Public Health - Seattle & King County

Division of Emergency Medical Services

2010 Annual Report

to the King County Council

September 2010

Public Health
Seattle & King County

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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

INTRODUCTION

We are pleased to present the 2010 Emergency Medical Services Annual Report as required by King County Ordinance #12849. The report reflects the hard work, innovation and dedication of the thousands of people across King County who make our Emergency Medical Services (EMS) system one of the best in the country in saving lives and providing top-quality pre-hospital care. This 2010 report marks the third year of the renewed six-year Medic One/EMS Levy which voters supported in November 2007 with an approval rate over 83%.

As you look inside this report, you'll find a wealth of information on how our system of 30 fire departments, six paramedic providers, five EMS dispatch centers and 19 hospitals work together to save lives. You'll learn about promising innovations, such as a pilot project to add automated external defibrillators in police cars for faster response for people in cardiac arrest.

You'll read about our strategic initiatives to continually improve our practice, such as our community medical technician pilot project, deploying a more cost-effective fire department response unit for patients with less severe conditions and who don't require an urgent response. And you can see how we account for the public money entrusted to us, and our continuing efforts to make the most efficient use of our resources.

This year's report also marks a significant change for Emergency Medical Services, with the retirement of Tom Hearne, who served as EMS Division Director for nearly 15 years and has been part of our EMS team for over 30 years. Under Tom's leadership, our system's strength and stature grew significantly, driven by the research and evidence-based approach he championed.

Michele Plorde was recently appointed Interim EMS Division Director

Tom has also been a leader in building the regional partnerships and cohesion that are essential for us to work well together. We owe Tom a great debt of gratitude for his significant contributions to our EMS system and the public's health.

With Tom's retirement, we have appointed Michele Plorde to serve as the interim EMS Division Director. We are grateful that Michele, a 15 year devotee to EMS and a member of Tom's leadership team, has been willing to step up in this role and sustain our Division's critical work. In the months ahead, we will be moving forward with a recruitment process for the permanent position.

We appreciate the opportunity to share this 2010 EMS Division system update with you, and look forward to our continuing work in giving the best possible EMS care to the residents of King County, 24 hours a day, 365 days a year.

David Fleming, MD
Director & Health Officer
Public Health - Seattle & King County

ACKNOWLEDGEMENTS

The Emergency Medical Services (EMS) Division would like to thank all of the individuals who contributed to the EMS 2010 Annual Report, including managers of the various EMS projects and programs depicted in the report; Leonard Roberts and the Seattle Fire Department; James Apa of the Public Health - Seattle & King County Communications Team, and the EMS Division data analysis team of Linda Becker, Carol Fahrenbruch, Dan Henwood, and Dmitry Sharkov.

The EMS Division would also like to thank Dr. Leonard Cobb and Dr. Michael Copass of the Seattle Medic One program for their collaborative efforts in partnering with the EMS Division.

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EXECUTIVE SUMMARY

During the past year, the Emergency Medical Services (EMS) Division undertook a substantial number of complex activities, including evaluating methods to enhance cardiac arrest survival, responding to the 2009 King County Auditor's report, and reinventing the EMS Annual Report.

First and foremost, findings from a recently concluded study have provided the EMS Division with an opportunity to take a new look at the way cardiac arrests are treated. The results from the EMS Dispatcher Assisted Resuscitation Trial (DART) shed new light on cardiopulmonary resuscitation (CPR) with results showing that conducting CPR with just chest compression was at least as beneficial as conventional CPR (chest compression and rescue breathing). These results strengthen a CPR strategy that emphasizes chest compression and minimizes the role of rescue breathing, providing a more streamlined approach to administering CPR. The DART study is an example of how the EMS system partners with research experts to help make data driven decisions about the services we provide.

In addition, the King County Auditor's 2009 Review of the systems and practices in place to manage the EMS fund effectively was largely positive. Proposed recommendations include clarifying EMS fiscal policies and making EMS system costs more transparent. Also proposed was development of an approach to fund unanticipated costs experienced by Advanced Life Support (ALS) providers. The results of the audit have given the EMS Division and its partners an excellent opportunity to reexamine, adjust and clarify financial policies to enhance management of EMS levy funds. This process is in accordance with the King County Executive's Office interest in providing transparency and good stewardship of public funds.

Finally, the EMS Annual Report has been restructured to be clearer, more concise, and better organized. Improved continuity from report to report while still presenting a complete overview of EMS activities and finances in a visually appealing layout and abbreviated format is the aim. Another enhancement is to begin transition to a more performance and outcome-based reporting of programs and activities. The goal is to provide a more detailed accounting of the impacts for the many projects the EMS Division manages.

This report spans EMS programs and finances from the 2009-2010 timeframe, with specific time references made within each program area. The following is a summary of each major section of the annual report:

Part I - EMS Division Programs and Activities:

In step with the Executive, King County EMS is focusing on efficiencies. Of particular interest are the following two programs:

The Community Medical Technician Initiative, as part of the strategy to better manage non-emergency calls to 9-1-1, initiates and evaluates a more cost and resource-efficient response for low acuity patients. Should the model prove to be successful, the EMS system could save substantial costs while still ensuring the most appropriate level of patient care.

Reviewing and revising the ALS Triage Criteria that determine the level of care required by patients provides the opportunity to identify where improvements could be made that could safety limit how often ALS is dispatched. The EMS Division estimates a total cost avoidance of $49 million over the 10 year span of 1998-2008, from the reduction in number of ALS dispatches, due to dispatch initiatives.

Part II - Year 2009 Statistics:

In Seattle and King County, the EMS system responded to a total of 169,334 calls to 9-1-1 and 49,950 responses for Advanced Life Support (ALS) in 2009. Despite continued modest increases in population, the average medic unit response time remained steady at 7.7 minutes. In addition, cardiac arrest survival for witnessed cases of cardiac etiology with ventricular fibrillation remained at an exceptionally high rate of 46% in 2009.

Part III - EMS Funding and 2010 Financial Plan:

The EMS system in King County is funded primarily by a six-year EMS levy. Property tax collections for the EMS levy in 2010 are forecast at $101.6 million (including the City of Seattle). Since this report focuses on the KC EMS Fund, most financial information is for the KC EMS Fund only. Forecast revenues for 2010 are $65,444,399. Forecast 2010 expenditures are $59,449,065 million.

While economic conditions have changed significantly since the levy was planned, the EMS levy is fortunate to be in sound condition. Because the beginning assessed value for the levy was higher than planned, the additional revenue has cushioned the EMS levy from the full extent of the downturn. Additionally, expenditures are decreasing more than the reduced revenues due to lowered inflationary increases, low use of contingencies and reserves, and programmatic reductions (including eliminating the two 12-hour units planned for 2011 and 2012). The EMS Division's ability to reduce expenditures beyond the overall reduction in revenues (over the duration of the levy) means that critical EMS service can be continued in the midst of significant cuts to lowered revenues.

A theme repeated in each of these sections is the powerful commitment by EMS agencies to regional partnership and consensus. These broad regional partnerships have, in effect, allowed the management of growth in paramedic responses and produced system efficiencies. EMS agencies in the region should be proud of their achievements and collaborative efforts in making such substantial progress. Their success reflects the vital working relationship that provides effective out-of-hospital medical care, every day, to the residents of King County.

SYSTEM OVERVIEW

The Medic One/ EMS System Design and Operation

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 of over 1.8 million. The response system is tiered to ensure that 9-1-1 calls receive medical care by the most appropriate care provider.

There are five major components in the tiered regional Medic One/EMS system, as described below:

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 an accident can greatly impact the chances of patient survival.

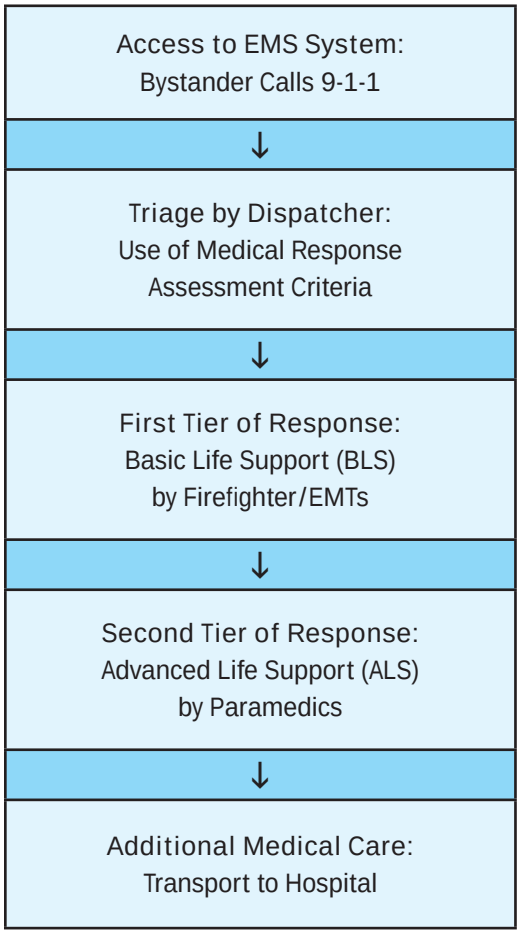
Dispatcher Triage: Calls to 9-1-1 are received and triaged by professional dispatchers who determine the most appropriate level of care needed. Dispatchers are trained to provide pre-arrival instructions for most medical emergencies, and guide the caller through life-saving steps, including Cardiopulmonary 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, providing immediate basic life support medical care that includes 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 on average in under five minutes.

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 30% 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.

EMS Tiered Response System



SYSTEM OVERVIEW, continued

The Medic One/EMS system operates in a coordinated partnership among the various cities, fire districts, private ambulance companies, and local area hospitals in King County to provide high quality pre-hospital medical care.

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. They are trained to provide pre-arrival instructions for most medical emergencies, and guide the caller through life-saving steps – including Cardiopulmonary Resuscitation and Automated External Defibrillator instructions - until the Medic One/EMS provider arrives.

Advanced Life Support (ALS) services, or regional paramedic services, are provided by six paramedic provider agencies in 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 (7.5 units) and Vashon Island Fire & Rescue (1 unit). In addition, funds are provided to Snohomish County Fire District 26 to provide ALS services in the Skykomish/King County Fire District 50 area from Baring to Stevens Pass. Paramedics provide out-of-hospital emergency care for serious or life-threatening injuries and illness. As the second on scene for critically ill patients, paramedics administering ALS service provide airway control, heart pacing, the dispensing of medicine, and other life saving out-of-hospital procedures as expected under the medical supervision of the Medical Director. There are currently 25.5 ALS units located throughout King County.

EMTs and paramedics work together to deliver seamless prehospital care.

Basic Life Support (BLS) or rapid, first-on-scene medical care, is provided by over 4,500 Emergency Medical Technicians (EMTs) employed by over 30 different 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. As the first-on-scene provider, BLS contributes significantly to the success of the Medic One/EMS system.

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.

Examples:

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

SYSTEM OVERVIEW, continued

Regional coordination of these various activities is important to support a standard delivery of pre-hospital patient care, develop regional policies and practices that reflect the diversity of needs, and maintain the balance of local area service delivery with centralized interests.

The EMS Division also manages Strategic Initiatives, which are innovative projects and operations 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 its field, and have been key in the system's ability to manage its costs.

The Medic One/EMS 2008 - 2013 Strategic Plan is the primary policy and financial document that directs the Medic One/EMS system and the EMS Division in managing the regional system. The plan details the roles, responsibilities and programs for the EMS system, and a levy rate to fund these approved functions. The EMS Division plays a significant role in developing, administering, and evaluating many of these critical EMS activities throughout King County.

HOW THIS DOCUMENT WORKS

The EMS Division has restructured its annual report in efforts to be clearer, more concise and better organized. The goal is to create improved continuity from year to year.

SECTION TITLES

This report is divided into sections that appear at the top of the page.

The Program Index

Each section is organized by a program index listing its activities or components. Moving forward, readers will be able to track individual activities within each program from year to year. Most programs will give an overview and an update on recent activity. Of those programs, several have been selected for a highlight.

PROGRAM HIGHLIGHT

These pieces turn the spotlight on some of the Division's many successful programs. Each piece includes extra information on the key components.

The EMS Division is continually looking at how it can develop strategies that address the demand for services and encourage efficiencies. Throughout the report, projects that meet the Division's pursuit to improve EMS care, manage growth in paramedic services, and develop further system efficiencies and cost savings are showcased.

EMS DIVISION PROGRAMS

Introduction

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.

The regional system depends on this complex partnership of providers, all of whom recognize the strong value for residents in maintaining the layered 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.

Programs

The EMS Division 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 uniform regional medical direction, standardized EMT training and continuing medical education, standard EMS training for emergency dispatchers, centralized data collection and paramedic service planning, and administrative support and financial management of the regional EMS levy fund. This section summarizes the EMS Division's primary programs and activities, including King County Medic One.

Kent firefighters and King County paramedics transport a patient suffering cardiac arrest.

KING COUNTY MEDIC ONE PROGRAM

OVERVIEW: King County Medic One (KCM1) is one of the six Advanced Life Support (ALS) providers in the regional EMS system. It serves approximately 450 square miles of south King County, an area with a population now close to 690,000 persons. In calendar year 2009, KCM1 responded to 13,769 calls for this advanced care. These calls involved all types of circumstances and patients such as pediatric patients, mass casualty motor vehicle crashes, and heart emergencies.

KCM1 works as part of a coordinated system of effective emergency care that includes 9-1-1 emergency dispatch, basic life support care by fire departments, advanced life support care by KCM1, and hospital-based care. KCM1's 70 paramedics work side-by-side with local fire department personnel to provide the highest-quality, cost-effective emergency medical care to those in need, 24 hours a day, every day of the year. To help achieve this effective and coordinated care approach, paramedic units co-locate with fire stations when possible, which promotes a team atmosphere. This cost-effective strategy also eliminates the need for additional facilities.

Physicians provide medical oversight for clinical care decisions and actively participate in strategic planning decisions that guide the KCM1 organization. The "medical model" that incorporates a tiered response strategy achieves the best-trained, most-experienced paramedic providers, who in turn serve as a critical and integral component of emergency care in King County. This system of care practiced throughout King County consistently achieves the highest benchmarks of EMS care and is recognized worldwide.

Program Index

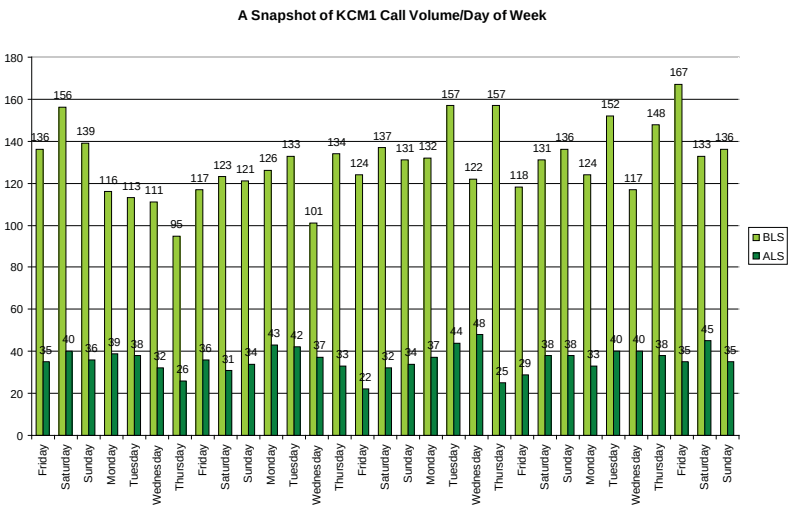
The core mission of KCM1 is to provide optimal emergency care as part of a coordinated and efficient EMS system. This goal is paramount and relies heavily upon the clinical excellence of the KCM1 field paramedics. A variety of personnel and activities work to support the overarching mission of KCM1, including medical direction, training and emergency preparedness.

MEDICAL DIRECTION

1. King County Medic One Medical Direction

The Medical Program Director for KCM1 is Dr. Tom Rea, who is assisted by four Associate Medical Directors assigned to each shift to assist the Medical Program Director with quality review, guidance for procedures, new equipment and training needs for the program.

Quality assurance activities undertaken include systematic review of specific medical conditions or critical procedures, or case-based review and feedback. Assessments have demonstrated proficient care, and underscore the importance



of the fundamental approach of these clinical guidelines that require proactive paramedic implementation and involvement.

2. TRAINING

a. Initial Training

The 10-month Initial Paramedic Training program, provided by the Seattle Fire Department and Harborview Medical Center, is the most comprehensive and intensive program in the nation. This rigorous training fully integrates classroom experience with field care, providing an unparalleled clinical education.

b. Continuing Education

Every year, paramedics must complete over 50 hours of continuing education training that covers a broad range in topics and format:

- Harborview Medical Center Tuesday Series convenes regional and national experts to lead monthly three-hour educational seminars.

- Grand Rounds Training provides ongoing training to review critical paramedic skills and important clinical scenarios. The training emphasizes manipulative skills and critical thinking, although operational updates, equipment changes and safety awareness training are also included.

- Medication of the Month (MoM) has paramedics reviewing their knowledge about medications they encounter in the course of care.

- Medical Updates and Physician Meetings are held quarterly when KCM1 Medical Directors meet with paramedics to review specific medical cases. Paramedics receive feedback on patient admitting diagnosis, in-hospital care, and final disposition. The Medical Directors also organize twice-yearly meetings that discuss specific topics or projects pertinent to KCM1.

EFFICIENCIES

3. Medic Unit Relocations

In 2010, KCM1 relocated the Renton unit (Medic 5) into the newly renovated Station 11 in downtown Renton. The relocation of Medic 5 not only helped better utilize the medic units in the system, but it improved response times in Renton and adjacent communities. Response times are the most important factor in improving survival from cardiac arrest. Therefore, this relocation will ultimately translate into lives saved, as well as an efficiency for all medic units in the system.

KCM1 is currently working to relocate Medic 7 within the City of Kent, with the goal of additional response improvements. EMS continues its relocation reviews on a regular basis to ensure residents are provided a timely medic unit response. Partner cities are included in the review to assure their future growth and special needs are considered.

- Paramedic Case-of-the-Month highlights specific teaching points or clinical challenges based on actual cases.

4. OPERATIONS, PREPAREDNESS AND SAFETY

KCM1 operates from 10 locations, with a mobile intensive care unit (Medic unit) at eight of the locations, and Medical Supervisors stationed at two locations. The KCM1 fleet is well prepared to handle daily responses, as well as large scale disasters and special events. Health and safety practices are reviewed to minimize risks associated with emergency operations and extraordinary circumstances, such as earthquakes, inclement weather or pandemic outbreaks. New hardware

is being installed on every Medic unit to improve communications for all situations.

KCM1 recently tested its preparedness efforts in the areas of personal vaccine administration, protective equipment, and public and responder awareness through a complicated and fast changing H1N1 event.

- KCM1 achieved high-level compliance with vaccination for seasonal and H1N1 influenza. The agency was also able to assist other first responder agencies implement their vaccine programs using the public health framework.
- Protective fire resistant outerwear needed to be replaced, for which KCM1 received a grant in 2010 to complete the replacement by 2011.
- KCM1's local department operations center is fully capable of coordinating responses during a heavy call load, unusually large incidents, and disasters. KCM1 is in the process of upgrading this operations center to provide better interaction with the King County Regional Communications Center and Public Health - Seattle & King County's Emergency Operations Center.

5. GRANTS

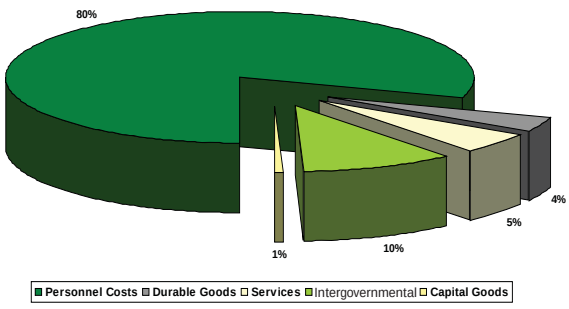
KCM1 seeks to further enhance services by acquiring external grant funding. Most recently, KCM1 was awarded funding as part of the Assistance to Firefighters program and the Washington State Department of Health Trauma fund. Combined, this funding amounted to approximately $85,000.

6. ADMINISTRATION

KCM1 Administration supports its 70 employees and 10 medic unit locations. Administrative responsibilities include managing the hundreds of vendor and venue contracts required to support the operations 24 hours a day/7 days a week, financial management of payroll, procurement of supplies, and records management. KCM1 is the lead contract agency responsible for both the Regional Medical supplies/equipment, and medications purchasing contracts (see page 36 for more detail). Contracts are used by most fire departments in King County and enable economy of scale purchasing for medical supplies and equipment. In 2010, regional purchasing was applied to obtain lower costs for items such as heart defibrillators and vehicles.

7. COST STRUCTURE

2009 Budgeted Expenses



For more information on KCM1, visit: http://www.kingcounty.gov/healthservices/health/ems/MedicOne.aspx

REGIONAL MEDICAL CONTROL

OVERVIEW: *The core of the EMS program is based on the medical model, which in essence says that direction and practice must be derived from the highest standards of medical training and medical care. Thus the EMS Division strives for emergency medical care that is founded on the highest standards of training, best medical practices, scientific evidence, and close supervision by physicians experienced in EMS.*

A stretcher is ready for patient transport

Components

1. EMS Advisory Committee

Formed in December 1997, the EMS Advisory Committee monitors the uniformity and consistency of the entire EMS system. It provides key counsel to the EMS Division on regional Medic One/EMS policies and practices in King County and reviews major governance and consolidation issues, the implementation of strategic plans, and other proposals. In 2010, it was integral in developing financial and reserve policies in response to the 2009 EMS Financial Audit, the result of which will be reflected in the 2011 budget submittal.

2. Regional Medical Control

The position of Medical Program Director for King County (MPD) is vital to the success and ongoing quality improvement of the EMS system. Every county in Washington state has a state-mandated MPD who is responsible for EMS practices.

Mickey Eisenberg, MD, PhD, has filled this role for the past seven years. His responsibilities include writing and approving medical protocols, approving all initial EMT and continuing EMT medical education, undertaking new and ongoing medical quality improvement activities, initiating disciplinary actions when indicated, and working closely with the Central Region Trauma Council.

Dr. Eisenberg coordinates policies and procedures among the Paramedic Medical Program Directors. There are six Medical Program Directors for the six paramedic programs in Seattle, Bellevue, Redmond, Shoreline, south King County, and Vashon: Michael Copass, MD, Jim Boehl, MD, Adrian Whorton, MD, Gary Somers, MD, Tom Rea, MD, and Sam Warren, MD, respectively. They and Dr. Eisenberg, along with the medical service administrators for each of the paramedic programs, meet quarterly to discuss and take action on paramedic-related matters.
In addition to being the medical director of the Seattle Medic One program, Dr. Copass is also the director of paramedic training. As such, he provides initial training for all paramedics in Seattle and King County as well as continuing education and recertification.

Quality Improvement (QI) is integral to ensure the best possible outcomes of care. A classic example is the management of cardiac arrest. The EMS Division has closely studied every cardiac arrest event for the past 35 years, which has led to constant improvement in training, practices, and programs. The result is a steadily rising cardiac arrest survival rate - currently the highest in the nation. In 2011, the King County EMS Division intends to initiate detailed QI on patients with stroke.

MEDICAL QUALITY IMPROVEMENT (QI)

OVERVIEW: *The Medical QI section conducts programmatic, scientific, and case-based evaluation on 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.*

Throughout 2010, the Medical QI section has undertaken a range of activities to develop and expand critical evaluations of pre-hospital care. The following sections provide a brief background of the Medical QI section, and detail core QI programmatic activities and research collaboration.

PROGRAM INDEX

1. Cardiac Arrest Quality Improvement

Out-of-hospital cardiac arrest - also termed sudden cardiac arrest – strikes approximately 1,000 persons each year in King County, and is a leading cause of death in the United States. The survival rate from out-of-hospital cardiac arrest is a critical benchmark of EMS performance and is a reflection of individual and integrated components of the system.

As such, substantial resources are dedicated to measuring care and outcome. Members of the Medical QI Section and the Center for Evaluation of EMS Section (see page 25) review hospital charts as well as EMS and dispatch reports for every sudden cardiac arrest patient transported to the hospital (statistics can be found on page 63). This collection and review process provides opportunity for individual case feedback and regional system evaluation.

2. Dispatcher Assisted Resuscitation Trial (DART) Study: HIGHLIGHT page 17

3. Comprehensive Heart Attack Surveillance and Evaluation (CHASE)

ST segment elevation myocardial infarction (STEMI) is regarded as a cardiovascular emergency for which time to treatment is critical. Steps taken in the field can dramatically shorten the time for patients to receive life-saving treatments, like angioplasty and/or placement of coronary stents, but this requires a critical partnership between EMS and hospitals. In 2010, the Medical QI section partnered with Seattle Medic One to create a STEMI surveillance program that provides systematic evaluation of all potential STEMIs including cataloging of all prehospital ECGs, and improving communication of these findings to ALS agencies and area hospitals.

The Comprehensive Heart Attack Surveillance and Evaluation (CHASE) project analyzes the care provided in the field for STEMI patients, and tracks the treatment and outcome of such patients through hospital discharge. The purpose is to identify ways that both EMS and hospitals can improve the identification, triage and management of these patients. The type of information identified via CHASE will be used as the basis for many QI and research projects to come.

4. Airway Quality Assurance Report/ Safety of Central Venous Lines

Every King County paramedic must maintain competent critical skills to remain

Continued on page 18

A laryngoscope helps paramedics place endotracheal tubes so patients can get oxygen.

2. The Dispatcher Assisted Resuscitation Trial

Dispatchers at Valley Communications review a call for quality improvement purposes.

The EMS Division recently published an article about Dispatcher Assisted CPR in the New England Journal of Medicine. The results of this trial changed the way bystander CPR is performed.

During a cardiac arrest, a bystander can save a life by calling 9-1-1 and providing Cardiopulmonary Resuscitation (CPR) until emergency medical responders arrive. In some cases however, the victim does not receive CPR until after the arrival of emergency medical responders. One approach to increase bystander CPR is to have emergency dispatchers coach the caller. Emergency dispatchers offer and provide CPR instructions over the phone so that CPR can be started prior to arrival of the emergency medical responders.

For many decades, conventional CPR has consisted of chest compressions interspersed with rescue breathing. For the general public however, rescue breathing can be a challenging skill especially if CPR is not practiced regularly. Chest compression alone is simpler and could enable more people to learn and perform CPR. Experimental and clinical studies have provided conflicting results about whether survival outcomes differ between CPR instruction that includes just chest compression, or chest compression plus rescue breathing. Both types of instruction are approved by the American Heart Association and are practiced in Washington state.

The Dispatcher Assisted Resuscitation Trial (DART) compared these two types of approved, emergency dispatcher CPR instruction to determine if one approach produces better survival for adult persons suffering cardiac arrest. The study results presented at the 2009 American Heart Association Resuscitation Session indicated that chest compression alone was at least as beneficial as conventional CPR. Given the challenges the public might experience with administering rescue breathing, the findings support a more streamlined CPR approach for layperson treatment of adult cardiac arrest. The results strengthen a CPR strategy that emphasizes chest compression and minimizes the role of rescue breathing.

Rea TD, Fahrenbruch C, Culley L, Donohoe RT, Hambly C, et al: CPR with Chest Compression Alone or with Rescue Breathing. New Engl J Med 2010; 365: 423-433.

EFFICIENCIES

5. Supporting Public Health with Emergency Responders (SPHERE)

The SPHERE program maximizes the role of EMS providers as public health educators by having them identify patients with specific medical conditions, and connect them to appropriate resources. It challenges the conventional model of pre-hospital care by recognizing that EMS does not need to be limited to the treatment of current medical emergencies, but can include the identification of persons at risk for future adverse health outcomes. SPHERE has been featured in EMS trade journals, and many EMS systems across the county have adopted similar programs.

At its inception, SPHERE was designed to identify persons with potentially under-treated hypertension or diabetes. In 2010, the EMS Division expanded the inventory of health topics to include falls in the elderly, and worked with EMS providers to revise the medical incident report forms to better provide information to patients.

Projects that target specific users of EMS, like SPHERE, provide more appropriate patient care and contribute to the overall efficiency of service delivery.

Continued from page 16

certified, two of which are interventional airway management (intubation) and intravenous line placement. Each time one of these difficult and precise procedures is performed, supplemental information detailing event circumstances, challenges, and remedies experienced must be submitted to the Medical QI section for intensive review. This ongoing quality assurance activity documents skills required for paramedic certification with benchmarking system procedure performance.

6. Resuscitation Academy

The EMS Division and Seattle Medic One, in collaboration with the Medic One Foundation, developed the Resuscitation Academy to share local strategies for success and enable other communities to improve their cardiac arrest care and survival rates. Managers and directors of EMS systems from around the country enroll in a mini-fellowship program that extends over a year. Through pre-course work, an intensive week of lectures and site visits, and targeted projects mentored by Academy faculty, participants learn the skills to make meaningful changes in their own communities using the information, tools, and network of support of the Academy.

Mickey Eisenberg, MD lectures at the 2010 Resuscitation Academy.

The Resuscitation Academy has been in operation for three consecutive years, and has met with tremendous enthusiasm and success. Due to a growing list of interested applicants, it now offers two yearly sessions. For more information on the Resuscitation Academy, visit www.resuscitationacademy.org.

7. EMT Advisory Council

The success of the regional EMS system relies heavily upon strong partnerships and collaboration between the EMS Division and EMS personnel. To strengthen these connections, the EMS Division created the EMT Advisory Council (EMTAC) which meets quarterly to engage field providers in shaping policies, programs, research designs, and day-to-day service interactions. Working together, the aim is to continuously improve the care experience for all patients and providers. An excellent example of such collaboration is EMTAC's valuable input on the revised 2010 SPHERE patient education material. (see Efficiency: SPHERE on page 18)

8. Limited English Proficiency (LEP) Callers: Challenges for Emergency Medical Dispatch/ Communication and Limited English Proficiency for Victims of Cardiac Arrest

King County EMS is identifying barriers and challenges experienced by LEP callers when calling 9-1-1, such as difficulties communicating with dispatchers, and understanding instructions for administering bystander CPR. Local studies started in 2009 and 2010 will evaluate the frequency of all calls from LEP callers, the recognition of cardiac arrest, the timeliness of CPR instruction, and bystander CPR performance. This will be assessed through focus groups in Chinese and Spanish languages to learn more about cultural barriers to performing CPR. Additionally, experiments testing revised CPR instructions to determine whether they result in higher quality CPR performed by both LEP and native-English speaking bystanders will be conducted. If results indicate the revised instructions are more effective for both English and limited-English speaking callers, they will become the new standard used by King County emergency dispatch centers.

9. Socioeconomic Status/Understanding the Relationship of Socioeconomic Status and Survival from Out-of-Hospital Cardiac Arrest

A core concept of pre-hospital emergency care in King County is universal access - the EMS system strives to deliver consistent and expert care across the region, regardless of community or individual characteristics. Lower socioeconomic status has been related to poorer health outcomes for a number of health conditions. Currently in the evaluation stage, this study will assess the relationship between traditional socioeconomic status characteristics and survival from cardiac arrest in King County. Efforts to better understand this relationship are important in addressing health disparities and improving health. If lower socioeconomic status is linked to poorer cardiac arrest survival, EMS may want to direct efforts to improve the links in the chain of survival for particular geographic or demographic groups in the community.

PHOTO COURTESY OF DOUG BULGER & THE MEDIC ONE FOUNDATION

Seattle paramedics work on a patient suffering cardiac arrest.

10. Long Term Outcome of Pediatric Cardiac Arrest

Out-of-hospital cardiac arrest is a rare event in children, and little is known about best treatments

or outcomes. EMS is partnering with area hospitals to better understand the long term implications for children resuscitated from out-of-hospital cardiac arrest. The results will help guide care and expectations for families whose child suffers a cardiac arrest. In 2010, identification of all pediatric arrests, review of the medical incident report forms completed by EMS responders at the scene, and the creation of a study database were completed.

11. Cardiac Arrest in Exercise Facilities

In 2010, the Medical QI section, in partnership with Seattle Medic One, continued its study of cardiac arrest at exercise facilities in Seattle and King County to determine the frequency and characteristics of these events. The study includes an evaluation of the impact on-site AEDs have on survival from cardiac arrest. Data collection was completed in 2009 and the study is currently in the data analysis stage. The EMS Division hopes the data from this study will be used to assist planning efforts for medical emergencies at exercise facilities.

12. Antiarrhythmics Used in Cardiac Arrest

A. Antiarrhythmic drugs such as lidocaine are typically administered to patients by EMS to promote the return of an organized cardiac rhythm with shock, though with little documented evidence of clinical benefit. This year, the Medical QI section completed an evaluation of the use of prophylactic lidocaine by paramedics in King County. The aim of this study was to determine whether the prophylactic administration of lidocaine for the prevention of Ventricular Fibrillation/Ventricular Tachycardia (VF/VT) reduces the frequency of recurrent ventricular arrhythmias and improves survival after out-of-hospital cardiac arrest due to VF/VT. Findings will be published in the near future.

B. Procainamide remains a second-line antiarrhythmic agent used when other antiarrhythmic interventions and defibrillator shocks fail to terminate shock-resistant out-of-hospital ventricular fibrillation. However, its efficacy under these circumstances is unknown. The sum of the world's published literature on the use of procainamide in cardiac arrest is limited to only 20 hospitalized patients, with no published experience in the setting of out-of-hospital cardiac arrest. A recently completed and published comprehensive survey from King County's cardiac arrest surveillance system has significantly expanded this knowledge base and provided valuable insight as to the drug's potential value as well as limitations.

A paramedic kit ready for use.

13. Police Defibrillation Pilot Program

Summary: HIGHLIGHT PAGE 21

14. EpiPen Use by EMTs

The EpiPen is a medical device used to deliver a measured dose of epinephrine (also known as adrenaline) most frequently for the treatment of acute allergic reactions to avoid or treat the onset of anaphylactic shock. The Medical QI section is analyzing EMTs' use of the EpiPen in King County. Data collected will help us evaluate several important issues surrounding patient safety and EMT training.

PHOTO COURTESY OF PHILIPS HEALTHCARE

13. POLICE DEFIBRILLATION

Out-of-hospital sudden cardiac arrest is a substantial public health challenge, accounting for approximately 10% of total mortality in North America. Efforts to improve resuscitation of a patient in sudden cardiac arrest rely on early defibrillation, with each minute of delay in providing a defibrillation shock leading to a 10% decrease in survival.

Bellevue Police Officer trains in CPR.

Background

Studies and practice have shown that the sooner defibrillation is provided to cardiac arrest patients, the higher the survival rate will be. Efforts aimed at providing early defibrillation have typically involved equipping EMS and the lay public with defibrillators. Law enforcement, although fiercely committed to public safety, has not traditionally been included in sudden cardiac arrest (SCA) resuscitation efforts. However, results from a handful of communities - most notably Rochester MN – led the EMS Division to begin a pilot project that adds police to its “chain of survival”, making them “first responders” to cardiac arrest calls.

Objective

The two-year Police Defibrillation program provides police in King County with basic cardiopulmonary resuscitation (CPR) skills and automated external defibrillators (AEDs). The program will determine whether dispatching police to begin patient resuscitation more quickly improves survival rates for SCA. The Bellevue and Kent Police Departments were selected as pilot communities for this project, and initiated their programs in early to mid 2010. Officers participating in the program received training in using the AEDs, which are being provided by Philips Healthcare.

Evaluation

These two communities will be matched with two other communities which do not have Police AED programs. The EMS Division believes that Police AED cities will have police providing the first defibrillatory shocks for 25% of Ventricular Fibrillation cardiac arrest patients and approximately 60% of those receiving police shocks will survive to hospital discharge. Should the project prove successful, the EMS Division will recommend that the Police AED program be implemented countywide.

MEDICAL QUALITY IMPROVEMENT, continued

15. Vital Signs by EMTs

The classic vital signs of blood pressure, pulse, respiration and temperature have been the backbone of EMS since its inception. Maintaining consistent standards around how this information is collected and recorded is essential to delivering excellent patient care. Data collected on this topic will drive upcoming EMT training curricula.

COMPLETED PROJECTS

16. Public Access Defibrillation in Out-of-Hospital Cardiac Arrest

This study was completed in 2009.

17. Aspirin Use by EMTs for Acute Coronary Syndrome

This pilot project was completed in 2007.

18. Bystander Chest Compressions for Non-cardiac Arrest Pre-hospital Patients

This project was completed in 2008.

19. EMS Quality Improvement (QI) Forum

This forum was dissolved in 2009. EMT QI is now being addressed through the EMT Advisory Committee.

20. Proficiency of EMTs and Paramedics in Making Disposition/Treatment Decisions for Patients with Acute Coronary Syndrome

This project ended in 2009.

21. Evaluating the Scope of Practice: Glucagon

This activity was completed in 2009.

For more information on Medical QI projects, please refer to the EMS annual reports. http://www.kingcounty.gov/healthservices/health/ems/reports.aspx

BASIC LIFE SUPPORT (BLS) TRAINING & EDUCATION

OVERVIEW: *The EMS Division provides initial training, continuing education, instructor education and oversight of the recertification process for over 4,500 Emergency Medical Technicians (EMTs) in King County. Through considerable coordination and communication among EMS stakeholders, it develops the curricula that ensure the training and education programs meet agencies' needs and Washington State requirements. It also acts as the liaison between the Washington State Department of Health and the 30 EMS/fire agencies in King County, relaying continuing education, certification, and regulatory and policy changes to EMS agencies. The following highlights current BLS Training and Education Projects.*

PROGRAM INDEX

1. Patient Care Guidelines

These protocols are the foundation of EMS training. The EMT Patient Care Guidelines are also known as the "Blue Book" and outline the standards for providing pre-hospital care of patients. The 2010 EMT Patient Care Guidelines were published and distributed in the first quarter of 2010. The next update will take place in 2013. The Paramedic Patient Care Guidelines, written in cooperation with the University of Washington/Harborview Medical Center Paramedic Training Program, offers a countywide approach to paramedic-level treatment and medications. These Guidelines will be updated by the Training Section at the end of 2010, making them ready for distribution to paramedics throughout King County in early 2011.

2. EMT Initial Training

Training courses are offered in the spring and fall, and open to personnel from all fire/EMS

agencies in King County. Each course consists of 132 hours of classroom and practical instruction in addition to 10 hours of hospital observation time to ensure EMT certification is in accordance with Washington State regulations. In the spring of 2010, close to 50 EMTs completed the EMT Basic course, and similar numbers are expected for the fall course. Recognizing that fire departments have requirements specific for each agency, the EMS Division sponsors EMT classes that fall outside the standard course structure, but still meet the mandated state requirements. This type of partnership ensures the agency needs are met, and EMS standards are maintained.

3. Competency Based Training (CBT)

The State of Washington mandates that EMTs complete both didactic and practical skill continuing medical education and evaluation to maintain certification. In King County, the topics are prescribed by the Medical Program Director and include five annual modules on various emergency medical topics, a total of fifteen modules in a three-year recertification cycle. In aggregate, this program is referred to as Competency Based Training (CBT). The BLS Training staff develops, writes, performs instructional training and implements the curriculum each year.

EMTs use EMS Online to stay up to date with patient care guidelines

Every fall, the BLS Training Section holds over 20 CBT Instructor workshops to train the 500 instructor-evaluators who oversee the practical skills training. These day-long workshops cover topics in basic skills, new techniques, protocol updates and instructional delivery. For the Fall 2010 trainings, EMS will consolidate the workshops to be more cost effective and efficient. EMS will also utilize its quality assurance video to assess evaluators' strengths and weaknesses, the results of which will be used to ensure fall workshops target the correct areas of study.

4. EMS Online: HIGHLIGHT page 24

5. EMT Defibrillation Quality Assurance

Early defibrillation is still the first-line treatment for witnessed ventricular fibrillation (VF). Used in conjunction with cardiopulmonary resuscitation (CPR), it is a key component in the treatment of individuals suffering a cardiac arrest. In King County, all resuscitations that occur are evaluated in detail, with the gathered information used to provide feedback to each EMT and their training officers. This data is used for improved EMT resuscitation training.

Success of an EMS system is often based on its ability to resuscitate patients from sudden cardiac arrest. The most recent EMS data in King County indicate a resuscitation rate of nearly 50% of patients suffering a witnessed arrest due to VF. The ultimate goal is to improve survival from cardiac arrest for the regional EMS system's end-users - King County residents, work force and visitors. To help reach this target, EMS will expand its quality assurance to include placing evaluators in the field to witness actual defibrillator use. Their feedback on patterns and behaviors will help EMS deliver improved defibrillator education.

For more information on BLS Training & Education, please visit: http://www.kingcounty.gov/healthservices/health/ems/training.aspx

4. EMS ONLINE

29 CME classes are available to the 12,000+ EMTs (100% of the 4,466 EMTs in King County) enrolled in the EMS Online program. This technically-savvy approach to continuing education uses current web-based technologies (blogs, interactive activities and streaming video) and allows EMT access to training modules any time of day or night. BLS Training staff provide technical support for the website and support an instructor hotline for questions about the courses and treatment protocols. Interactive enhancements are being made to the system as part of the EMS Online Strategic Initiative (see page 52).

The EMS Online website was originally designed for local area training, but is now being used for continuing education/recertification in numerous other states and British Columbia. It was recently adopted by the Navy NW (Department of Defense) and approved by the Department of Homeland Security as appropriate educational content for certified EMS providers. Additionally, several organizations have contracted with the EMS Division to host courses and deliver instruction through EMS Online, such as the Northwest Stroke Regional Network, the Resuscitation Outcomes Consortium and Whatcom County EMS. Such national interest in this program shows that the EMS Division's combination of online learning and verified in-person skill checks is proving to be a very popular model for training.

EFFICIENCIES

EMS Online and RETRO offer two excellent examples of how the development of projects that incorporate advancements in technology offers a variety of opportunities for improved efficiencies in the EMS system.

A. EMS Online:

The EMS Online teaching website offers significant efficiencies, ranging from scheduling ease to cost savings. The website allows the EMS Division to reach a large audience in a way that is convenient for students and instructors alike. Its 24 hours a day/7 days a week access accommodates fire fighters' varied schedules, which traditional classroom training can't. It promises consistent and standardized content delivery, providing EMTs across King County and the state with the same presentation and course work. It allows time sensitive information (pandemic flu, recalls) to be distributed to its thousands of users easily and quickly. Its $18/EMT per year cost, as opposed to $133/EMT per year standard classroom cost, yields a dramatic reduction for training expenses for the 30 EMS agencies in King County. Its expansion for use by other cities and agencies generates revenue to the EMS Division.

B. Regional EMS Tracking Resource Online (RETRO):

The RETRO Database, developed during the 2002-2007 levy, has led to great efficiencies in the realm of data quality, management and retrieval. With its integration into the BLS Training Section as an ongoing program, the EMS Division is able to store, track and access essential information related to EMS personnel across King County. To date, RETRO has over 34,500 electronic record sets documenting dates and requirements related to certification and recertification, reciprocity, practical skill set completion certification, and teaching certification requirements.

CENTER FOR THE EVALUATION OF EMS (CEEMS)

OVERVIEW: *The Center for the Evaluation of Emergency Medical Services (CEEMS) is a multidisciplinary collaborative research program that conducts grant-funded research studies aimed at improving the care and treatment of sudden cardiac arrest and other life-threatening emergencies. CEEMS is a collaboration between the University of Washington and the EMS Division. Its collective work has shaped resuscitation science and prehospital emergency care through thoughtful research. As such, it has attracted funding from private foundations, state agencies and federal institutions such as the National Institutes of Health and the Centers for Disease Control and Prevention.*

PROGRAM INDEX

1. Resuscitation Outcomes Consortium (ROC)

The Resuscitation Outcomes Consortium (ROC), consisting of 10 communities across North America and Canada (including Seattle and King County), evaluates pre-hospital management and treatment of cardiac arrests and traumatic injuries. ROC is supported by the National Heart, Lung and Blood Institute (NHLBI) for another six years.

2. ROC – Prehospital Resuscitation Using an Impedance Threshold Device and Early versus Delayed Rhythm Analysis (PRIMED)

This trial studied two interventions in out-of-hospital cardiac arrest: (1) analyze early - 30 seconds of EMS CPR before first rhythm analysis and shock or analyze late (3 minutes of EMS CPR prior to the first rhythm analysis and shock); and (2) the use of an impedance threshold device (ITD) designed to improve blood flow during CPR in subjects with out-of-hospital cardiac arrest. Approximately 11,500 cardiac arrest patients were enrolled in the PRIMED study, which concluded in November 2009. Preliminary analysis showed that both CPR timing strategies were equally effective, and the ITD use did not significantly improve or worsen survival rates for cardiac arrest patients. A proposal for a new randomized clinical trial to study how effective certain medications are in the treatment of cardiac arrest is under review by the NHLBI.

3. Home Automated External Defibrillator Training of High-Risk Patients

The At-Home Automated External Defibrillator Training Study evaluated four different training approaches in the use of an automated external defibrillator (AED) for family members of high-risk patients. Funded by the National Institute of Health, it studied 300 couples to determine which approach achieves optimal skill performance and retention of skills. Preliminary results indicate that learning to use a home AED can be successfully achieved by any of the four approaches tested: 1) video training, 2) video training + practice packet, 3) in-person home training + practice packet, and 4) in-person home training + practice packet + resource assistance. Findings from this study will influence how the EMS Division provides training for this life-saving skill.

4. Program to Integrate Technology and Cardiac Arrest Resuscitation

In 2009, the Life Sciences Discovery Fund Authority supported a new program to improve the use of technology in resuscitation. This program is a set of interrelated projects that span the links in the "chain of survival,' i.e. early activation of emergency care, early CPR, early defibrillation and timely advanced life support measures. Currently in its second year, the program continues to engage a group of working members who meet regularly to review progress, set priorities, and advance individual projects.

5. Mentorship

Every year, affiliated clinicians and researchers such as medical students, physicians and EMS professionals, are provided a unique opportunity to participate in a research project under the mentorship of CEEMS staff. A number of peer-review publications and a wealth of analyzable data have resulted from this worthwhile program. This opportunity often advances scientific understanding, has implications for emergency care, and provides an instructive experience for all those who participate.

6. VF Waveform Library HIGHLIGHT (see below)

SUMMARY:

As CEEMS moves forward, there is substantial opportunity to make important new discoveries in resuscitation science as well as improve translation of scientific understanding to achieve better field-based, clinical care.

PROGRAM HIGHLIGHT

6. VF WAVEFORM LIBRARY

Cardiac arrest is a condition where the heart suddenly stops pumping blood, often occurring because of an abnormal electrical heart rhythm called ventricular fibrillation (VF). The most effective treatment for VF is early defibrillation, or the delivery of an electrical shock.

King County emergency medical technicians (EMTs) carry AEDs that they attach to the chest of a patient in cardiac arrest. The AED analyzes the heart rhythm and electronically records and stores the graphic recording of the electrical heart rhythm, or electrocardiogram. If the rhythm is VF, the AED will instruct the rescuer to deliver a shock.

The stored electrocardiogram is downloaded to a "library" where it can be quantitatively measured and analyzed. The data will help determine whether certain characteristics may predict the outcome from cardiac arrest, and how different treatments or combination of treatments could improve resuscitation and survival. The VF waveform library consists of hundreds of recordings and provides a rich and growing repository of information that may improve care for cardiac arrests.

A heart rhythm tracing showing ventricular fibrillation.

For more information on CEEMS, please visit: http://www.kingcounty.gov/healthservices/health/ems/ceems.aspx

Secondary VF: Some resuscitations begin with the heart in ventricular fibrillation (primary VF), while others begin with a different arrhythmia, such as asystole, pulseless electrical activity, or ventricular tachycardia, and then convert to VF later during the resuscitation. These cases are termed secondary VF. How these cases differ from those that initially present in VF is not well understood. By utilizing the VF Waveform Library, a better understanding of the underlying pathophysiology of secondary VF may help direct resuscitation care in the future.

Beta-Blockers and VF: This project aims to better understand how chronic medications such as beta blockers affect the heart in VF and if they produce a kind of VF that responds to a shock better or worse than patients not on these medications. This type of knowledge may help tailor care to the individual patient.

CPR AND PUBLIC ACCESS DEFIBRILLATION

OVERVIEW: *Cardiac arrest is one of the most life threatening of all pre-hospital medical emergencies. Numerous clinical studies have demonstrated that patients who receive early cardiopulmonary resuscitation (CPR) and early defibrillation have a significantly improved chance of survival from cardiac arrest. The EMS Division has a number of programs to provide CPR and Automated External Defibrillators (AED) training to residents of King County.*

1. King County Student CPR/AED Program:
HIGHLIGHT page 28

2. Community Responder Defibrillation Program

This joint effort between the Seattle Fire Department and Public Health - Seattle & King County promotes Public Access Defibrillation (PAD) in the community. The EMS Division provides advice to residents on purchasing, training, placement consultation and registration of AEDs. It also supports the PAD Registry database for both Seattle and King County, which links to dispatch systems and shows the availability and location of AEDs. There are 2,331 AEDs currently registered in this program throughout the region. In 2010, the name of the program was changed from Seattle-King County Community Responder CPR-AED Program to Community Responder Defibrillation Program.

3. Regional Approach to Municipal Public Access AED Registry and Training (RAMPART):
HIGHLIGHT page 29

AEDs are placed all over King County in public locations like schools, businesses, and sports facilities.

2,331 AEDs REGISTERED

For a complete version of the map above, see page 77.

PROGRAM HIGHLIGHT

1. King County Student CPR/AED Program

SUMMARY: *This program trains secondary school students (grades 6-12) in King County to perform CPR and use Automated External Defibrillators (AEDs) in American Heart Association approved classes taught by their teachers and local firefighters. During the 2009-2010 school year, 10,259 students were trained in life saving CPR/AED skills. A major component of this program is the CPR Train-the-Trainer program that instructs school teachers and fire department personnel to provide training for the school program.*

Many schools in King County have AEDs accessible for public use hanging on the walls within elementary, junior high and high schools. There are currently 291 AEDs located in public schools registered in the King County Public Access Defibrillation Registry.

CASE STUDY

Elementary School Teachers Assist in Life-saving Effort

It was a normal recess on Wednesday, May 12, 2010, at Horizon Elementary School in Kent at 11:24 AM, when suddenly a 12 year old boy playing ball on the playground fell forward lying on his stomach on the concrete. When the staff checked him they found he had no pulse and was not breathing - twelve year old Austin Glenn was in cardiac arrest.

9-1-1 was called while two of the school teachers immediately began CPR until the Kent Fire Department arrived. EMTs and South King County Paramedics took over CPR and shocked the patient. Austin was air lifted to Children's Hospital in Seattle where he made a full recovery.

With help from quick acting teachers, Kent Fire Department EMTs and King County Paramedics saved Austin Glenn's life.

3. Regional Approach to Municipal Public Access AED Registry and Training (RAMPART)

Background

Research has demonstrated that rapid defibrillation after cardiac arrest is the most critical factor for improving survival. AEDs placed in high incidence/high risk locations provide a greater opportunity for citizens to act as Community Responders and provide CPR and defibrillation prior to the arrival of EMS units. Trained responders, public education programs, and accessible AEDs are the key to King County having one of the highest survival rates in the world.

Objective

The EMS Division, in partnership with five selected local municipalities, initiated RAMPART in 2010 to pilot strategies that improve and enhance the existing King County Public Access Defibrillation (PAD) Program. The goals of RAMPART are to 1) expand the King County and city PAD programs by increasing the number of AEDs in the PAD Registry used by EMS and dispatch agencies as required by state law; 2) provide incentives and guidelines for purchase and best placement of AEDs in high risk/high incidence locations; and 3) promote AED training (related to a legal requirement) for the workforce of King County and project cities.

The cities of Kent, Renton, Burien, Shoreline, and Woodinville, along with King County, participated in the first year of the pilot. They received funding, based on the number of employees and the number of registered devices currently in the PAD Registry, for purchase of AEDs and the training of employees. The EMS Division maintains the PAD Registry and cities were encouraged to seek out and identify unregistered AEDs in their community. Tasks undertaken by the EMS Division include preparing and distributing a public awareness/fundraising presentation for use by cities, assisting with identifying critical locations and placement criteria, and supplying information about equipment purchase using a Washington state contract.

An AED demonstration shows proper pad placement.

Evaluation

During the first year of the pilot, 1,343 employees were trained in CPR/AED, and 26 AEDs were placed in public locations. An additional 27 AEDs were located and registered in the PAD Registry. Such encouraging results has led the EMS Division to consider enrolling five more cities into the program for 2011.

This project complements the 2008-2013 Strategic Initiative promoting Public Access Defibrillation and increasing AED registration through public awareness. Funds are available for a public awareness campaign focused on citizens and private business. Please see page 51 for more information on this Strategic Initiative.

For more information on this and other CPR/Public Access Defibrillation projects, please visit: http://www.kingcounty.gov/healthservices/health/ems/community.aspx

CRITICAL INCIDENT STRESS MANAGEMENT

The King County Critical Incident Stress Management (CISM) Program

This program exists specifically to help emergency services professionals (ESP) cope with occupational-caused stress. In 2009, law enforcement agencies across the region suffered significant psychological trauma from the on-duty murders of six police officers; this level of violence against this emergency services profession had never been seen before in the Pacific Northwest. The 18-member CISM team of mental health professionals and volunteers trained in crisis intervention was there to provide intervention services, education and resource support for those who needed it.

Not all trauma is incident specific, and ESP have turned to CISM for assistance working through the stressful impacts resulting from the economic downturn. They, too, have been personally impacted with increased workload for some and reduction in force for others, including furloughs. To help expand resources available to ESP, the EMS Division recently partnered with the City of Seattle Police Department Peer Support Program to provide training on stress reduction techniques. For more information on this and other CPR/Public Access Defibrillation projects, please visit: http://www.kingcounty.gov/healthservices/health/ems/community/cism.aspx

FACTS

- **18** CISM Volunteers (mental health professionals and peer support debriefers)
- **28+** incident specific requests in 2009
- **325** volunteer hours contributed in 2009

EMERGENCY MEDICAL DISPATCH

OVERVIEW: *Dispatchers play a vital link in the EMS continual "Chain of Survival", as the first point of contact with the public. They are trained by the EMS Division in Criteria Based Dispatch, which uses specific medical criteria, based on signs and symptoms, to send the proper level of care with the proper urgency - this allows critical medical conditions to receive an ALS response and less critical conditions to receive a BLS only response. Dispatchers also provide pre-arrival instructions for most medical emergencies, and guide the caller through life-saving steps – including Cardiopulmonary Resuscitation and Automated External Defibrillator instructions - until the Medic One/EMS provider arrives.*

PROGRAM INDEX

1. Criteria Based Dispatch (CBD) Training

The EMS Division oversees the basic training of dispatchers from four communication centers. The teaching is participant-centered with simulation exercises, and enhanced with greater scenario-driven content. The 32 hour Basic Course content focuses on body system pathology

(pathophysiology), signs and symptoms of 26 chief complaints, and pre-arrival instructions, including all emergency instructions and identifying and treating sudden cardiac arrest.

2. CBD Continuing Education

King County dispatchers must complete eight hours of Continuing Education to remain informed on system-wide trends and new emerging medical standards of patient care. At least half of these credits can be obtained via EMS Online, which is a web-based format accessible 24 hours a day right from dispatcher consoles. The EMS Online training is supplemented with in-classroom instruction which allows students to ask questions and apply what was learned online to specific scenarios and guided group discussions.

The EMS Division is constantly raising the bar in dispatcher medical education by developing even more challenging online courses, and through the construction and delivery of more complex scenarios.

3. Emergency Medical Dispatch (EMD) Quality Improvement (QI) Program

The QI program allows the EMS Division to identify issues and system-wide trends that are then used to develop courses for individual training and continuing education opportunities. By reviewing call audio and records, feedback and specific training can be provided to the individual dispatcher, ensuring excellent patient care, better management of ALS services, and helping limit future risks.

2010 was dedicated to trend identification and criteria review for revising CBD Guidelines, as well as continued case review. Since implementing a new QI process, the dispatchers receive more timely feedback specifically related to their job performance.

Recognized as a leader in the field of dispatch training, the EMS Division participates in statewide and nationwide conferences. In 2010, EMS presented three concepts at the Washington State Chapter of APCO (Association of Public Safety Communications Officers) conference that emphasized Dispatcher Assisted CPR, limited English speaking caller challenges, and diabetes-focused continuing medical education.

For more information, please visit: http://www.kingcounty.gov/healthservices/health/ems/community/emdprogram.aspx

4. EMD AWARDS

The EMS Division is honored to recognize the outstanding and critical work of its partners, the 9-1-1 emergency medical call-receivers and dispatchers in King County. The 2010 award winners are Britney Goll and Janice Adams from Valley Communications, and Sue Schutz and Sandy Hogue from NORCOM. Ms. Goll and Ms. Schutz received the award for sustained exemplary performance throughout the year. Ms. Adams and Ms. Hogue received their awards for exemplary handling of a critical Emergency Medical Services Incident. Ms. Adams received her award for her expert and quick identification and response to a reported cardiac arrest. Ms. Hogue was honored for her ability to quickly begin CPR for an infant who was not breathing and her empathetic and nurturing treatment of the mother.

Sandy Hogue (l) and Sue Schutz (r), NORCOM

Janice Adams (l) and Britney Goll (r), Valley Communication

2010 FACTS*

- 4 dispatch agencies in King County
- 190+ dispatchers in King County
- 34 dispatchers completed Basic EMD Training
- 180 dispatchers were provided 8 hours of CME each
- 2700 cases reviewed for quality improvement

*excluding the City of Seattle

EFFICIENCIES

The EMS Division continually seeks strategies that address the demand for services and encourage system efficiencies. The following programs work together as a multifaceted approach to improve the dispatching of EMS personnel to help reduce the demand for paramedic response, and use resources in an efficient and thoughtful manner.

Nursing Home/Adult Care/General Medical Clinic Facilities

When the EMS Division recognized that nursing homes and adult care facilities were calling 9-1-1 with non-emergency concerns (a delayed response from a private ambulance regarding patient transport, or confusion about a patient's care), it worked with regional ALS providers to initiate a program to educate facilities personnel about the appropriate use of EMS services. A video provides facility staff with information on the EMS tiered response system and how it works, assists facility staff in getting the level of EMS response that is appropriate for the patient, and prepares facility staff about what to expect during the 9-1-1 call. A job aid card alerts facility staff to what specific information they should provide the dispatcher when calling 9-1-1. King County's innovative approach to managing demand for services has garnered much attention and acclaim across Washington State, sparking fire agencies outside the region to request EMS's assistance in developing similar initiatives in their communities. As such, the EMS Division will collaborate with skilled nursing facilities, fire departments and the state with the goal of quality appropriate patient care.

Review/Revision of CBD (Criteria Based Dispatch) Guidelines (ALS Triage Criteria)

Every three years, EMS reviews the CBD Guidelines, which determine the level of care required by patients, to identify potential areas for dispatch revision that could safely limit the frequency with which ALS is dispatched. This process is very data driven and includes a review of call volume, cancelled alarms and requests for ALS from BLS crew at the scene. The results of this could be that calls that may have originally received an ALS response would no longer receive one. The ultimate objective with these revisions is giving the most appropriate response for the patient. The EMS Division estimates a reduction of approximately 9,000 calls over the 10 year span of 1998-2008, resulting in total cost avoidance of $49 million, from the reduction in call volume, due to dispatch initiatives.

CBD (Criteria Based Dispatch) Guidelines Software (eCBD)

The EMS Division developed software to automate the paper based Criteria Based Dispatch Guidelines. This software allows a significant amount of detailed 9-1-1 call data to be captured and available to supervisors and EMS administrators for quality improvement activities and planning. Versions of the software are currently utilized by three communications centers: Northeast King County Regional Communications Center (NORCOM), Enumclaw Police Department and Port of Seattle Airport Operations. A basic upgrade to the software is necessary over the span of the 2008-2013 levy and two additional CAD integrations will be developed at NORCOM and Valley Communications.

More information on these projects can be found in past annual reports: http://www.kingcounty.gov/healthservices/health/ems/reports.aspx

INJURY PREVENTION

OVERVIEW: *Injury is the leading cause of death for those under 45 years of age, while for the elderly, falls account for many hospitalizations. The EMS Division has invested considerable time and energy into building long term relationships with fire departments, community agencies and organizations that work toward the common goals of reducing injury and death through injury prevention and public education programs.*

Program Index

1. Child Passenger Safety & Used Car Seat Program

Child restraint systems are 71% effective in reducing deaths for infants in passenger cars. Every child safety seat saves $85 in direct medical costs and an additional $1,275 in other costs. The Child Passenger Safety & Used Car Seat Program aims to remove barriers to obtaining a child seat by providing free car seats, as well as car seat education, to low income pregnant mothers at six Public Health Centers. In March 2010, EMS trained 11 Community Health Workers to be certified car seat technicians. This allowed EMS to expand the program to now cover eight Public Health Centers. 315 clients received this education from July 2009 through June 2010, which generated more than $9,000 in revenue from Washington State DOH Maternity Support Services.

2010 also produced two new partnerships with EMS to further the goal of providing appropriate car seats to low-income families. EMS collaborated with the Washington State Safety Restraint Coalition to develop protocols for proper documentation in acquiring and distributing used car seats. A local retailer of high end car seats, Merry-Go-Round, will collect slightly used car seats for distribution through Public Health Centers to low-income families.

2. Think Again

The Think Again program educates teenagers on the consequence of drinking and driving. It focuses on seat belt use, drinking and driving, and road racing. The program was initially funded by seed money from the EMS Division to allow the fire departments to get the program started. It was taken over by the King County Fire and Life Safety Association and funded for several years by grants from the Washington State Traffic Commission (WSTC). WSTC stopped funding the program in 2006. Currently several fire departments still fund some elements of the program.

3. Smart Kids Safe Kids

The Smart Kids Safe Kids Program educates preschool teachers on fire and life safety issues – pedestrian, bicycle, poison, and scalds/burn safety. This program was funded with seed money from the EMS Division and was stopped because the preschool market was saturated with the materials. Preschool teachers were able to get State Training And Registry System credits which are mandated by the Washington State Department of Health. The results of a survey of teachers indicated they still have the information. The Seattle Fire Department still offers the program.

For more information on these programs, visit: http://www.kingcounty.gov/healthservices/health/ems/community.aspx

ADMINISTRATION

The EMS Division Administration Section is responsible for the management and coordination of divisional and regional activities in the following areas:

- Personnel
- Payroll
- Union negotiations
- Diversity management
- Mandatory training
- Implementation and management of policies and procedures
- Compliance and liability
- Contract administration and oversight
- Budget preparation and monitoring
- Long term financial planning
- EMS audit
- Planning and management of levy funds
- Regional purchasing
- Strategic Initiatives
- Disaster preparedness and planning

The EMS Division is located in the Chinook Building in downtown Seattle.

The Administration Section reviews all divisional contracts, including those with five Advanced Life Support (ALS) provider groups, and 30 Basic Life Support (BLS) agencies. The section is responsible for preparing the annual budget and monthly monitoring and projections, long term financial planning, participating in the EMS audit, and the management of levy funds. The Administration Section also coordinates services with other Public Health - Seattle & King County divisions, as well as other county agencies, councils and offices, including the King County Executive, Prosecuting Attorney, Risk Management, and the King County Council. The Division maintains close relationships with the University of Washington and Harborview Medical Center, and ongoing cooperation with local hospitals and medical providers. Rooted within Administration are the sections that supply integrated regional direction. Collaborating with county partners, the EMS Division provides quality data and planning, medical oversight, basic life support training, community training and education, and research. These dedicated professionals have a nationwide reputation for providing excellent service to the residents and visitors of King County.

King County Audit

Part of the 2007 Medic One/EMS levy approval package includes an annual review of the EMS fund conducted by the King County Auditor. The first audit, completed in 2009, focused on the systems and practices in place to manage the EMS fund effectively. Results were positive, with the Auditor concluding that the funds were being managed well and in accordance with the levy and Financial Plan, the assumptions were sufficient, and the EMS Division and providers complied with contractual requirements for using levy funds. What the Auditor noted was that the economic downturn presented unforeseen challenges to ALS providers, who experienced unique costs outside the unit methodology used for allocating levy funds. While the Financial

Plan included contingencies and reserves, the strict usage policies were preventing them from being applied toward such unique/one-time costs. Proposed recommendations include clarifying EMS fiscal policies and making EMS system costs more transparent. Also advised was the development of an approach to fund unanticipated costs experienced by ALS providers.

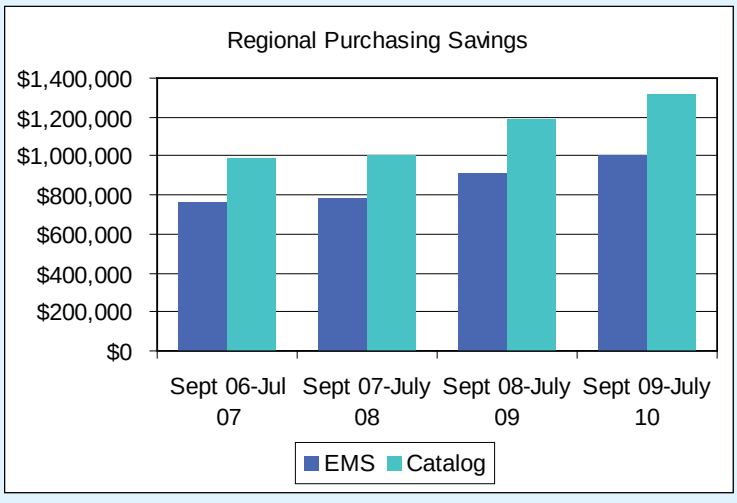
The results of the audit have given the EMS Division and its partners an excellent opportunity to reexamine and adjust financial policies to enhance management of EMS levy funds. Completed recommendations will be implemented via the annual budget process, and Executive policies and procedures.

The 2010 audit is currently underway, and will be submitted to the King County Council in September 2010.

EFFICIENCIES

Regional Purchasing Program

The Regional Purchasing Program is a voluntary countywide program designed to reduce supplies and equipment expenses by maximizing the joint purchasing power of EMS agencies. Initially a pilot project with a few select EMS agencies, the program has since operated on a regional basis allowing any EMS agency in King County to purchase EMS supplies and equipment using the regional contract. The program has since been expanded to create a separate regional medications contract. The program has consistently demonstrated significant cost savings to EMS agencies since the program was developed in 1998. Recent data comparing actual costs to catalog prices are reflected in the graph below, confirming the overall cost savings to the region.



2008-2013 STRATEGIC INITIATIVES

The Medic One/EMS 2008-2013 Strategic Plan contains specific Strategic Initiative projects designed to improve patient care, manage growth in paramedic services, and develop system efficiencies and cost savings. The following section describes the Strategic Initiatives that are currently underway.

Strategic Initiatives
Emergency Medical Dispatch Enhancements
- Complete CAD Integration
- Dispatch Center Performance Standards
- Advanced EMD Training
- Better Management of Non-Emergency Calls to 9-1-1
- EMS Efficiencies & Evaluation Studies
Injury Prevention
- Community Awareness Campaign
- Small Grants Program for BLS Agencies
- Expanded Countywide Falls Program
- Grant and Other Funding Opportunities
Public Access Defibrillation Campaign
Interactive Enhancements to EMS Online
Systemwide Enhanced Network Design (SEND)
All Hazards Management Preparation
EMS Efficiencies & Evaluation Studies
Strategic Planning for Next EMS Levy Period

More information on these projects can be found in past annual reports: http://www.kingcounty.gov/healthservices/health/ems/reports.aspx

SI: Dispatch Enhancements

The following four strategic initiatives are dispatch projects currently underway.

1. Criteria Based Dispatch (CBD)/Computer Aided Dispatch (CAD) Integration

The CBD Guidelines are the medically approved triage tool used by 9-1-1 dispatchers to determine the appropriate level of EMS response to send. The EMS Division previously developed software for the Criteria Based Dispatch Guidelines (eCBD) that is currently utilized by Northeast King County Regional Communications Center (NORCOM), Enumclaw Police Department and Port of Seattle Airport Operations.

A version of eCBD was integrated into the CAD system at Eastside Communications Center in 2007. When NORCOM took over providing dispatch services in north and east King County in July 2009, it purchased a new CAD system, requiring a new integration of eCBD for use by its dispatchers. NORCOM processes approximately 45,000 EMS 9-1-1 calls annually using the eCBD Software.

Objective

This project will integrate eCBD with the New World Systems CAD at NORCOM and will provide basic upgrades to the eCBD software. Objectives include:

- Developing a business partnership with NORCOM/New World Systems CAD Project Team;
- Organizing a Dispatch User Group to ensure eCBD functionality is aligned with call processing and interface with the new CAD;
- Completing development of the CBD/CAD Integration according to the NORCOM CAD implementation schedule; and
- Training all dispatchers in use of the new application.

Description

The project began in May 2010 after it was approved by the King County IT Governance, Project Review Board. It is expected to be completed in March 2011. A Dispatch User Group was formed at NORCOM and identified desirable upgrades to the eCBD Software. The eCBD/CAD Integration work will be completed by New World Systems and will begin in September 2010.

Results

In December 2008, the percentage use of the eCBD Tool was 80%. In June 2010, NORCOM used the eCBD software for call processing in 97% of all calls.

ANNUAL PROGRAM COST
Project Budget = $43,903
Expenditures YTD 2010 = $0

⇨ Integrated electronic tools assure more appropriate care will be dispatched, resulting in better EMS system effectiveness.

2. Dispatch Center Performance Standards

The EMS Division is implementing methods to strengthen the recognition for the role of communication centers in managing growth of EMS resources. Proper training and quality improvement practices are essential to maximizing this function.

Objective

This project creates a list of performance standards for communication centers in King County, outside the City of Seattle, and allocates funding to meet these standards, including participation in required training, quality improvement activities and data collection.

Description

In September 2008, the EMS Division convened EMS system representatives to develop criteria for communication center performance standards. Representation included the following:

1 ALS representative from each ALS provider (not including Seattle Medic 1);
1 BLS representative from Zone 1 and Zone 3;
1 (or more) representatives from each communication center;
Regional Medical Program Director; and
EMS Division representatives (Community Programs, Planning/Data)

The following performance standards and compliance criteria were established for implementation in 2009:

Performance Standards	Compliance Requirements
Use of CBD Guidelines Software (eCBD Tool) for Call Processing of EMS Calls	80% use of eCBD tool within 1 year of implementation
Training	100% Attendance at EMD Basic and Continuing Education courses, by all line employees/supervisors answering 9-1-1 calls
Data Completeness Standards Data elements fully populated in CAD and downloaded to RMS	Incident address – 100% Initial Dispatch Codes - 98% Alarm Time - 100% Aid/Medic Dispatch Times – 100% Geocode – 98%
Provide the EMS Division access to CAD reporting and audio recordings of 9-1-1 calls	100% access, unless technology or RCW restrictions apply (i.e. access to Police data)
Quality Improvement	Internal Communication Center QI Review of six EMS calls for each employee that answers 9-1-1 lines per calendar quarter

Results

Communication Centers are evaluated quarterly for compliance with each standard, and payments of performance funding are made for compliance with all standards. No payment is made for partial compliance.

In 2009, Eastside Communications (which became NORCOM 7/1/2009), NORCOM, Valley Communications and Enumclaw Police Dept. complied with all of the standards. In 2010, NORCOM, Valley Com and Enumclaw Police Dept. have met the standards for 1st and 2nd Quarter.

Approximate Cost (2009):	
Annual Budget	$300,163
Contracted funds to Centers	$246,444
Actual Contract Expenditures	$236,586
Misc & Indirect	$23,600
Total Expenditures 2009	$260,186
Approximate Cost (2010):	
Annual Budget	$327,796
Contracted funds to Centers	$241,181
Actual Contract Expenditures	$61,847 (YTD as of June 30, 2010
Misc & Indirect	$ 24,100 (Estimated)

⇨ Providing dispatchers and call-receivers incentives to improve their job knowledge and abilities assures more appropriate care will be sent, resulting in better EMS system effectiveness.

3. Emergency Medical Dispatch Advanced Emergency Medical Dispatch (EMD) Training

In this regional system, emergency medical dispatchers play a critical role in determining when paramedic units are sent, and a necessary role in referring minor, non-urgent calls to a nurse referral line. The EMS Division supports investing in the training and education of dispatchers to improve the effectiveness and efficiency of ALS dispatch in support of our tiered response system.

Topics for Advanced Dispatch Training include the following:

- The need to provide the dispatchers with opportunities to improve their understanding of cultural and language issues encountered in their daily operations;
- The desire to provide networking and more general exposure to public safety EMS issues; and
- EMS/9-1-1 courses, training and conference opportunities that already exist.

King County dispatchers participate in ongoing training to meet the challenges of their demanding job.

Objective

This strategic initiative will provide dispatchers and call-receivers with additional learning opportunities in-line with improving performance of their job tasks, knowledge, skills and abilities.

Emergency Medical Dispatch Advanced EMD Training (continued)

Description

The EMS Division uses designated funds to reimburse dispatch agencies with the costs, including salary and backfill, of sending EMDs to the following training courses:

QI / Feedback Course

Objective: Provide 9-1-1 center supervisors with guidance on providing EMD feedback to staff and dealing with QI issues that arise; understand the QI/Feedback process that occurs at the regional level and understand the consequences of undelivered feedback.

Basic EMD Course

Objective: Send dispatchers and call-receivers that have not been through the Basic EMD class in five years or more to complete the Basic class again. The focus of the course has changed drastically over the past few years and this will help those still operating with out of date material or misdirection from trainers.

Cultural Competence / Cross Cultural Communication Course

Objective: Help 9-1-1 personnel communicate more effectively with residents of diverse communities and provide them with a better understanding of the different cultures and barriers these residents may face when interacting with public safety.

EMS and 9-1-1 Conferences

Objective: Provide opportunities for 9-1-1 personnel to attend national, regional or local EMS and 9-1-1 conferences to obtain advanced continuing medical education for dispatchers and call-receivers.

Audit EMT Basic Course

Objective: Dispatchers audit the didactic portions of the EMT basic course in order to give them additional knowledge of anatomy and physiology.

Results

Appropriate use of ALS resources is dependent on the knowledge, skills, abilities and experience of the EMDs. The efficacy of the Advanced Training courses is evaluated through the EMS Division's extensive continuous quality improvement process as well as surveying the participants, trainers, supervisors and EMS Coordinator.

In 2009, six dispatchers attended the Quality Improvement course for supervisors, three dispatchers attended the didactic portion of the Basic EMT class, and two dispatchers attended the National APCO Conference. In 2010 to date, four dispatchers attended an "Undoing Racism" training, five attended the Washington State APCO conference, and two dispatchers will attend the 2010 National APCO Conference in Houston, TX.

Program Cost

$50,660.00

Providing dispatchers and call-receivers with opportunities to improve their job knowledge and abilities assures more appropriate care will be sent, resulting in better EMS system effectiveness.

4. Better Management of Non-Emergency Calls to 9-1-1 (two programs)

A tenet of Strategic Initiatives is to manage the rate of growth on the EMS system - unmanaged growth can negatively impact fire department response times, achievement of performance standards, and quality of patient care. While the EMS Division has effectively managed growth in ALS responses over the past several years, growth in BLS responses has averaged 2.8% per year since 2000.

Some EMS responses do not require a rapid response by BLS units, and in some cases, a response is provided because no lower level of medical aid is available in the EMS system. The following two strategic initiatives identify two potential alternatives to dispatching a BLS unit, which can help manage the stress placed upon the EMS system, and still provide the most appropriate patient care.

4A. Telephone Referral Program/Nurseline

In 2008, the EMS Division undertook an analysis of current methods and potential programs to serve non-emergency patients and callers, such as the Telephone Referral Program (TRP), 2-1-1 Resource Line, transport options, alternatives for chronic callers, public awareness, and the creation of a Community Medical Technician (CMT) response unit. The TRP, also known as the Nurseline, was identified as a program with significant unrealized potential. In place since 2000, transfers to the TRP averaged 720 calls per year, or less than 1% of BLS responses. Additionally, hundreds of calls each month identified as meeting Nurseline criteria were dispatched to Engines and Aid units instead of being transferred to the Nurseline. Because the units were handling low-acuity patients, they were potentially either not available or out of position for higher acuity medical incidents and fire calls.

Objective

Using the established Emergency Medical Dispatch (EMD) program, the EMS Division will address the issues and impacts of non-emergency medical calls on the EMS system. This will improve the management of EMS resources and the continued growth in demand.

Project

In November 2008, the EMS Division initiated a six-month Enhanced Rapid Dispatch (ERD) pilot project in south King County. Included in this project were improvements in Nurseline call processing and TRP continuing education modules for 9-1-1 dispatch staff at Valley Communications (VCC) and Eastside Communications (now NORCOM).

Results

- Countywide transfers to the TRP increased from the pre-2008 average of 720 calls per year to 2,122 calls in 2009, a 194% increase.
- Growth at VCC in south King County, using ERD protocols, was pronounced: from 0.82% of BLS calls the first 10 months of 2008 to a 2.81% average for 2009. Sendbacks (patients referred back to 9-1-1 for BLS dispatch) remained below 10%.
- Increased use of the TRP may have also contributed to a nearly 2% decline in BLS call volumes for 2009, the first such decline since 2002.
- ERD protocols have been approved as a permanent procedure in south King County and may eventually be

adopted in the north as well. The EMS Division will continue to review and implement further strategies to address non-emergency calls. Each patient served by the TRP saves an unneeded BLS response, providing a more appropriate level of patient care, and allowing for a more efficient using resources and EMS funds.

Approximate Cost (2010):

Evergreen Healthline (Nurseline)	$34,768
Dispatch fees*	$36,420
Total	$71,188

*Dispatch fees are actually a cost shifting to the EMS Division, since BLS would pay these fees if the call were not transferred to the nurse line.

⇨ Reducing the stress on the entire Medic One/EMS system by better managing non-emergency calls will help ensure the most appropriate care is provided, lead to a decrease of BLS calls (producing cost savings), and make units available for responding to calls, all resulting in better EMS system effectiveness.

4B. Community Medical Technician (CMT)

This initiative is a combined effort of two strategic initiatives, Better Management of Non-Emergency Calls (project staffing) and Efficiencies and Evaluation Studies (funding for CMT Units).

As BLS responses have continued to grow since 2000, nearly 1/3 of such responses are for lower acuity calls that don't require transport, but still need the care of an EMT at the scene. Yet, the primary BLS response unit for most fire departments is a 2-EMT transport-capable unit, or costlier 3-EMT non-transport fire engine. Not only is this expensive in personnel and vehicle/apparatus costs, but it makes those units unavailable for responding to patients with higher acuity and more emergent medical conditions.

A Community Medical Technician (CMT) may be a more promising response to non-emergency medical calls. Sent on lower acuity calls in non-transport capable units, a CMT would provide basic patient evaluation, patient assistance, specified BLS treatment at the scene, and arrange for transport if medically necessary. This would reserve other BLS responders and transport-capable vehicles for more serious medical emergencies.

The project intends to demonstrate a "proof of concept" model that can provide EMS savings in personnel costs, fire apparatus operating costs, deferred apparatus replacement costs, and management of low-acuity EMS call growth while providing a high level of patient satisfaction.

Project Objective

Deploy and evaluate a more cost and resource-efficient fire department response unit for low-acuity, non-emergent patients.

Description

On July 1, 2010, a six-month CMT pilot project began that deploys two EMTs in a light duty SUV to low-acuity, non-emergent patients. Kent Regional Fire Authority, South King Fire & Rescue, and Valley Communications Center are participating.

Results

The pilot project will be evaluated in a 2011 study approved by the University of Washington Human Subjects Institutional Review Board. The study group will determine if the pilot demonstrates:

- Potential for reduction in personnel costs
- Increased "in-service" availability of Aid units and Engines for higher acuity medical and fire calls
- Decreased response times for higher acuity medical and fire calls
- Intervention patient satisfaction equal to or better than non-intervention patients
- Potential for extending service life of apparatus, reducing maintenance costs, and deferring replacement expenditures.

Approximate Cost (2010)

EMT salaries	$142,758
Researcher/Data entry	$5,114
Misc & Indirect	$16,767
Total	$164,639

Kent EMTs prepare to respond to non-emergent calls.

Reducing the stress on the entire Medic One/EMS system by better managing non-emergency calls will help ensure the most appropriate care is provided, lead to a decrease of BLS calls (producing cost savings), and make units available for responding to calls, all resulting in better EMS system effectiveness.

SI: Injury Prevention

The following four strategic initiatives are injury prevention projects currently underway.

Falls are the leading cause of injury deaths for adults 65 years and older. Older adults who experience a fall are two to three times more likely to fall again within one year. For elderly persons who suffer hip fracture, half require being discharged to a nursing home, and more than a quarter die in the year following the injury.

In King County, there are more accidental deaths each year among adults 65 and older due to falls than there are deaths due to motor vehicle accidents among the same group. Because the cause of falls in the elderly is often multi-factored, successful strategies to reduce falls require a multidimensional approach to correctly address the pertinent individual risks. The EMS Division administers four strategic initiatives to eliminate or reduce unintentional injuries through a variety of collaborations with various community and public organizations to provide exercise programs to seniors; utilize mass media channels that specifically target seniors; and provide home/patient intervention and safety educational programs.

1. Community Awareness SHAPE UP campaign - www.kingcounty.gov/health/shapeup

Objective

When seniors choose activity programs that build strength, balance and flexibility, they significantly reduce their chances of experiencing a fall. Shape Up aims to get seniors (50+ in years) enrolled in physical activity programs at eight regional community/senior centers. The program is designed to attract seniors to participate in a group exercise class by providing them with a $10 discount coupon or a free class in hopes that the seniors will continue to participate in other exercise classes after their initial participation. Numerous group exercise classes are offered such as: yoga, in-line dancing, matter of balance, enhanced fitness, zumba gold, tai chi, fit N fun, and more.

Results

In 2009, four community/senior centers participated in the Shape Up program which began in September and ended in December. A total of 123 participants redeemed the discount coupon for classes in yoga, enhanced fitness, and body conditioning, where there were increases of up to 50%.

In December 2009, two focus groups of Shape Up participants were held to provide input for promotional strategies for the Shape Up program for 2010. Some key points are:

- Continue offering the $10 discount, as it is especially important for “first-timers” and may be their “tipping point”;
- Market the program through the community center newsletters, flyers at local libraries, senior housing, senior clubs and retail stores, and handouts at special senior wellness events;
- Highlight that, unlike exercising on your own, this is an opportunity to be with others and make new friends; and
- In terms of target audience, the “bulls-eye” appears to be those 65 – 75, especially those who have recently retired. This doesn’t mean that the 50-64 year olds should not be included; rather, it says that the most likely participants will be in this age group so this should be considered most prominently when developing and targeting communications and program offerings.

2009 Budget
Budget = $46,000.
Actual expenditure = $37,553

The current 2010 Shape Up program participation from January 2010 to March 2010 is 59% of the 2009 participation totals.

2010 Budget
Budget = $74,886.
Actual expenditure YTD Jan - May = $7,288

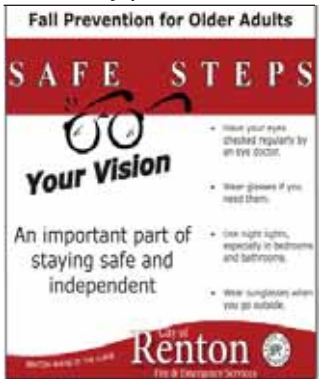
Developing interventions that eliminate or reduce unintentional injuries will reduce the need for an EMS response to an injury, lead to a decrease in BLS and ALS calls (producing cost savings) and make units available for responding to calls, all resulting in better EMS system effectiveness.

2. Fire Department Small Grant program

Objective
This program provides fire departments with an opportunity to fund a fall prevention program that must incorporate one or more of the four fall risk factors: exercise, vision, medication management, and environmental modification/education. Grant requests must be either a best practice or proven strategy supported by research, or a recommended and tried strategy with a strong evaluation plan that assesses the effectiveness of the project at its conclusion. All projects should be able to be duplicated by other fire departments. Funds can be used to address any of the above mentioned risk factors.

2009 Grants
In 2009, the following four fire departments submitted and were awarded grants.

Renton Fire Program Description & Results
Renton Fire Department (FD) participated in two educational senior health fairs at Valley Medical Center at which they promoted the importance of exercise and vision care. Renton FD worked closely with the Lions Club and Valley Medical Center's eye clinic to help visitors learn more about age related macular degeneration (AMD), Glaucoma and Diabetic Retinopathy from vision care specialists. Over three days, 94 total screenings were provided by the Lions Clubs. Approximately 72% of those screened were 60 year old or older, and 16 of those were given an "alert" to seek further assistance from a professional for either high blood pressure/blood sugar or vision concerns. In addition, Renton FD partnered with their senior center in hosting a walking event through the historical business sector of Renton.



Shoreline Fire Program Description & Results
Shoreline Fire Department (FD) partnered with the Shoreline/Lake Forest Park Senior Center to provide four Matter of Balance (MOB) classes that reached over 60 people. Of the 60 participants, all filled out before and after class surveys. Every student reported feeling more confident on their feet, more aware of the dangers of falling, and feeling healthier and in control. Many expressed relief at being able to do something about their

fear of falling. Shoreline held a “Say NO to Falls” event in December at the Senior Center where MOB and the Wii programs were promoted and publicized. It was billed as a “Wii Love Bowling” tournament where participants bowled competitively.

Shoreline FD is also working on a Home Intervention project and purchased risk reduction devices to be installed in 2010. Using firefighter reporting to find residents who had fallen and called 9-1-1, three individuals were identified who agreed to a home fall assessment and who accepted free risk reduction devices and educational material about fall prevention.

Bothell Fire Department Program & Results

Bothell Fire Department trained two firefighters to present eight community fall presentations to their senior populations, free of charge. 120 seniors and senior facility staff attended the presentations. Home safety checklists were distributed as a follow up to the presentations. Participants rated the class and the instructors on a scale of 1-10 (10 being the highest) an average of 9.5 for both the class and the instructors.

HIGHLIGHT

The 2nd annual ShapeUp Wii bowling tournament was a big hit with 40 seniors participating from six centers. Seniors from 60 to 84 years old joined in a half day event culminating in awards given to the three highest individual scores and overall team scores.

Three Matter of Balance classes were held at the Northshore Senior Center, Foundation House and Aegis of Bothell. A total of 30 people participated. Evaluation of participates showed that 88% tested improved or maintained number of chair stands in 30 seconds. 87% tested improved or maintained in the Get up and Go test.

King County Fire & Life Safety Association Program

The King County Fire & Life Safety Association (KCFLSA) Program sent three fire department public educators from Renton Fire Department, Fire District #44, and Kent Regional Fire Authority, plus two senior services employees to a two day Master Matter of Balance (MMOB) training. Fire personnel conducted one community training workshop.

2009 Budget

Budget = $55,458
Grants awarded = $38,808
Actual expenditure = $24,267

2010

Maple Valley Fire and Safety, Shoreline Fire Department, and Mercer Island Fire Department were awarded grants to fund their projects that addressed fall prevention.

Shoreline Fire Program

Shoreline Fire is partnering with the Shoreline Senior Center to provide a comprehensive outreach, education and fall risk reduction program to residents over the age of 65 who live independently. This program will target those who have not fallen, but are at risk because of age and fitness level through public presentations, public relations, and general marketing of the program.

Maple Valley Fire Program

Maple Valley Fire provides a multidisciplinary approach to addressing the issue of fall prevention by partnering with the Greater Maple Valley Community Center (GMVCC) to promote and provide community exercise programs through their 50+ Senior programming. The Fall Prevention program will offer a community education forum each quarter addressing issues that can increase the risk of falling.

Mercer Island Fire

Mercer Island Fire will reach out to seniors by providing community fall prevention presentations where off-duty fire department staff will provide these important safety presentations. During these presentations they will market Matter of Balance classes, and free home inspections. The goal is to offer eight fall prevention presentations with a minimum of 10 participants in each class. Pre/post evaluation of participants will occur at 2 and 6 months.

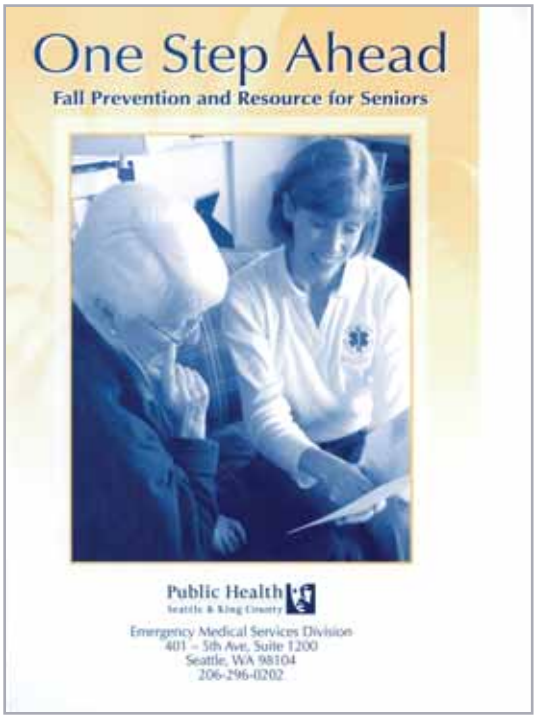
2010 Budget

Budget = $44,688
Grants awarded =$22,668
Actual expenditures YTD Jan – May = $3,469

⇨ Developing interventions that eliminate or reduce unintentional injuries will reduce the need for an EMS response to an injury, lead to a decrease in BLS and ALS calls (producing cost savings) and make units available for responding to calls, all resulting in better EMS system effectiveness.

3. Expansion of the One Step Ahead Fall Prevention Program

Falls occur in older persons often because of a combination of risk factors. These risk factors include individual specific conditions such as muscle poor balance, decreased vision, complications of medication treatment, unsafe footwear, and weakness especially of the lower limbs. Fall risks also include environmental hazards such as uneven or slippery walking surfaces, poor lighting, or lack of wall bars in showers.



Objective

The One Step Ahead Fall Prevention program enables an efficient and directed approach to identify those persons living in the community who are at the highest risk of serious injury due to falls. Once high-risk persons have been identified, they are offered a multi-pronged, no-cost approach to reduce their individual risk for falling, and receive follow-up to assure that their risks are being addressed.

A Fall Prevention specialist meets with each participant in their home to identify the exact set of risk factors, and design a prevention action plan. The specialist then works with the individual to help coordinate fall prevention care, which can include installing grab bars, bed assist handles, toilet seat safety frames, or no-slide bath mats in the home. The prevention action plan may also include contacting the participant's personal doctor to discuss the potential need for preventive care, and connecting the participant with local fall prevention resources, such as those available through senior centers.

Results

In 2009, 163 persons participated in the King County One Step Ahead Program, a nearly 50% increase compared to 2008. From January to June 2010, 65 seniors were enrolled in the program. Participants come from all over King County and represent a wide spectrum of social and demographic backgrounds. About 60% are women and the average age is 80 years old. Participants have a variety of fall risks and most have several risk factors. In 2009, like prior years, every aspect of the program is important, and face-to-face contact and home assessment are keys to engaging the participant and effectively implementing the individual fall prevention plan. Periodic assessment has demonstrated an important reduction in fall rates in this high-risk group compared to national samples. Nearly all participants are appreciative of the program efforts and report "a real positive benefit" as a results of their participation.

2009 Budget

Budget =$106,601 (includes salary/benefits)
Actual expenditure = $66,499

4. Grant and Other Funding Opportunities

The EMS Division hired a part time grant writer in April 2009 to contact corporations and foundations to fund various injury prevention programs. Three foundation grants were submitted to Wells Fargo, Premera and Amgen. This strategic initiative was eliminated from the proposed 2011 budget due to lack of revenue generated.

2009 Budget
Budget = $24,442
Actual expenditure = $33,001

SI: Public Access Defibrillation (PAD) Community Awareness Campaign

250,000 persons die each year in the US from cardiac arrest, making it the leading cause of death. Patients who receive early cardiopulmonary resuscitation (CPR) and early defibrillation have a significantly improved chance of survival from cardiac arrest. The average response time in King County for EMTs who can defibrillate is six minutes. However, if an Automated External Defibrillator (AED) is close, a bystander can apply safely deliver a lifesaving shock in less than two minutes.

Objective

The EMS Division supports efforts to place AEDs in public locations, such as commercial businesses, government buildings, recreation facilities and shopping malls to provide a greater opportunity for bystanders to act as Community Responders and provide CPR and defibrillation prior to the arrival of EMS units. The focus of this strategic initiative is to increase the public's awareness about the need to purchase AEDs to help save lives when cardiac arrest occurs. It is also intended to encourage existing and future owners of AEDs to register their devices in the King County PAD Registry maintained by the EMS Division. This registry enables the EMS Division to contact AED owners if necessary and helps owners be in compliance with Washington State Law requiring registration of the AED.

Desired outcome:

- More AEDs in the community in areas at high risk for cardiac arrest;
- More AED sites in the PAD registry; and
- A public awareness campaign "How to" package that could be distributed to other communities.

Description

The Community Programs and CEEMS sections of the EMS Division will work together to meet the objectives of the EMS Strategic Initiative and the Life Sciences Discovery Foundation grant (see page 71).

During the last year, efforts have focused on registering devices that were found during a review of all cardiac arrest incidents between January 2004 and December 2008 where a public access AED was present but was not registered. A six minute DVD presentation on Public Access Defibrillation was prepared for distribution to promote awareness for the PAD effort and to encourage agencies to raise funds to enhance the PAD effort in their communities. Widespread distribution of the DVD is anticipated in the last half of 2010. A PAD brochure is under development.

Future plans for 2010/2011 include a media campaign to increase awareness and promote placement and registration of additional Public Access AEDs.

Results

In July 2009, there were 2,232 AEDs listed in the King County PAD Registry. As of July 2010, there are 2,331 AEDs listed in the PAD Registry.

Cost

2010 Annual Budget = $71,748
Expenditures August 2009 to July 2010 = $1,700

SI: Interactive Enhancements to EMS Online

EMS Online is an interactive web-based teaching tool designed for EMTs, paramedics, and dispatchers to study subject matter in an interactive format, including realistic video case studies with complete online evaluations. All course content is produced by BLS Training staff and updated on a yearly basis to keep the program content up-to-date and useful for the large EMS audience (>14,000 users overall with approximately 4,500 of those within King County).

Included in the Medic One/EMS 2008-2013 Strategic Plan is an initiative to develop additional interactive enhancements to EMS Online. The website was originally intended to serve only a small number of EMS providers and deliver only a limited number of courses. However, its offerings have expanded tremendously due to its effectiveness in delivering quality training at a low cost. There has been a constant demand for additional content and expanded features for EMS Online.

Objective

Using updated software tools, EMS Divison staff has been able to support increased content offerings and functionality and provide quality technical support. The production team has been ramped up to produce additional content and expanded features for EMS Online within the 2008-2013 levy period.

Description

The website now offers updated courses with additional interactive exercises, streaming video that goes "full-screen", additional skill video productions, a customized "protocol" section for department information and two new blogs ("Ask the Doc" and "Case of the Month").

In 2010 a large effort has gone into the development of a new content management system to better serve the audience and make the site easier to maintain and update. An advanced exam system has been purchased to provide better evaluations and user performance analytics via reports and visual dashboards. These features will be online in 2011 along with a new graphical main page with tutorials on how to use the CBT program.

Results

Success of the strategic initiative efforts will be determined by surveying the BLS audience in 2013. The number of subscribers will be another indicator of performance; using this as a metric, the EMS Divison can already see success with the current features and functionality added to-date.

Cost

$1.04 million is dedicated to the project over the span of the 2008-2013 levy. Approximately $65,890 has been used to-date leaving $977,000 for completing the remaining tasks.

⇨ Increased training techniques and tools assures improved quality of patient care; enhancements lead to more subscribers and increased funding for the program.

SI: Systemwide Enhanced Network Design

Background

The Systemwide Enhanced Network Design (SEND) Project is a strategic initiative in the Medic One/EMS 2008-2013 Strategic Plan to enhance the existing EMS data network to improve the quality and timeliness of EMS data, thus improving patient care. Developed in partnership with regional EMS agencies, this five-year project works in conjunction with several events occurring right now in the region that enable SEND to be implemented in a much more effective manner, including Computer Aided Dispatch (CAD) upgrades at two major dispatch centers and implementation of a regional record management system (RMS) in north and east King County.

Objective

Broad SEND objectives include the following:

- Improving access to complete and timely EMS patient data, especially patient outcomes, thus improving oversight of EMS protocols and procedures and enhancing patient care (eg. management of stroke patients). Currently may take up to 2-3 months;
- Communicating critical and timely patient information to hospitals prior to patient arrival at emergency departments (eg. chest pain patients requiring catheterization). This information is not currently available prior to patient arrival;
- Supporting the early identification of syndromic trends allowing for proactive public health response (eg. flu symptoms). EMS data is not currently available for syndromic surveillance; and
- Improving data processing, including fully automating uploads to the central repository, reducing administrative staff work and errors.

Description

The SEND Project is divided into three distinct implementation phases. The initial phase will focus on procurement of a hub for data processing and the development of the interfaces with ten EMS agencies and five hospitals for pilot purposes. Subsequent phases will add the remaining EMS agencies and hospitals. Initial pilot agencies and hospitals include: Bellevue Fire Department, Fire District #20, Kent Fire Department,

King County Medic One, Kirkland Fire Department, Mercer Island Fire Department, Redmond Fire Department, Renton Fire Department, Shoreline Fire Department, South King Fire & Rescue, Evergreen Hospital, Harborview Medical Center, Northwest Hospital, Overlake Hospital, and Valley Medical Center.

Results

The initial pilot will be evaluated with respect to a successful procurement and implementation of a data hub. The data hub will be expected to automate the process of integrating EMS data and hospital data using built interfaces from existing EMS and hospital data sources to the data hub. In addition, the activation of electronic field data collection and transmission of critical information to emergency departments will be evaluated.

Cost

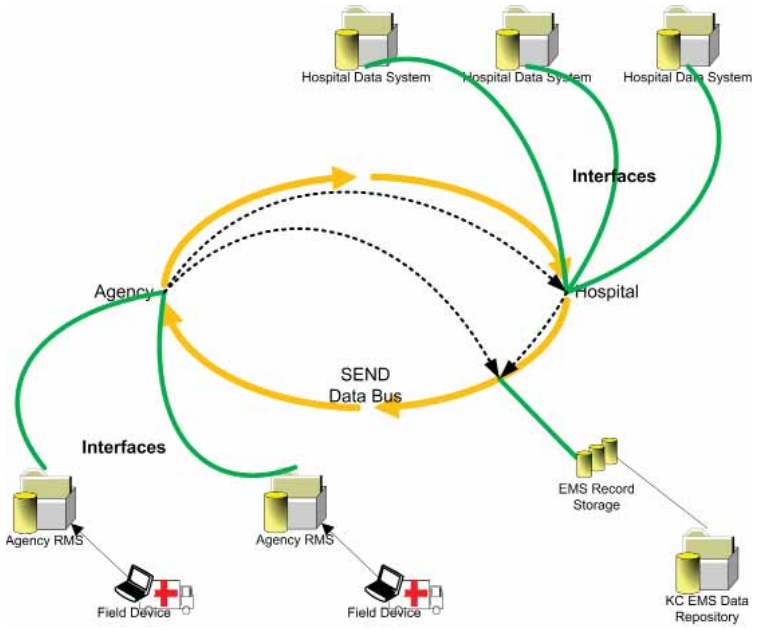
The 2010 funding is $475,031 to support the costs of the initial phase of implementation, including interface/hardware costs ($123,720) and internal labor ($351,311).

Estimated costs:

Project costs:	$1,347,064 *
Operating costs:	$ 406,384
Total estimated cost for implementation:	$ 1,753,448

*$766,757 of this is for internal labor, which will be paid for with Regional Services operating funds. The rest of the project will be paid for with Strategic Initiative funds.

⇨ Improved data, including completeness and access, assures increased system oversight and improved patient care.



SI: All Hazards Management Preparation

Recent national experience with natural disasters and emergency incidents has demonstrated the need for coordinated planning among regional response partners. The Medic One/EMS system in King County is comprised of more than 30 public and private provider agencies, and the EMS Division has a relationship with each of the providers through its various programs and the EMS Medical Program Director. Because of this nexus, the EMS Division is uniquely positioned to promote regional planning and preparation in the EMS community.

Objective

Through this strategic initiative, the EMS Division has initiated its planning and preparation to sustain its support of the regional Medic One/EMS system in case of an emergency or disaster. Included in this is the Division's promotion and participation in regional Medic One/EMS emergency and disaster planning efforts.

A key to this initiative is improving the communication between the EMS Division and Public Health – Seattle & King County, and the regional EMS system leadership in an emergency. This could include utilizing the existing resources used by the EMS Division's partners, and could directly connect to the revision of the EMS Infectious Disease Response Plan based on lessons learned in the spring 2009 H1N1 influenza outbreak.

Description

The EMS Division has developed its Business Continuity Plan to assure its ability to provide support and leadership to the Medic One/EMS system in the event of a regional emergency incident or natural disaster. The current plan was adopted in 2008 and is now undergoing its biennial update. The Business Continuity Plan identifies its line of succession, delegation of authority key staff, mission critical functions and details the Division's emergency operations.

Results

The effectiveness of this planning and preparation is evaluated through regular exercises and after action reports of response to regional emergencies.

⇨ Better coordination during a regional emergency assures an improved response and improved patient care.

SI: EMS Efficiencies & Evaluation Studies

The emphasis behind all Strategic Initiative projects is to improve patient care, manage growth in paramedic services, and develop system efficiencies and cost savings. This initiative provides funds to further pursue areas identified by other strategic initiatives (by working in tandem with other initiatives) and to also review the existing system.

Community Medical Technician

The Community Medical Technician project is an example of how the region is pursuing areas showing potential for additional efficiencies. The pilot is sponsored and managed by the Better Management of Non-Emergency Calls to 9-1-1 Strategic Initiative described on page 43. The Community Medical Technician project will assess the feasibility of responding in a non-transport capable vehicle in response to low-acuity incidents rather than dispatching BLS responders and transport capable vehicles. The Efficiency and Evaluation Studies Strategic Initiative money will cover the fire department costs of the pilot testing.

⇨ Improved program or system effectiveness can lead to improved patient care, reduced calls, and improved allocation of resources.

SI: Strategic Planning for Next Levy Period

The Medic One/EMS Strategic Plan is the primary policy and financial document that guides the Medic One/EMS system into the future. It provides a description of the programmatic Medic One/EMS services to be supported throughout the levy, and a financing plan to implement these recommendations. The recommendations from the Strategic Plan for the current 2008-2013 levy plan were approved by the voters in November 2007, effective January 1, 2008, and will expire on December 31, 2013.

The King County Council adopted King County Ordinance #15862 which creates an EMS Advisory Task Force to develop "interjurisdictional agreement on an updated EMS strategic plan and financing package for the next levy funding period". The Task Force is comprised of leaders and decision makers from throughout the region. An Advisory Task Force Work Plan, detailing a plan for managing and coordinating the Task Force during the next levy planning process, is due to the King County Council no later than September 15, 2010, and Task Force final levy recommendations are due September 15, 2012.

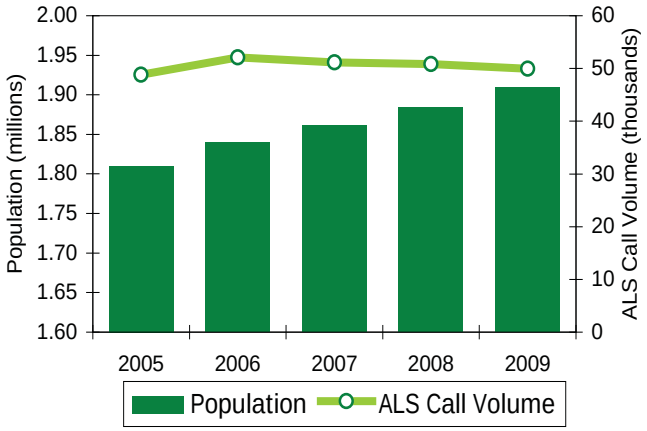
Summary of 2009 EMS Statistics (Seattle and King County)*

The following statistics are derived from the data collected on the Medical Incident Report Forms (MIRFs) and submitted by EMS agencies to the EMS Division for the year 2009.

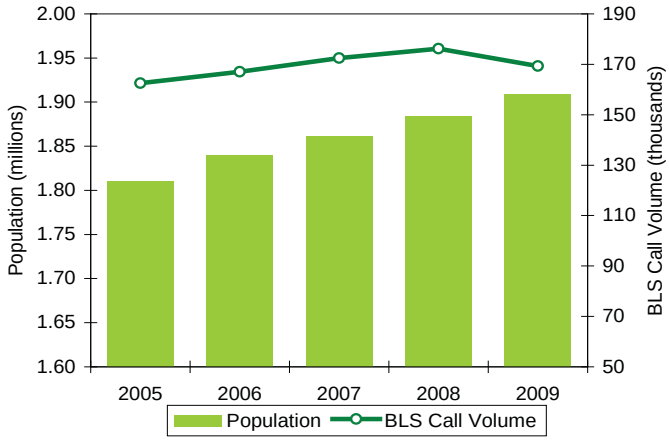
Population	Seattle-King County	% Growth (Annualized)
1980	1,269,898	
1990	1,507,305	1.87%
2000	1,737,034	1.52%
2009	1,909,300	1.06%

Over the past decade, population growth in King County has diminished to just above 1% per year. Population has often been a factor in EMS call volume growth and in 2009 saw the first BLS call volume decline since 2002. The two graphs below depict the population growth relative to both BLS and ALS call volume patterns. Of continued interest is the four-year actual decline in ALS calls volumes due in part to the success of the ALS Dispatch Criteria Revisions. Note that the scales for population and call volumes are different.

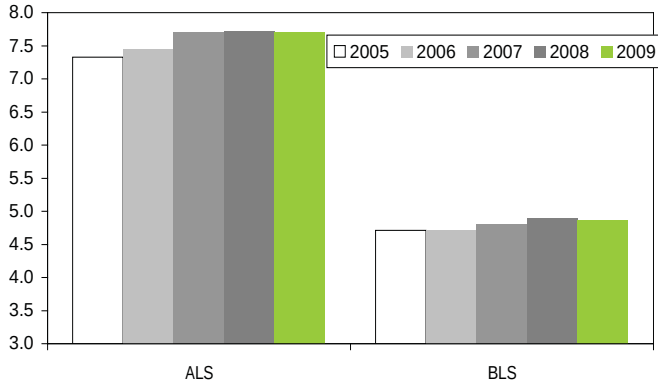
Population & ALS Call Volume



Population & BLS Call Volume



Average Unit Response Time
(time of unit dispatch to arrival at scene)

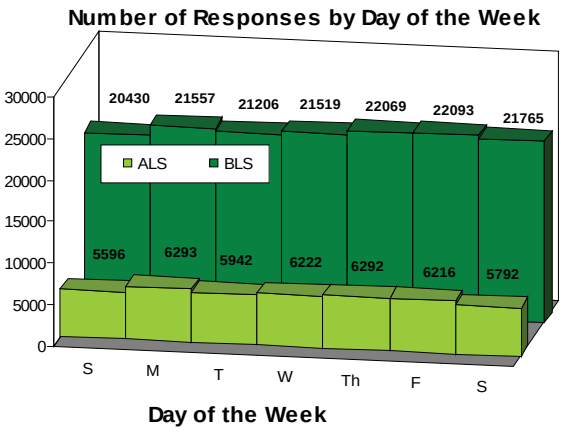


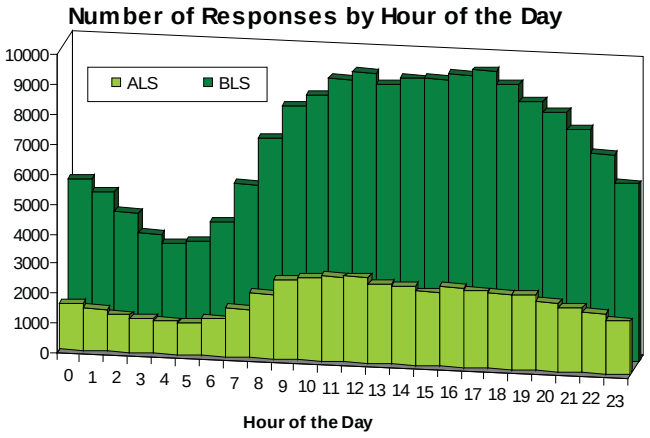
**EMS data uses a fully integrated EMS Division and Seattle dataset. Response times are defined as follows: Total - the time of call received at dispatch center to the time of arrival at the scene, and Unit - the time of unit dispatch to time of arrival at the scene. In some instances, totals differ due to missing values.*

Characteristics of Responses

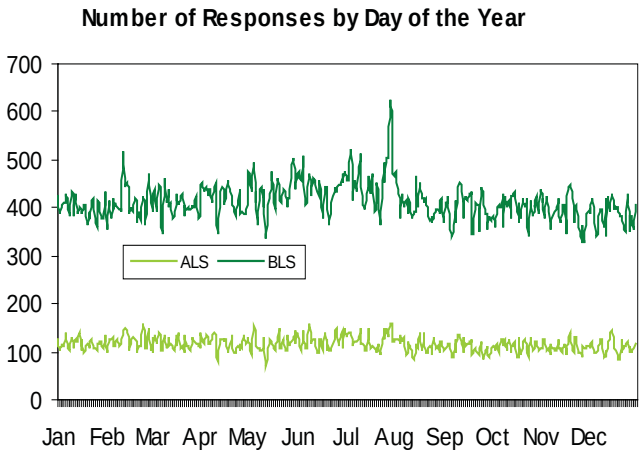
Operations

Service	ALS		BLS	
Number of Responses	49,950		169,334	
Average Response Time	Total RT	Unit RT	Total RT	Unit RT
	11.4	7.7	6.0	4.9
6 minutes or less			71.0%	82.2%
8 minutes or less	42.6%	67.9%		
10 minutes or less	59.1%	82.8%		
12 minutes or less	70.3%	91.0%		
14 minutes or less	77.7%	95.1%		
Cancelled Enroute Calls	8,807 (17.6%)		5,743 (3.4%)	





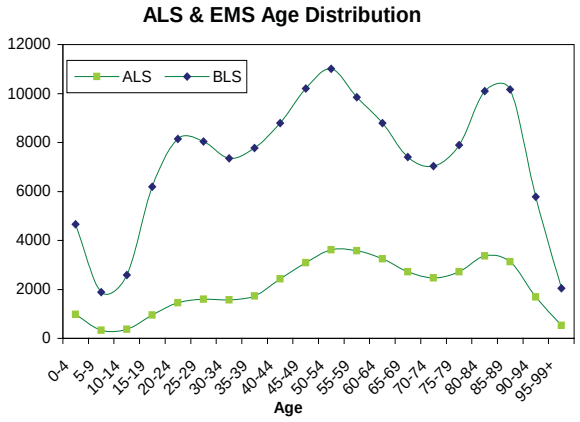
The average BLS unit response times have remained relatively stable, indicating some capacity in the system. In the case of ALS response times, the average remained steady last year. The two graphs located above reflect the patterns of ALS and BLS response during the day and throughout the year. There is a large difference in range of BLS responses per day over time (~320-610 calls) in comparison to ALS responses (~75-150 calls). Note the unusual spike in BLS responses in late July corresponding with the 100°F+ heat wave.



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 tend to trauma in young adults.

Responses by Age Group

Responses by Age Group	ALS	BLS
0-4 yrs	975 (2.3%)	4,665 (3.2%)
5-9 yrs	334 (0.8%)	1,891 (1.3%)
10-17 yrs	866 (2.1%)	5,756 (3.9%)
18-24 yrs	1,920 (4.6%)	11,164 (7.7%)
25-44 yrs	7,333 (17.6%)	31,963 (21.9%)
45-64 yrs	13,522 (32.5%)	39,863 (27.4%)
65-84 yrs	11,278 (27.1%)	32,441 (22.3%)
85+ yrs	5,344 (12.9%)	17,983 (12.3%)
Total	41,572	145,726

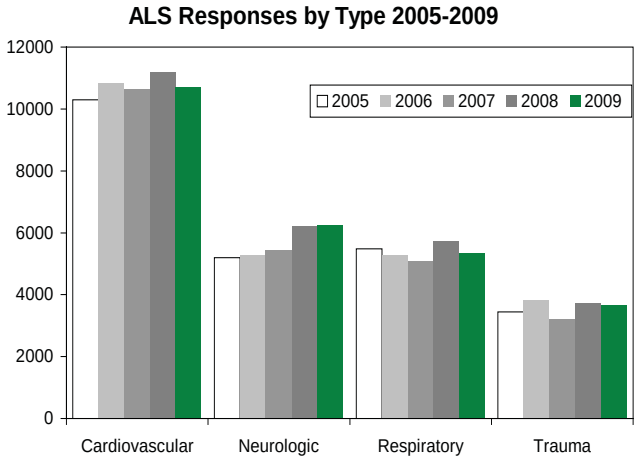


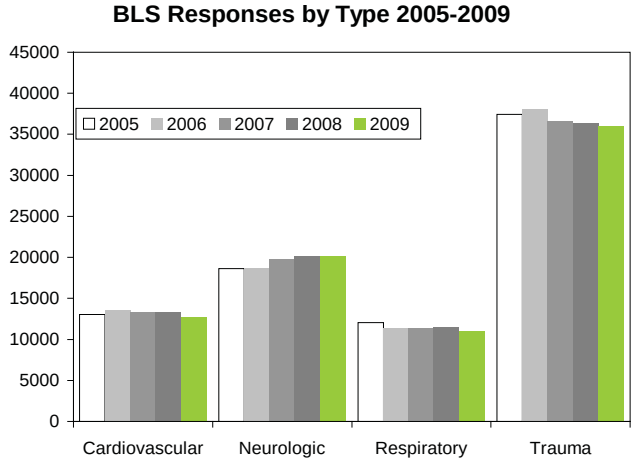
Characteristics of Responses, continued

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 aspect requires not only an in-depth knowledge of specific invasive medical procedures but also requires a considerable breadth of knowledge and skills for diagnoses and management.

Responses by Medical Type

Responses by Medical Type	ALS	BLS
Cardiovascular	10,701 (26.0%)	12,741 (9.3%)
Neurologic	6,260 (15.2%)	20,229 (14.8%)
Respiratory	5,347 (13.0%)	10,979 (8.0%)
Trauma	3,661 (8.9%)	36,050 (26.4%)
Abdominal/Genitourinary	2,434 (5.9%)	11,038 (8.1%)
Metabolic/Endocrine	1,892 (4.6%)	3,681 (2.7%)
Alcohol/Drug	1,720 (4.2%)	6,706 (4.9%)
Psychiatric	1,414 (3.4%)	7,260 (5.3%)
Anaphylaxis/Allergy	488 (1.2%)	1,356 (1.0%)
Obstetric/Gynecological	446 (1.1%)	1,179 (0.9%)
Other Illness	6,747 (16.4%)	25,201 (18.5%)
Total Medical	41,110	136,420
Other Illness	6,747 (16.4%)	25,201 (18.5%)
Total Medical	41,110	136,420



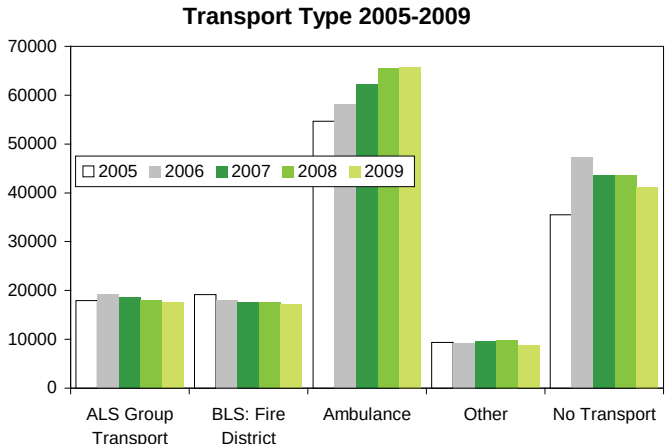


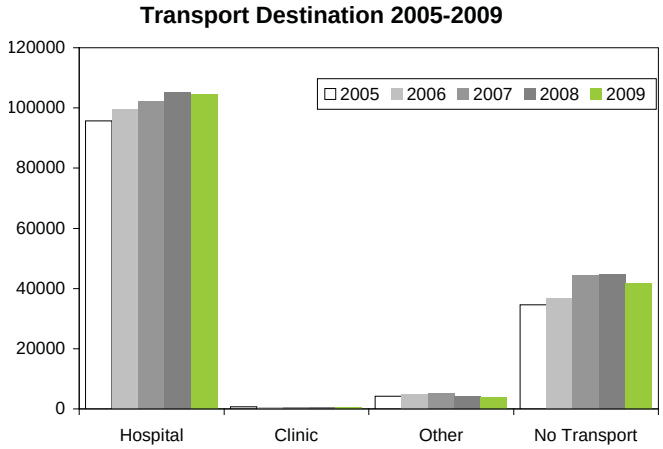
Similar to the variation reflected in the types of responses EMS agencies provide, EMS personnel respond to a variety of physical settings, again requiring a versatility of skills. For example, providers may respond to settings where they need to interact with other medical professionals or need to deliver 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	ALS	BLS
Home/Residence	25,978 (58.4%)	78,195 (53.7%)
Nursing Home/Adult Family Home	3,809 (8.6%)	11,167 (7.7%)
Clinic/MD Office	2,109 (4.7%)	3,469 (2.4%)
Other/Unknown Location	12,598 (28.3%)	52,689 (36.2%)
Total	44,494	145,520

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.

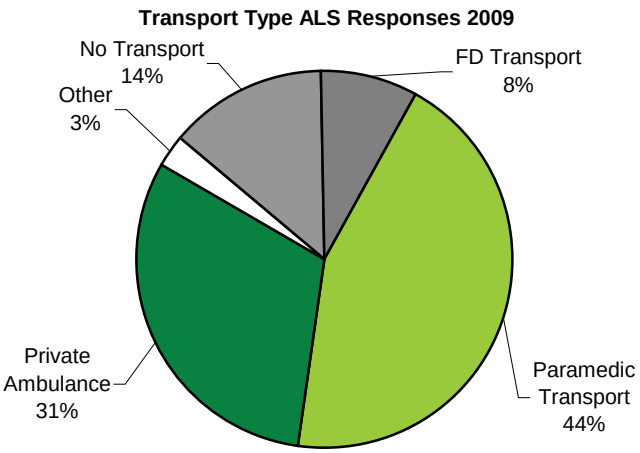
Transport Type and Destinations

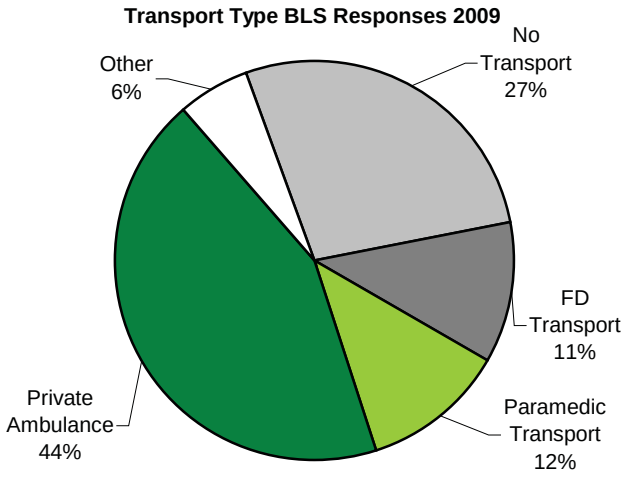




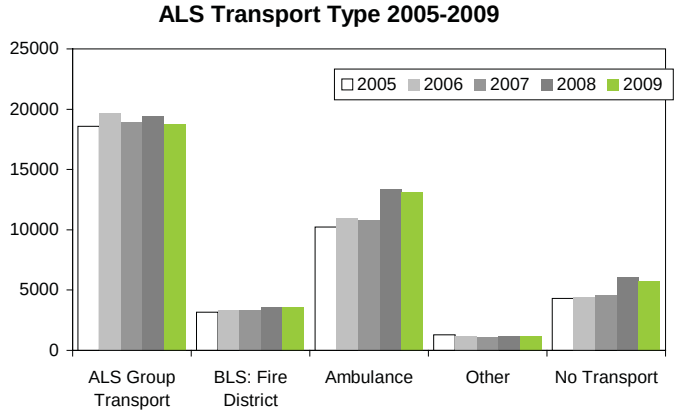
Characteristics of Responses, continued

Transport Type		Transport Destination	
ALS Transport	17,486 (11.7%)		
ALS Air	94 (0.1%)	Hospital	104,324 (69.2%)
BLS - Fire District	17,099 (11.4%)	Clinic	479 (0.3%)
BLS - Ambulance	65,722 (43.7%)	Other	3,999 (2.7%)
Other	8,694 (5.7%)	No Transport	41,838 (27.8%)
No Transport	41,206 (27.4%)		
Total	150,301	Total	150,640





ALS Transport Type	
ALS Transport	18,672 (44.0%)
ALS Air	103 (0.2%)
BLS - Fire District	3,606 (8.5%)
BLS - Ambulance	13,142 (30.9%)
Other	1,203 (2.8%)
No Transport	5,737 (13.5%)
Total	42,463



Cardiac Arrest Statistics

Cardiac Arrest Statistics: Seattle and King County have evaluated cardiac arrest statistics for over 30 years and the following is from their combined registries. A cardiac arrest is defined as a pulseless, breathless state for which CPR is required. The data are for cardiac arrests due to all causes except trauma, and paramedic-treated patients over the age of two. Survival is defined as discharged from the hospital alive.

All Cardiac Arrests:

	Year				
	2005	2006*	2007	2008	2009
Total number of cardiac arrests (all causes, resuscitation attempted)	1,124	993	1,035	1,046	1,072

*modification in case definition initiated

For 2009, the following table depicts cardiac arrests broken down by arrest before and after EMS arrival, rhythm on arrival, and survival for each category:

Total cases treated:	1,072		
		# Survival	% Survival
Arrest before arrival:	933	137	15%
Ventricular fibrillation/ tachycardia (VF/VT)	257	94	37%
Asystole	390	6	2%
PEA	181	35	19%
Unknown	5	2	40%
Arrest after arrival	139	69	50%
VF/VT	44	20	45%
Asystole	21	3	14%
PEA	67	11	16%
Unknown	1	1	100%

Ventricular Fibrillation (VF): Survival is highest among patients with a rhythm of VF/VT and is commonly reported on a subset of VF/VT patients whose arrests are witnessed, before EMS arrival, and due to underlying heart disease. Survival is defined as discharge from the hospital alive. The following is a one-year and a five-year summary:

Year	Rate
2009	87/188 (46%)
2005-2009	434/976 (45%)

CPR initiated by Bystanders (includes all cases of CPR):

Year	Rate
2004	501/952 (53%)
2005	568/1007 (56%)
2006	496/875 (57%)
2007	502/898 (56%)
2008	530/920 (58%)
2009	577/1067 (54%)

EMS FUNDING AND 2010 FINANCIAL PLAN

OVERVIEW: EMS Levy Structure

The EMS levy is a regular property tax levy, subject to the limitations contained in Chapter 84.55.010 RCW. Levy funds are restricted by RCW and can only be spent on EMS-related activities. The levy growth is limited to a 1% increase for existing properties, plus assessment on new construction.

EMS Levy funds are collected throughout King County and managed by the EMS Division for the region, based on RCW 84.52.069 Emergency Medical Care and Service levies and policy guidelines of the 2008-2013 Medic One/EMS Strategic Plan. King County EMS funds are spent on the four main areas of Advanced Life Support (ALS), Basic Life Support (BLS), Regional Support Services, and Strategic Initiatives.

King County and the City of Seattle signed an inter-local agreement stating that EMS levy funds collected within Seattle go directly to the City. Subsequently, funds generated within the City of Seattle are managed separately by the city. Therefore, this section targets only the EMS fund within the remainder of King County (referred to as the KC EMS Fund), and excludes the City of Seattle.

1. Revenues

The primary revenue supporting the KC EMS Fund is property taxes, although grants, miscellaneous taxes, interest earnings, and fees for reimbursable services contribute a small amount to the fund.

EMS Major Revenue (KC EMS Fund)		
Revenue Source	2009	2010 Adopted
Property Taxes	98.61%	99.04%
Grants	0.01%	0.00%
Charges for services	0.27%	0.31%
Interest and other Miscellaneous	1.11%	0.65%
Total	100%	100%

2010 Adopted Revenue for the KC EMS Fund, excluding the City of Seattle, was $63,599,001; forecast revenue is $65,444,399.

The 2008-2013 EMS Financial Plan was developed in 2006 and 2007. Consistent with forecasts from that time period, it did not forecast the current economic downturn and, therefore, did not assume any decreases in Assessed Valuations (AV). Instead, it assumed modest growth in property values and a one-percent limit on revenues from existing properties. It also assumed a stable division of levy revenues between the KC EMS Fund and the City of Seattle, based on the proportional distribution of assessed valuation (35.6% City of Seattle/64.4% KC EMS Fund).

Revenue Source	2009 Actual	2010 Adopted Financial Plan	Change	% Change
Property taxes	67,256,696	62,985,901	(4,270,727)	-6%
Charges for services	181,397	196,690	15,291	8%
Interest & other income	764,492	416,410	(343,096)	-45%
Total	68,202,587	63,599,001	(4,603,518)	-7%

The table above shows that in 2010, lower AV, associated with the economic downturn, resulted in decreased property taxes. The 2010 Interest & miscellaneous income also decreased from 2009 levels, which were higher than anticipated due to the conservative budgeting of revenue sources that can vary significantly, and a partial return on investment losses.

In 2010, the division of revenues between the City of Seattle and KC EMS Fund changed slightly from historic and forecasted amounts. The assessed valuations outside the City of Seattle decreased more than those in the City of Seattle, resulting in a decrease in the split for King County to 63.8%.

Division of Assessment	2009	2010
KC EMS fund	67,987,277	65,177,756
City of Seattle	37,596,524	36,919,481
Total	105,583,801	102,097,000
% of King County	64.4%	63.8%

Discussions with budget analysts attribute this change to greater reductions in AV for residential than commercial properties (with Seattle having a larger percentage of commercial properties than the area covered by the KC EMS Fund). They indicated this may return closer to the traditional split if commercial properties experience greater decreases than residential properties in 2010.

2. Expenditures

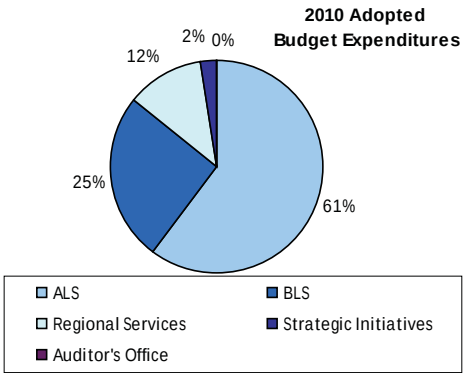
EMS revenues support four major EMS activities related to direct service delivery or support programs:

- Advanced Life Support (ALS) Services
  - Receives over 60% of EMS funds
  - Inflated with compound inflator that considers the different inflators for labor, pharmaceuticals, equipment and benefits; reconciled to actual indices
  - Uses standard unit cost consisting of an operating and equipment allocation

- Basic Life Support (BLS) Services
  - Inflated by forecast CPI and reconciled to actual CPI
  - The 2009 reconciliation resulted in a slight reduction in the BLS budget
  - Funds are distributed to individual agencies based on an allocation that includes the assessed valuation of the district and demand on services (based on call volume)

- Regional Support Programs
  - Uses CPI as inflator

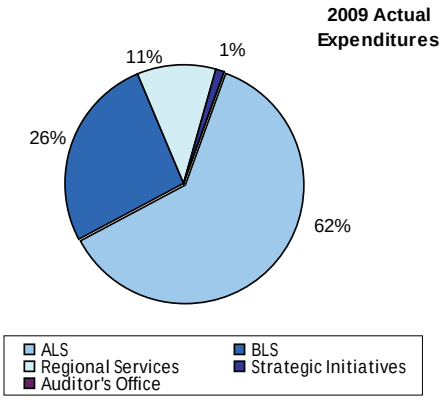
- Strategic Initiatives
  - Funded with lifetime budgets.
  - The budgeted amount by year is adjusted to reflect changing cash flows based on project needs

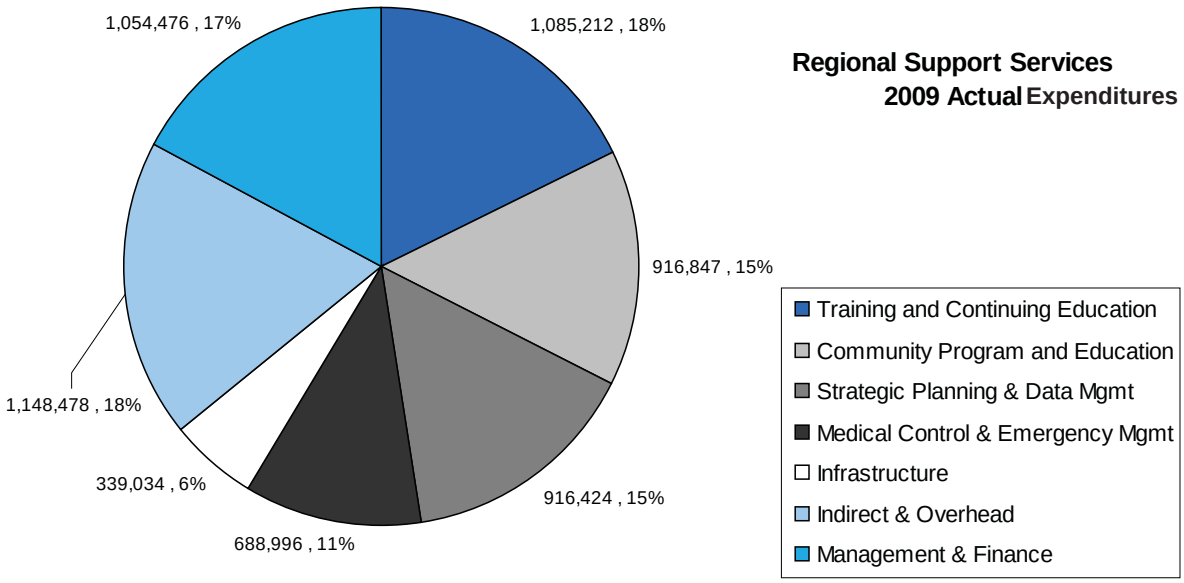


Sub-Area	2010 Adopted Budget*
ALS	35,675,256
BLS	15,033,805
Regional Services	6,854,788
Strategic Initiatives	1,456,856
Auditor's Office	68,360
Total	59,089,065

*$7.5 million in contingencies not shown above.

Sub-Area	2009 Actuals
ALS	35,656,800
BLS	15,281,662
Regional Services	6,149,464
Strategic Initiatives	629,468
Auditor's Office	60,000
Total	57,777,394





EMS Strategic Initiatives - Life to Date Results (2008-2013)				
	2008	2009	Life Time Budget	Balance
Emergency Medical Dispatch Strategic Initiatives				
CAD Integration	258,448	0	522,529	263,679
Dispatch Center Performance Standards	406	260,186	1,576,531	1,315,939
Advanced EMD training	0	7,008	233,921	226,913
Better management of Non-Emergency calls	60,242	119,595	560,669	380,832
Injury Prevention Strategic Initiatives	161,890	168,242	1,465,269	1,135,137
Public Access Defibrillation	76	402	162,980	162,502
Interactive Enhancements to EMS Online	8,150	57,740	1,042,928	977,038
Enhanced Network Design (SEND)	101,996	16,296	1,134,831	1,016,538
All Hazards Emergency Management Preparation	0	0	205,522	205,522
EMS Efficiencies and Evaluations Studies	0	0	648,416	648,416
Levy Planning	0	0	382,664	382,664
Total	591,208	629,469	7,936,260	6,715,180

3. EMS Contingencies, Reserves and Required Fund Balance

The 2008-2013 levy added contingencies related to ALS Wages and Disaster Relief. The levy also added reserves to cover unanticipated inflation, vehicle costs/chassis obsolescence, risk abatement, and potential millage reduction.

In 2009, the Diesel Cost Stabilization reserve was accessed to cover increased diesel costs and distributed to agencies on a per unit basis. The Chassis Obsolescence (vehicle) reserve was available to cover the difference between the amount allocated to agencies for replacing medic units and the actual costs of these units. There has been discussion that the index chosen to inflate vehicles does not represent the costs agencies actually been experienced. The use of a different index in the future is being explored.

The Millage Reduction reserve, which can be used to lower property tax rates in the future or replenish other reserves, was changed to $5 million by the King County Council as part of the 2010 adopted budget (original financial plan was $1 million in 2010).

CONTINGENCIES, RESERVES & DESIGNATIONS	2009 Actual	2010 ADP
EMS Contingencies		
Use of Designations*		996,509
ALS Salary and Wage Contingency		1,500,000
Disaster Response Contingency		5,000,000
SUBTOTAL EMS CONTINGENCIES		7,496,509
Designations		
Provider/Program Balances**	4,795,818	3,075,139
ALS Provider Loans	(939,172)	(328,439)
KCM1 Equipment Replacement	1,811,306	769,910
Designations from 2002-2007 Levy	689,773	289,773
Reserves for Unanticipated Inflation		
Diesel Cost Stabilization	1,512,000	750,000
Pharmaceuticals/Medical Equipment	506,000	828,000
Call Volume/Utilization Reserve	488,000	732,000
Reserves		
Chassis Obsolescence	173,249	360,749
Risk Abatement	565,000	565,000
Outstanding ALS Retirement Liability	-	2,185,000
Millage Reduction	9,614,449	5,041,654
SUBTOTAL RESERVES & DESIGNATIONS	19,216,423	14,268,786
TOTAL	19,216,423	21,765,295
*use of designations included in program area totals; **including encumbrances		

Provider/Program Balances: These allow programs and providers to balance yearly program needs with the prescribed budget allocations, and let agencies save funds to cover expenditures in future years. In 2009, most ALS agencies placed their equipment reserves in the provider balances. These funds were then moved to the agencies in 2010 after they set up internal reserves.

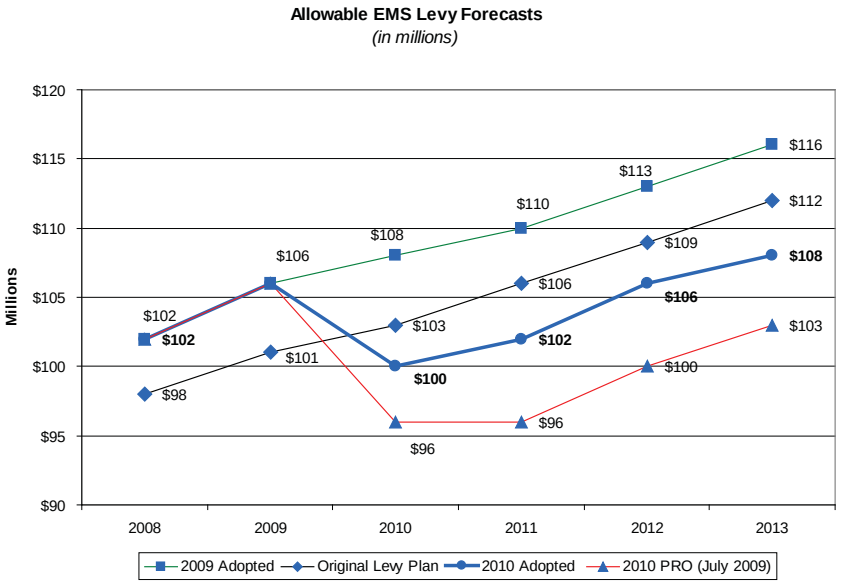
Fund Balances: EMS Financial Policies require a fund balance of 6% of revenues. The current fund balance is above the minimum requirement. The following chart shows Reserves and Designations included in the EMS Levy Financial Plan:

4. 2008-2013 Financial Plan Trends

Economic conditions have changed significantly since the levy was planned in 2006 and 2007. In addition, a new Office of Economic and Financial Analysis and King County Forecast Council has been established. This office forecasts revenues conservatively (with a 65% chance that revenues will be higher than forecast).

Reductions in assessed valuations, along with 30 cent per $1,000/AV cap of the EMS levy, have resulted in lowered property tax assessment forecasts. Due to the EMS levy collections starting at a higher level than originally planned (as shown in the chart below), the actual 2010 assessment was $1.2 million less than originally planned (up from the $3 million forecast reduction shown below). The forecast includes further reductions in assessed valuations in 2011 with increases in assessed valuations beginning in 2012 and increases in new construction beginning in 2013.

The following chart illustrates the differences between the original levy plan assumptions, assumptions from the 2009 adopted budget (the last forecast before the economic downturn), the July 2009 forecast, and the forecast used for the 2010 budget.



The City of Seattle and the KC EMS Fund have different strategies to address this decrease. Fortunately, the KC EMS Fund placed revenues received above the level projected in the original levy financial plan into reserves. In addition, unused contingencies and lower than planned programmatic budgets provide sufficient funding to continue core EMS services.

The EMS Division remains committed to minimizing new costs and looking for programmatic efficiencies. The regional partners have reiterated their commitment to continue to look at placing funds into the millage reserve, while at the same time meeting the needs of the system, to potentially reduce the rate needed for the next levy.

5. Recommendations for EMS Levy Fund 2011 Rates

Due to the changed economic conditions, it is recommended that the 2011 levy rates remain at the statutory limit. It is recommended that reserves set aside for lowering property taxes be saved to "buy down" the levy rate for the next levy or held in reserve to cover lower than currently anticipated property taxes in the final years of the current levy.

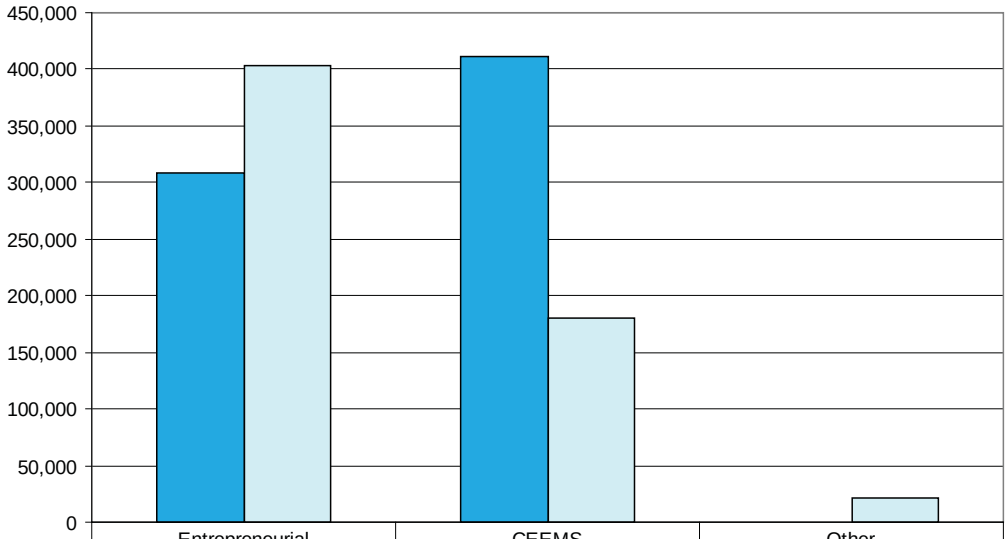
6. EMS Grants (in Public Health Fund)

The EMS Division, through the EMS Grants group and the Center for Evaluation of Emergency Medical Services (CEEMS) located in the Public Health Fund, has been very successful in competing for research grants (primarily funded by Center for Disease Control (CDC) and National Institutes of Health (NIH)). The group was awarded a major $2.6 million, four year programmatic grant from the Washington State Life Sciences Discovery Fund (LSDF) for the Program to Integrate Technology and Cardiac Arrest Resuscitation (PITCAR) in late 2009.

The EMS grants group focuses on research grants that usually do not obligate the EMS program to fund future services. The results of these research grants have been incorporated into the existing work load of EMS personnel or have affected interventions, protocols and standard operating procedures used in the field. The EMS Division will evaluate any on-going continuation of activities initiated by the PITCAR grant during the planning process for the next levy period (the grant is scheduled to end just prior to the end of the current levy).

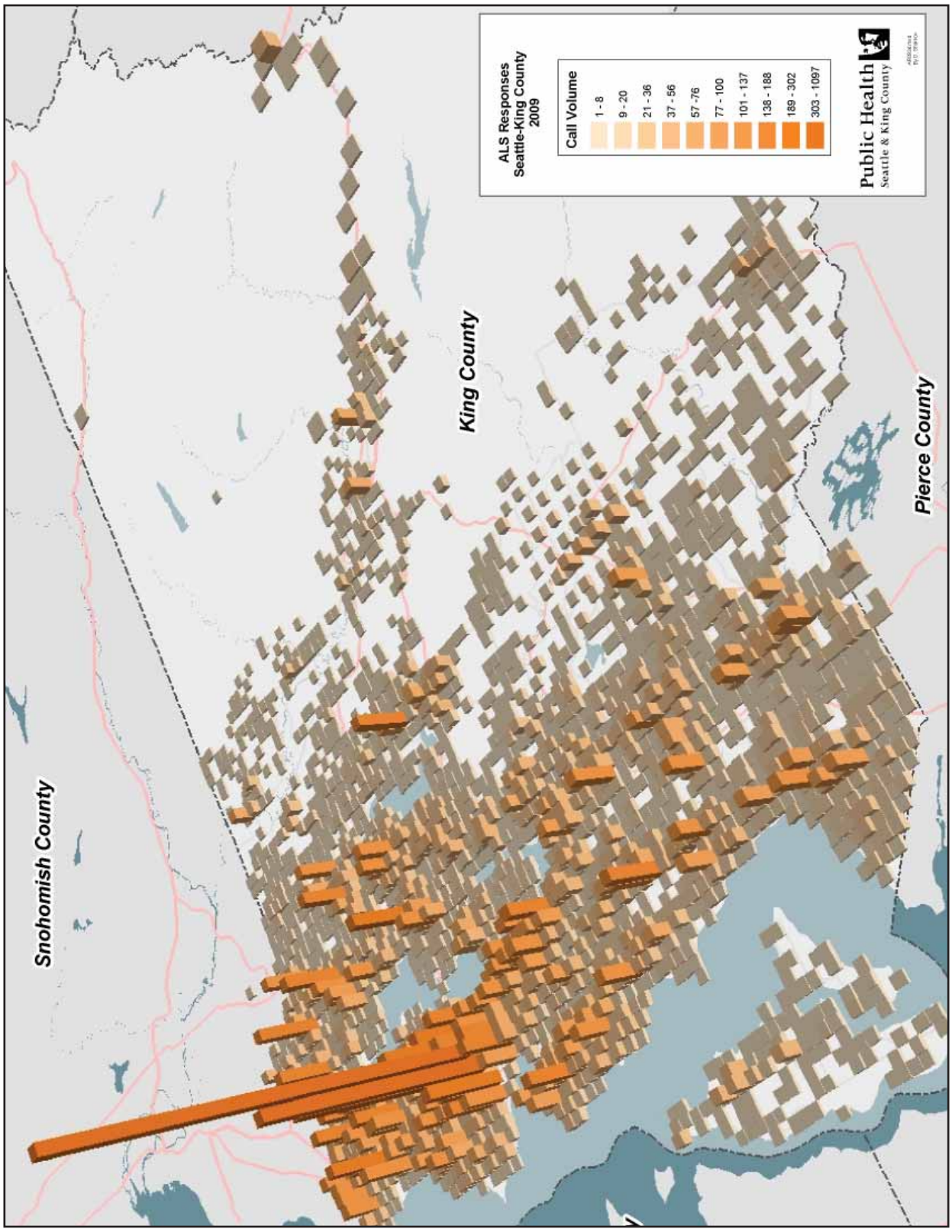
The EMS Online Entrepreneurial Project provides online training to agencies outside King County as a subscription service (see page 52 for more information). The project was based on the interest of the outside agencies, a response to the King County Executive's Entrepreneurial Project initiative and included legal review and approval. The expenses incurred in providing the service outside of 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.

EMS GRANTS

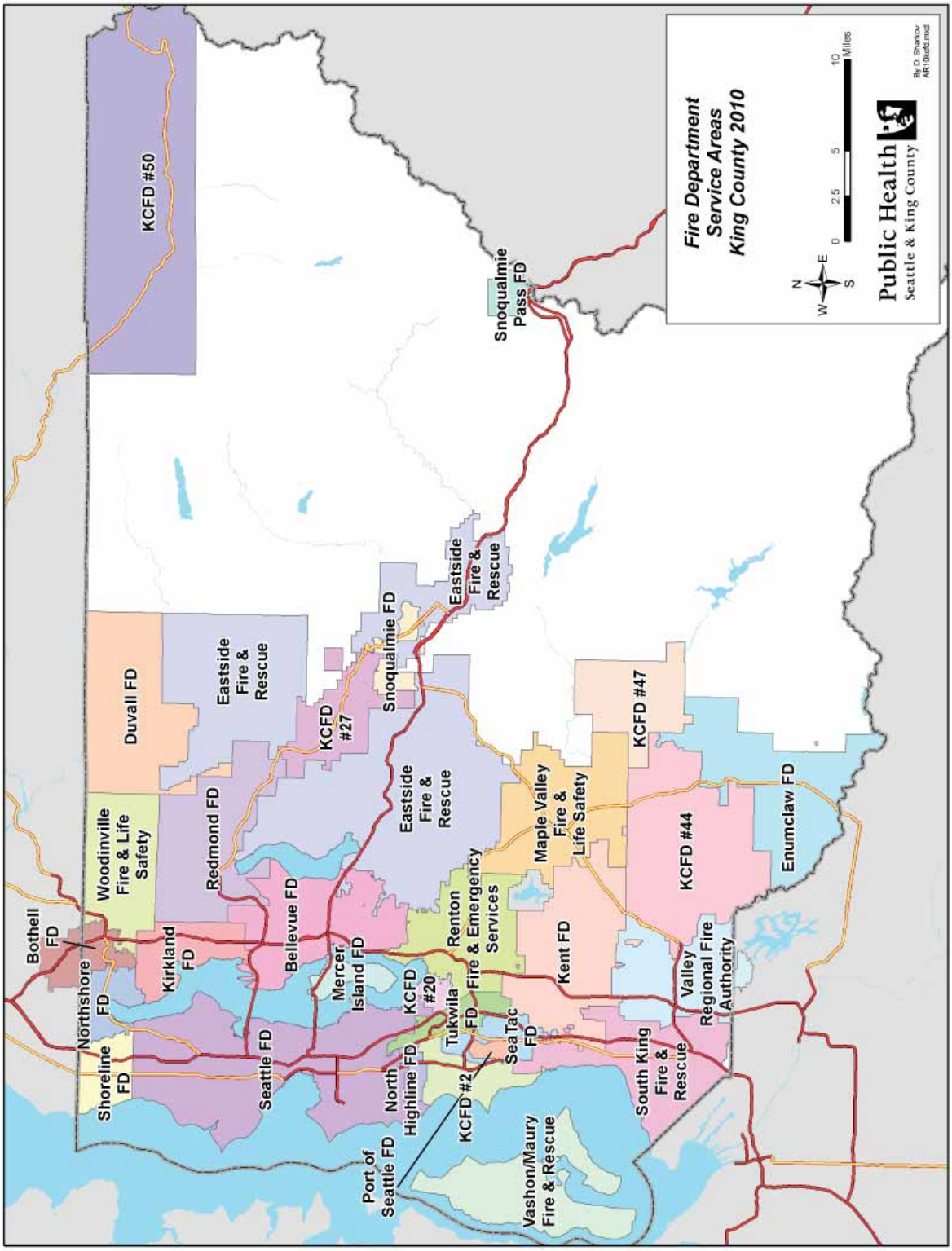


	Entrepreneurial	CEEMS	Other
2009	308,519	411,193	-
2010 Adopted Budget	403,458	180,673	21,289

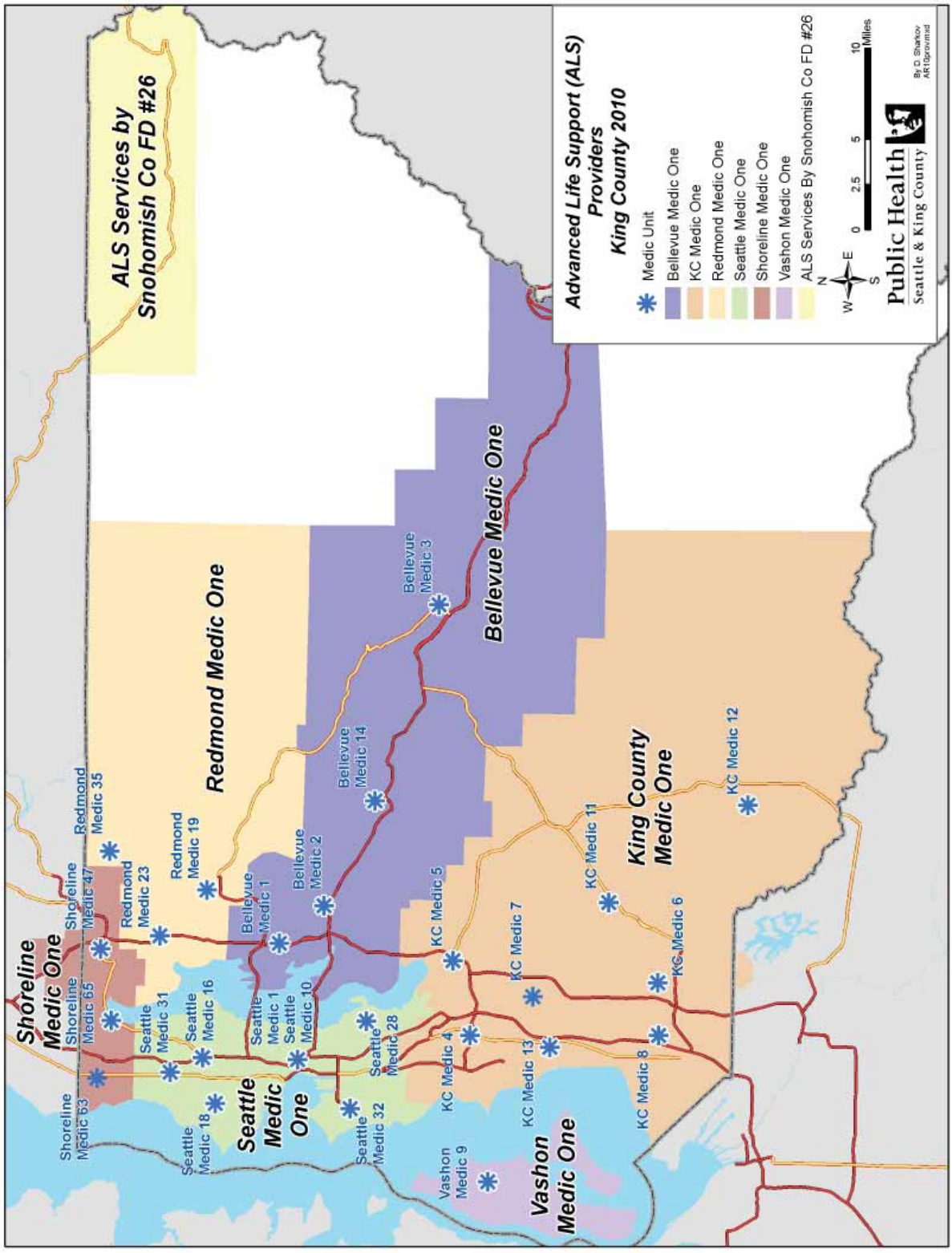
Appendix A: Regional Map of 2009 Total ALS Call Volume



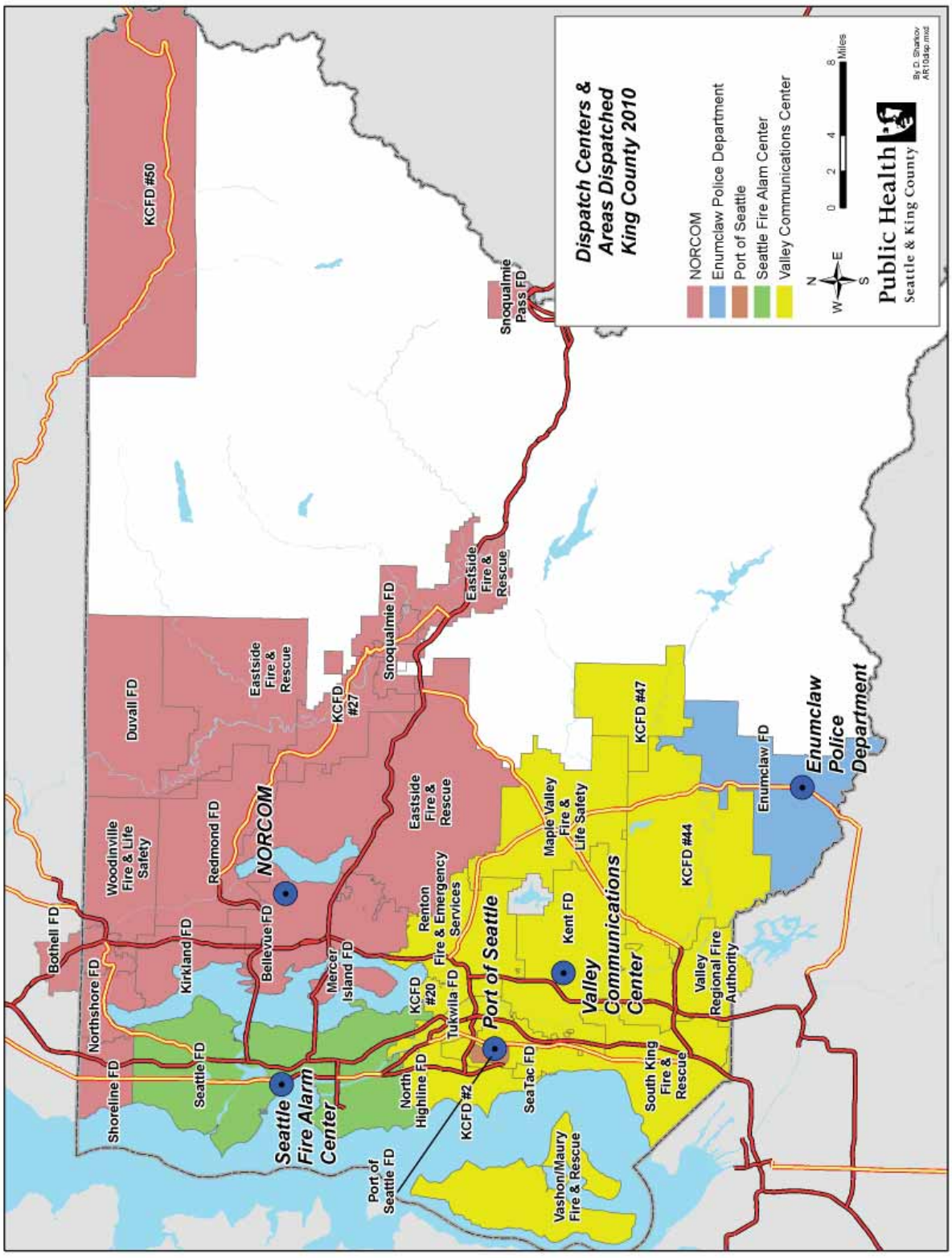
Appendix B: Regional Map of BLS Provider Areas



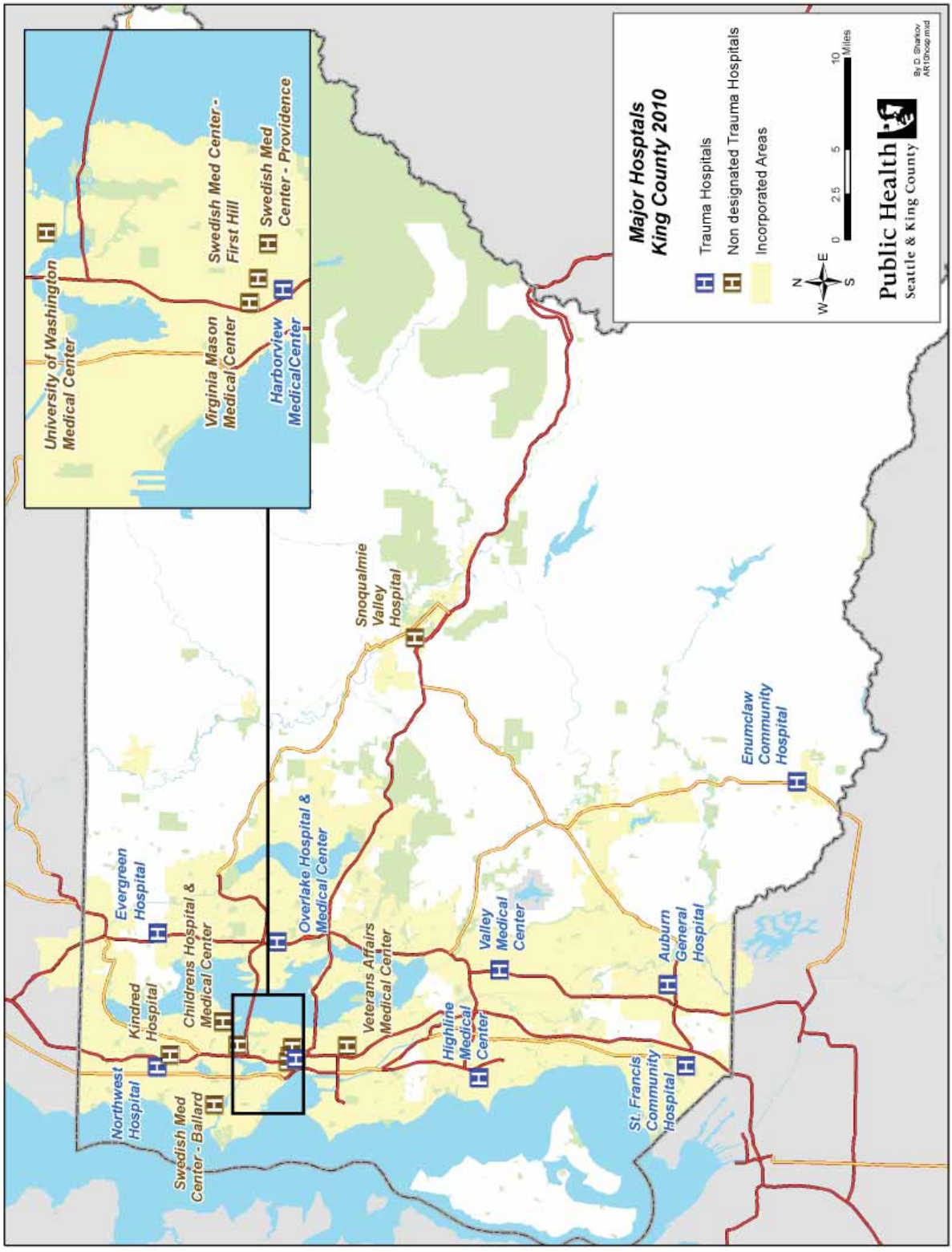
Appendix C: Regional Map of ALS Provider Areas



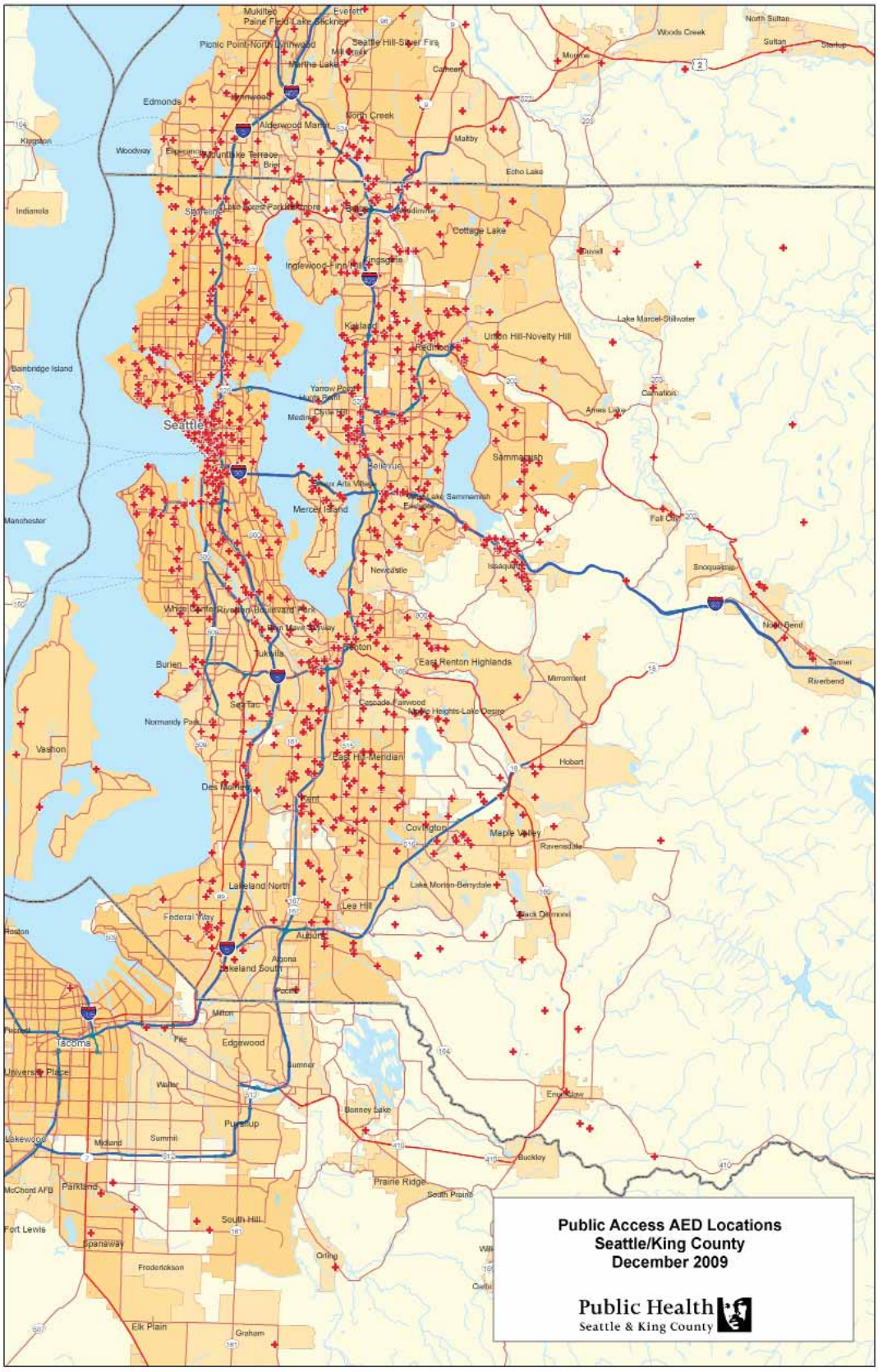
Appendix D: Regional Map of Dispatch Center Service Areas



Appendix E: Regional Map of EMS Hospitals



Appendix F: Public Access AEDs - King County



Appendix G: 2010 EMS Advisory Committee Listing

Name	Representation	Title/ Organization
Michele Plorde, Chair	KC Emergency Medical Services	Interim Director, KC EMS Division
Bob Berschauer	Ambulance Service	Director of Operations, American Medical Response
Al Church	BLS in Cities > 50,000	Chief, South King Fire & Rescue
Michael Copass, M.D.	Seattle Medical Program Director	Medical Program Director, Seattle Medic One
Wayne Corey	Citizen Representative	
Gregory Dean	ALS Providers – Seattle	Chief, Seattle Fire Department
Mickey Eisenberg, M.D.	EMS Medical Program Director	Medical Program Director, KCEMS
Mike Eisner	ALS Providers - Bellevue	Chief, Bellevue Fire Department
David Fleming, M.D.	Public Health - Seattle & King Co.	Director & Health Officer
Jim Fogarty	ALS Providers - KC Medic One	Chief, King County Medic One
Jon Kennison	KC Fire Commissioner's Assn. - Rural	Fire Commissioner, Shoreline
Mark Bunje	ALS Providers - Shoreline	Chief, Shoreline Fire Department
Hank Lipe	ALS Providers - Vashon Medic One	Chief, Vashon Island Fire & Rescue
Steve Marth	Labor - ALS	Paramedic, KC Medic One
Doug McDonald	Labor - BLS	EMT, Renton Fire Department
Tim Fuller	ALS Providers - Redmond	Chief, Redmond Fire Department
Mark Peterson	BLS in Cities > 50,000	Chief, Renton Fire Department
Alan Reed	Health Care System	Manager, Medical Support Services, Group Health
Steve Reinke	Dispatch	Valley Communications Center, Director
John Rickert	KC Fire Commissioner's Assn. - Urban	Fire Commissioner, South King Fire & Rescue
Jim Schneider	BLS in Cities >50,000	Chief, Kent Fire & Life Safety
Adrian Whorton, M.D.	Chair, Medical Directors' Committee	Medical Director, Redmond Medic One

Appendix H: EMS FUND 1190 Revenue/Expenditures Summary

Financial Plan 2008 through 2010			
	2008 Actual	2009 Actual	2010 Adopted
BEGINNING FUND BALANCE	6,242,796	19,686,011	25,929,424
REVENUES			
Property Taxes	64,735,969	67,256,696	62,985,901
Grants	29,526	4,986	0
Charges for Services	196,351	181,397	196,690
Interest Earnings/Miscellaneous Revenue	558,642	723,852	413,200
Other Financing Sources	54,162	35,654	3,210
Transfer from Current Expense Subfund	375,000		0
EMS REVENUE TOTAL	65,949,651	68,202,585	63,599,001
EXPENDITURES			
Advanced Life Support Services (12)	(32,585,628)	(35,283,146)	(35,675,256)
Basic Life Support Services	(14,256,340)	(15,281,662)	(15,033,805)
Regional Services	(5,294,071)	(6,149,464)	(6,854,788)
Strategic Initiatives	(591,206)	(629,468)	(1,456,856)
Use of Designations	0	(373,654)	(996,509)
ALS Salary and Wage Contingency1	0		(1,500,000)
Disaster Response Contingency	0		(5,000,000)
King County Auditor's Office	0	(60,000)	(68,360)
EMS EXPENDITURE TOTAL	(52,727,245)	(57,777,394)	(66,585,574)
GAAP Adjustment	224,200	(119,000)	
Journal Entry Error	(3,391)	(3,391)	
Subtotal	220,809	(122,391)	0
ENDING FUND BALANCE	19,686,011	29,988,811	22,942,851
RESERVES AND DESIGNATIONS			
Encumbrances	(2,138,516)	(519,010)	(2,138,516)
Reappropriation	0		0
Designations (incl. program balances)	(2,175,367)	(4,076,395)	(897,957)
KCM1 Equipment Replacement	(769,910)	(1,811,306)	(769,910)
Reserves for Unanticipated Inflation	(1,230,000)	(2,506,000)	(2,310,000)
Reserves (incl. millage reduction)	(4,937,096)	(10,352,698)	(8,152,403)
TOTAL RESERVES AND DESIGNATIONS	(11,250,889)	(19,265,409)	(14,268,786)
ENDING UNDESIGNATED FUND BALANCE	8,435,122	10,723,402	8,674,065
TARGET FUND BALANCE	3,956,979	4,092,155	3,815,940
King County Medic One Donations			
Fund 6980/Account 06204	2008	2009	
Beginning Balance	60,834	$79,285	
Donations	23,265	$33,584	
Expenditures	(4,814)	0	
2009 Ending Balance	$79,285	$112,869	

Appendix I: EMS Division Bibliography

Peer Reviewed Publications and Journal Articles as of August 2, 2010

1. Mitchell MJ, Stubbs BA, Eisenberg M: Socioeconomic Status Is Associated with Provision of Bystander Cardiopulmonary Resuscitation. Prehospital Emer Care 2009; 13: 4, 478-486.

2. Markel DT, Gold LS, Fahrenbruch CE, Eisenberg MS: Prompt Advanced Life Support Improves Survival from Ventricular Fibrillation. Prehospital Emer Care 2009; 13:3, 329-334.

3. Rea TD, Cook AJ, Steil IG, Powell J, Bigham B, and et al: Predicting Survival after Out-of-Hospital Cardiac Arrest: Role of the Utstein Data Elements. Annals of Emergency Medicine 2010; 55: 249-257.

4. Rea TD, Olsufka M, Bemis B, White L, Yin L, and et al: A Population-Based Investigation of Public Access Defibrillation: Role of Emergency Medical Services Care. Resuscitation 2010; 81: 163-167.

5. Rea TD, Page RL. Community Approaches to Improve Resuscitation After Out-of-Hospital Sudden Cardiac Arrest. Circulation 2010; 121: 1134-1140.

6. Rea TD, Stickney RE, Doherty A, Lank P. Performance of Chest Compressions by Laypersons During the Public Access Defibrillation Trial. Resuscitation 2010; 81: 293-296.

7. Seymore CW, Cook CR, Mikkelsen ME, Hylton J, Rea TD, et al: Out-of-Hospital Fluid in Severe Sepsis: Effect on Early Resuscitation in the Emergency Department. Prehospital Emer Care 2010; 14: 145-152.

8. Meischke H, Chavez D, Bradley S, Rea T, Eisenberg M. Emergency Communications with Limited-English-Proficiency Populations. Prehospital Emer Care 2010; 14: 265-271.

9. Callaway CW, Schmicker R, Kampmeyer M, Powell J, Rea T, et al: Receiving Hospital Characteristics Associated with Survival Out-of-Hospital Cardiac Arrest. Resuscitation 2010; 81: 524-529.

10. Markel DT, Gold LS, Allen J, Fahrenbruch C, Tea TD, et al: Procainamide and Survival in Ventricular Fibrillation Out-of-Hospital Cardiac Arrest. Academic Emergency Medicine 2010; 17: 617-623.

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12. Eisenberg MS, Psaty BM. Cardiopulmonary Resuscitation: Celebration & Challenges. JAMA 2010; 304: 87-88.

13. Rea TD, Fahrenbruch C, Culley L, Donohoe RT, Hambly C, et al: CPR with Chest Compression Alone or with Rescue Breathing. New Engl J Med 2010; 365: 423-433.

14. Eisenberg MS. The Resuscitation Academy. EMS Magazine 2010; 39 (7): 39-48.

15. White L, Rogers J, Bloomingdale M, Fahrenbruch C, Culley L, Subido C, and et al: Dispatcher-Assisted Cardiopulmonary Resuscitation - Risks for Patients not in Cardiac Arrest. Circulation 2010; 121: 91-97.

Appendix J: 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 (206) 296-8550
www.kingcounty.gov/healthservices/health/ems/MedicOne.aspx

BLS Training and Education Program (206) 263-8580
www.kingcounty.gov/healthservices/health/ems/training.aspx

CPR/AED Training Programs (206) 263-8669
wwwkingcounty.gov/healthservices/health/ems/aed.aspx

Emergency Medical Dispatch Programs (206) 263-8636
www.kingcounty.gov/healthservices/health/ems/emdprogram.aspx

Injury Prevention and Public Education Programs (206) 263-8544
www.kingcounty.gov/healthservices/health/ems/community.aspx

Regional Medical Control and Quality Improvement (206) 263-8659
www.kingcounty.gov/healthservices/health/ems/quality.aspx

Regional Planning and Evaluation (206) 263-8603
www.kingcounty.gov/healthservices/health/ems/planning.aspx

Center for the Evaluation of EMS (CEEMS) (206) 263-8564
www.kingcounty.gov/healthservices/health/ems/CEEMS.aspx