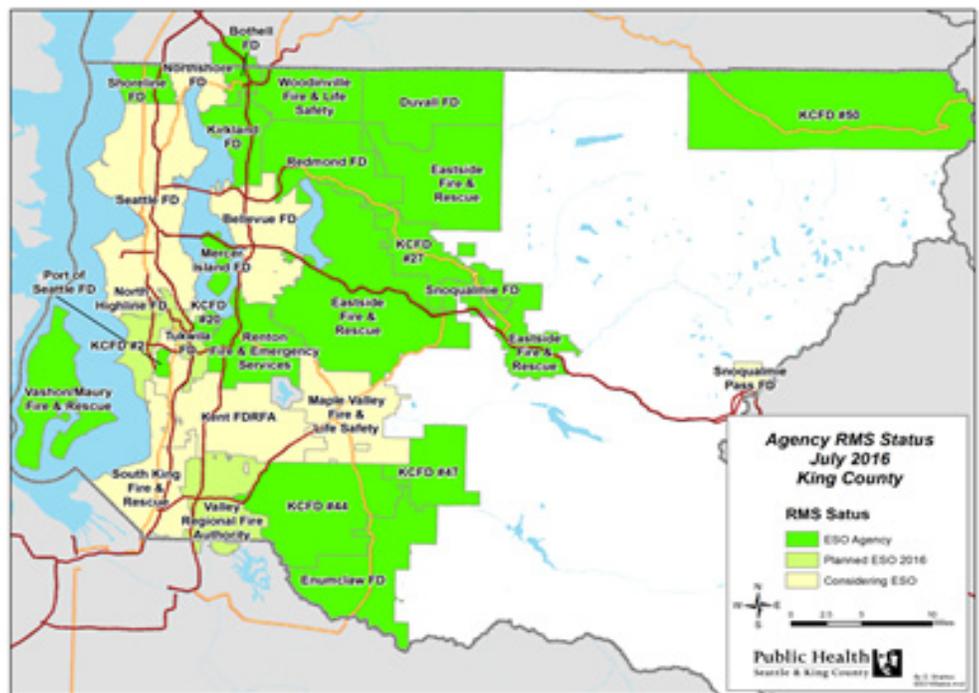
The Medical Quality Improvement (QI) section conducts programmatic, scientific, and case-based evaluation of the EMS system to improve the quality of EMS patient care in King County. To advance the science of resuscitation and EMS care, it partners with investigators in the EMS Division and at the University 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.

Singular Records Management System for the Region

Electronic health care records provide a greater and more seamless flow of information, which is integral for managing all aspects of the EMS system throughout King County. **The Regional Records Management System (RMS) Strategic Initiative** is one effort underway

to ensure that complete, accurate and timely data is available for the EMS Division and its partners. The Initiative encourages agencies to use a singular EMS records management system, centralizing information and improving the quality and access to EMS data. Please see page 26 for additional details on the Initiative.

In consultation, collaboration, and partnership with all EMS agencies, ESO Solutions Inc (ESO) was identified as a potential regional records management system. Currently, 24 out of 35 King County BLS and ALS agencies are using ESO as their records management system.



Current & anticipated status of ESO adoption by BLS agencies throughout King County.

Recognizing that the new ESO users would need support with this new system, the EMS Division pulled together a workgroup of its regional partners to discuss ESO training needs. This group consisted of current and future ESO users, as well as ESO representatives, and collaboratively developed a user guide on the new software, as well as outlined the Division's expectations for documentation and retention. The manual is available via EMS Online.

Using a singular regional records management system improves the quality of, and access to, EMS data. Both of these are integral for the EMS Division's ongoing QI audits to systematically identify how EMS responses can be improved.

Medical Quality Improvement

QI Report: EMT Administration of Epinephrine Intramuscularly

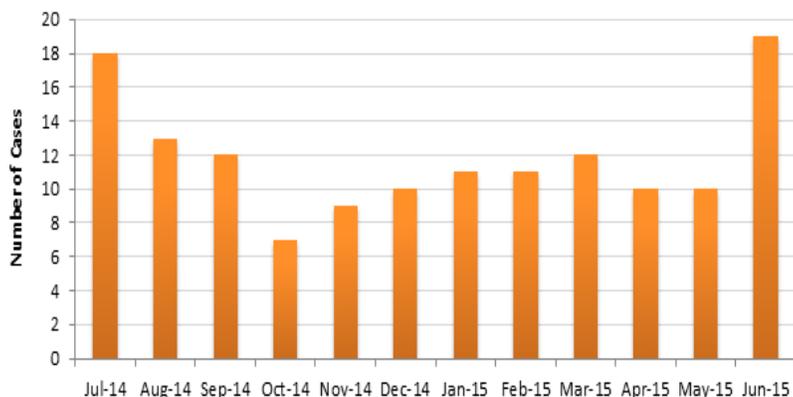
Anaphylaxis is a severe allergic reaction to an allergen, which can become life-threatening if not treated immediately with epinephrine. For this reason, the Washington State Legislature has enacted laws to make epinephrine more readily available, including requiring that all ambulances and aid services have epinephrine in their emergency care supplies, and that EMTs be trained in its administration.

As highlighted in the 2014 Annual Report, King County developed the **Check and Inject Program**, which has changed the way that EMTs deliver epinephrine to patients experiencing allergic reactions. This program was developed after hearing EMS agencies voice concerns about the rising cost, and short shelf life, of EpiPens. Returning to the traditional method of administering the drug via syringe, Check & Inject swaps out EpiPens for a small “Epi Kit”, containing a syringe, enough epinephrine for at least two emergency doses to an adult or child, and a check list to follow for identifying when to use the drug, and subsequently administering it.

The first few BLS agencies began implementing this mode of administration in April 2014, after receiving focused training on administering epinephrine intramuscularly and its indications. By July 1st of that same year, all King County BLS agencies, except Seattle Fire Department, were trained and participating in the program.

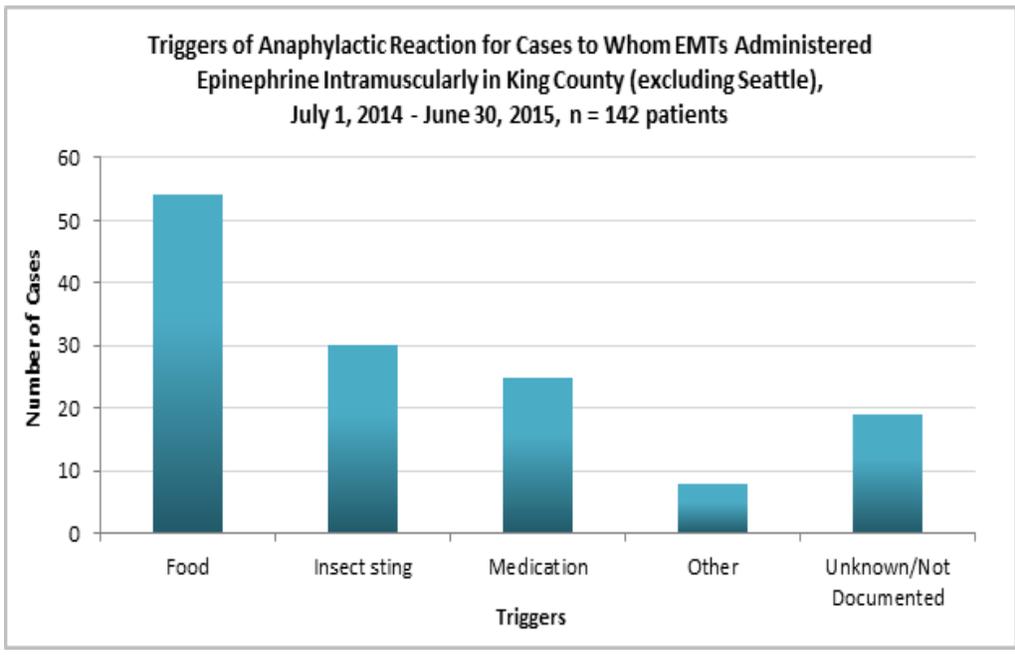


Number of Epinephrine IM Administrations by King County EMTs (excluding Seattle) by month, July 1, 2014 - June 30, 2015, n = 142 patients



Medical Quality Improvement

The EMS Division’s Medical QI and Professional Standards Sections closely monitor every administration of epinephrine to ensure the proper identification and use of the drug. Identifying triggers, the appropriate use of epinephrine, and the completeness of documentation are all scrutinized as part of the Division’s ongoing commitment to ensure that the level of care provided by the EMS system remains of the highest standard.



Pinpointing the trigger for potential anaphylaxis sometimes requires a bit of detective work, but is extremely important to help verify the diagnosis and avoid recurrent episodes in the future.

“Check and Inject” program

The EMS Division’s **“Check and Inject” program** continues to gather steam and garner national attention. It was recently highlighted in the latest edition of NACo’s CountyNews magazine, and praised for its success in saving lives while also saving the County money. More information can be found here. <http://www.naco.org/articles/new-king-county-wash-ems-protocol-treat-allergic-reactions-saves-money>. New York initiated a pilot program based on King County’s program and uses similar kits. Proponents have set their sights on expanding the program statewide. Kits from King County, sans the epinephrine, have made their way into the hands of public health agencies in Alaska, Montana, Oregon, Utah and Wyoming. The EMS Division’s Professional Standards Section is helping South Denver EMS, which oversees 23 agencies, with its launch of a comparable program.



BLS Efficiencies & Injury Prevention

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. Working in tandem with this is developing methods to address the needs of these lower-acuity callers, thereby improving patient care and avoiding repeat calls to 9-1-1.

Connecting Response to Service:

An EMS-based referral system to prevent repeat 9-1-1 fall related calls

The EMS Division and its partners have piloted the **Community Medical Technician (CMT)** concept for the past six years as part of its commitment to more effectively respond to lower-acuity 9-1-1 calls. Dispatched as an alternative to a traditional BLS unit, CMTs evaluate and help link patients to the appropriate medical, social and community services to address their need and aim to reduce their using future EMS assistance.

Currently, there are three CMT units within King County:

- CARE71 unit operating in partnership between the EMS Division and Kent Fire Regional Fire Authority's FDCARES program;
- CMT63 operating in partnership between the EMS Division, Shoreline Fire Department, Bothell Fire EMS, and Woodinville Fire & Rescue; and
- CMT36 operating in partnership between the EMS Division, Valley Regional Fire Authority, and South King Fire & Rescue.



These are the largest concurrently-run pilot of CMT units in King County to date (following earlier pilots with Kent Fire Regional Fire Authority, South King Fire & Rescue, Eastside Fire & Rescue, and Woodinville Fire Rescue) and will operate through at least the end of 2017.

Not surprisingly, non-injury falls represent the type of call to which CMTs are most often dispatched. About one-third of the population over 65 falls each year. Those who fall are two to three times more likely to fall again within six months. Rather than allowing this statistic to run unabated, responders can play an integral role in reducing repeat falls by enrolling individuals into the **One Step Ahead** program.

This fall prevention program includes an at-home visit by a physical therapist to explore the various causes and concerns for falls, and work on resolving potential threats, such as installing grab bars in key locations around the home. One Step Ahead has enrolled 1,886 individuals since 2003, ranging in age from 50 to 105 years old (average age is 74), with nearly two-thirds being female (62.2%). Working to reduce or eliminate the risks has proven to decrease chances of future falls; 88% of those who completed the final One Step Ahead evaluation did not have a fall after the intervention.

BLS Efficiencies & Injury Prevention

Last year, the Central Region EMS & Trauma Care Council awarded the King County EMS Division a grant to hire a part time fall intervention specialist to expand the program into Seattle and provide additional resources to residents outside of Seattle. In 2015, the program enrolled 414 individuals, compared to 278 the year prior. 2016 will be another banner year for the program, with more than 200 already enrolled as of May.

The EMS Division is looking at evaluating different ways of addressing the populations associated with the calls, such as with a CMT response model, or other models that could include a follow-up model (similar to Spokane CARES). The Division plans on completing the evaluation of these alternatives so the results can be used to inform levy planning for the next levy.

Partnerships are key for CMT units to improve EMS delivery, and provide benefits to the region. Only by collaborating with community providers can responders reach into their toolkits and connect patients to the appropriate health care clinics or human services centers to ensure patients receive the type of care they need.

Child Passenger Seat Program

Putting children in car seats that are size and age appropriate can reduce serious and fatal injuries by more than 50% - but only if properly installed and used. Since 2010, the EMS Division and the Community Health Division have worked in tandem to reduce barriers to obtaining a child seat by providing car seats, and car seat education, to low income pregnant mothers through eight Public Health Centers. **The Child Passenger Seat program** trains Community Health Workers working with Maternity Support Services clients to also be child passenger safety specialists, and provide and car seat installation assistance and car seats.

To reach as many clients as possible, the EMS Division also takes its show on the road, and hosts community car seat check-up events at various locations throughout the County. It recently teamed up with the Tukwila Babies R Us store to host monthly check-up events for from May through September, 2016.

This past year, over 315 car seats were inspected at clinics and community events. The program is the result of successful collaborations between local, regional, state and private partners, all working together to secure the safety of our most precious cargo.



King County Medic One

King County Medic One (KCM1) is one of the six Advanced Life Support (ALS) providers in the regional EMS system. It serves approximately 520 square miles of south King County, an area with a population now close to 725,000 people. In calendar year 2015, KCM1 responded to 17,214 calls for this advanced care, including pediatric patients, mass casualty, motor vehicle crashes and cardiac emergencies.

Air Support Unit

For many years, the King County Sheriff's Office has heroically rescued scores of victims from otherwise inaccessible areas with its Air Support Unit (ASU) helicopters. King County Medic One (KCM1) recently joined forces with Bellevue Fire and the Sheriff's Office to support ASU and deliver advanced life support to those in need.



Providing this service meant revisiting KCM1's existing training and patient care delivery model. Paramedics volunteering to be part of this specialized team underwent specific training in survival strategies, should they be stuck in the wilderness without a way out due to weather or other unforeseen circumstances, and received instruction on avalanches and rotary aircraft operations.

Because patient care in the wilderness or in a moving helicopter differs from that delivered on the ground or in a medic unit, KCM1's standard practice of medical treatment had to be evaluated. In a thoughtful and medically substantiated way, KCM1 added extra interventions and medicines to its Helicopter Medics' arsenal so they could better treat major trauma and symptoms of exposure and altitude sickness. The safety of its crews is of paramount importance, and the medics on this team are held to the same high training standards that the Sheriff's Office maintains for its ASU Deputies.

Mens sana in corpore sano (A sound mind in a sound body)

Across the nation, there have been increasing awareness and concern for First Responder mental health. Many departments are experiencing the consequences of work-related stress, such as employee absenteeism, substance abuse, decreased employee career satisfaction, separation from employment, and ultimately, in some tragic cases, suicide.

KCM1 is approaching this growing problem through a holistic approach of education. KCM1 administration recruited local mental health experts to design a multi-year training curriculum aimed at improving the mental health and safety of medics and staff alike. A local psychologist specializing in PTSD with extensive First Responder and military experience has been selected for this work, introducing a curative approach to KCM1's commitment in supporting its personnel's health.

King County Medic One

Call of duty

When firefighters battling Eastern Washington’s devastating forest fires last year needed reinforcements, the region - and the world - listened, sending hundreds of first responders to assist. King County Medic One was among those who lent crews to help and treat firefighters. In collaboration with Zone 3 Fire Chiefs, King County Fire Chiefs, and the South King County Fire Training Consortium, training this year has been focused on wildland fire fighting and safety, so that KCM1 medics are fully prepared to respond to another possible call for help.



Administration

The Administrative 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 the EMS Division sections that directs a multitude of regional programs, including contract management, personnel-related activities, budget preparation, and day-to-day operational activities.

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

Continual assessment of the EMS system is critical for assuring continued high performance. Since its creation nearly 40 years ago, the system has focused on reviewing its operations and processes to search for ways to improve. This year, an independent consultant will examine whether changing the current number of ALS providers could benefit the regional system.

As included in the 2014-2019 Strategic Plan, the focus of this study is to analyze the appropriate number ALS providers, and evaluate any potential impacts that changing the current number/configuration of ALS providers and/or units per agency would have on the system. The study will also develop a regional process for responding to any changes to the current ALS agency configuration (such as if an ALS agency relinquishes oversight).

The region took great care in writing the scope of the study to emphasize that the evaluation and subsequent recommendations must recognize that the current EMS system provides excellent patient care. Additionally, it states that any potential recommendation must ensure the following:

- No deterioration in the provision of medical care or patient outcomes;
- The system remains a tiered, integrated, regional system;
- The delivery of patient care is derived from the highest standards of medical training based on scientific evidence with continued oversight by EMS physicians; and
- The system sustains its focus on operational and financial effectiveness and efficiencies.

Elements to be evaluated include impacts on cost, regional governance and management, agency operations, and medical outcomes. The study should consider how operational changes may impact the rest of the tiered system, and identify any advantages or additional benefits to being an ALS agency (examples: BLS services, public image/perception).

With the help of a small panel of ALS and BLS representatives, the EMS Division selected and retained a consultant to perform the study. The EMS Advisory Task Force, Regional Policy Committee, the King County Council and EMS Stakeholders will be briefed on the findings of the study later this year.

The intent of the study is not to revamp the successful regional system or assess how ALS services are specifically provided. Rather, it is to determine medical, operational and financial advantages to adding, or reducing, ALS provider agencies.

Administration

Financial Stewardship: 2015 Audit

The King County Auditor's office conducts periodic financial and programmatic reviews of the EMS levy fund and the EMS Division's activities. In 2015, an assessment of the EMS Division's financial practices and compliance with the council-adopted financial plan and levy policies was completed. It was the first audit after the change in King County business systems and the first audit for the 2014-2019 levy period.

As in past years, the results were positive, with the review concluding that the funds were being managed appropriately. The audit found that the EMS levy balances aligned with the Division's strategic and related financial plans for expected revenues, priorities for allocation of resources, and expected spending levels. The review also identified opportunities to develop more efficiencies and effectiveness related to management of financial information. Observing the high number of correcting entries, the report recommended that the EMS Division work to reduce the rate of correcting such entries. Also noted was that with the current level of decentralization with the new business systems, there is a greater need for accounting and business system knowledge and expertise within the division.

EMS Financial staff has begun identifying processes that were creating the need for later adjustments, and is working on implementing changes related to the new business systems to reduce corrections. These actions have led to better understanding of the new business systems and reduced correcting entries. In addition to recently reorganizing its Finance section to bring on an accountant, the EMS Division is also working collaboratively with its partners within Public Health - Seattle & King County to clarify process improvements and improve other areas affecting correcting entries.

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.

Training King County Sheriff's Deputies on the Use of Intra-nasal Naloxone (Narcan®)

Death due to opioid overdose is an increasing public health challenge in King County. With the rise in deaths related to narcotic overdoses, there has been a significant push to change the laws that allow non-medical personnel, such as police officers, to carry and administer Naloxone. Known by its brand name Narcan®, Naloxone is a drug used to treat a narcotic overdose in an emergency situation by blocking or reversing the effects of opioid medication. It is also used to help diagnose whether a person has used an overdose of an opioid.

Police agencies across the country have begun to train their officers to recognize opioid overdoses and treat these patients with intra-nasal Narcan®. One of these agencies is the Seattle Police Department, which trained its bicycle team earlier this year on the use of Narcan®. This unit now carries the drug, and is authorized to use it.

In May of 2016, the EMS Division partnered with the King County Sheriff's Department to train specific deputies on the appropriate use of Narcan® as part of comprehensive approach to acute treatment that includes recognition and rescue breathing. Starting with members of its "Metro" division and extending it to deputies in the south King County area, this training and partnership will continue until all King County Sheriff Deputies are trained to use, and authorized to carry, Narcan®. This collaboration complements the Sheriff's training by bringing medical expertise and insight needed for educating deputies about the signs and symptoms of opioid overdoses, and treating patients with rescue breathing and intra-nasal Narcan®.

The benefit of equipping deputies to carry and use Narcan® will most likely be seen in the more rural areas in King County where EMS may experience delays in responding. The EMS Division will partner with the King County Sheriff to evaluate the clinical impacts of the program as part of an ongoing quality improvement initiative.



Vulnerable Adult Pilot Project Training

Building off of findings from the Vulnerable Adult Pilot Project (see page 28 for details), the Professional Standards section will begin training its EMS partners to recognize and report abuse, neglect and the financial exploitation of vulnerable adults in King County. Developed in conjunction with the King County Prosecuting Attorney's Office, this training will focus on the mandatory reporting requirements and address how, and to whom, providers should report this neglect. Standardization is an important step for increasing awareness and improving health outcomes of vulnerable adults throughout the region. As such, training may soon be expanded to include law enforcement.

In other news...

Measuring and Improving - The regional system's commitment to medical quality improvement activities, as witnessed through its cardiac arrest survival rate, was showcased in the Cleveland Plain Dealer earlier this year. Read the article here: http://www.cleveland.com/healthfit/index.ssf/2016/03/how_one_county_achieved_the_nations_highest_cardiac_arrest_survival_rate_critical_moments.html#incart_m-rpt-1

Teaching CPR in Schools - the program works! Through the EMS Division, more than 10,000 students per year on average are taught to perform CPR and other life saving techniques so they are trained and able to assist in times of need. The benefits of this program are reflected in stories like this one that highlights the courage of an area eighth grader who saw a problem and leapt in to help.

Life saved by lesson learned in Evergreen Middle School health class: On Thursday, March 17, 2016, Moiz Chawdhary was honored during an assembly at Evergreen Middle School for using a technique taught in health class to save a girl's life. During Winter Break, the 8th grade student witnessed his younger sister and her friends challenge each other to a grape-eating contest. This contest quickly turned dangerous when one of the girls began turning purple and grabbed her neck. Chawdhary immediately knew that she was choking and without hesitation, he did what he had learned in Mr. Paul Blair's health class: he stepped behind the young girl, got on his knee (because the girl was small), put one of his knees between her legs, and performed the Heimlich maneuver.

After a couple of tries the grape popped out. The young girl was scared and started crying, but physically she was fine. She soon went back to playing with her friends. Chawdhary's quick-thinking saved the girl's life. He thanked Mr. Blair for teaching the Heimlich maneuver and said, because of that lesson, "I wasn't scared at all - I was calm because I knew what I was doing".

Moiz's story also appeared in the Redmond Reporter. <http://www.redmond-reporter.com/news/374308171.html>



Health teacher, Mr. Paul Blair, and Moiz Chawdhary

Check & Inject - STAT, the national publication focused on telling compelling stories about health, medicine and scientific discovery, featured an article about the rising price of EpiPens that mentions how the Medic One/EMS system of King County has gotten around this prohibitive expense through its innovative "Check & Inject" program: <https://www.statnews.com/2016/07/06/epipen-prices-allergies/>

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 EMS Division continues to pursue various strategies with its partners to manage current BLS demand, and delay future growth in the request for BLS assistance through its **BLS Efficiencies Strategic Initiative**. By measuring performance, initiating pilot programs and evaluating the results, this program has developed approaches that improve the quality of care, gain system improvements and contain costs.

Many of these methods have been incorporated into other EMS programs, such as the expansion of the taxi voucher program (highlighted on page 30 in the 2015 Annual Report) and partnering with community-based clinics to accept patients seen by Community Medical Technicians (see page 17 for information on the CMT program).

Objectives of the program include:

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

The EMS system is able to support current and future demand in part because of its focus on providing efficiencies at the BLS level. As such, emphasis will continue to be placed on developing quality alternatives for better serving non-emergency patients and callers.

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 SI adheres to a strong evaluation component in order to focus on performance measures, system outcomes, standards and other metrics.

2015 marked the successful conclusion of three proposals. **The Bellevue Fire Department C.A.R.E.S. program** identified and implemented changes to improve its ability to link clients to appropriate medical, social and/or community services. **The Hope Academy**, in working with the Somali community in King County, identified and worked to resolve

2014-2019 Strategic Initiatives

9-1-1 communication challenges in limited English proficiency communities. Finally, **the South King Fire and Rescue Fall Prevention program** increased the number of referrals to the One Step Ahead program, conceivably reducing the rate of repeat falls (and calls). Full reports of each of these programs are available through the King County EMS Division. Two projects awarded funding last year are currently underway. **King County's Paramedic Continuing Education grant** seeks to test the efficacy of online learning via EMS Online, compared to traditional classroom learning, for paramedic training. **The Kent Fire Department Regional Fire Authority's FDCARES program** received an E&E grant to incorporate a social worker into its response to ensure that patients receive the appropriate assistance by FDCARES staff at the most effective care setting.

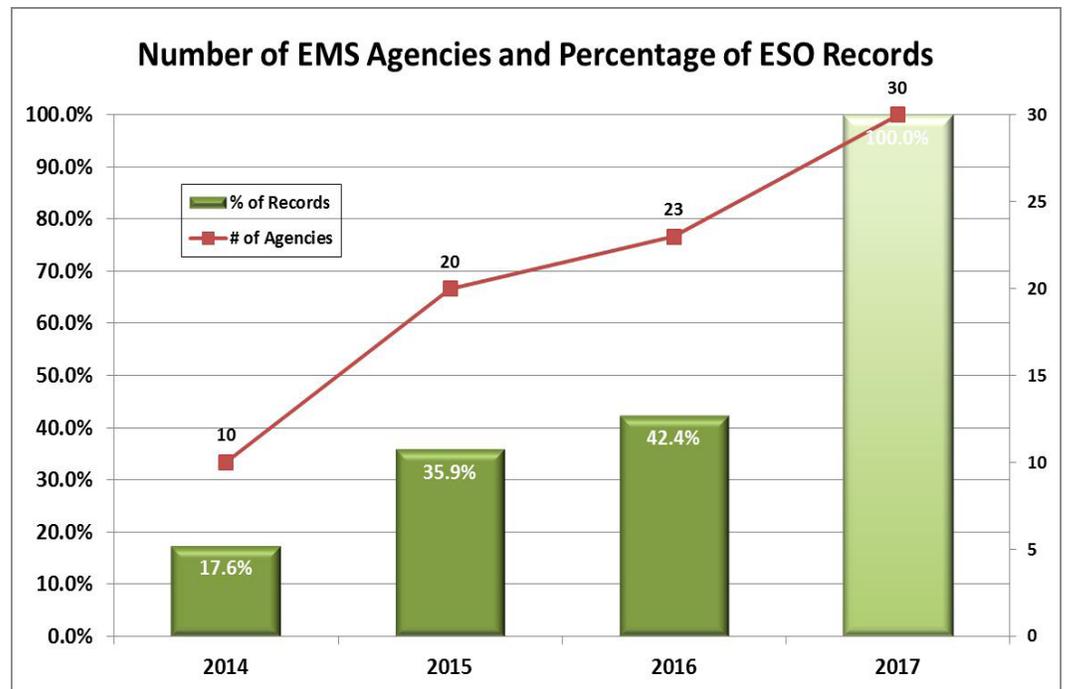
Joining these running E&E projects are **two EMS Division studies**. The first study seeks to identify the feasibility of expanding the BLS Medical Control concept (currently operating in four north King County agencies after a small pilot in the Redmond Fire Department) to parts of south King County. A second project aims to integrate Equity and Social Justice values and themes into the EMS Division workplace and programs. More information about these pilots will be included in future reports.

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.

The RMS Initiative is an important penultimate step in the larger



2014-2019 Strategic Initiatives

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 11% of all transported patients are received electronically). By the end of this year, 23 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. A map of agencies that are using ESO can be found in the RMS/ESO write-up on page 14.

4. Vulnerable Populations

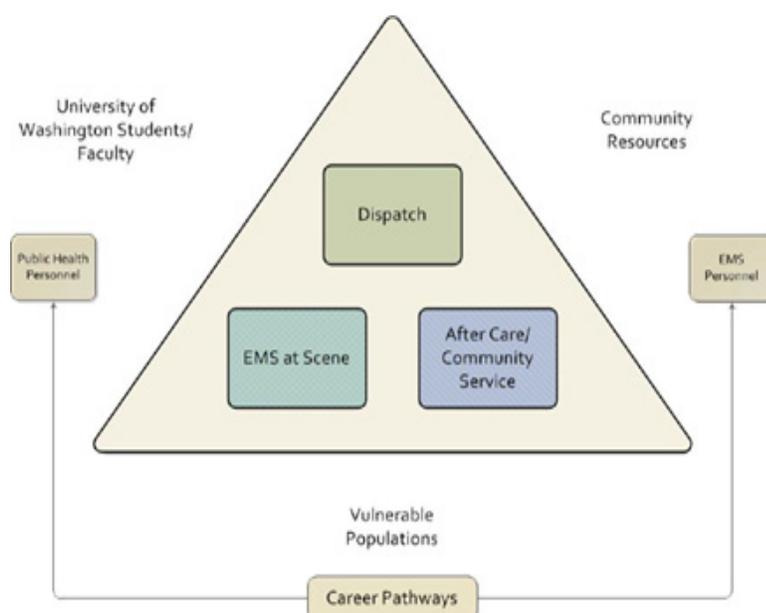
As is common in large metropolitan areas, there are significant disparities in health status and access to health care in King County. Poverty, discrimination, and limited English proficiency (LEP) are all factors that affect access to services, including calls to 9-1-1 for emergency medical care.

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

1. Successful communication between vulnerable populations and 9-1-1 dispatch;
2. Best practices for at-scene care of vulnerable populations; and
3. Follow-up care and community services for vulnerable populations.

The objectives of this Initiative are many and varied. Among other things, it aims to:

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



2014-2019 Strategic Initiatives

Project Highlight: The Vulnerable Adult Pilot Project

The EMS Vulnerable Adult Pilot Project was implemented on September 12, 2014 and ran for nine months. The project was a coordinated effort between the Seattle Fire Department (SFD), Aging and Disability Services (ADS), Adult Protective Services (APS), Seattle Police Department (SPD), the Emergency Medical Services (EMS) Division, Seattle area hospitals, and the University of Washington (UW). It aimed to improve the identification and reporting of vulnerable adult abuse and neglect, to increase care coordination and communication among involved agencies, and to improve health outcomes of vulnerable adults in Seattle, King County.

Nine months of data was collected via a SharePoint Vulnerable Adult Reporting Form and analyzed for this evaluation.

REPORTING

SFD reported 212 cases of vulnerable adult abuse/neglect in this time period, with 37 duplicated patients. *This is an increase of approximately five reports per month, compared with the nine months previous to the pilot.*

The most common impression for filling out the reporting form by SFD **was neglect/self-neglect** (77.4% of cases).

Of the 161 patients initially reported by SFD as neglect/self-neglect patients,

106 (65.8%) were found by APS to have an outcome of **neglect/self-neglect**, *validating the SFD reports of neglect/self-neglect.*

Of these 106 patients

101 (95.3%) were found to be experiencing self-neglect, and **5 (4.7%) were found to be experiencing neglect by APS.**

SERVICES

Of the 171 unduplicated reports to APS,

107 (62.6%) had no social services in place at the time of reporting.

This demonstrates that SFD is uniquely identifying patients not already linked in with state social services.

137 (80.1%) patients enrolled in some type of services through ADS.

Of those 137 patients who enrolled,

92 (67.2%) did not have social services in place at initial reporting, and **45 (32.8%) received expanded services.**

OUTCOMES

Of the total 212 reports to APS,

ADS was able to close 63 (29.7%) of the cases by the end of the nine month pilot project.

Of those 63 cases, 41 (65.1%) were closed due to residential placement of the patient.

2014-2019 Strategic Initiatives

PROGRAM ANALYSIS & RESULTS

Qualitative data collected via interviews with major stakeholders and SFD stations was used for analysis of program strengths and areas for improvement. Major strengths identified were having a dedicated case manager for patient follow up, data collection via the Vulnerable Adult Reporting Form, and communication among stakeholders. Areas identified for improvement were increased training for SFD members on identification of vulnerable adult abuse/neglect and access to reference sheets on site for SFD to reference reporting guidelines.

Based on these findings, it is recommended that this program continue in Seattle and be expanded regionally to King County. Recommendations for expansion include uniform training for regional mandated reporters, and regional adoption of a uniform reporting form. Implications for expansion include resolving how to support case management for the increased workload from the additional fire departments in King County. However, continuity of this program with the included recommendations and continuous evaluation will increase the recognition of these patients among mandatory reporters and further improve the health outcomes of vulnerable adults in the entire King County region.

The **Vulnerable Populations Strategic Initiative** has set its sights on the following projects for the upcoming year.

2017 Project Work Plan		
EMS Agency Projects	Community Projects	LEP Community
Vulnerable Adult Expansion Project	9-1-1/CPR Training and Education in Senior Centers	Somali Community: At-Scene, Community Referral, Work Force
Shoreline FD: Patients with Mental Health/Substance Abuse - Evaluation	CPR Training for LEP Youth	Chinese + Cambodian + Vietnamese: Dispatch, At-Scene
<u>New:</u> Kent Regional Fire Authority - Translation Services At Scene	Seattle OEM Outreach and Education	<u>New:</u> Korean Community: Dispatch, At-Scene
<u>New:</u> Renton/Kent Sobering Pilot Project	<u>New:</u> Dispatch Training on LEP Communication	

2014-2019 Strategic Initiatives

5. BLS Training and Quality Improvement Strategic Initiative (formerly known as BLS Lead Agency)

The **BLS Lead Agency Strategic Initiative (SI)** was created to discover system effectiveness in clinical and operational performance within BLS agencies. It is part of the larger effort to deliver programs on a regional basis to help reduce BLS costs, improve effectiveness and increase BLS role in regional decision-making.

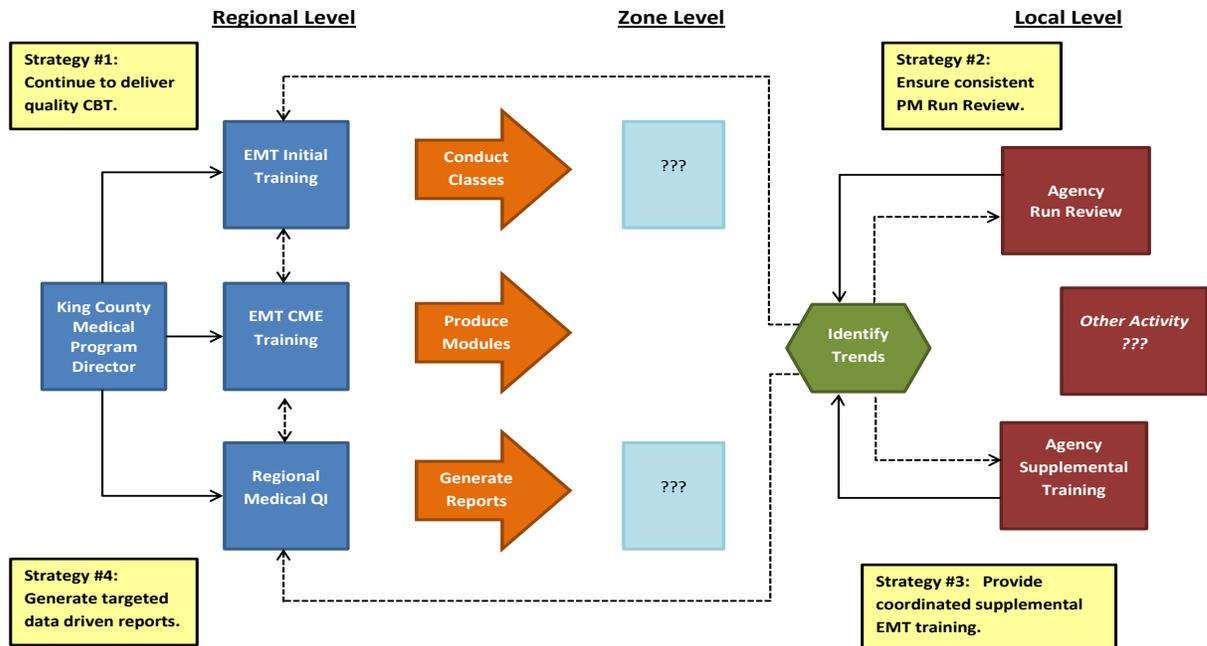
For the past year, the EMS Division and its partners have met regularly to develop and subsequently implement this new Initiative. The original proposal was to designate a BLS lead agency (or agencies) to conduct financial and quality improvement activities (currently managed on a local level by individual BLS agencies) on a regional and multi-agency level.

However, in discussing how to do this, the region collectively agreed that focusing on strategies to ensure the system is providing uniform and consistent patient care across the system was a more meaningful priority.

They identified standardized and consistent BLS training, coupled with increased access to targeted quality improvement activities, to be appropriate approaches to address this need, and recommended that the BLS Lead Agency plan be reframed to become the **BLS Training and Quality Improvement (QI) Strategic Initiative (SI)**.

BLS Training & Quality Improvement (QI) Strategic Initiative

Goal: Provide standardized and consistent high quality EMT training based on best practice and performance measures to achieve optimal medical outcomes.



2014-2019 Strategic Initiatives

As it is currently developed, the goal of the new SI is to “Provide standardized and consistent high quality EMT training, based on best practice and performance measures to achieve optimal medical outcomes”, using four specific tools:

- High quality Competency Based Training (CBT) for EMTs in King County;
- Coordinated supplemental EMT training;
- Consistently conducted paramedic ‘run review’ across King County; and
- Targeted data driven reports on BLS performance to help inform training at both the local and regional levels.

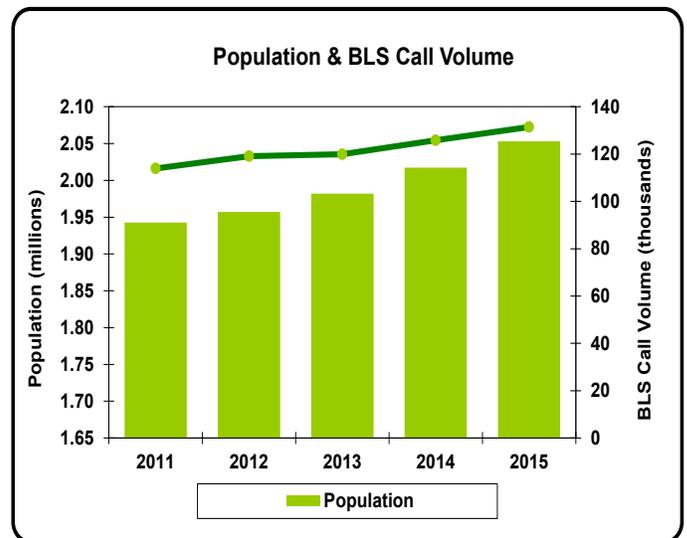
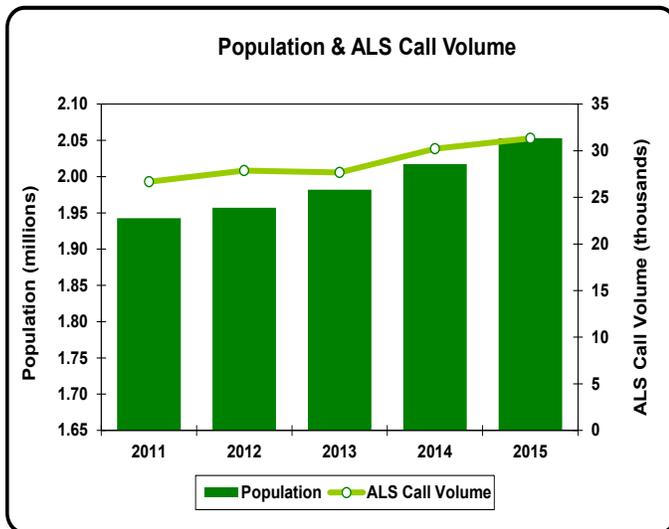
In short, this new Initiative seeks methods to better connect and provide training and improvement activities consistently across the region and to all agencies, regardless of size or budget. It creates a process to more systematically and uniformly review data, and develop training linked to the results of the data review.

While the Initiative requires further refinement, it has begun to take shape, and is built on a foundation that will help ensure the system is providing – and continues to provide - the best possible patient care.

Summary of 2015 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%
2015	2,052,800	1.26%

Population has historically been closely correlated to EMS growth. The rate of population growth in King County continues to recover from the recession 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. Note that the scales for population and call volumes are different in the tables below.

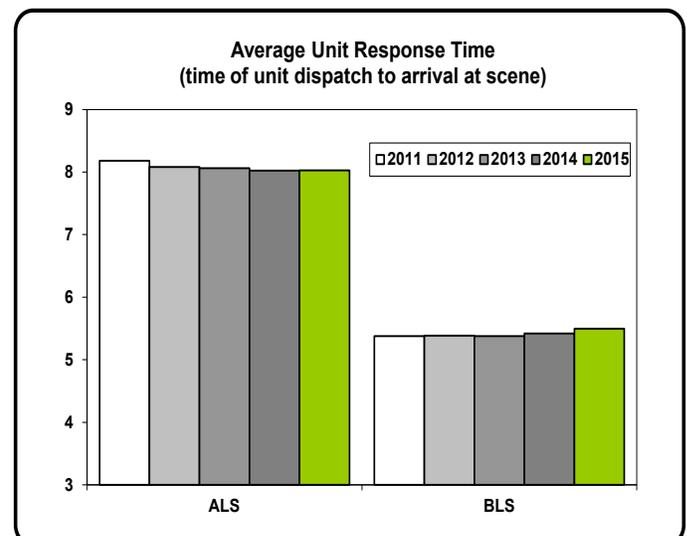


Response times are defined as follows:

Total - the time of call received at dispatch center to the time of arrival at the scene.

Unit - the time of unit dispatch to time of arrival at the scene.

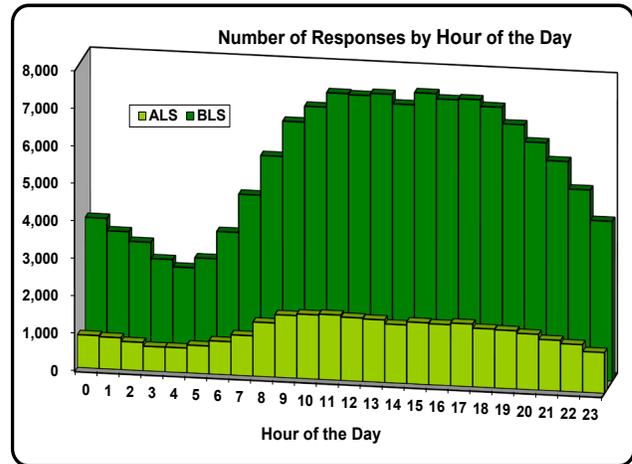
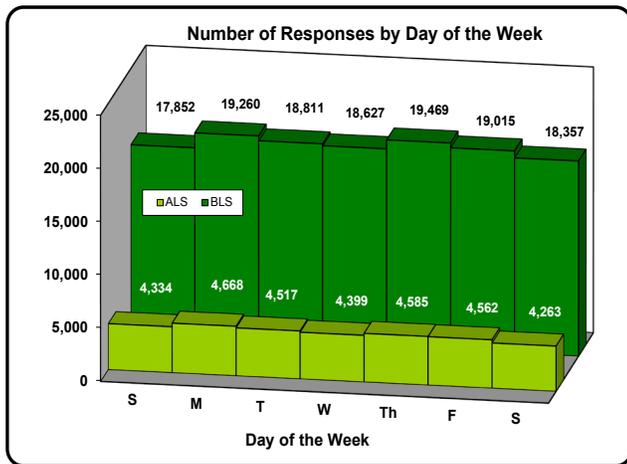
*The 2015 Summary of Statistics section includes only King County data outside the City of Seattle (except where noted) due to the Seattle Fire Department transition to a new records management system.



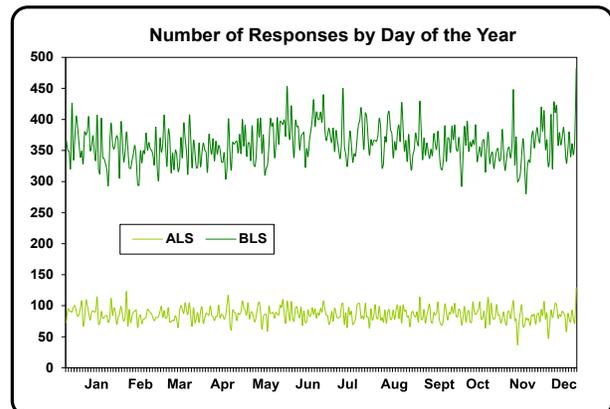
Characteristics of Responses

Operations

Service	ALS		BLS	
Number of Responses	31,328		131,391	
	Total RT	Unit RT	Total RT	Unit RT
Average Response Time	12.4	8.0	6.7	5.5
6 minutes or less			52.3%	68.2%
8 minutes or less	28.3%	57.7%		
10 minutes or less	47.1%	77.8%		
12 minutes or less	61.8%	88.4%		
14 minutes or less	71.5%	93.8%		
Cancelled Enroute Calls	5,989 (19.1%)		6,087 (4.6%)	



The average unit response time for BLS and ALS has remained stable over time. The three graphs located above and to the right reflect the patterns of ALS and BLS response during the day, the week, and throughout the year. As indicated in the Day of Year 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). Of note, the unusual spike in BLS responses in the month of November corresponds with the November 17th windstorm.

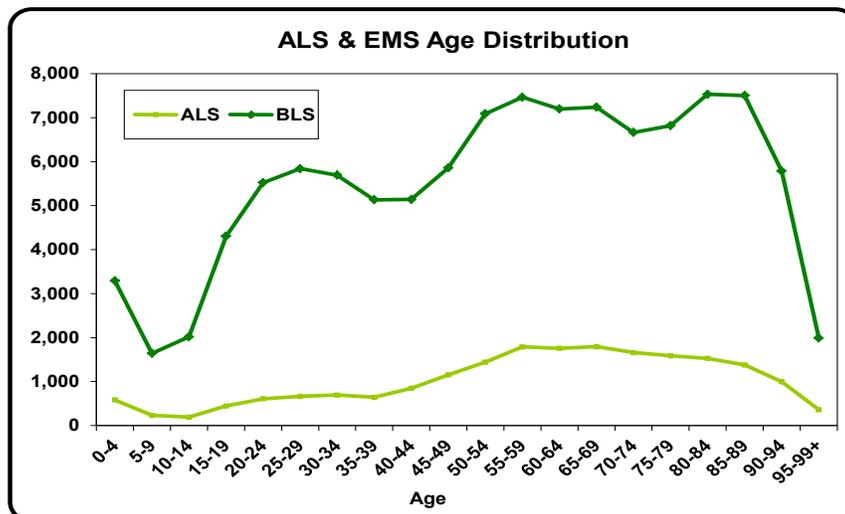


Characteristics of Responses

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	583 (2.9%)	3,290 (3.0%)
5-9 yrs	233 (1.1%)	1,641 (1.5%)
10-17 yrs	446 (2.2%)	4,348 (4.0%)
18-24 yrs	799 (3.9%)	7,495 (6.8%)
25-44 yrs	2,847 (14.0%)	21,810 (19.9%)
45-64 yrs	6,141 (30.2%)	27,612 (25.2%)
65-84 yrs	6,566 (32.3%)	28,261 (25.8%)
85+ yrs	2,739 (13.5%)	15,286 (13.9%)
Total	20,354	109,743

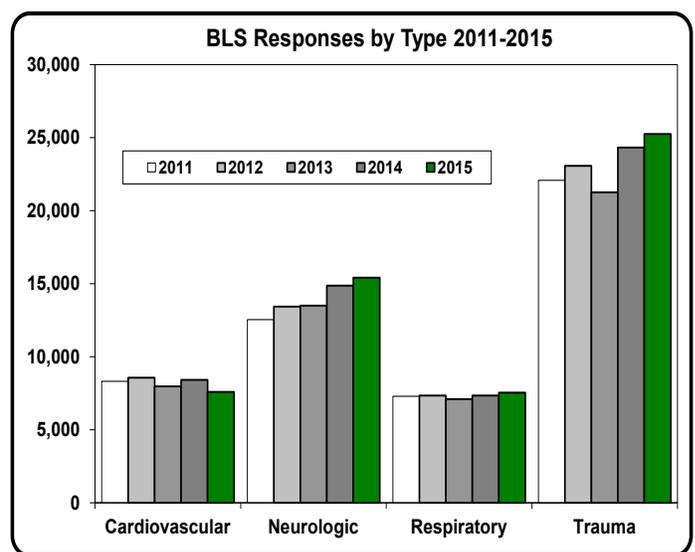
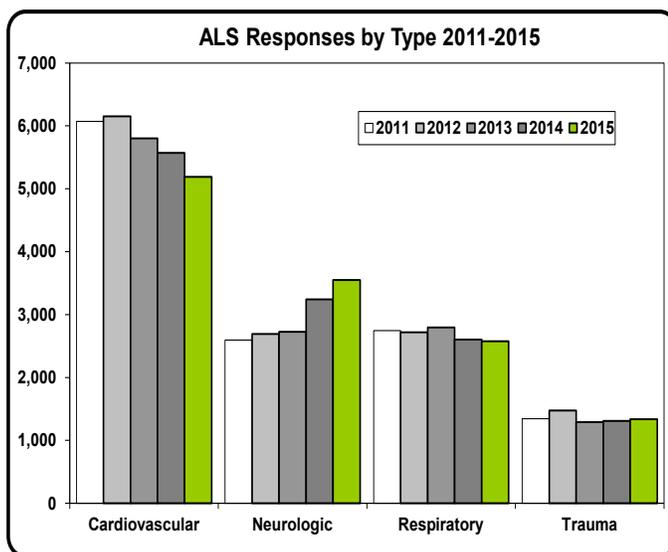


Characteristics of Responses

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

	ALS	BLS
Cardiovascular	5,190 (26.9%)	7,591 (7.6%)
Neurologic	3,551 (18.4%)	15,405 (15.4%)
Respiratory	2,575 (13.4%)	7,535 (7.5%)
Trauma	1,338 (6.9%)	25,239 (25.2%)
Abdominal/Genito-Urinary	784 (4.1%)	7,499 (7.5%)
Metabolic/Endocrine	761 (3.9%)	2,469 (2.5%)
Alcohol/Drug	737 (3.8%)	5,661 (5.6%)
Psychiatric	348 (1.8%)	5,066 (5.0%)
Anaphylaxis/Allergy	313 (1.6%)	1,029 (1.0%)
Obstetric/Gynecological	134 (0.7%)	685 (0.7%)
Other Illness	3,549 (18.4%)	22,166 (22.1%)
Total Medical	19,280	100,345



Characteristics of Responses

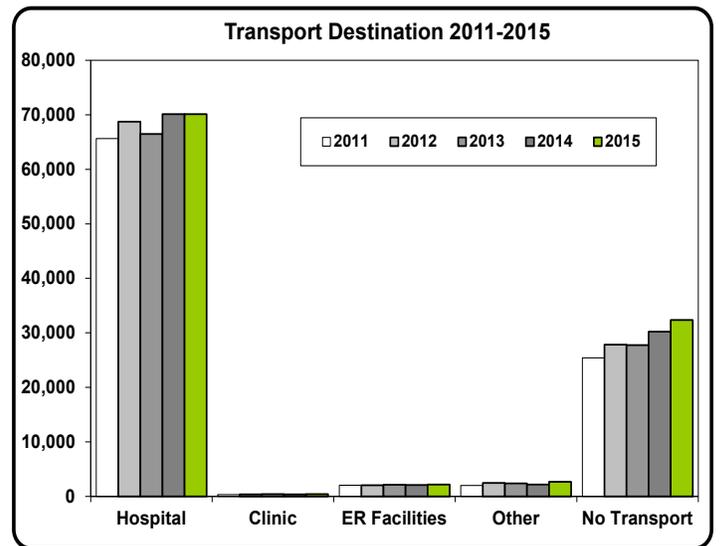
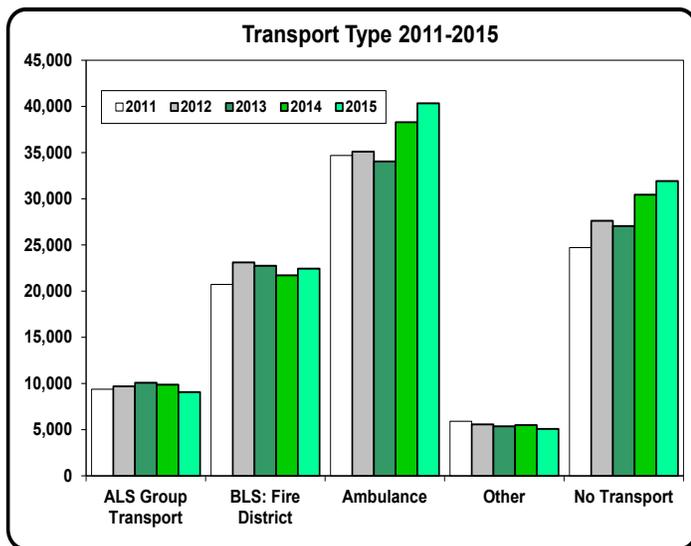
Similar to the variation reflected in the types of responses EMS agencies provide, EMS personnel respond to a variety of physical settings, again requiring a versatility of skills. For example, providers may respond to settings where they need to interact with other medical professionals or need to deliver 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	16,347 (52.2%)	66,551 (53.5%)
Nursing Home/Adult Family Home	2,517 (8.0%)	11,831 (9.5%)
Clinic/MD Office	1,346 (4.3%)	3,409 (2.7%)
Other/Unknown Location	11,118 (35.5%)	42,560 (34.2%)
Total	31,328	124,351

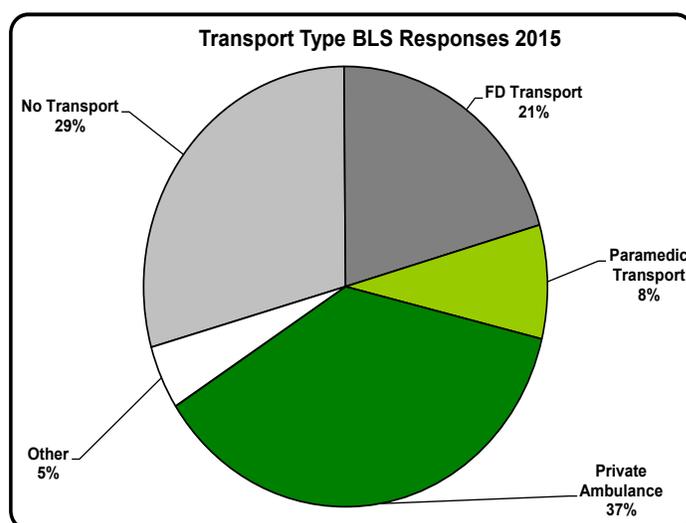
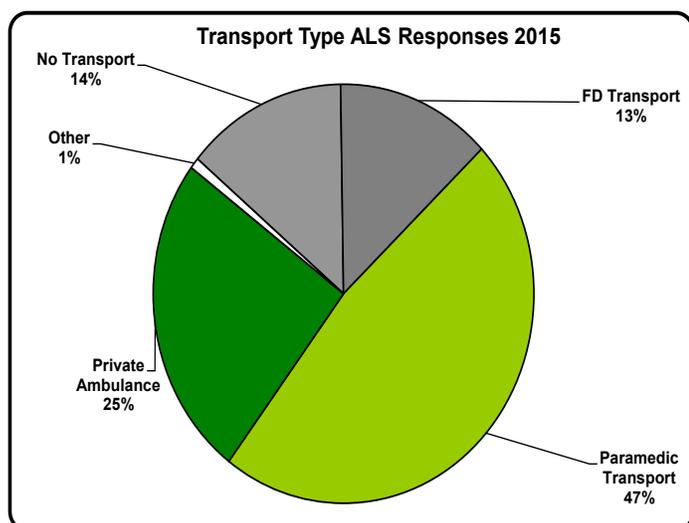
Transport Type and Destinations

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.

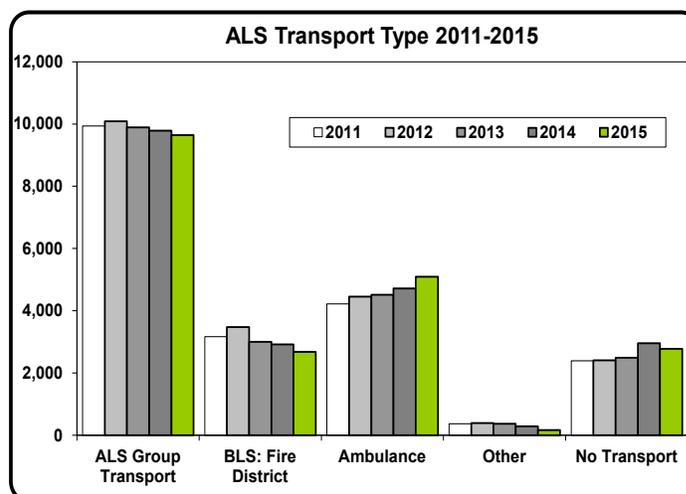


Characteristics of Responses

Transport Type		Transport Destination	
ALS Transport	9,036 (8.3%)		
ALS Air	37 (0.0%)	Hospital	70,110 (65.1%)
BLS - Fire District	22,423 (20.6%)	Clinic	393 (0.4%)
BLS - Ambulance	40,328 (37.1%)	ER Facility	2,179 (2.0%)
Other	5,089 (4.7%)	Other	2,659 (2.5%)
No Transport	31,913 (29.3%)	No Transport	32,337 (30.0%)
Total	108,826	Total	107,678



ALS Transport Type	
ALS Transport	9,606 (47.2%)
ALS Air	39 (0.2%)
BLS - Fire District	2,679 (13.2%)
BLS - Ambulance	5,090 (25.0%)
Other	171 (0.8%)
No Transport	2,776 (13.6%)
Total	20,361



Cardiac Arrest Statistics

Cardiac arrest continues to be an important public health challenge and a leading cause of death here in King County and across the United States. 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. In 2015, there were over a thousand persons in the region who suffered out-of-hospital cardiac arrest and were treated by EMS.

The EMS Division reports on the system's 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.

Both groups provide a benchmark for performance improvement. The different populations help provide context and inform the overall public health impact as well as provide community benchmarks that can be used to relate to other systems. This year, the information is presented for 2015 as well as for the cumulative years 2011-2015. The rolling 5-year average is a method to help 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.

Overall survival in Seattle and King County is about double what is observed among "performance-minded" communities that make a real effort to monitor care and measure performance. The result is that more than 100 "extra" lives are saved in King County each year compared to the reality of other communities. For persons who are successfully resuscitated and ultimately discharged from the hospital, the prognosis is quite favorable (please see the Cardiac Arrest Highlight on page 40). There is no single explanation for this success - resuscitation is referred to as the ultimate "team sport" in medicine. It is critical to appreciate the importance of each role, from layperson to EMS professional to hospital.

Cardiac arrest resuscitation is a benchmark condition for a community's emergency medical response readiness. Successful resuscitation requires involvement of a range of providers starting with the citizen and including the emergency medical dispatcher, EMT-firefighters, paramedics, and hospital providers. Seattle and King County continue to be a national leader in resuscitation.

One of the critical treatments to achieve successful resuscitation is early CPR. Citizens are essential to deliver this vital treatment as soon as possible. Community, work, and school settings provide an important foundation for CPR training. The emergency medical dispatcher is well-trained to help the citizen identify a person who has suffered cardiac arrest and coach them to start CPR. Together, these efforts enable Seattle and King County to achieve one of the highest bystander CPR rates in the world and provide one of the important reasons why more persons survive cardiac arrest in our region.

Cardiac Arrest Statistics

Seattle and King County have compiled cardiac arrest statistics for over 40 years. The following are data from the combined registries. 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 patient 2 years of age and older due to all causes except trauma. Survival is defined as discharge from the hospital alive.

Total Number of Cardiac Arrests for which resuscitation was attempted:

Year	2011	2012	2013	2014	2015
Cardiac arrests	1,047	1,134	1,135	1,246	1,114

2015 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:	985	180	18%
Ventricular Fibrillation/ Tachycardia (VF/VT)	270	111	41%
Asystole	368	9	2%
PEA	250	44	18%
Not Shockable, but unknown if PEA or asystole	91	10	11%
Unknown	6	6	100%
Arrest After Arrival of EMS:	129	41	32%
Ventricular Fibrillation/ Tachycardia (VF/VT)	25	15	60%
Asystole	11	3	27%
PEA	81	20	25%
Not Shockable, but unknown if PEA or asystole	8	2	25%
Unknown	4	1	25%
Total	1.114	221	20%

Survival to Hospital Discharge for Arrests due to Heart Disease, Witnessed by Bystanders (Excludes EMS-witnessed), with an Initial Rhythm of Ventricular Fibrillation:

Year	2015	2011-2015
Survival Rate	89/192 (46%)	508/937 (54%)

CPR Initiated by Bystanders, Limited to Arrest Before Arrival of EMS Personnel:

Year	2011	2012*	2013	2014	2015
Bystander CPR	551/906 (61%)	662/982 (67%)	657/998 (66%)	734/1,093 (67%)	666/985 (68%)

Cardiac Arrest Highlight:

Long-term Survival Following Resuscitation

Efforts to treat cardiac arrest have often focused on short-term resuscitation goals, such as restarting the heart or whether the patient is discharged from the acute hospitalization. While these outcomes are critical endpoints, they tell us nothing about the long-term prognosis following initial successful resuscitation. Wanting to better understand just how our cardiac arrest “survivors” fare after their treatment, the EMS Division tracked the long-term survival of persons who were successfully resuscitated and discharged from the hospital to determine their life expectancy.

Median survival is almost 10 years, meaning that, on average, **a person who is resuscitated from cardiac arrest and discharged from the hospital has a life expectancy of about a decade.** It is important to understand that the average age of a cardiac arrest survivor is 62. Therefore, for most, the extra decade of life is a very meaningful addition.

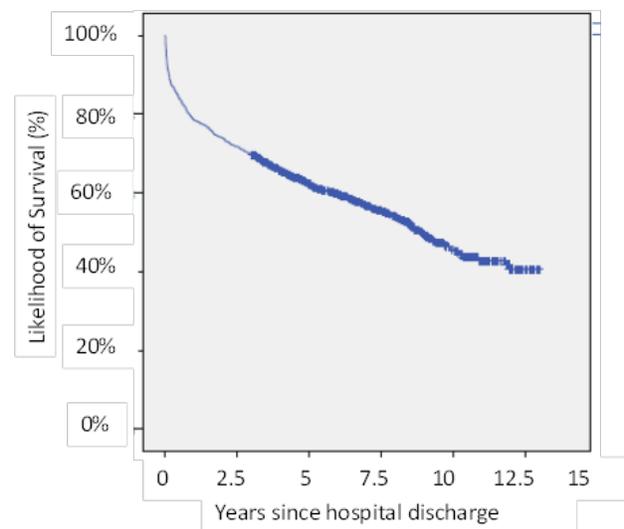
The life expectancy is, however, about half of what a healthy person age 62 without a prior cardiac arrest might experience. There was no evidence of a long-term survival difference between men and women. When one accounts for differences in age and arrest presentation (women are, on average, several years older at the time of their cardiac arrest), men and women enjoy about the same long-term prognosis.

A strong predictor of long-term survival is the person’s function when discharged from the hospital. Most survivors of cardiac arrest have satisfactory brain function – they have good thinking, can take care of themselves and many are able to return to work.

However, a fraction of the survivors have a disability usually related to brain injury that occurs from the low oxygen state during the cardiac arrest. In evaluating long-term survival according to brain function, survival approaches 15 years for those who are discharged from the hospital with favorable function, compared to less than five years for those with moderate or severe disability.

An important observation is that brain function early on at hospital discharge influences long-term prognosis. Consequently, a promising approach to improve long-term prognosis is to try to improve brain recovery. Evidence indicates that the most important predictors of brain recovery and function are early bystander CPR, early defibrillation, quick EMS response with expert EMS care, followed by hospital-based therapies that treats suspected heart artery blockage and keep the patient’s body temperature cool.

Figure Survival according to time interval since hospital discharge following cardiac arrest



Findings:

- Long-term prognosis following initial successful resuscitation from cardiac arrest is good, with average life expectancy of nearly 10 years.
- A promising approach to further improve long-term prognosis is to protect the brain and help it to recover early on.
- The best strategy to help the brain is to deliver the treatments that are part of the links in the chain of survival.

Whether considering short-term or long-term outcomes following cardiac arrest, success relies on a true team that consists of lay citizens, the emergency dispatcher, EMS providers, and hospital experts.

The review by of cardiac arrest survivors reiterated that long-term survival – like short-term survival – depends on the actions and care of the team of responders involved early on in the first minutes and hours following cardiac arrest.



Public Health Highlight:

The Global Resuscitation Alliance

Survival from Sudden Cardiac Arrest is tragically and unacceptably low, averaging less than 10%. An estimated 1 million people die every year from cardiac arrest worldwide. However, improvement is certainly possible. In fact, Seattle and King County has reported over 60% survival, the highest in the world.

Best practices can dramatically improve survival if they are implemented at the local level. This recognition led Seattle Medic One, the University of Washington, and King County Emergency Medical Services (EMS) to jointly create **the Resuscitation Academy** in 2008 to improve cardiac arrest survival, one community at a time. A dynamic and engaging program that includes didactic lectures, demonstrations, hands-on breakout sessions and user-friendly workshops, the Resuscitation Academy is offered tuition-free with attendees coming from throughout the nation and the world.

One of the most valuable aspects of the program is the two-way exchange of information - faculty provides evidence-based information and tools to improve cardiac arrest survival, and attendees share the real-life challenges they face. This open-ended dialogue is vital, since the key to success often lies at the local level where local community resources must be mobilized to focus on challenges specific to implementation.

Recognition on a world-wide level

Earlier this year, EMS leaders, researchers, and experts from throughout the world called for internationally expanding the reach and utility of King County's Resuscitation Academy concept. In response, **the Global Resuscitation Alliance** was created to assist communities world-wide with implementing EMS best practices.

This global network consists of over 30 partnering agencies in Europe, Asia, North America, and Australia committed to the ambitious target of increasing survival rates by 50 percent. The Alliance will develop curricula and resources, host RA events, and build and train a consortium of satellite communities to build an RA network. Not only will the Alliance use Seattle/King County's concepts, but it will also use King County's Resuscitation Academy Director, Ann Doll, as the Executive Director of **the Resuscitation Academy Foundation**, which was chosen to help lead the Global Resuscitation Alliance.

All those involved with these varying academies are committed to being catalysts to improve resuscitation, but caution that change is challenging. They acknowledge that new programs and ideas will not always be embraced or implemented, and impediments to change, stemming from habit, inertia, malaise or lack of resources, can overwhelm the best of intentions. They accept that no system will transform itself overnight, that it's a slow and incremental conversion, and will be there to assist, step by tiny step.

EMS Funding and 2016 Financial Plan

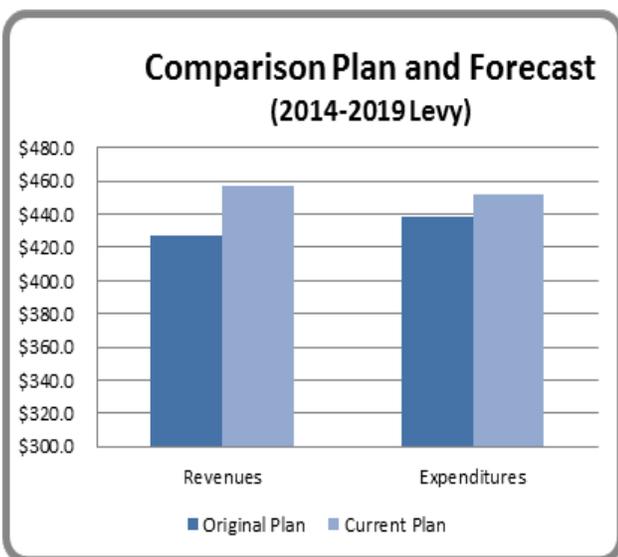
RCW 84.52.069 allows jurisdictions to levy a property tax “for the purpose of providing emergency medical services.” The levy is subject to the growth limitations contained in RCW 84.55.010 of a 1% increase for existing properties, plus assessment on new construction.

EMS levy funds are collected throughout King County and managed regionally by the EMS Division, based on Medic One/EMS 2014-2019 Strategic Plan policies and guidelines, and recommendations from the EMS Advisory Committee (EMSAC). King County EMS funds are spent on four main areas: Advanced Life Support (ALS), Basic Life Support (BLS), Regional Support Services and Strategic Initiatives. Community Medical Technician (CMT) units and periodic audits conducted by the King County Auditor’s Office are tracked separately from the four major program areas.

Per an agreement with King County in place since the creation of the countywide EMS levy, Seattle receives all Medic One/EMS levy funds raised within the city limits. As such, the Finance section of the Annual Report excludes the City of Seattle and pertains only to the EMS fund within the remainder of King County (referred to as the KC EMS Fund). Information on grants, donations and entrepreneurial projects included in the Public Health Fund can be found at the end of the Finance section.

SUMMARY

Three years into the current levy, revenues and expenditures are both forecasted to be higher than anticipated in the original plan - revenues are up by \$29.7 million, and expenditures by \$12.7 million. Both of these increases are due to using conservative financial modeling when developing the 2014-2019 Financial Plan. The increase in forecasted expenditures includes the use of program balances and reserves, which more service providers and programs have used, or are planning to use, because the reduced allocations have left little room for programs to adapt to expenditure challenges.

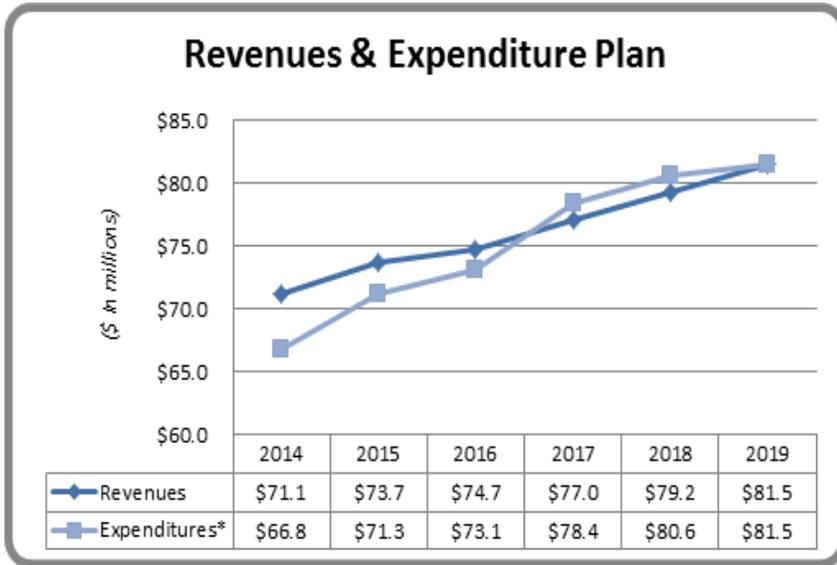


2014-2019	Original Plan	Current Plan	Difference
Revenues	\$427.6	\$457.3	\$29.7
Expenditures*	\$438.9	\$451.6	\$12.7
Reserves/Designations	\$13.9	\$16.0	\$2.1

* Includes actual and budgeted use of program balances & reserves

Although authorized at 33.5 cents per 1,000 Assessed Valuation, the levy rate for 2016 is 28.2 cents per \$1,000 Assessed Valuation. **This rate means that the average homeowner will pay just over \$150 a year in 2015 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 2016 Financial Plan



The EMS levy is structured so that property taxes collected early in the levy period are planned to cover expenditures during the later years of the levy.

REVENUES

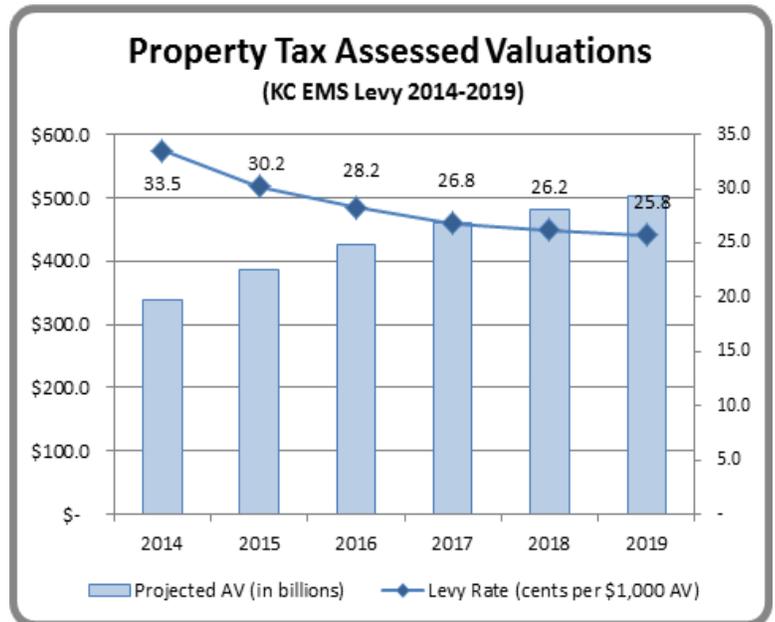
Over 99% of revenue for the EMS levy comes from taxes and associated income related to property taxes (interest income and reimbursements).

REVENUES	2014	2015	2016	2017	2018	2019	Total
Property Taxes	\$70.3	\$72.9	\$74.1	\$76.3	\$78.4	\$80.5	\$452.5
Charges for Services	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$1.2
Interest/Other Income	\$0.6	\$0.6	\$0.4	\$0.5	\$0.6	\$0.8	\$3.5
Total	\$71.1	\$73.7	\$74.7	\$77.0	\$79.2	\$81.5	\$457.2

Dollars in millions

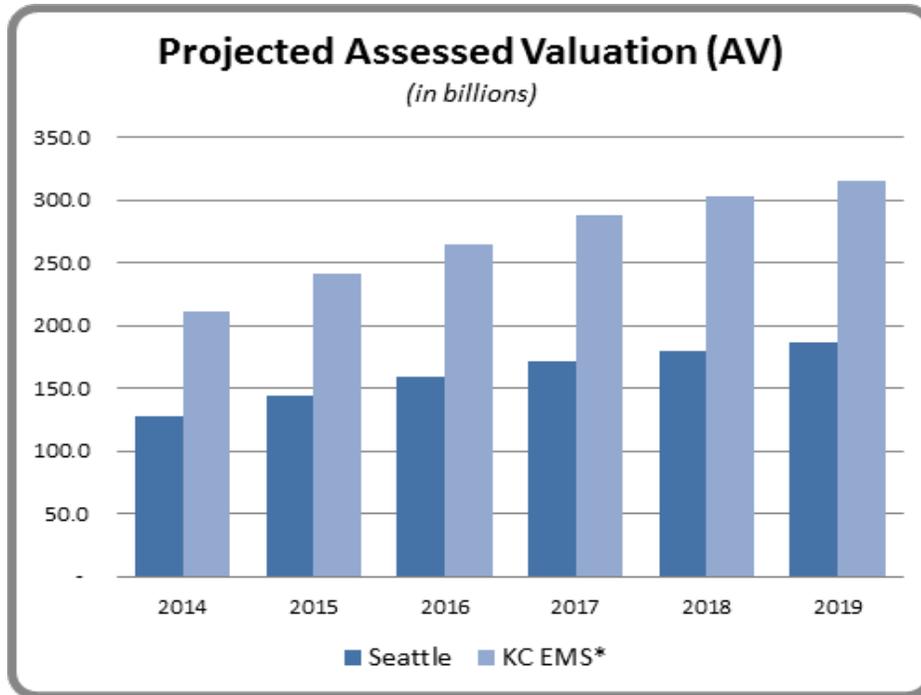
ASSESSED VALUATIONS (AV)

The economic downturn and depressed Assessed Valuations (AV) from the previous levy span contributed to the 2014-2019 levy rate beginning at 33.5 cents. 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 adjusts down to not exceed the total amount allowed (1% + new construction). The decreases in levy rate shown on this chart are proportionate to the increase in AV above 1%. Because AV is projected to increase at a rate higher than the limit factor of 1% throughout the levy period, the levy rate decreases from 33.5 cents/\$1,000 AV to 25.8 cents/\$1,000 AV in 2019.



EMS Funding and 2016 Financial Plan

Assessed Valuation (AV) has continued to grow, with this year's AV 9.9% higher than that of 2015. The percentage of the levy to the King County EMS Fund (based on AV outside the City of Seattle) is projected to increase at a slow rate through the levy period – from 62.2% in 2014 to 62.8% in 2019.



Taxable Assessed Valuation						
	2014	2015	2016	2017	2018	2019
City of Seattle	128.2	144.5	159.7	171.9	180.0	187.0
KC EMS Fund	210.6	241.8	264.8	287.5	302.4	315.5
Total	338.8	386.3	424.5	459.4	482.4	502.5
% KC EMS Fund	62.2%	62.6%	62.4%	62.6%	62.70%	62.8%
% City of Seattle	37.8%	37.4%	37.6%	37.4%	37.3%	37.2%
Change in AV		14.0%	9.9%	8.2%	5.0%	4.2%

*Does not include AV related to Milton (Milton receives taxes directly from County)

EMS Funding and 2016 Financial Plan

EXPENDITURES

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

Advanced Life Support (ALS) Services (paramedics):

- Represents over 60% of EMS expenditures
- 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:

- Represents 24% of EMS expenditures
- Distributed to individual agencies based on an allocation that includes the assessed valuation of the district and demand for services (call volume)
- Includes the addition of a BLS Core Services Program beginning in 2015

Regional Support Programs:

- Represents 13% of EMS expenditures
- 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:

- Represents 1.5% of EMS expenditures
- Funded with lifetime budgets (budgeted amount by year is adjusted to reflect changing cash flows based on project needs)
- Includes carryover of SEND, and Emergency Medical Dispatch initiatives from the 2008-2013 levy period

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

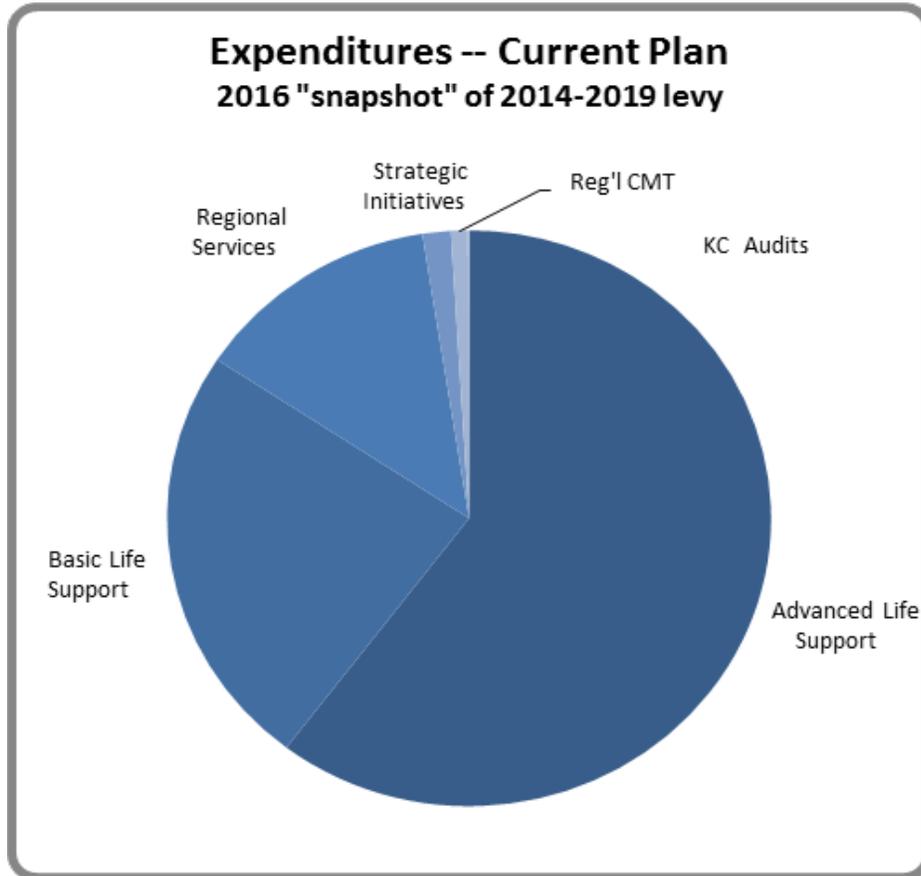
Community Medical Technician (CMT) Units:

- Represents 1% of EMS expenditures
- New for 2014-2019 levy period

Audits:

- Represents .1% of EMS expenditures
- Financial review and audits by the King County Auditor's office complement and augment the oversight and accountability of the King County EMS Fund.

EMS Funding and 2016 Financial Plan



2016 Snapshot of the 2014-2019 Levy

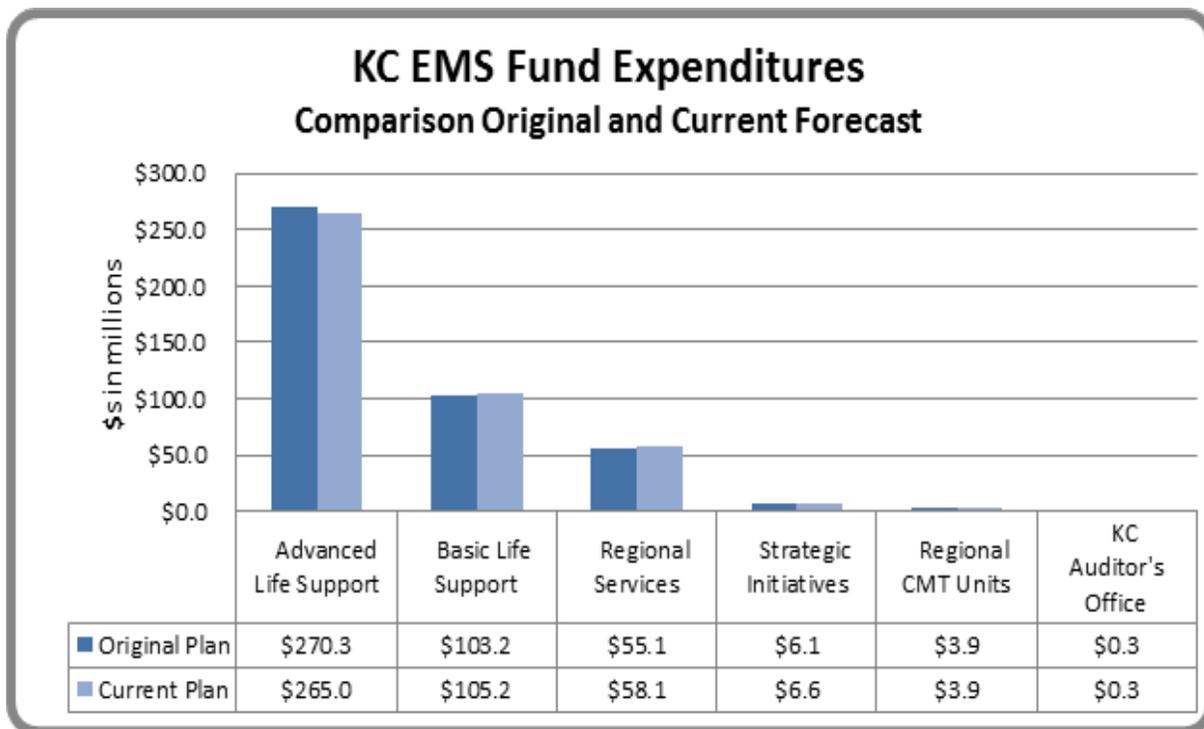
Program Areas	Current Plan	%
Advanced Life Support (ALS)	\$265.0	60.4%
Basic Life Support (BLS)	\$105.2	23.9%
Regional Services	\$58.1	13.2%
Strategic Initiatives	\$6.6	1.5%
Regional CMT	\$3.9	.9%
King County Audits	\$0.3	.1%
Total	\$439.1	100.0%

EMS Funding and 2016 Financial Plan

Overview of Expenditure Areas

The main focus of the levy continues to be fully funding ALS units. BLS expenditures were projected to be proportional to the previous levy. Changes from the original plan include:

- ALS and BLS allocations have decreased due to economic indices being lower than projected. These indices are used to calculate yearly increases in allocations.
- Reduced allocations and increased costs have led to ALS providers accessing nearly \$2.5 million of reserves to cover costs above the allocation. Areas requiring the use of reserves include Paid Time Off above what was planned, additional paramedic student costs, and costs related to power stretchers (see Use of Reserves table for more detailed information).
- 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 \$3.75 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.



EMS Funding and 2016 Financial Plan

Strategic Initiatives

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

	2014 Actuals	2015 Actuals	2016 Forecast	2017 Forecast	2018 Forecast	2019 Forecast	Total Lifetime Forecast
STRATEGIC INITIATIVES - 2014-2019							
Reg'l Records Mgmt System	33,750	162,719	164,460	164,460	164,460	164,862	854,711
BLS Training & QI				492,000	493,500	495,378	1,480,878
Vulnerable Populations	80,148	188,956	250,011	335,850	336,229	342,455	1,533,649
BLS Efficiencies	8,389	17,521	24,528	89,572	119,572	162,482	422,064
Efficiency & Evaluation Studies	42,472	99,115	183,516	539,222	541,949	376,637	1,782,911
Total 2014-2019 SIs	164,759	468,311	622,515	1,621,104	1,655,710	1,541,814	6,074,213
STRATEGIC INITIATIVES - 2008-2013							
Emergency Medical Dispatch (EMD)	77,523	(111,249)	126,674	206,193	96,193		395,334
Enhanced Network Design (SEND)	68,960	30,183	70,717				169,860
Total 2008-2013 SIs	146,483	(81,066)	197,391	206,193	96,193		565,194
TOTAL STRATEGIC INITIATIVES	311,242	387,245	819,906	1,827,297	1,751,903	1,541,814	6,639,407

EMS Funding and 2016 Financial Plan

Reserves

Four main reserve categories were established as part of the 2014-2019 Strategic Plan - ALS Capacity, ALS Equipment, ALS Operational and ALS Risk Abatement – along with a Community Medical Technician (CMT) reserve and a King County-required Fund Balance reserve. As included in the Strategic Plan, Regional Services may access the ALS Operational Reserve to cover specific expenses that are higher than anticipated. In 2014, a Rate Stabilization reserve, similar to the millage reduction reserve in the previous levy, was added. At the same time, the Fund Balance reserve was converted to a Cash Flow reserve, to be consistent with King County policies. All Use of Reserves are reviewed and endorsed by the EMS Advisory Committee (EMSAC) Financial Subcommittee and the full EMSAC.

2014-2019 Reserves	2014	2015	2016	2017	2018	2019
ALS Capacity Reserves	1,067,700	1,067,700	1,067,700	1,067,700	1,985,700	3,358,700
ALS Equipment Reserve	488,900	488,900	488,900	488,900	488,900	488,900
ALS Operational Reserve*	981,900	1,019,415	1,075,055	1,075,055	1,075,055	1,075,055
ALS Risk Abatement Reserve	1,510,000	1,510,000	1,510,000	1,510,000	1,510,000	1,510,000
CMT Unit Reserve	0	363,546	388,424	739,897	1,519,484	1,519,484
Cash Flow Reserve	9,945,412	10,262,581	6,648,241	5,267,059	5,562,472	5,562,472
Rate Stabilization Reserve**	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	16,292,830	15,263,121	17,346,121	18,719,121

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

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

Use of Reserves/Designations	2014	2015	Total
ALS Operating Reserve			
Excess Paid Time Off (PTO)	214,000	25,689	239,689
Regional Services	306,261	925,922	1,232,183
Paramedic Students	271,648	407,012	678,660
Dispatch costs	133,893	169,629	303,522
ALS Equipment Reserve			
Power stretchers		434,562	434,562
ALS Risk Abatement Reserve		816,109	816,109
Subtotal	925,802	2,778,923	3,704,725
Designations			
Supplement BLS Allocation	219,144		219,144
Subtotal	219,144		219,144
TOTAL	1,144,946	2,778,923	3,923,869

EMS Funding and 2016 Financial Plan

Use of Reserves

Several uses of reserves have been approved to date. The Use of Reserves and Designations table on the next page shows actual amounts used through the end of 2015. Additional use of reserves has been approved with “not to exceed” amounts for power stretchers, risk abatement, ongoing support for paramedic services, and regional services.

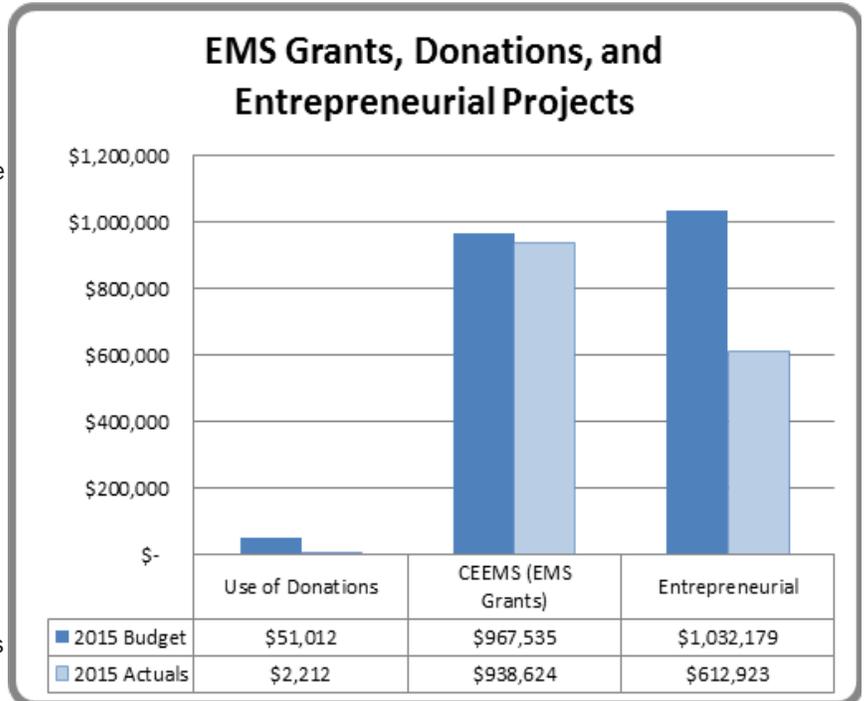
EMS Grants, Donation, and Entrepreneurial Projects (Public Health Fund)

The EMS Division, through the EMS Grants Group and the Center for Evaluation of Emergency Medical Services (CEEMS), receives funding from outside organizations to conduct studies aimed at improving the delivery of EMS care and advance evidenced-based care and treatment. This group works collaboratively with faculty from the University of Washington and many of the grant funds come through the university. These are research oriented grants that usually do not obligate the EMS program to fund future services.

The results of these grants have been incorporated into existing EMS services and have affected interventions, protocols and standard operating procedures used in the field. For more information on CEEMS, please see page 50.

The EMS Online Entrepreneurial Project provides online training to agencies outside King County as a subscription service. The expenses incurred in providing the service outside King County are covered by revenue from the subscription program. In addition, subscription revenues are used to make enhancements above those funded by the EMS levy.

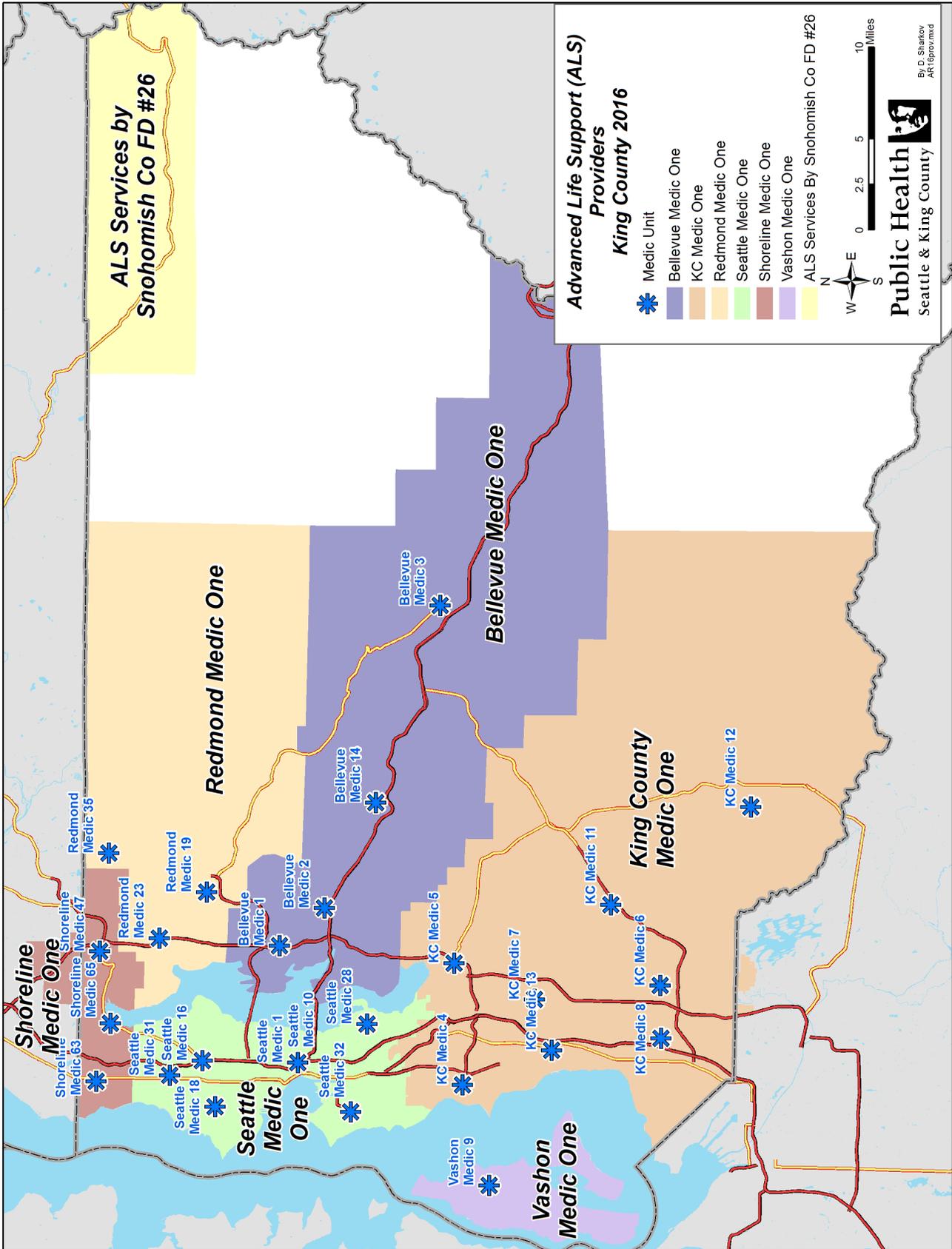
King County Medic One may receive donations from private citizens. There was minimal use of these donations in 2015.



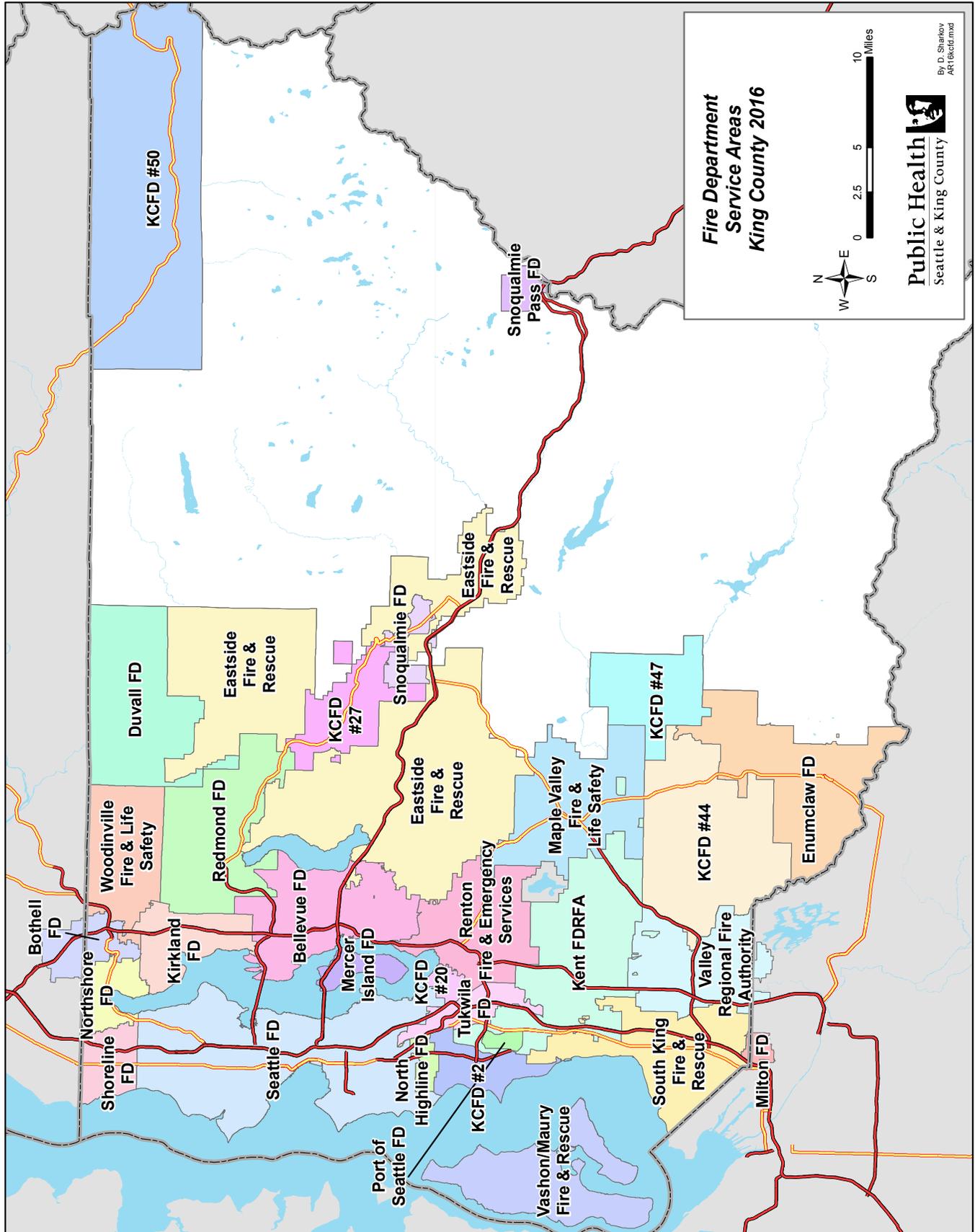
Conclusions

Expenses are continuing to increase at a rate greater than anticipated when the region developed the Financial Plan during the economic downturn. 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. Fortunately, 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.

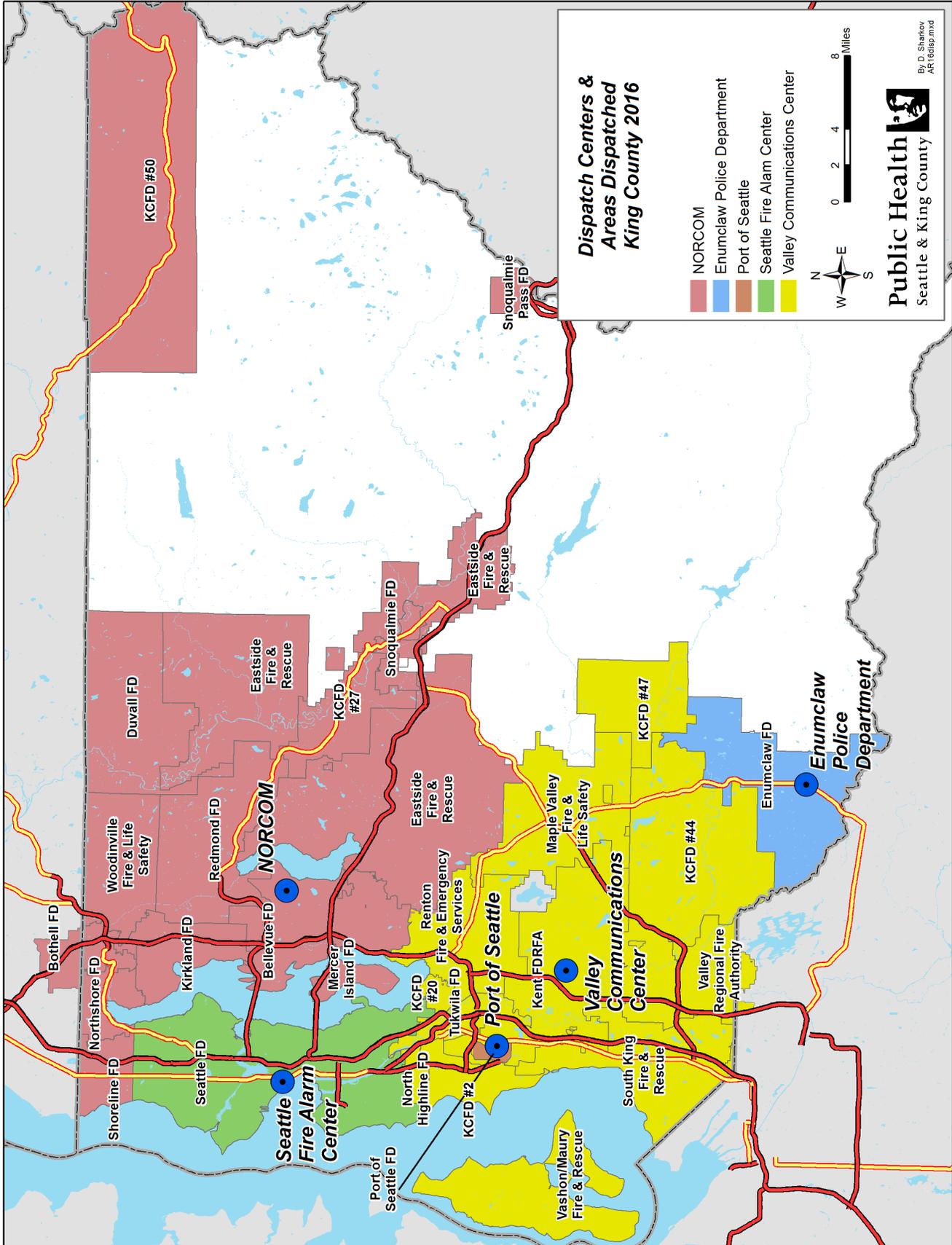
Appendix A: Regional Map of ALS Provider Areas



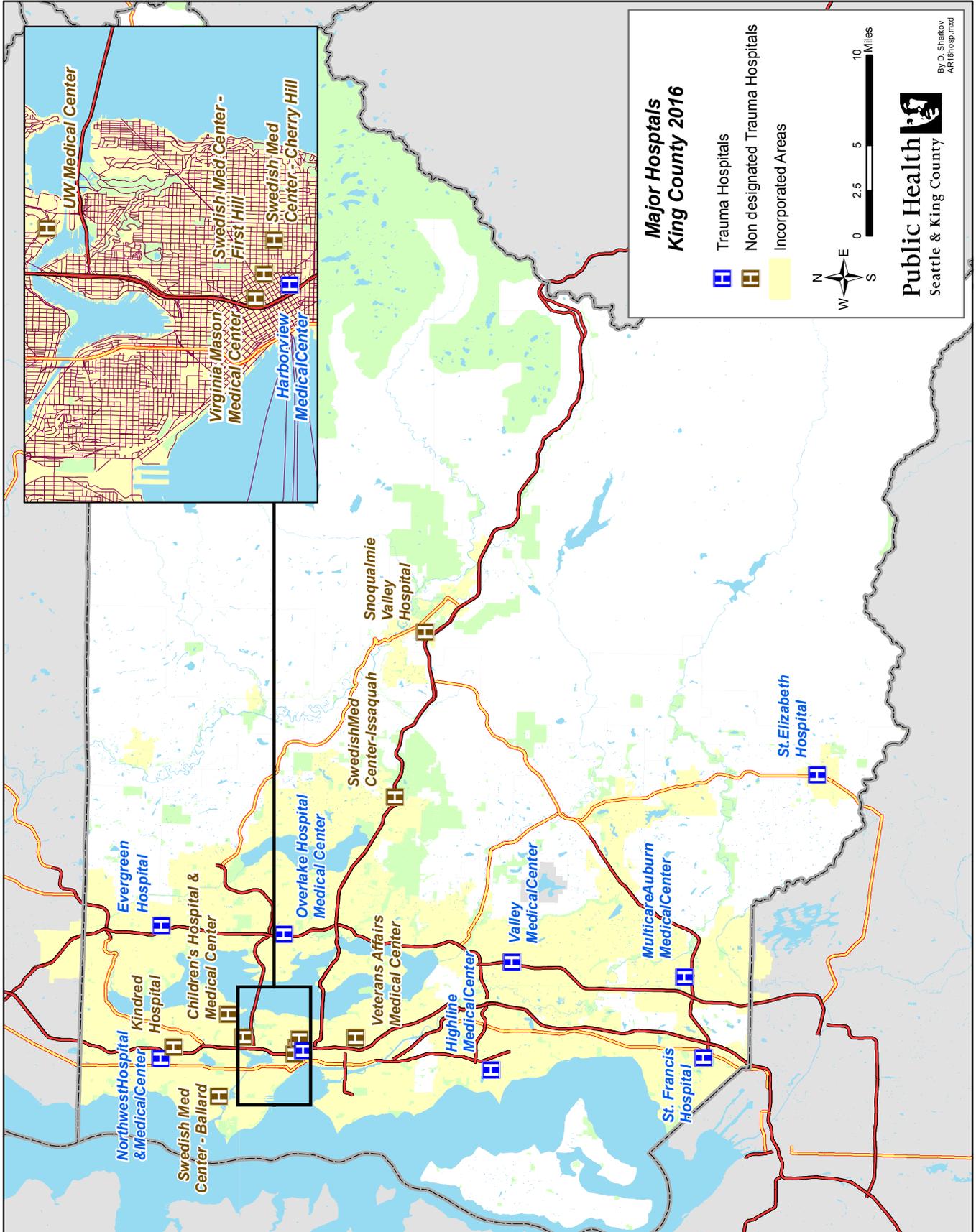
Appendix B: Regional Map of BLS Provider Areas



Appendix C: Regional Map of Dispatch Center Service Areas



Appendix D: Regional Map of EMS Hospitals



Appendix E: 2016 EMS Advisory Committee Listing

Name	Representation	Title/ Organization
Michele Plorde, Chair	KC Emergency Medical Services	Director, KC EMS Division
Patty Hayes	Public Health - Seattle & King Co.	Director Public Health
Matt Cowan	ALS Providers - Shoreline	Chief, Shoreline Fire Department
Harold Scoggins	ALS Providers - Seattle	Chief, Seattle Fire Department
Mark Risen	ALS Providers - Bellevue	Chief, Bellevue Fire Department
John Herbert	ALS Providers - KC Medic One	Chief, King County Medic One
Tommy Smith	ALS Providers - Redmond	Chief, Redmond Fire Department
Hank Lipe	ALS Providers - Vashon Medic One	Chief, Vashon Island Fire & Rescue
Al Church	BLS in Cities > 50,000	Chief, South King Fire & Rescue
Joe Sanford	BLS in Cities > 50,000	Chief, Kirkland Fire Department
Mark Peterson	BLS in Cities > 50,000	Chief, Renton Regional Fire Authority
Jim Schneider	BLS in Cities >50,000	Chief, Kent Regional Fire Authority
Brent Swearingen	BLS in Cities > 50,000	Chief, Valley Regional Fire Authority
Dr. Michael Sayre	Seattle Medical Program Director	Medical Program Director, Seattle
Dr. Tom Rea	EMS Medical Program Director	Medical Program Director
Dr. Peter Kudenchuk	Chair, Medical Directors' Committee	Medical Director, King County Medic One
Jon Kennison	KC Fire Commissioner's Assn. - Rural	Fire Commissioner, Shoreline
John Rickert	KC Fire Commissioner's Assn. - Urban	Fire Commissioner, South King Fire & Rescue
Doug McDonald	Labor - BLS	EMT, Renton Regional Fire Authority
Steve Perry	Labor - ALS	Paramedic, King County Medic One
Lora Ueland	Dispatch	Director, Valley Communications Center
Brandt Butte	Ambulance, General Manager	American Medical Response, Seattle
Wayne Corey	Citizen Representative	

Appendix F: EMS FUND 1190 Revenue/Expenditures Summary

	2015 Actuals	2016 Estimate	2017 Forecast
BEGINNING FUND BALANCE	34,515,583	42,142,020	43,785,039
REVENUES			
Property Taxes	72,891,658	74,056,900	76,324,195
Grants	1,341	1,427	1,427
Charges for Services	231,643	172,327	195,046
Interest Earnings/Miscellaneous Revenue	518,625	425,200	507,200
Other Financing Sources	28,351	12,000	12,000
EMSO Transfer from PH Fund ¹	263,683		
EMS REVENUE TOTAL	73,935,301	74,667,854	77,039,868
EXPENDITURES			
Advanced Life Support Services ²	(44,621,824)	(43,450,140)	(47,419,545)
Basic Life Support Services	(16,157,444)	(16,493,517)	(17,016,361)
Regional Services	(9,384,891)	(10,068,195)	(9,762,181)
Strategic Initiatives	(387,245)	(794,214)	(1,835,337)
Regional CMT Units	(294,672)	(1,056,579)	(1,144,626)
King County Auditor's Office	(387,913)	(38,913)	(160,000)
Use of Designations/Program Balances ²			
Use of Reserves ²			
BLS Core Services Support Contingency	(376,723)	(1,123,277)	(750,000)
EMS EXPENDITURE TOTAL	(71,261,712)	(73,024,835)	(78,421,050)
<i>Difference Revenues & Expenditures</i>	2,673,589	1,643,019	(1,381,182)
Other Fund Transactions	(47,152)		
ENDING FUND BALANCE	42,142,020	43,785,039	42,403,857
RESERVES AND DESIGNATIONS			
Designations (incl Program Balances)	(10,097,574)	(8,844,497)	(7,184,721)
Reserves ³	(19,830,043)	(16,292,830)	(15,263,121)
TOTAL RESERVES AND DESIGNATIONS	(29,927,617)	(25,137,327)	(22,447,842)
ENDING UNDESIGNATED FUND BALANCE	12,214,403	18,647,712	19,956,015
¹ EMS Grants and Entrepreneurial projects moved from Public Health to EMS Fund at the end of 2015; funds related to the EMS Online Entrepreneurial were transferred to EMS fund at the end of 2015			
² Forecast Use of Program Balances & Reserves included in program line items for 2015			
³ For detail on reserves, see Financial Section (this presentation includes EMSO transfer in designations)			

Fund 6980/21800/DEP0023	2013	2014	2015
Beginning Balance	35,716	52,835	94,713
Donations	17,119	41,878	50,407
Expenditures	0	0	2,112
Ending Balance	52,835	94,713	143,008

Appendix G: EMS Division 2015 Bibliography

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Appendix H: EMS Performance Measures

Resource Category	Performance Measure	Definition	2015 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 > 2yo.	46%*
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 yo.	68%
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	98%
	Rate of correctly identified resource used by telecommunicator	% of total number of reviewed calls that received correct EMS resource	94%
	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: 72%
BASIC LIFE SUPPORT	% that response time standards are met for emergency BLS calls	Urban response areas: Ten minutes or less, eighty percent of the time; Suburban response areas: Twenty minutes or less, eighty percent of the time; Rural response areas: Forty-five minutes or less, eighty percent of the time; Wilderness response areas: As soon as possible	Urban: 5.1 Suburban 5.5 Rural 6.5 Wilderness: --
	Rate of EMTs documenting FAST and glucometry in stroke patients	% of hospital- and pre-hospital-diagnosed stroke patients for whom FAST exam and glucometry were documented by EMTs on MIRFs	53%
	Rate that "on scene time" standards are met	% of suspected CVA and suspected TIA patients with < 15 minute BLS scene time	57%
	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)	89%
PARAMEDICS	% that response time standards are met	Respond on average < 10 minutes, and <= 14 min 80% of the time	<=10 = 77.8% <=14 = 93.8% MEAN = 8.0 min.
	Rate of paramedics using a 12-lead ECG for STEMI patients	% of suspected STEMI cases where paramedics documented the use of a 12-lead ECG	70%
	Rate that "on scene time" standards are met	% of suspected STEMI patients with < 15 minute on scene time	34%
	Rate of paramedics documenting Glasgow Coma Scale for trauma patients	% of trauma patients transported to HMC by paramedics where GCS was documented	56%
	Rate of scene time for trauma patients	% of trauma patients taken to HMC by paramedics with < 15 minute ALS scene time	42%
	Rate of successful first attempt intubations	% of successful first attempt intubations	83%
REGIONAL	Rate of cancelled enroute ALS calls	% cancelled enroute ALS calls to all ALS calls	19.1%
	% of calls where no upgrade or downgrade was needed	% of calls where ALS was not cancelled and not requested from scene	74.3%
	Rate of ALS requests from scene	% of BLS request for ALS from scene of all ALS calls	16.2%
	# of paramedic hours above planned 2PM unit staffing	# of paramedic hours above planned 2PM unit staffing	1,006 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

Mailing Address: Emergency Medical Services Division
Public Health – Seattle & King County
401 5th Ave, Suite 1200
Seattle, WA 98104
(206) 296-4693 (206) 296-4866 (fax)

Web Address: <http://www.kingcounty.gov/healthservices/health/ems.aspx>

Specific Program Contacts:

King County Medic One www.kingcounty.gov/healthservices/health/ems/MedicOne.aspx	(206) 296-8550
Professional Standards Programs www.kingcounty.gov/healthservices/health/ems/training.aspx	(206) 263-8054
CPR/AED Training Programs www.kingcounty.gov/healthservices/health/ems/aed.aspx	(206) 263-8562
Emergency Medical Dispatch Programs www.kingcounty.gov/healthservices/health/ems/emdprogram.aspx	(206) 263-8636
Injury Prevention and Public Education Programs www.kingcounty.gov/healthservices/health/ems/community.aspx	(206) 263-8544
Regional Medical Control and Quality Improvement www.kingcounty.gov/healthservices/health/ems/quality.aspx	(206) 263-8659
Center for the Evaluation of EMS (CEEMS) www.kingcounty.gov/healthservices/health/ems/CEEMS.aspx	(206) 263-8564