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Division of Emergency Medical Services

2003 Annual Report to the King County Council

September 2003

Preface

I am pleased to present the Emergency Medical Services (EMS) Division 2003 Annual Report to the King County Council, the sixth such report prepared by the division. The King County Council originally requested this report in order to track progress on the work by the EMS Division on the EMS Strategic Initiatives, describe the status of the EMS Financial Plan, and to present service and financial challenges that develop in the regional EMS system. The report has now grown to the point where it provides a very complete overview of EMS activities throughout the region as well as financial and service challenges to the regional system.

There are three themes in this year's report that I would like to highlight for the reader's attention, all related to the strength of partnership and collaboration. First, the continued strong collaboration between fire departments and paramedic providers, dispatch centers, physicians, hospitals, and the EMS Division is remarkably evident. This strong partnership is the cornerstone of the EMS system that the citizens of the county have depended on for over thirty years. This is manifested in a number of ways.

Thanks to the new method of integrating Seattle Fire Department data into the EMS Division database, we can now report easily on EMS activities across the entire county. We know that there were almost 148,000 EMS responses in 2002 and over 47,000 of these calls were acute enough to warrant a paramedic response. The equivalent of 9% of the population of King County is seen every year by EMS providers, however, the rate of increase in EMS calls is less than the rate in population growth, especially for paramedic responses. There is good evidence that our careful, appropriate changes in dispatch criteria have had a positive impact on managing the rate of growth in paramedic responses.

Second, the region has responded admirably to the funding and service challenges presented in outlying areas. Earlier this year, the Bellevue Medic One unit in North Bend was increased to two paramedics through a vital partnership between Bellevue Fire Department, Eastside Fire & Rescue, and King County. Although no specific funds were identified for this unit in the EMS Strategic Plan, these agencies showed remarkable partnership in permitting this staffing increase. Similar discussions are currently underway regarding the Redmond Medic One EMT/Paramedic unit in Woodinville, and for improving paramedic service in the Skykomish-Steven's Pass area.

Third, I am very pleased to see the continued successful collaboration between the Epidemiology Planning and Evaluation Unit of Public Health - Seattle & King County and the EMS Division in this report. Since 2001, the Public Health Highlight has selected a public health issue and evaluated the related EMS effects. This year's highlight describes the relationship between poverty levels, death from diabetes, and EMS responses in King County.

The EMS Division 2003 Annual Report is available online through the Public Health - Seattle & King County website located at the following address: www.metrokc.gov/health/ems.

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Public Health - Seattle & King County

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Commonly Used Acronyms:

Emergency Medical Services (EMS)
Advanced Life Support (ALS)

Basic Life Support (BLS)
Emergency Medical Dispatch (EMD)
Emergency Medical Technician (EMT)

Executive Summary

Emergency Medical Services (EMS) System Review: This year's theme relates to the provision of paramedic services in outlying geographical areas of King County. Soon after the six-year EMS levy passed in November 2001, interest in increased paramedic services in specific outlying areas of the county developed. Unlike the funding that supports Advanced Life Support (ALS) services identified in the Strategic Plan, there was *no specific designated funding* for providing additional services to these areas. The provision of paramedic services in outlying areas is complicated because they usually do not meet the criteria used in assessing paramedic service needs designed for urban areas of the county. However, paramedic programs, fire departments, and the EMS Division are finding ways to improve paramedic service in these regions and have created exciting partnership models to provide the necessary financial support.

EMS Program and Pilot Project Highlights: The EMS Division is dedicated to increasing survival and reducing disability from out-of-hospital emergencies in King County. This is achieved through strong partnerships with other agencies and innovative leadership in the emergency medical field. All EMS Division programs are designed to contribute to this effort. The following highlights some of the EMS Division associated programs and attests to the level of program diversity, including those that target dispatch enhancements, improved technologies, community-based programs, and financial efficiencies:

- The **Advanced Life Support (ALS) Dispatch Triage Guidelines Revisions** project was implemented to increase the efficiency of the EMS system by reducing the rate of growth of ALS calls and decreasing unnecessary ALS responses. A final evaluation of the impact of the changes on ALS call volume is discussed in this report. Results show a significant reduction in ALS call volume in 2001 as compared to 1999 (see page 19).
- The **Competency Based Training (CBT) Website** delivers sixteen modules online. Each year, the State of Washington mandates that EMTs complete ten hours of continuing medical education or a county-approved program of continuing medical education and evaluation. There are 3,598 EMTs enrolled, 90% of the EMTs in the county, and over 13,301 courses have been completed (see page 31).
- The **Community Responder Automatic External Defibrillator (AED) Program** was designed to allow the EMS Division to assist businesses and private homes in implementing the appropriate training, placement, and registration of their devices in compliance with the Washington State law concerning Public Access Defibrillation. As of August 2003, there are approximately 710 devices registered in the Community Responder AED Program (see page 36).
- The **EMS Regional Purchasing Program** is a voluntary countywide program designed to reduce equipment and supply expenses. An annual review of the cost savings for the May 1, 2002 - April 30, 2003 contract period revealed an increase in savings of $234,604, 19.5% above the previous year (see page 32).

Year 2002 Statistics: In Seattle and King County, the Emergency Medical Services system responded to 147,810 calls with a continued two-year actual decline in ALS calls volumes, due in part to the success of the ALS Dispatch Criteria Revisions.

A Brief Description of the EMS / Medic One Tiered System

The **Emergency Medical Services (EMS) / Medic One system** provides an internationally regarded regional service to the citizens of Seattle and King County, responding in an area of over 2,000 square miles and serving a population of approximately 1.7 million. The EMS/Medic One system operates in a coordinated partnership between King County, various cities, fire districts, private ambulance companies, local area hospitals, and others involved in providing high quality pre-hospital medical care. The EMS response system is tiered to ensure that 911 calls receive medical care by the most appropriate care provider.

There are five **major components** in the regional tiered EMS/Medic One system and they are described below:

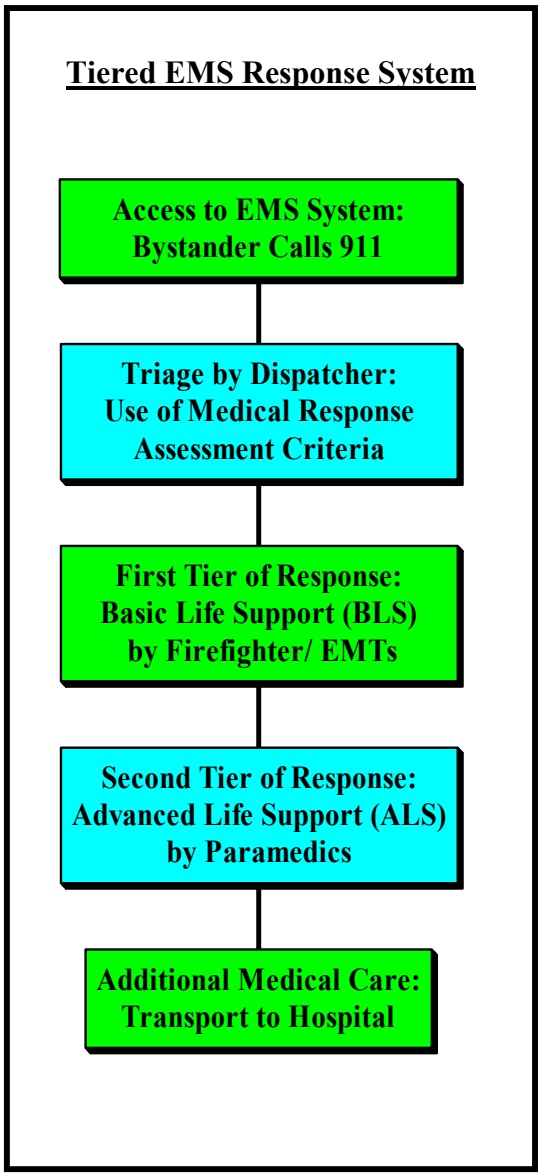
- **Universal Access:** Patient or bystander accesses the EMS system by calling 911 for medical assistance.

- **Dispatcher Triage:** Calls to 911 are received and triaged by trained professional dispatchers in six dispatch centers throughout King County. A majority of dispatch centers use the Criteria Based Dispatch (CBD) Guidelines to provide uniform triaging to callers.

- **Basic Life Support (BLS) services:** BLS personnel provide the first level of response to most calls and are staffed by firefighters trained as Emergency Medical Technicians (EMTs). BLS units arrive at the scene in an average of about six minutes.

- **Advanced Life Support (ALS) services**: ALS services are provided by six paramedic agencies responding to patients with more critical or life-threatening injuries and illnesses. Paramedics respond to about 30% of all EMS responses.

- **Transport to Hospitals:** Some patients require additional medical care and are transported to hospitals for further attention.



Part I: EMS System Review

Paramedic Services in Outlying Areas: The Power of Partnerships

The EMS Division's 2003 Annual Report to the King County Council is the most complete description of regional EMS activities and programs heretofore published. The report conveys in detail the regional focus on the EMS Strategic Initiatives and the substantial regional commitment to carrying out the EMS Strategic Plan. Progress on the regional strategic initiatives is a testament to the widespread commitment to the EMS Strategic Plan and the strong regional partnerships that exist between fire departments, dispatch centers, paramedic providers, medical directors, hospitals, and the EMS Division.

There are several important areas, however, that continue to present both financial and service challenges to the county as the regional EMS system approaches the year 2004, the third year of the current six-year levy. The EMS System Review theme selected for presentation in this report is the regional challenge to provide paramedic services in outlying geographical areas of King County. The discussion will provide a historical background of how current practices were derived and describe the steps that the EMS partners in the region are taking to resolve these recently presented service issues on a regional basis.

Background

An EMS regional task force of providers and elected officials worked for over three years to review the EMS system in detail and develop an integrated operational and financial plan as the basis for funding the 2002-2007 levy period. The purpose of the EMS Strategic Plan was to ensure continued support for the major elements of the regional EMS system over the life of the levy period, including anticipated increases in ALS units, and identify key strategic initiatives that would direct these efforts. The EMS Financial Plan identified funding through the remainder of this levy period for these elements, including:

- Support for current Advanced Life Support services through 2007 with an option, if warranted, to expand planned paramedic services in 2004 and 2006.
- Continued allocations for Basic Life Support services at levels included in the EMS Strategic Plan.
- Continued support for EMS Regional Services, such as training of Emergency Medical Technicians and dispatchers, medical direction and data collection, at levels included in the EMS Strategic Plan.
- Continued provision of funds for the EMS Strategic Initiatives.

Soon after the six-year EMS levy passed in November 2001, interest in increased or improved paramedic services in specific outlying areas of the county developed. Unlike the funding that supports ALS services in the areas described above, there was <u>no specific designated funding</u> identified in the EMS Strategic Plan for providing additional or enhanced services to these areas. In addition, the provision of paramedic services in outlying areas is complicated because they

usually do not meet the criteria used in assessing paramedic service needs designed for urban areas of the county. Nevertheless, paramedic programs, fire departments, and the EMS Division are finding ways to improve paramedic service in these regions and have developed some exciting partnership models to provide the necessary financial support.

Standard Paramedic Service Assessment

The standard method for assessing proposed changes or additions to paramedic service as detailed in the 1995 EMS Master Plan Update utilizes four primary performance indicators: unit workload, percent unit backup coverage required, response time in the unit's primary service area, and frequency of multiple alarms. The *workload* indicator summarizes the total number of ALS responses per unit, including responses in the unit's primary service area as well as to other ALS unit service areas. Full-time, two-paramedic units are generally considered for areas with call volumes between a minimum of 1,200 to 1,400 and a maximum of 2,500 to 3,000 calls. The *backup coverage* indicator measures the extent to which other paramedic units are required to provide coverage in a particular service area. It is a surrogate measure of the availability of ALS units to respond in its own primary service area. Full-time, two-paramedic units should not require backup by other ALS units for more than 20% of their total calls.

The *average response time* indicator refers to a calculated mean and is defined as the interval from the receipt of a call for medical assistance by the dispatch center to the arrival of the paramedic unit at the scene. ALS units are generally evaluated with respect to their average response time in ten (10) minutes or less and if 80% of their responses are equal to or less than fourteen (14) minutes. Finally, the *frequency of multiple alarms* indicator measures ALS unit availability by reviewing the number of times ALS units are out-of-service and not available to respond to an incoming call during the same hour of the day. The standard sets the maximum at 10% of all calls in the primary service area.

Addressing the Demand for Paramedic Service in Outlying Areas

It has long been recognized that although the needs for paramedic service in outlying areas may be significant, they tend to have relatively low workloads. The major difficulty has been determining how to address those needs in a cost-effective, efficient way. Historically, the region has taken three different approaches, including:

- Addition of EMT/paramedic units
- Use of 12-hour, peak workload units
- Use of volunteer paramedic services

EMT/Paramedic Units (EMT/P units): Initiated more than ten years ago, the EMT/Paramedic concept was implemented as a means of shortening response times in outlying areas of the county. The plan called for staffing units 24 hours a day, 7 days a week in outlying areas with one EMT trained in defibrillation and supported by the local fire department, and one paramedic supported by the EMS levy. Funding was provided to the paramedic provider at the equivalency of 1/2 an ALS unit. It was expected at the time of implementation that both EMT/P units would

grow annually in workload until they reached call thresholds similar to workloads in suburban areas and a second paramedic could be added.

The first EMT/P unit was deployed in North Bend in 1992 and proved to be a successful model, shortening paramedic response times in that area from over 20 minutes to about 6 minutes. A second EMT/P unit was later placed in the Woodinville-Duvall area in 1993. However, over the past ten years the workloads for these units have either plateaued or have grown much more slowly than expected. Thus, these two units have remained as EMT/P units, since they did not meet the standard criteria for an upgrade to two-paramedic ALS unit status.

Twelve-hour, Peak Load Paramedic Units: The twelve-hour, peak load ALS unit, staffed by two paramedics and operating during peak workload time periods, was put into service in outlying areas in order to provide a level of paramedic service in areas that were growing but not yet at a workload level to warrant full-time, two-paramedic services. Funding was provided to the paramedic provider at the equivalency of 1/2 an ALS unit. Two 12-hour units were placed into service; one in 1997 in the Issaquah area, serving the Sammamish Plateau and operated by Bellevue Medic One, and the other in 1998 in the Black Diamond area, serving the Enumclaw Plateau and operated by King County Medic One.

Volunteer Paramedic Units: A third approach to providing paramedic service in outlying areas of the county utilizes the willingness of individual paramedics to respond within their communities as volunteers when off-duty. These paramedics are all trained at the University of Washington Paramedic Training Program, and are all actively employed as paramedics in the provider programs around the county. Volunteer paramedics do not replace a paramedic response in communities, but may shorten the time to paramedic evaluation by responding to the scene, treating the patient, and awaiting the arrival of the regular two-person paramedic unit for that area. Communities served by volunteer paramedics have benefited for many years by the willingness of off-duty paramedics to respond.

New Demands for Paramedic Service in Outlaying Areas

Interest in increased paramedic service has been raised in three types of areas in the county: 1) those served by units staffed with one EMT and one paramedic (EMT/P units), 2) those served by volunteer-only paramedic services, and 3) areas served by 12-hour paramedic units designed to cover the peak workload hours. These areas include primarily the more outlying parts of Eastern King County and all share certain characteristics, including a relatively remote setting, geographic separation from urban and suburban areas of the county, relatively lower residential population compared to the rest of the county, and substantially lower paramedic workloads. Road access can be more limited and may be dominated by a single major highway such as Highway 2, Interstate 90, or Route 410. There may be major recreational areas nearby, such as national forests, wilderness areas, and ski resorts and many King County citizens routinely utilize these routes for recreational or travel, attracting large pockets of people and impacting demands for EMS response. It is typical to have both longer paramedic response times and longer transport times to hospitals due to the distances traveled, limited road networks, inclement weather, and difficult access to the scene. It is also typical to have a far higher percentage of trauma cases than the more urban ALS units and a far lower workload, in the range of 100-700

calls per year, compared to urban or suburban paramedic units with workloads of 1,700 or more paramedic calls per year.

EMS Financial Plan: The EMS Strategic Plan contains funding for the continuation of existing paramedic services and includes an option to expand planned paramedic services in 2004 and 2006. As part of the planned funding schedule, the Bellevue Medic One 12-hour, two-paramedic unit located in Issaquah was expanded to a 24-hour staffing in January 2003. In addition, full funding for the 12-hour unit serving the Enumclaw Plateau is included in the 2004 budget proposal, and pending King County Council approval, is expected to begin 24-hour service in January 2004.

The remaining demands for increased or improved paramedic services in the county are not included in the Strategic Plan. The challenge is to build a productive partnership between fire departments, paramedic programs, and the EMS Division allowing unanticipated service needs to be positively addressed. This regional desire by multiple agencies to solve service problems characterizes the strength of the regional EMS system.

Changing the EMT/P Unit Model: Due to the unique circumstances in the North Bend EMT/P unit service area, including the high rate of trauma incidents, limited backup options, long transport times, mountainous terrain, and delay in providing critical advanced care since only one paramedic was available on scene, the Medical Program Directors in King County recommended to the EMS Division and the EMS Advisory Committee in 2001 that EMT/P units be upgraded to two-paramedic units as quickly as funding allowed.

It was not immediately apparent where the approximately $650,000 per year to increase the paramedic service would be obtained. However, a thorough financial review indicated that with careful planning it would be possible to staff a second paramedic on the North Bend unit through a combination of fire department support, existing EMS levy funds from the fund reserve, and in-kind support. Largely as a result of close cooperation by EMS partners in the region that included Bellevue Fire Department, Eastside Fire & Rescue, and the EMS Division, the EMT/P unit in North Bend was transitioned to a full two-paramedic staffing in July 2003.

With the increase of paramedic staffing for the EMT/P unit in North Bend, the entire I-90 corridor in King County, from Seattle to Snoqualmie Pass, now has several constellations of paramedic units staffed by two paramedics. These service increases are beneficial to all the citizens of King County who travel this corridor, or who live in the communities along it. Discussions and planning are currently underway to determine when the EMT/P unit in the Woodinville/ Duvall area can receive a second paramedic.

Enhancing ALS Services in Fire District #50: Discussions are currently taking place to address the need for additional services in Fire District #50 along Highway 2 in the northeastern part of King County. Again, the model of forming strong partnerships among local area service providers and the EMS Division will no doubt be resolved to the satisfaction of all partners.

Summary

The EMS system in King County and the current EMS levy fund are facing the challenge of enhancing and increasing paramedic services in outlying areas. In a few cases, additional services were anticipated in the EMS Strategic Plan. However, in most other cases, these needs were not anticipated and thus not included in the EMS Strategic Plan funding structure. The EMS levy fund, like other property tax levies, is beginning to feel the impact of the I-747 1% increase limit not matching the increased costs of providing service. Projected growth in new construction is down as a result of the slowed economy, and while there are sufficient funds for all committed services, there are limited funds for new initiatives or demands.

Reviewing the EMS financial status on a regular basis in order to make wise choices with the limited amount of funds available will be a continuing challenge throughout this levy period. Leveraging levy funds with other agencies, as was done with the conversion of the EMT/P unit in North Bend to a two-paramedic unit, will be essential in attempting to meet these new challenges.

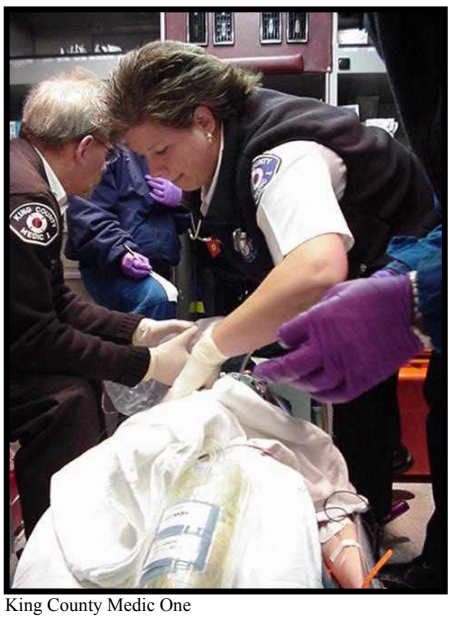
Part II: Status of EMS Division Programs and Activities

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. All EMS Division programs are designed to enhance this effort and are developed through strong partnerships with other EMS agencies and innovative leadership in the emergency medical field. This section summarizes the major EMS programs and activities involving the EMS Division.

A. King County Medic One Program

The EMS Division administers the King County Medic One (KCM1) paramedic program, one of six Advanced Life Support (ALS) programs operating in the county. KCM1 employs over 65 paramedics and support staff, and provides emergency medical response to patients in the south King County region. The KCM1 service area covers 500 square miles with a population of over 750,000 people. In the year 2002, KCM1 responded to nearly 12,000 dispatch-selected paramedic alarms in their primary service area, in addition to responding to mutual aid in neighboring jurisdictions.


King County Medic One

Each day of the year, King County Medic One operates six full-time medic units and one 12-hour unit. Each unit is placed strategically throughout the service area to minimize response times and maximize cost-efficiencies and is housed at one of eight satellite sites that include local fire department stations, KCM1 facilities, and a central office in the industrial area of Kent. KCM1 has 20 vehicles in their fleet, putting approximately 250,000 fleet miles on the medic units per year. Medic units are staffed with two paramedics working 24-hour shifts and utilizing five area hospitals for medical direction. Plans are being made to increase the 12-hour unit to a 24-hour unit at the beginning of 2004. The medic unit is also being relocated to a more central site within its primary response area. Both enhancements are designed to better serve the citizens of south King County.

Training Requirements: All King County Medic One paramedics are trained in the Paramedic Training Program at the University of Washington School of Medicine, based at Harborview Medical Center (HMC). Students develop their skills under the tutelage of experienced physicians, nurses, and Seattle Fire Department paramedics during the rigorous ten-month training course. As a condition of employment, all KCM1 paramedics are required to have a

minimum of 100 hours of biannual continuing education in addition to skill levels testing that exceeds both Washington State and national standards. To meet this obligation, KCM1 provides quality training through a number of in-house, on-duty educational opportunities. In addition, various required classes are available to paramedics, including three-hour, Harborview-based, UW School of Medicine continuing education classes each month. The training programs follow the path of logical and systematic progression from basic skills manipulation and knowledge testing to industry leading programs developed specifically for King County paramedics. Training cost efficiencies are obtained by rotating crews into headquarters for several hours of training every other month.

Educational Opportunities: Recent innovations to the King County Medic One program include the institution of a Grand Rounds Training (GRT) program that allows on-duty medics to train during their shifts at a central station. This model utilizes a team from the KCM1 program, under the tutelage of the King County Medical Director, to teach paramedics new skills as well as provide training on high-risk/low-frequency skills and procedures. The following is a list of additional educational opportunities provided by KCM1: Tuesday Series (monthly paramedic education at Harborview), monthly pharmacology exams, advanced paramedic training courses such as Experienced Provider - Advanced Cardiac Life Support (EP-ACLS) and Pediatric Advanced Life Support (PALS), difficult airway lab, scenario or situation-based education using anatomical simulators, and local EMS conferences and educational opportunities.

Special Services in the Community: Additional paramedic services are provided to the citizens of King County by staffing medic units for special events at the White River Amphitheater and the Pacific Raceways, and for major drills like the TOPOFF weapons of mass-destruction event in Seattle earlier this year (see page 38) and other high-volume public activities. A paramedic "Bike Team" has been developed for events where motor vehicle access is limited. KCM1 personnel also participate in regional BLS training, dispatch quality review and training, regional medical supplies and equipment purchasing programs, and vehicle replacement initiatives. The King County Medic One program also has a long history of being involved in many local and national clinical studies. KCM1 is currently involved in the Omega-3 fatty acid study, a study of the relationship between diet and cardiac arrest, and the pre-arrival aspirin HASK study (see page 39). KCM1 will begin a third study in October 2003 investigating an IV fluid that 'simulates' blood.

Administrative Structure: The King County Medic One administrative staff is configured to not only provide round-the-clock, supervision and response back-up to the paramedic program, but to extend the 'reach' to include partner agencies in south King County. Representatives from KCM1 participate in regional planning and operations groups, including the King County Fire Chiefs, Training Officers, trauma councils, hospital and emergency preparedness. The following positions provide liaison representation and expertise in these specified areas: Program Administrator, 24-hour Shift Supervisor, Operations Supervisor, Training Supervisor, and Emergency Management Supervisor.

King County Medic One remains one of the premier paramedic providers in the nation. Its high cardiac-arrest survival rate and superior customer service and customer satisfaction levels help maintain its reputation and define its performance standards. The personnel who provide this

core service are dedicated to public service at the highest level.

B. 2002 - 2007 Strategic Initiatives

The Emergency Medical Services system in King County provides an outstanding public service to its citizens. The EMS Division coordinates development of the regional strategic plan, in conjunction with EMS providers, EMS partners in providing services, and elected officials to help maintain this high quality service.

The **2002-2007 EMS Strategic Plan Update** supports both currently implemented programs and the development of new projects in order to meet the identified objectives. These 'strategic directions' were amended slightly from the original version in the 1998-2003 EMS Strategic Plan and now consist of the following:

- Enhance existing programs and add new programs to meet emerging community needs to maintain or improve current standards of patient care;
- Manage the rate of growth in the demand for EMS services; and
- Use existing resources more efficiently to improve operations of the system to help contain costs.

In order to provide a more detailed vision of how these directions might be implemented, the **2003 Supplemental Plan** was drafted. Following a thorough process of review and discussion by EMS Division senior staff, the EMS Advisory Committee, and EMS agency representatives, several broad themes emerged. They include the following three areas of interest:

- Dispatch Enhancements
- Advanced Technology Projects
- EMS System Efficiencies

In the 1998-2003 EMS Strategic Plan, the term 'strategic initiative' was used almost exclusively to describe a handful of new and innovative approaches to improving the EMS system in King County, including for example, the Telephone Referral Program (see page 35), and the Regional Purchasing Program (see page 33). The 2003 Supplemental Plan, however, attempts to broaden the 'strategic initiative' definition by including already existing programs that are thought to have significant impact on the success of the Strategic Directions.

In aggregate, this list of Strategic Initiatives highlights an array of new and ongoing projects and programs designed to meet the objectives of the Strategic Directions. Strategic Initiatives have dedicated Strategic Initiative funds to ensure adequate financial support. The following chapter describes each of the currently identified Strategic Initiatives. A 2002-2007 Strategic Initiative Summary Table is located on page 29.

I. Dispatch Enhancements

As indicated in the 2002-2007 EMS Strategic Plan Update, dispatch is the access point to emergency medical services and thus 'plays a critical role in managing the use of the high cost advanced life support (ALS) resources'. Strategic Initiatives that invest in the training and education of dispatchers and enhance quality improvement practices are expected to improve the effectiveness and efficiency of ALS dispatch. The following section describes the three major dispatch-related Strategic Initiatives.

Continued Review and Revision of the Criteria Based Dispatch (CBD) ALS Triage Criteria: One of the Strategic Directions identified in the 1998-2003 EMS Strategic Plan and supported in the 2002-2007 Strategic Plan Update was to determine ways to decrease the rate of growth of ALS calls in our system. A major component of this effort was to revise the Criteria Based Dispatch (CBD) Guidelines that determined the level of ALS care required by patients.

During the year 2000, the EMS Division implemented comprehensive revisions to the CBD Guidelines, provided training in the revisions to all dispatchers and fire department personnel, and started an Emergency Medical Dispatch Quality Improvement process. A comparative analysis was conducted to measure the impact of the 2000 CBD Guidelines revisions. Annual data from 1999 was compared to 2001data, a period of time when the changes had been in place for a full year.

Table 1. Percentage of Dispatch of ALS Responses

Group	1999 ALS/BLS calls (%)	2001 ALS/BLS calls (%)	P-value
Overall	28,696/87,245 (32.9)	27,184/94,112 (28.9)	0.0001
2nd ALS dispatch	1327/87245 (1.6%)	1279/94112 (1.4%)	0.004
Signs of shock	2626/13,423 (19.6%)	3086/16958 (18.2%)	0.001
Respiratory distress	2901/6724 (43.1%)	4090/10,078 (40.6%)	0.001
Decreased LOC	2974/10,952 (27.2%)	3586/13,622 (26.3%)	0.14

BLS calls represents the total number of BLS dispatches regardless of whether ALS was dispatched. P-value represents the chance that a finding (relationship) was observed due to chance. The typical cutoff is less than p=0.05

Results showed that overall, ALS was dispatched on 32.9% of EMS responses during 1999 and 28.9% of responses during 2001. If the observed decrease had not occurred, there would have been approximately an additional 3,800 ALS dispatches during 2001. ALS dispatch also decreased in specific areas targeted for reductions (see Table 1). The decrease in the proportion of ALS dispatches for Eastside Communications was 1.3% and 3.9% for Valley Communications Center (see Table 2). A random sample of cases that did not receive an ALS response after the guidelines revisions, although they would have received an ALS response prior to the changes, was reviewed for medical appropriateness. Of the 367 cases reviewed, 60% of the patients were assessed as needing ALS care and 40% as not requiring ALS care. The delay in receiving ALS care was not harmful to the patient in 95% of the cases reviewed.

Table 2. Differences in ALS Dispatch Frequency by Dispatch Center

Dispatch Center	1999 ALS / BLS calls (%)	2001 ALS / BLS calls (%)	P-value
Eastside Comm.	13,037/33,032 (39.5%)	14,597/38,166 (38.2%)	0.01
Valley Comm.	12,498/47,032 (26.6%)	11,371/49,983 (22.7%)	0.0001

BLS calls represents the total number of BLS dispatches regardless of whether ALS was dispatched. P-value represents the chance that a finding (relationship) was observed due to chance. The typical cutoff is less than p=0.05

As a result of the findings in the evaluation of the 2000 CBD Revisions, the EMS Division concluded that ALS was less likely to be dispatched during 2001 compared to 1999. Some of this decline may be due to changes in the dispatch triage guidelines. Dispatch quality review of cases and enhanced dispatch training may also have contributed to the decreases in ALS responses. Quality review practices and training are discussed below. Differences in decreases of ALS dispatches by dispatch center were observed. A large majority of cases dispatched as BLS and resulted in an ALS request from the scene did not cause harm to the patient as a result of a delay in ALS care.

The findings exhibit data that clearly indicates a marked difference in the statistics between several dispatch centers with respect to ALS dispatch data. While these variances are striking, it is not entirely clear, at the time of this report, the underlying cause for the differences. The EMS Division will closely examine the results and practices at the various dispatch centers to learn how to improve emergency medical dispatching in our region.

EMD Quality Improvement: The development of an Emergency Medical Dispatch Quality Review Program is an integral part of the 2002-2007 Strategic Plan. In 2001, the EMS Division in cooperation with King County Dispatch centers, began a formal process for review of dispatch tapes and associated EMS reports for the purpose of EMD quality improvement. As of June 2003, approximately 1,700 cases have been reviewed. The process includes, 1) the identification of cases meeting certain review criteria; 2) the retrieval of dispatch tapes and reports from the dispatch centers; and 3) a review of these cases by a team consisting of a paramedic and a dispatcher. Feedback from this case review is provided to the individual dispatcher, if appropriate, and is also used in continuing education when system wide trends for improvement are identified.

Enhanced CBD Basic Training and Continuing Education Curricula: A priority for enhanced dispatch training included revisions to both Basic and Continuing Education training in Criteria Based Dispatch. Two major changes to this training occurred between July 2002 and June 2003.

1) *Addition of Pre-course Anatomy and Physiology Class:* Dispatch improvements continue to focus on expanding and creating enhanced training for Emergency Medical Dispatchers (EMD). A pre-requisite course of Anatomy and Physiology is currently in the development stage and will be a requirement prior to attendance in the Basic Criteria Based Dispatch course. This 8-hour class will provide the dispatcher with a basic understanding of human anatomy and physiology.

Included in the course is a pre-course color workbook that students will complete one week prior to the Anatomy and Physiology prerequisite course. The students will also receive the 'Anatomy and Physiology Coloring Workbook' along with various job aids and charts to assist them in the learning process. The basic CBD course will provide the students with a review of anatomy and physiology and include pathophysiology aspects as well. The objective is to empower the EMDs with this knowledge and enhance their good decision-making skills with this additional medical training.

2) *Problem/Scenario-Based Method of Delivery:* One of the main projects for 2003 is to update and revise the method of training delivery to include more student-centered learning activities such as problem-based scenarios, role-playing, and other methods that involve students in the learning process. Instructors in the program are now required to attend a revised EMD Instructor Recertification workshop. The first workshop topic was 'Problem-based Facilitation Skills and Adult Learning.' The objective for this training was to provide instructors with information about the change in the method of delivery (from lecture to more scenario/problem based) from those they have used in the past. The curriculum consists of carefully selected and designed problems that demand from the learner, acquisition of critical knowledge, problem solving proficiency, self-directed learning strategies, and team participation skills. Studies have shown that the participants are able to apply the knowledge and seek out information more effectively than those students receiving the lecture-based method.

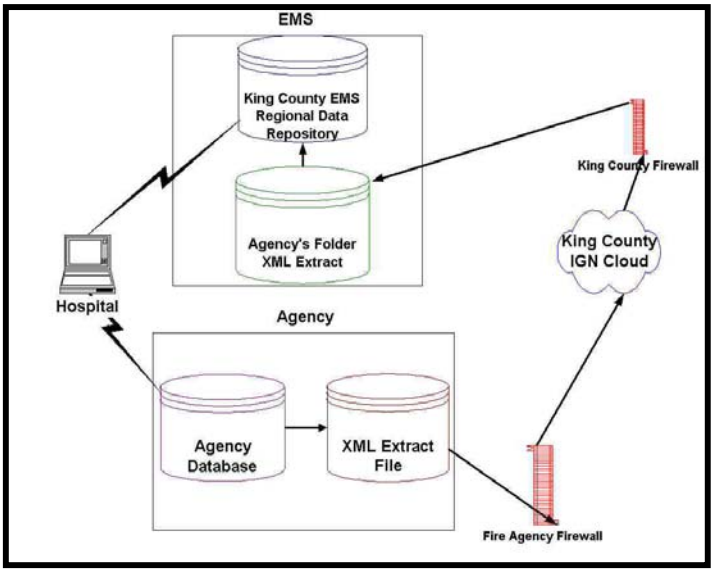
3) *Online Web-based Training:* During 2003, the first module of web-based continuing education is under development with November 2003 as the target offering month. More information on this project is provided under Advanced Technology Projects.

II. Advanced Technology Projects

The development of projects that incorporate advancements in technology offers a variety of opportunities for improved efficiencies in the EMS system. This includes data collection and training of personnel. Current technologies allow for rapid and direct communication between EMS agencies, accurate and secure transmission of information, and simplified management and oversight of EMS activities. The following section describes the two major technology-related Strategic Initiatives.

Continued Implementation of the Regional Electronic Data Collection Project: One of the Strategic Initiatives identified in the 1998-2003 EMS Strategic Plan was the development of an enhanced EMS monitoring system that would allow for improved oversight of the EMS system.
The **Regional Data Collection (RDC) Project** is an ongoing countywide effort to implement a system that allows for electronic collection and distribution of EMS data. The goal of the project is to enable all EMS providers in King County to complete an electronic version of the Medical Incident Report Form (MIRF) and electronically transfer that report directly to the regional EMS database. The collection and consolidation of data via electronic means will improve the accuracy and completeness of the data, provide access to the aggregate data by individual service providers, allow for more intensive analysis of the data and facilitate the assembly of system reports.

The RDC project is divided into three major phases: Phase I included the development and implementation of a system prototype in collaboration with pilot EMS agencies in the County. Once the system design had been successfully tested, Phase II invited the remaining EMS agencies to participate. Phase III focuses on connectivity with hospitals and other health care agencies. Development of the Regional Data Collection Project began in August 1998 with six pilot agencies and Phase I was successfully completed in December 2001. Phase II was initiated in January 2002 and continues through December 2003.



There are currently twelve agencies collecting EMS data electronically, including Auburn Fire Department, Bellevue Fire Department, Federal Way Fire Department, Fire District #40, Kent Fire & Life Safety, Kirkland Fire Department, Port of Seattle, Redmond Fire Department, SeaTac Fire Department, Shoreline Fire Department, Woodinville Fire and Life Safety, and Vashon Fire & Safety. These departments represent 53.7% of the forms generated in a year.

Two additional agencies are expected to begin electronic data collection by the end of 2003, increasing electronic reporting by agencies to 63.6%. The EMS Division began working with local area hospitals to begin piloting the exchange of a limited set of electronic pre-hospital and hospital data for EMS patients transported to hospitals.

In all cases of data collection and transfer, the strictest policy of patient confidentiality is maintained. This includes utilization of secured methods for data transfer and limited access to confidential information. The implementation of Health Insurance Portability and Accountability Act (HIPAA) regulations in April 2003, the EMS Division is evaluating any additional areas for improvement.

As a subset of the Regional Data Collection Project, the **Alternate Input Device (AID) Pilot Project** is testing hardware options for EMS data collection in the field and developing the specifications for a software product that allows the Medical Incident Report Form narrative to be completely captured in electronic form using current handwriting recognition capabilities. Development of this new pilot project began in August 2001 and a six-month pilot was completed in April 2003.

Implementation of Phase I determined the usability and feasibility of both the software prototype and the selected hardware devices, in addition to evaluating the specifications for a long-term electronic data collection solution for all EMS agencies within King County. Four EMS

agencies participated in the pilot project: Federal Way Fire Department, Kent Fire Department, King County Medic One, and Shoreline Fire Department. The device rotation schedule was set so each agency was provided two devices from one of the four hardware manufacturers for a six-week period. This allowed each agency to test all four of the hardware devices during the six-month study period.

The final report for Phase I of the AID Pilot Project recommended continuing with the project's original objectives of moving towards a fully electronic data collection system. Phase II of the AID project will incorporate the suggested enhancements to the data collection tool, and initiate a plan to begin addressing some of the out of scope items, including the ability to print the form when needed and development of a data extract to match the standard King County XML data schema. The report recommended purchasing a limited number of Tablet PC units from the vendor that has the best overall performance at the time of implementation with the revised form loaded on each unit for continued testing in the field by participating agencies. The projected time of implementation for Phase II is January 2004.

Web-based Training for Dispatchers, EMS Personnel, and AED Users: Development of training programs that utilize current web-based technologies allows for expedient and cost-efficient delivery of training services for dispatch, EMS personnel, and other targeted public populations.

The web-based training Strategic Initiative targets the development of basic and continuing education modules for dispatchers and continued development of continuing education modules for EMTs. This method of delivery allows participants the opportunity to log onto the Web and access the training modules during non-peak service hours and receive the training in intervals that best meets the needs of the participant. The lessons are interactive with a focus on application of the objectives. There is a participant feedback mechanism built into the lesson plan, thus allowing students immediate response on both test questions and scenario responses.

Another web-based teaching module was developed to provide Automatic External Defibrillator (AED) training for senior citizens. A pilot study enrolling seniors from King County senior centers was undertaken to determine the best means of teaching AED skills using the Internet. Results will be used to refine a web-based instruction site designed specifically for seniors.

III. EMS System Efficiencies

The Emergency Medical Services (EMS) system provides an internationally regarded regional service to the citizens of King County. However, improvements and innovations regarding the management and financing of the three levy-supported ALS, BLS and Regional Services sub-funds, review of EMS standards of practice, continuation of injury prevention programs, and analysis of particular EMS populations that could benefit from enhanced care are integral to the provision and maintenance of any high quality EMS system. The following section describes the five major efficiency-related Strategic Initiatives.

Financial Review of EMS Sub-Funds: The EMS levy in King County provides full support for Advanced Life Support (ALS) services, Regional Services, and Strategic Initiatives, and contributes to Basic Life Support (BLS) services. When the 1998-2003 EMS Strategic Plan was updated, a committee of elected officials, representatives of cities and unincorporated areas reviewed each of these sub-funds extensively. This review process was useful in identifying areas for improvement, assisting in the prioritization of projects, and providing flexibility in responding to program needs. Quality review of the EMS levy funding contributes indirectly to all three directions in the strategic plan by supporting programs that reduce ALS call volumes, highlighting program efficiencies, and advocating for innovative program practices. The review process educates decision-makers on how funds are being spent and allows the system to assess the services provided in each of the sub-areas. This review strengthens the regional system's ability to allocate funds, target areas of greatest need, and support areas that produce efficiencies or increase the systems effectiveness.

Paramedic and EMT Procedure and Patient Treatment Evaluations: Provision of the highest level of patient care is the primary objective of the EMS program in King County. Ongoing review of paramedic and EMT procedures and patient treatment plans is essential to maintaining a quality EMS system. Topics of recent interest include the following (see page 35 for additional details):

- **EMT Pulse Oximetry:** Pulse oximetry in a simple non-invasive measurement of oxygen saturation (amount of oxygen present in the blood). A pilot project was initiated in April 2003 to look at the safety and effectiveness of EMT pulse oximetry.

- **EMT Glucometry:** This minimally invasive procedure provides rapid measurement of blood glucose levels and can be helpful in the assessment of patients with altered level of consciousness. In September 2003, the EMS Division will introduce a pilot project that will look at EMT use of blood glucose testing, or glucometry.

Public Education on the Use of 911: Injury is an under-recognized major health problem facing the nation today. The study of injury represents an unparalleled opportunity to reduce morbidity and mortality and to realize significant savings in both financial and human terms, all at a relatively modest investment (National Academy of Sciences, Injury Control, 1988). Injury is predominately a problem for the young and is the leading cause of death for those under 45 years of age. In the elderly, falls account for many hospitalizations, and often begin the downhill slide, ending in death.

One of the Strategic identified in the 1998-2003 EMS Strategic Plan and supported in the 2002-2007 Strategic Plan Update was investment in injury prevention activities through public education to help manage the rate of growth in EMS calls. Injury prevention programs are designed to target high risk populations or programs that are known to decrease injuries. These include programs such as: preschool injury and fire prevention program, child passenger safety programs, bicycle helmet safety programs, DUI prevention programs, and fall prevention in senior populations. The following program descriptions provide some insight into the various programs operating in King County and supported by the EMS Division.

The leading causes of death and unintentional injury to children under the age of five are from car crashes, drownings, fire and burns, suffications, motor vehicle/ pedestrian-related crashes, and poisonings. To address these injury and fire injury issues, the EMS Division has formed a partnership with the Seattle Fire Department to develop and implement a program called **Smart Kids Safe Kids – A Preschool Fire and Injury Prevention Program** in conjunction with the *BIC Pen* fire prevention program 'Play Safe, Be Safe'**.** The Smart Kids Safe Kids program assists preschool teachers and caregivers with injury prevention education to their students. The curriculum includes teacher lesson plans, teacher and parent information, and activities for students.

Seattle Fire Department

Over the past six years, the **Fall Factors Prevention Program** has been funded by the Central Region EMS and Trauma Care Council, the King County Fire & Life Safety Association (KCFLSA), and the PacificCare Foundation. This program targets low-income people 65 years and older who have fallen at least once during the past year or people at high risk for falling.

The Fall Factors Program aims to prevent falls among older persons at an elevated risk of falling by providing home safety assessments and risk reduction device installation as well as education regarding methods to reduce the chance of falling. EMS personnel coordinate client referrals that are generated by a variety of community agencies, including the Seattle Mayor's Office on Aging, the Department of Social and Health Services (DSHS), Senior Services of Seattle/King County, Visiting Nurse Services, and several hospitals.

These referrals are then sent to a local fire department where specifically trained personnel, known as Public Fire Educators, conduct an assessment of the home with respect to the hazards associated with falling. City fire departments in Bellevue, Bothell, Federal Way, Kent, Kirkland, Redmond, Renton, Shoreline, and Woodinville as well as Eastside Fire & Rescue and King County Fire District #40 are actively involved in the program. Based upon the outcome of the assessment, the Public Fire Educators install the appropriate 'risk reduction devices' that may help reduce the risk of falling. These devices include tub grab bars, toilet grab bars, shower seats, rug slips, bath mats, night lights, tread tape, smoke alarms, and hand held showers.

Since funding has decreased from $29,000 per year to $10,000, only 71 home evaluations were completed during this annual reporting period and a total of 967 home evaluations were completed since the program started. For those who participated in the program and had a prior

fall, the risk of recurrent fall was 24%. Other studies in similar populations have reported a 50-67% risk of falls (Tinetti et. al., Hornbrook et. al.). If these findings are compared to an expected rate, the Fall Factors Program appears to have reduced the relative risk of falls by approximately 50%. Such a reduction would have meaningful personal and public health benefits for the community.

In 2003, the EMS Division implemented a "randomized falls pilot project" in the Bellevue FD service area targeting 40 participants. In addition to installation of risk reduction devices in the home, assessments of general health, social function, depression, activity, and state of mind are conducted. To date, the program has 6 participants enrolled in this program. The pilot project's primary function is to test methodology in attempt to garner a National Institute of Health (NIH) grant for a larger randomized study of the effectiveness of home intervention.

Federal Way Fire Department

The **Think Again Program** is a unique effort by local firefighters and paramedics in King County to reach teen drivers with real-life stories about the tragedies EMS personnel encounter when people don't wear seatbelts, or use alcohol or drugs and get behind the wheel. This is part of a special effort by local fire departments, in conjunction with the EMS Division, to emphasize safe driving for teens. In the presentations at the schools, firefighters use graphic car crash photos, personal stories, and consequences of reckless driving decisions. Students are given information about alcohol poisoning, the perils of raves and underage alcohol parties, and the effects on families and friends when teens are hurt, permanently disabled, or killed in automobile crashes.

The EMS Division, Washington State Traffic Commission, and the King County Fire & Life Safety Association (KCFLSA) are sponsors of the Think Again Program. KCFLSA is a non-profit organization of fire and life safety educators from fire departments and other agencies throughout the county. The Washington State Traffic Safety Commission granted $7,500 to KCFLSA to pay for Think Again instructors for Fire District #40, Eastside Fire, Kent Fire, and Kirkland Fire. Since the program has been so successful, Auburn Fire, Bothell Fire, Federal Way Fire, Redmond Fire, and Shoreline Fire have incorporated the Think Again program expenses into their own operating budgets, therefore not needing any outside funding.

The Think Again program reached approximately 4,072 high school students from July 2002 to June 2003. The number of students impacted is significantly lower since only four fire districts are involved with the WTSC grant compared to last year.

The **Child Passenger Safety Program** is a collaboration of local fire department personnel and National Highway Traffic

Safety Administration (NHTSA) certified child car seat technicians to provide car seat check-up events throughout King County. Certified NHTSA technicians complete and pass a 32-hour Standardized Child Passenger Safety Training Program sponsored by NHTSA and the American Automobile Association (AAA). The EMS Division sponsored a car seat check-up event at the Boeing Flight Museum in support of 'Fire Department Day for Kids' festivities. A total of 20 car seats were checked at this event. Eighty-five percent of the inspected car seats were found to have been incorrectly installed, indicating the substantial need for the Child Passenger Safety Program to continue and the potential impact on reducing injuries to children in King County. In addition, the EMS Division has developed a draft Child Passenger Safety Policy addressing the procedures and protocols for education and installation of child restraint systems. This policy is currently under review. In collaboration with the Federal Way Public Health Clinic, a pilot project involving a child passenger safety community coalition model has been developed to provide the necessary child passenger safety education and installation opportunities for the south county general public.

The EMS Division initiated a perpetual **Bicycle Helmet Fund** through the King County Fire & Life Safety Association (KCFLSA) which provides low-cost bicycle helmets to the citizens of King County. Helmets are available for a $6 donation. All funds are donated to KCFLSA for the sole purpose of keeping the perpetual bicycle helmet fund going. The Bicycle Helmet Program is a partnership with all King County Fire Departments to provide low-cost helmets to their constituents. During the period from July 2002 through June 2003, 730 helmets were properly fitted and distributed during various community events, including the 'Fire Department Day for Kids' celebration at Boeing Flight Museum and local fire department open houses.

Eastside Fire & Rescue

<u>Enhanced Care for Specific Populations</u>: Although the management of emergency medical services usually includes the development and implementation of programs that target a unique subset of EMS patients, highlighting these programs does not occur often. Providing a focal point for the development and implementation of programs that target specific users of EMS will provide more appropriate patient care and contribute to the overall efficiencies of service.

The following provides a brief description of these programs:

<u>Nursing Home/ Adult Family Facilities</u>: The Community Programs and Education Section has identified an area in which community education in nursing home/ adult care facilities would result in better, more efficient use of ALS resources. An educational video and job aide is being developed to deliver to health care providers in these types of facilities. The objective of the training is to reduce unnecessary requests for ALS from nursing homes, adult care facilities, and general medical clinics.

<u>Domestic Violence</u>: The 'Domestic Violence: The EMS Response' curriculum was written in 2000 to address EMTs and their role in domestic violence calls. This program assists the EMT

in recognizing the possibility of abuse, evaluating the patient and the scene, supporting the patient or patients, and treating, referring and documenting the call. Since 2000, it has been presented at EMS conferences throughout the state of Washington, at a national conference in 2001, and taught to over one third of the agencies in King County. It is actively being presented as a two-hour class here in King County and to EMS agencies in Pierce and Thurston counties.

Elder Abuse Video for EMTs: In coordination and cooperation with the King County Prosecuting Attorney's office, a video is in production and will be released this year addressing the role of the EMT in elder abuse and neglect calls. This video will provide the EMT with the tools to properly assess a possible scene of abuse or neglect as well as the mandatory reporting laws and the appropriate numbers for immediate referral. This video also includes the role of the EMT with respect to police and social service agencies throughout King County. The video will be distributed to all EMS agencies in King County by early Fall 2003.

Assessment of the Impact of State Budget Cuts on the EMS System: The current financial crisis in Washington State has created unprecedented budget cuts to critical health care programs for children and families. This includes support of the Basic Health Care program and Medicaid reimbursements. The EMS Division will evaluate the impact of these cuts on the EMS system in King County in order to provide appropriate and adequate response to patients who may use 911 as an access point to primary health care.

IV. Strategic Planning for Next EMS Levy Period

The **2002 Strategic Plan Update** to the 1998-2003 EMS Strategic Plan was conducted in anticipation of placing the EMS levy on the ballot in November 2001. After three years of intense work and public scrutiny by two Task Forces comprised of elected officials and representatives from cities, fire districts, and the King County Council, the 2002 Strategic Plan Update outlined the operational and financial recommendations for the 2002-2007 funding period. A copy of the full report is available online at http://www.metrokc.gov/health/ems/ or by contacting the EMS Division (see Appendix G: EMS Division Contact Information). Developing a Strategic Plan for the next EMS levy period will require coordination and collaboration with EMS agencies and elected officials. Identifying this as a separate strategic initiative with associated funding will expedite this process.

2002-2007 Strategic Initiative - Summary Table

Topic	Initiative	Lead
Dispatch Enhancements	Continued Review and Revision of the Criteria Based Dispatch (CBD) ALS Triage Criteria	Community Programs and Education
	EMD Quality Improvement	Community Programs and Education

	Enhanced CBD Basic Training and Continuing Education Curricula	Community Programs and Education
Advanced Technology Projects	Web-based Training for EMS Personnel, Dispatchers, and AED Users Continuation of the Regional Electronic Data Collection Project	BLS Training and Education, Community Programs and Education, and CEEMS Strategic Planning & Data Management
EMS System Efficiencies	Financial Review of EMS Sub-Funds Paramedic and EMT Procedure and Patient Treatment Evaluations Injury Prevention Programs Enhanced Care for Specific EMS Patients Assessment of the Impact of State Budget Cuts on the EMS System	Finance Medical Director Community Programs and Education Medical Director Strategic Planning & Data Management
Strategic Plan	Development of Strategic Plan for Next Levy Period	Strategic Planning & Data Management

C. EMS Division Programs and Activities

Introduction

In addition to the eleven 2002-2007 Strategic Initiative projects outlined in the 2003 Supplemental Plan, the EMS Division plays a significant role in developing, coordinating, implementing, and managing a variety of EMS programs throughout King County. These programs provide the necessary regional cohesion to ensure that the standards for pre-hospital patient care are met by the 911 dispatchers receiving calls for medical assistance and by the EMTs and paramedics responding to the scene. They also reflect a commitment to providing regional oversight and cohesion, and EMS agency discussion and input. The importance of the developing and supporting regional programs is often under appreciated. The following section describes the many varied regional programs managed by the EMS Division.

I. Basic Life Support (BLS) Training and Education Program

Helping you become the best through Training, Education and Certification!

The **Basic Life Support (BLS) Training and Education Program** provides initial training, certification, continuing education, and recertification for 3,500 Emergency Medical Technicians (EMTs) and First Responders in King County. This requires considerable coordination and communication between the BLS Training Section staff and EMS agencies to ensure that training and education programs meet agency needs, as well as State of Washington requirements.

In addition, the section serves as the liaison between the State Department of Health and the thirty-four fire/EMS agencies in King County. In this capacity, the section provides EMS agencies all pertinent information from the State regarding continuing education, certification, recertification, and regulatory and policy changes. The BLS Training and Education Program is directed by the Basic Life Support Training Supervisor, a position affiliated with King County Medic One, and is staffed by two full-time and one half-time program managers, and an administrative assistant.

The following **BLS Training and Education Projects** are underway for 2003:

Patient Care Guidelines: The protocols used by EMTs to direct the pre-hospital care of patients are derived from the Patient Care Guidelines. The EMS Medical Program Director (MPD) is required by Washington Administrative Code (WAC) to draft and distribute these guidelines to all EMTs and First Responders in King County. In 2003, the patient care guidelines were updated by a committee of EMS providers from around the county in collaboration with the

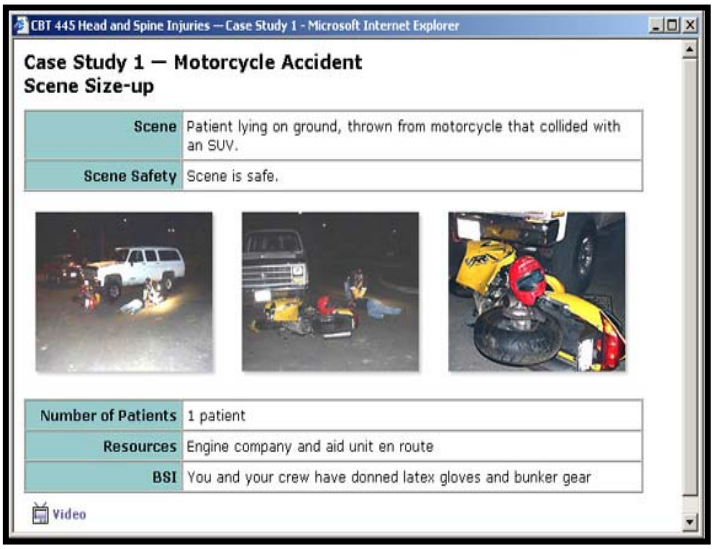
MPD, and distributed throughout the county. They were also placed online so changes could be rapidly communicated to EMS personnel.

Initial Training Classes for EMTs: Two initial EMT training courses are offered in the spring and fall of each year. These classes are open to personnel from all thirty-four King County fire agencies. Each course consists of 120 hours of classroom and practical instruction as well as 10 hours of hospital observation time. The courses utilize the State Department of Health curriculum. In 2002, over 120 EMTs completed the EMT basic course.

Competency Based Training (CBT): Each year, the State of Washington mandates that EMTs complete ten hours of continuing medical education or a county-approved program of continuing medical education and evaluation. 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 15 modules in a three-year recertification cycle. In aggregate, this program is referred to as Competency Based Training (CBT). The BLS Training staff write the curriculum each year consisting of printed manuals, exams, slides, and an interactive web-based format.

The 2004 Competency Based Training curriculum is currently being developed for the following selected topics: Soft Tissue Injuries, Abdominal Pain, Altered Mental States, Pediatric Fever/ Infection, and Infectious Diseases.

The CBT Online Training Website that delivers the web-based CBT modules was developed for the first time in 2001 with the assistance of grant money from the Medic One Foundation. Sixteen modules are currently available online with 3,598 EMTs enrolled (90% of the EMTs in the county). Over 13,301 courses have been completed, resulting in a dramatic reduction of CBT training costs since web-based training is approximately $18/EMT per year and standard classroom instruction is approximately $133/EMT per year.



The online CBT curricula are designed for EMTs to study the subject in an interactive format, including realistic video case studies (produced by BLS staff) with complete online evaluations. The test results are automatically stored in an electronic database for centralized record keeping and reporting to county fire departments and EMS agencies. Each module has a practical skills evaluation conducted by an onsite instructor to ensure clinical skills meet county standards. BLS Training staff provide technical support for the website and support an instructor hotline for questions about the modules and treatment protocols. The website is currently being revised for 2004 curriculum

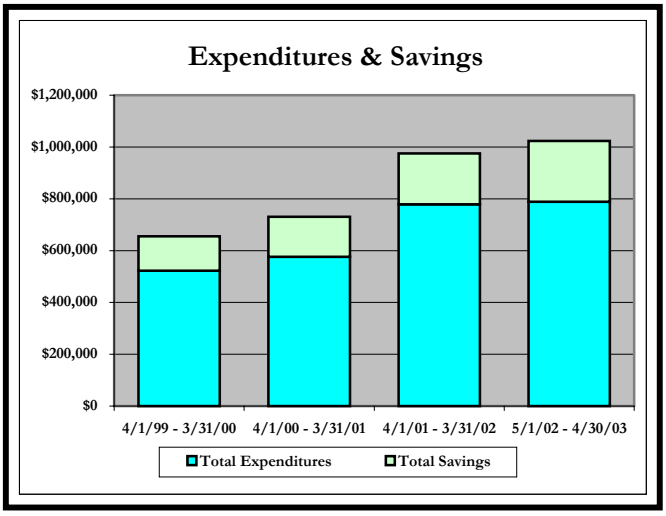
and will add improvements to this state-of-the-art training system including improved interactivity and advanced reporting features.

The CBT Online website was presented to the Washington State EMS and Trauma Licensing and Recertification committee in June 2003 and was approval for use in EMT continuing education. The site earned praise from the committee as an innovative and cost-effective method of delivering EMT continuing education. The committee is now exploring ways to replicate this concept of training for use around the State.

Early Defibrillation Program: The goal of the Early Defibrillation Program is to resuscitate the greatest number of people in cardiac arrest through a comprehensive plan that includes initial defibrillation training, continuing medical education, field documentation and reporting, equipment maintenance procedures, and quality assurance activities. The Early Defibrillation Procedures Manual was revised in 2003 to reflect new scientific understandings in resuscitation, including the standing orders for cardiac resuscitation. The defibrillation quality assurance program evaluates all resuscitations that occur in King County. The information is used to provide timely feedback regarding resuscitation to each individual EMT and their training officers. In aggregate, the data is used for improved defibrillation training and feedback to manufacturers regarding software and hardware design.

II. Regional Purchasing Program

The **EMS Regional Purchasing Program** is a voluntary countywide program designed to reduce equipment and supply expenses by maximizing the joint purchasing power of EMS providers. Since its successful completion as a one-year pilot project in 1998, the program has been operating on a contractual basis with Life-Assist, Inc, the vendor providing the lowest overall bid for EMS supplies and equipment. The primary purchase order operates through King County Medic One and EMS agencies in King County are able to coat-tail on the contract through their joint purchasing agreements.



An annual review of the cost savings during the May 1, 2002 - April 30, 2003 contract period with Life Assist, Inc. was conducted recently. Comparisons were made between total agency expenditures and Life Assist, Inc. catalogue prices. Although total agency expenditures from the Regional Purchasing Program increased slightly from $778,856 to $788,827, there was an increase in savings of $234,604, 19.5% above the previous year.

The Regional Purchasing Program is managed by an oversight committee that meets on a quarterly basis to address operational issues, review EMS products, and evaluate the progress of the program. The direct administrative costs are minimal as product orders, agency invoicing, and shipping are all managed at the agency level.

The EMS Division and the Regional Purchasing Committee have developed a similarly designed **Regional Purchasing Program for Medications** that offers paramedic agencies in King County a cost-savings option for purchasing patient medications. Representatives from each paramedic program met over that past six months to develop a standardized medications list, and following Medical Program Directors review and approval, the EMS Division will put the purchase order out for a competitive bid. The program is expected to be in place by November 2003.

III. Emergency Medical Dispatch (EMD)

The EMS Division provides **Basic and Continuing Education Training** in Emergency Medical Dispatch (EMD) to approximately 175 emergency 911 dispatchers in King County. This training allows the dispatcher to appropriately triage callers so that the right level of care is sent to the patient. During the past year, 28 dispatchers from King County completed the 32-hour Basic EMD Training class. In addition, 145 dispatchers were provided 8 hours of Continuing Education in EMD related topics. An EMD Instructor Course (train-the-trainer) was delivered in July 2002, with 16 dispatchers and paramedics participating. The instructor re-certification course was delivered in January with 16 participants.

Valley Communications Center

The 2002-2007 Strategic Plan Update identified a number of **enhancements to emergency medical dispatch**, focusing on enhanced dispatch training. Planning has begun in the following areas:

Basic Training: Changes to the EMD Basic curricula this year will focus on two areas. Additional training will be provided in the area of Basic Anatomy and Physiology to the dispatch students. This will be accomplished by adding one full day of training and testing prior to the existing 32-hour class. Another goal is to enhance the current 32-hour course to include more student application exercises and increase the students' participation in the learning process. This will be accomplished with role-play scenarios, simulation exercises and other incorporated activities. Both of these projects are in the development stage.

Continuing Education Training: In an effort to meet the 8 hour per year minimum requirement for continuing education, EMD training staff designed and developed several instructional topics for the purpose of delivery to Emergency Medical Dispatchers. In Spring 2002, the topics were Respiratory Distress, Anaphylaxis, and Environmental Emergencies. The Fall 2002 curriculum was on the topic of Trauma/ Hard Tissue Injuries. The Spring curriculum for 2003 included

Chest Pain and Stroke, and the Fall 2003 class will pilot web-based courses on Cardiac Arrest and Telephone CPR.

Alternate Delivery Methods for Continuing Education Training: The objective of this project is to develop and deliver the continuing education curricula in a web-based format. This will enable the dispatchers to log on from their own Communications Center consoles and participate in the training at their convenience when the call load volumes permit. This method of delivery would be used when suited to meet the desired lesson objectives. This will be a long-term project during this levy period and is still in the stages of conception and planning.

The following dispatch-related article has been accepted for publication in the Annals of Emergency Medicine: Hauff S, Rea TD, Culley LL, Becker L, Kerry F, Eisenberg MS. 'Potential obstacles to dispatch-assisted telephone CPR.' *Annals Emerg Med* (in press).

IV. Telephone Referral Program

The **Telephone Referral Program** continues to provide emergency medical dispatchers in King County with an alternative method for handling non-urgent calls to 911. From July 1, 2002 to June 30, 2003, 696 calls were referred to the nurse line, including 420 calls from Valley Communications Center serving South King County, and 276 calls from Eastside Communications Center serving east and north King County.

Evergreen Healthline

Results from a previous pilot project during the 1998-2003 Strategic Plan period, demonstrated that the transfer of specific 911 calls to a telephone nurse line was safe and effective with a high rate of patient satisfaction. As a part of the 2003 CBD Guidelines review process, the dispatch criteria for telephone referral to the nurse line is currently under review.

V. Regional Medical Control

The **Medical Program Director (MPD)** is responsible under the Washington Administrative Code (WAC) and Revised Code of Washington (RCW) for medical control and direction of certified EMS personnel in King County. This is accomplished through the delegation of medical oversight to the medical directors of individual paramedic programs and emergency room-based on-line medical control for ALS personnel. The MPD also assists in the development of policies and procedures related to the provision of ALS and BLS services, and provides written treatment guidelines for BLS personnel. The Medical Directors' Committee, comprised of the medical directors from each ALS provider agency, provides generalized

program oversight. The committee meets on a quarterly basis to address pertinent medical issues.

Topics of recent interest to the Medical Program Director include:

- **EMT Pulse Oximetry:** A pilot project was initiated in April 2003 to look at the safety and effectiveness of EMT pulse oximetry. Pulse oximetry in a simple non-invasive measurement of oxygen saturation (amount of oxygen present in the blood). The pilot consists of nine participating fire departments that obtained training via the BLS Training CBT Website. Each time the device is used in the field, participating EMTs are required to submit a completed questionnaire to the EMS Division. The aggregate information will be used to determine if the device should be approved for use countywide. A total of 400 patients will be needed to make this determination. It is expected that this number will be reached by September 2003.

- **EMT Glucometry:** In September 2003, the EMS Division will introduce a pilot project that will look at EMT use of blood glucose testing, or glucometry testing, in the field. This minimally invasive procedure provides rapid measurement of blood glucose levels and can be helpful in the assessment of patients with altered level of consciousness. Like the pulse oximetry project, participating fire departments will undergo training in the procedure via the BLS Training CBT Website and a completed questionnaire. The results of this questionnaire will be used to determine if EMT glucometry should be added as a BLS skill countywide.

- **Infectious Disease Survey:** A survey of fire department infectious disease policies was undertaken in 2003. The goal is to develop a model policy to ensure rapid care for EMS personnel exposed to potential infectious diseases such as HIV, Hepatitis B & C, meningococcemia, and tuberculosis.

VI. EMS Advisory Committee

The **EMS Advisory Committee** was formed in December 1997 and has met on a quarterly basis to discuss the progress of the strategic plan, review the development and implementation of the strategic initiatives, and act as a judicious discussion forum for important EMS issues. The committee played an integral role in supporting and reviewing the evaluation of the ALS Dispatch Guidelines, development of the 2003 Supplemental Plan, and the Alternate Input Device (AID) Pilot Project.

The EMS Advisory Committee also plays a supporting role in the direction of Emergency Medical Services in King County by making recommendations to various political bodies concerning key EMS issues, such as monitoring the feasibility study in south King County, reviewing the successful transition of Evergreen Medic One to the Redmond Medic One consortium, and reviewing the BLS funding formula. A copy of the current membership on the committee and their respective representation can be found in Appendix E on page 69.

VII. Cardiopulmonary Resuscitation (CPR) and Automated External Defibrillators (AED)

Community Responder AED Program: The Community Responder AED program goal is to have all AED devices located in public places and private homes registered with the EMS Division. The Seattle/King County Community Responder AED Program was designed to assist businesses and private homes in implementing the appropriate training, placement, and registration of devices in compliance with the Washington State law concerning AEDs. This Public Access Defibrillation program is continually growing. As of August 2003, there are approximately 710 devices registered in the Community Responder AED Program. In advance, the EMS Division provides dispatch agencies with specific AED device and location information. When a 911 call is received from within the vicinity, responding fire departments are forwarded the AED information.

SeaTac International Airport is one of the biggest sites that recently put AEDs in their facility. When the project is completed there will be an estimated 250 devices placed throughout the airport within easy access to staff and lay responders. Public Health - Seattle & King County has placed 6 devices in Public Health clinics with an additional 4 devices planned by the end of 2003. The EMS Division is in the process of training all staff at each locale to be able to use an AED should an event occur. Since the program began there have been 50 cardiac arrests in which AEDs were used by public bystanders prior to EMS arrival. The survival rate among these 50 patients was 50% - a remarkably high rate of resuscitation and discharge.

Student CPR Program: The EMS Division conducts annual training of school teachers and fire fighters to become CPR Instructors and provided nationally-recognized American Heart Association training last year to 12,660 students, grades 6-12 in King County. The EMS Division contracts with nine school districts and six fire districts to provide funding for program operations. In the spring of 2003, three students received awards for using life saving techniques they learned in a school CPR class. The annual fall and spring instructor training focused on the American Heart Association's new CPR/First Aid curriculum. The course was very well received and teachers and fire fighters are anxious to teach CPR and First Aid as one course.

King County Employee CPR Training Program: The goal of this program is to provide King County employees the training to assist in a life and death event should the occasion arise. This is accomplished by providing free CPR/AED training to all employees during their usual workday. EMS staff trained over 3,000 employees in 2002, and approximately 1,700 county employees have received CPR/AED training during the first 6 months of 2003. An estimated 3,000 employees will be trained during 2003.

Targeted CPR Training: The EMS Division works directly with several cardiologists in King County to provide CPR/AED training to patients considered high risk for heart related problems.

The program offers in-home training for these citizens and their families and friends. CPR training is provided, and if an Automatic External Defibrillator has been assigned to the family, they receive this training also. Last year, visits were made to 27 homes and 162 people were trained in CPR and/or AED.

VIII. Critical Incident Stress Management (CISM) Program

King County Medic One

The Critical Incident Stress Management Program within the EMS Division provides stress management services for emergency services personnel, including police officers, firefighters, EMTs, paramedics, dispatchers, and corrections officers. The purpose for this program is to help responders remain psychologically healthy. The CISM program is supported by 21 dedicated volunteer Peer Support Debriefers and Mental Health Professionals who donate their time to respond to post critical incident events. The EMS Division coordinates pre-incident stress management classes and provides support to Peer Support Teams from provider agencies. There are approximately 40 post-incident CISM related requests during the year and includes debriefings, defusings, one-on-one interventions, and referrals to mental health services.

Thus far in 2003, the CISM program continued with *Help the Helper Help,* providing various services to individuals, consultation to agencies, and support for health management initiatives. Three members of the CISM Team participated on the Washington State CISM Net Board of Directors. Four members of the CISM Team who traveled to New York in August of 2002 to provide debriefing services for New York City police officers were awarded special recognition for their contributions and for initiating a new psychological care method that was determined to be useful with latent psychological affects of 9/11.

The King County CISM staff continues to work with BLS Training and Education Section to provide EMTs with 'Crisis Intervention and Stress Management' as a part of their CBT curriculum. The EMS Division continues to evaluate stress management research and by the end of 2003 will develop a position and vision statement as a guide in future services and projects that support emergency service personnel.

IX. Emergency Management

Emergency Management Realignment and Enhancement: The Emergency Medical Services Division has provided direction in emergency preparedness planning for Public Health - Seattle and King County since 1982. In response to mounting federal and state demands for increased preparedness in the areas of homeland security and bio-terrorism, Public Health initiated a plan in 2002 to enhance the level of staffing and resources attributed to this effort. After a year of

planning, a new Emergency Management Section was implemented in the Office of the Director of Public Heath in January 2003. As a result, the emergency management responsibilities were realigned from the EMS Division to the Office of the Director and staffing was increased from a 0.3 FTE Manager and 0.5 FTE Program Coordinator to a full time Emergency Manager and 4 full time Program Managers. Increased staffing was supported by shifting existing resources and by the new bio-terrorism grant funding. EMS Division management and staff actively participated in transition activities to support this move. This change represents a key shift in priorities for Public Health in response to the increased threat acts of terrorism in our communities.

Top Off 2 Emergency Exercise: Top Off 2 was a congressionally-directed national exercise designed to combat terrorism and improve the national crisis and consequence management capability. King County, the City of Seattle, and the State of Washington participated in the week long exercise. Public Health participated in the radioactive dispersal device scenario by fully staffing the King County and Seattle Emergency Operations Centers and its own Public Health EOC, located in a new temporary location adjacent to the King County EOC. While many lessons for improvement were learned, initial after action reports are favorable of the Public Health response and the exercise increased our operational readiness to the potential for terrorist activity in our community. The EMS Division assisted the new Public Health Emergency Management Division by providing Exercise Design and Control functions prior and during the exercise. EMS Division staff spent approximately one year planning for the intense exercise.

X. Administrative Functions

The EMS Division operates under the guidelines presented in the various Master Plans, Master Plan Updates, and Strategic Plans, all approved by the King County Council. The process for updating these directives and implementing the specific programs identified in the plans requires significant data analysis and program coordination. An integral component of this analysis is the data modeling used to identify optimal placement of paramedic units. A few of the major activities this year included the provision of ongoing data analysis to those responsible for updating the 1998-2003 EMS Strategic Plan and development, implementation and ongoing management of current strategic initiatives.

The EMS Division is responsible for the coordination of services with other divisions of Public Health - Seattle & King County and other county agencies, councils, and offices, such as the Budget Office, Prosecuting Attorney, King County Executive, Risk Management, and the King County Council. Responsibilities also include the coordination and delivery of strategic planning, union negotiations, personnel and payroll issues, diversity management, legal compliance liability issues, contract administration, and the issuance and compliance of policies and procedures. The EMS Division maintains contracts for five paramedic provider groups of Advanced Life Support Services (ALS) and for thirty-three Basic Life Support Provider (BLS) agencies located in King County and maintains fiscal responsibilities for the EMS Division, including budget preparation and monitoring, projection of long term financial planning, and management of levy funds.

The EMS Division is also responsible for management of the Medical Incident Report Form (MIRF) data gathered in the field in compliance with Washington Administrative Code (WAC) 246-976-420. The EMS Division provides rapid response to data requests from external agencies and EMS agencies in King County; provides data analysis and reports for pilot projects, EMS programs, and research projects; and provides network connectivity and management for all EMS Division employees.

Duties related to the oversight of this dataset include management of the cardiac database and the entire data warehouse system, collection and processing of approximately 115,000 Medical Incident Report forms per year, and regular review of the EMS data set and data system. A new quality assurance effort to begin in 2003 will relate hospital outcomes following cardiac arrest to service and resuscitation factors. The goal is to improve resuscitation rates and neurological outcomes.

D. Grant Funded Programs and Projects

I. Center for The Evaluation of Emergency Medical Services (CEEMS)

CEEMS centers their research efforts in the field of pre-hospital emergency care and is supported by grants and staffed by investigators from the University of Washington and employees of the EMS Division. Known both nationally and internationally in the field of cardiac arrest, the investigators are continuously sharing their cutting edge research through numerous articles published in EMS and scientific journals.

A summary of the primary CEEMS activities of the past year is as follows:

Heart Attack Survival Kit (HASK) Program: The HASK Program is a National Institutes of Health (NIH) funded grant with the goal of increasing calls to 911 among seniors experiencing chest pain and increasing self-administration of aspirin. Twenty-seven thousand heart attack survival kits (containing symptoms of a heart attack and a single aspirin) were delivered to seniors by emergency medical technicians (EMTs) in thirty fire departments.

Along with the delivery of the kits, the EMTs spent about 3-5 minutes with the seniors at home going over barriers they may have in calling 911 for chest pain and educating them about taking an aspirin once they have called 911. Approximately half of the seniors were contacted at the time of the visit and the remainder received a kit in a plastic bag on their doorknob.

Currently, the program is in its fourth and final year of HASK grant-supported funding. During the study period from October 2000 through December 2003, chest pain calls to 911 are being matched with addresses of those seniors who received the Heart Attack Survival kits in person by a fire fighter/EMT, those seniors who had kits left on their doorknob, and those seniors who fell into the control group. Outcome measurements include whether or not aspirin was taken prior to arrival of the fire department. All 911 call logs will be checked to compare these areas before and after the kit deliveries to monitor the impact of the program.

Although data collection will not be complete until December 2003, preliminary glimpses of the data do suggest a somewhat positive outlook. This is encouraging, though not yet conclusive. To date, all of the numerous studies, public education campaigns, and advertising interventions that have attempted to change behavior when experiencing heart attack symptoms have had no effect and the HASK study may prove to be a viable alternative.

Family Heart Savers Project (FHS): The Family Heart Savers Project is expected to determine if there are psychological differences between receiving state-of-the-art CPR training, including automatic external defibrillator (AED) instruction, and traditional CPR training in patients with known cardiac disease. High-risk families are randomized to either CPR training or to receiving a donated AED. They are asked to complete 4 sets of psychological questionnaires and have retention of their skills tested at 3 months. Two local defibrillator manufacturers donated the AEDs for this research project. The study has currently enrolled 159 families of patients with plans to enroll another 40 randomized families, analyze the data, and publish the results.

Future Studies: Two grant applications are being prepared for submission. They include the AWARE grant and the Home Automated External Defibrillator Training for High-Risk Patients (HAEDT). AWARE is the daughter of the HASK study and will evaluate awareness and response for symptoms of cardiac ischemia among high-risk woman with a history of cardiac disease. If approved, this study would begin in July 2004. The Home AED Training grant will determine the optimal family responder to ensure AED skill proficiency. If approved funding, this study would begin April 2004.

The following related papers were published recently by CEEMS:

Chen MA, Eisenberg MS, Meischke H. 'Impact of in-home defibrillators on postmyocardial infarction in patients and their significant others: An interview study.' *Heart and Lung* 2002;31:173-85.

Meischke, HW, Rea, TD, Eisenberg, MS, Rowe, SM. 'Intentions to use an automated external defibrillator during a cardiac emergency among a group of seniors trained in its operation.' *Heart & Lung* 2003;Vol 31, No. 1.

II. Central Region Emergency Medical Service and Trauma Care Council

Traumatic injury is the leading cause of death for all people under the age of 44 and the leading cause of disability for all people under age 65. In 2002, Central Region (King County) hospitals treated 25,456 victims of trauma. 4421 patients were severely injured. 166 patients died.

The Central Region is one of eight Trauma Regions established by The Statewide Emergency Medical Services and Trauma Care System Act of 1990 (RCW 70.168). The Central Region Trauma Council and its sub-committees provide a forum where public and private EMS providers can meet and discuss the issues they all face, including how to provide the best possible care to the millions of people who live, work, and play in King County.

King County Medic One

Multiple-casualty incidents, disaster preparedness, and emergency room closures have been pressing issues for the Trauma Council during the past few years. Following the September 11th terrorist attack, preparation for multiple-casualty incidents intensified.

Regional Hospital Bio-terrorism Response Plan: In Fiscal Year (FY) 2003, hospitals in the region were contracted by Washington State's Department of Health (DOH) to conduct a standardized bio-terrorism needs assessment and to develop a regional hospital bio-terrorism response plan. Twenty-one hospitals in King County participated in individual hospital assessments to determine planning, equipment, and capital improvement projects needed to ensure treatment of 500 infectious disease patients.

Virginia Mason Medical Center

Following completion of all assessments, the Central Region Hospital Committee combined forces with an existing infectious disease workgroup (ORWG) headed by Jeff, Duchin MD, epidemiologist for Public Health - Seattle & King County to write a bio-terrorism plan. Over a period of eight months representatives from 20 hospitals in the region developed the Region 6 (King County) Hospital Bio-terrorism Preparedness and Response Plan.

The Plan was submitted to DOH on June 21, 2003. In FY 2004, Central Region hospitals will be required to expand the Region 6 Bio-terrorism Preparedness Plan to provide care for 900 patients (500 patients/million population).

Disaster Preparedness (TOP OFF II): The region's hospitals participated in TOP OFF II Exercise. Hospital staff that attended TOP OFF II debriefings stated that the hospital system was not sufficiently challenged by the event.

However, several key areas of vulnerability were identified including security, crowd control, and guidelines for selection of decontamination teams and length of time staff can safely remain suited up in personnel protective equipment. Hospitals are developing such guidelines and are planning additional drills to ready the trauma system for all hazards disasters.

Children's Hospital & Regional Medical Center

Central Region Trauma Council Goals for 2004 – 2005: Trauma Regions are required to review emergency medical systems within the region and to develop goals and strategies to enhance system performance and patient care. The Central Region has developed the following goals for FY 2004 and 2005.

- Increase financial support for web-based and telemedicine training for emergency department nurses, EMTs, and other emergency medical personnel.
- Continue to provide funding of injury prevention activities
- Provide hard data and publish results of:
    - Deceased public funding of medical care for low income and indigent
    - Effect of current medical malpractice insurance practices
    - Impact of inappropriate use of emergency departments for non-emergent cases
    - Need for after-hours and weekend non-emergent medical care to redirect patients flow to appropriate level of care
- Study long-term outcomes for victims of TBI (Traumatic Brain Injury)
- Develop resource manual for TBI victims, friends and families
- Continue disaster planning activities for hospitals

Trauma Regions are grant funded by the Washington State Department of Health. The current contract expires in June 2004. Until funding runs out, the Central Region EMS and Trauma Care Council will continue to plan and drill for disasters, man made or natural; as well as discuss prevention and treatment of day-to-day traumatic injury.

Summary of 2002 EMS Statistics (Seattle and King County)*

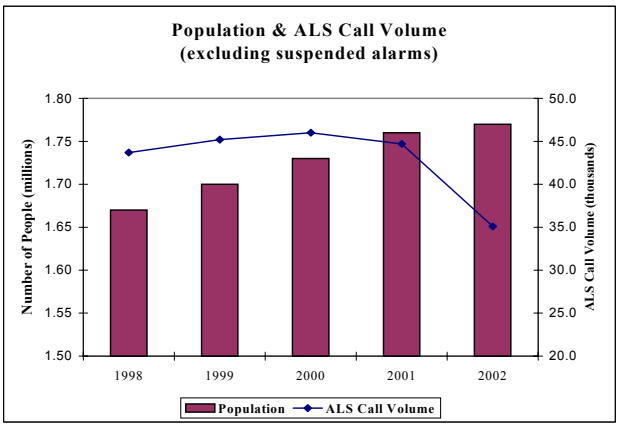
The following statistics are derived from the data collected on the Medical Incident Report Forms (MIRFs) and submitted by EMS agencies to the EMS Division for the year 2002.

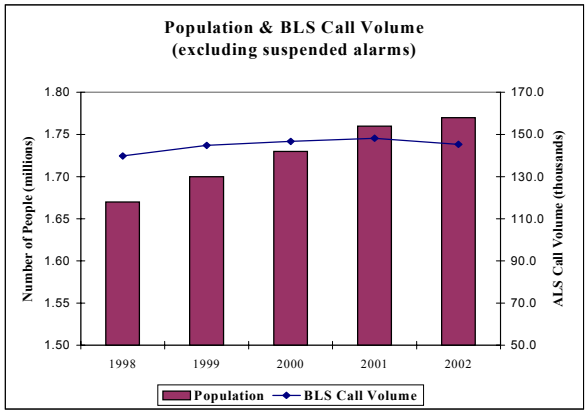
General Statistics:

Service Area: 2,134 sq. miles

Population	Seattle-King County	% Growth
1980	1,269,898	
1990	1,507,305	18.7% (10 yr)
2000	1,730,504	14.8% (10 yr)
2001	1,758,321	1.6% (1 yr)
2002	1,774,300	0.9% (1 yr)

Over the past two decades, population growth in King County has remained well above an average rate of 1% per year. In 2002, the yearly rate of increase declined to just under 1%. Population has often been a factor in EMS call volume. The two graphs below depict the population growth relative to both BLS and ALS call volume patterns. Of interest is the continued two-year actual decline in ALS calls volumes, due in part to the success of the ALS Dispatch Criteria Revisions (see page 19).



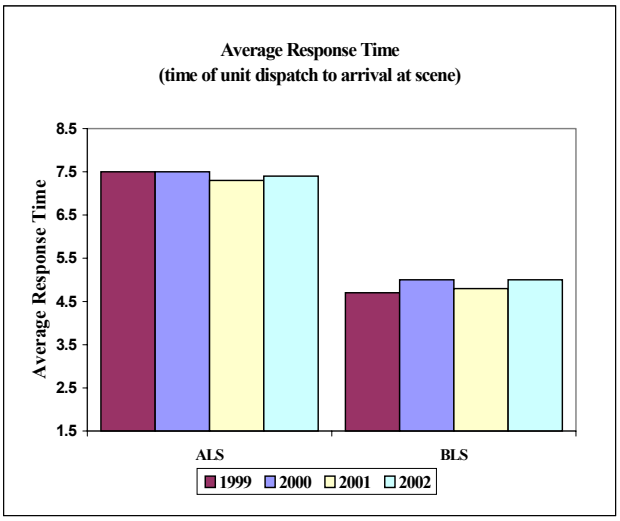


Note that the scales for population and call volumes are different.

Operations:

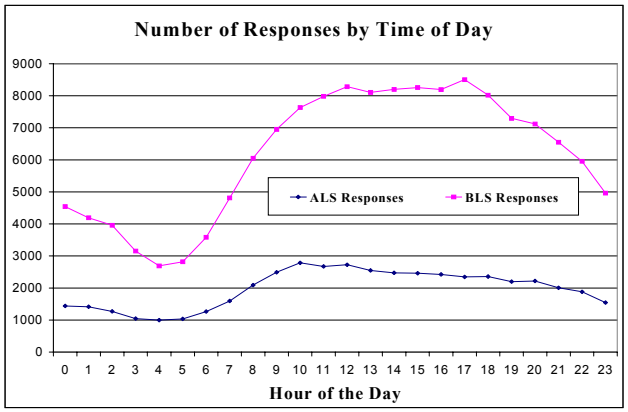
	ALS	BLS
Number of Responses	47,326	147,810
	ALS	**BLS**
Average Response Time	10.8 minutes / 7.4 minutes	6.2 minutes / 5.0 minutes
6 Minutes or less		68.3% / 81.6%
8 Minutes or less	46.6% / 69.8%	
10 Minutes or less	62.0% / 84.3%	
12 Minutes or less	72.6% / 92.0%	
14 Minutes or less	79.9% / 95.8%	
Suspended Alarms	25.8%	1.7%

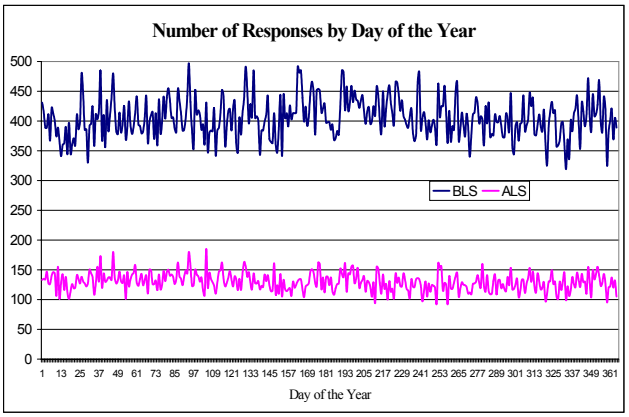
*This presentation of 2002 EMS data is the first using a fully integrated EMS Division and Seattle dataset and may limit a comparison of data between years. Response times are defined as follows: the time of call arrival at dispatch to the time of arrival at the scene / the time of unit dispatch to time of arrival at the scene. In some instances, totals differ due to missing values.



Despite the continued growth in population and call volumes over time, the average BLS unit response times have remained relatively even. In the case of ALS response times, the average remained steady last year as depicted in the graph to the left.

The two graphs located directly below reflect the patterns of ALS and BLS response during the day and throughout the year. Of note is the difference in range of BLS responses per day over time (~330-510 calls) in comparison to ALS responses (~90-280 calls).



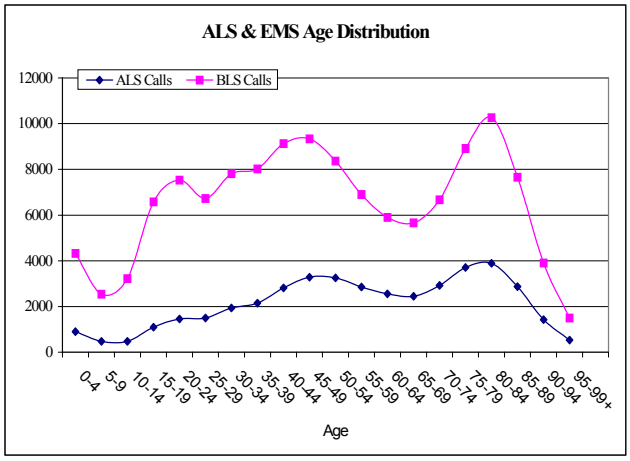


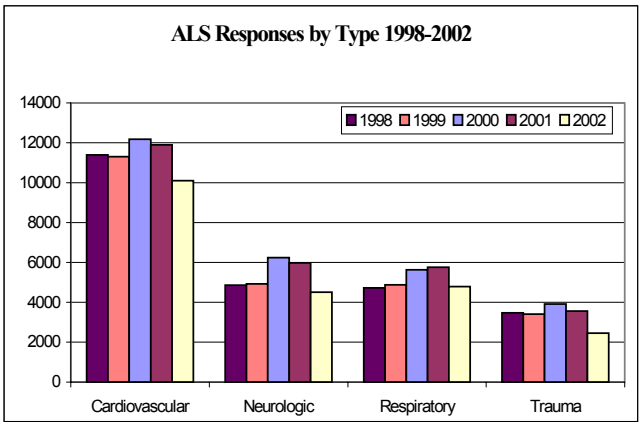
Characteristics of Responses:

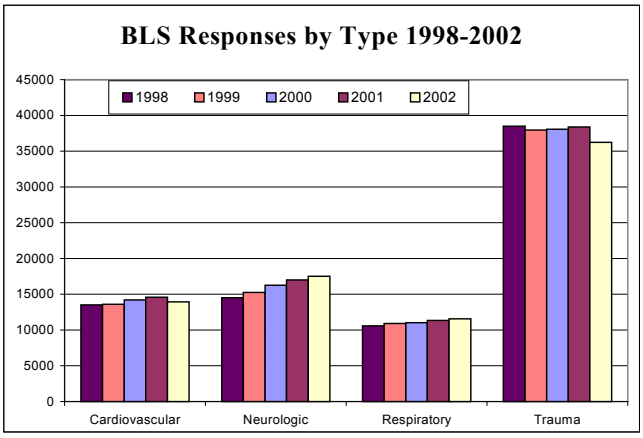
The following information reflects a variety of statistics that characterize the types of both BLS and ALS calls, including a comparison of age groups, types of medical complaints, where incidents take place, and patient transport information. Paramedics providing advanced life support are more likely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

Responses by Age Group:

	ALS	BLS
0-17 yrs	2,426 (5.7%)	13,628 (10.4%)
18-24 yrs	1,987 (4.7%)	10,561 (8.1%)
25-44 yrs	8,393 (19.7%)	31,679 (24.2%)
45-64 yrs	11,944 (28.1%)	30,496 (23.3%)
65+ yrs	17,799 (41.8%)	44,556 (34.0%)
Total	**42,549**	**130,920**

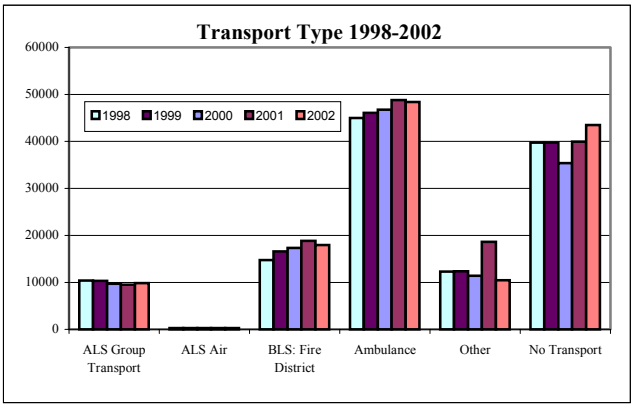


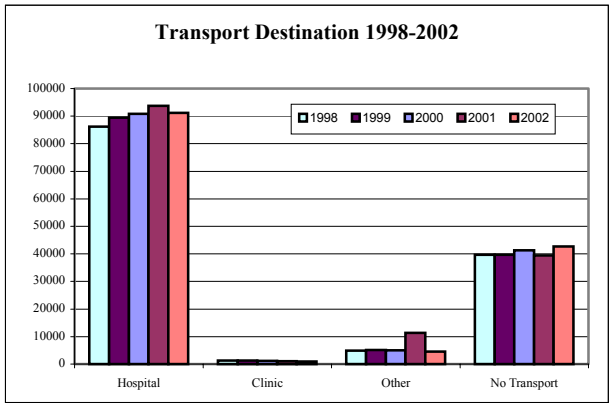




Responses by Type:	**ALS**	**BLS**
Cardiac	10,106 (30.7%)	13,931 (11.4%)
Neurologic	4,502 (13.7%)	17,502 (14.4%)
Respiratory	4,788 (14.6%)	11,571 (9.5%)
Trauma	2,455 (7.5%)	36,249 (29.8%)
Abdominal/GU	1,932 (5.9%)	8,126 (6.7%)
Metabolic / Endocrine	2,175 (6.6%)	3,608 (3.0%)
Other Illness	6,932 (21.1%)	30,788 (25.3%)
Total	**32,890**	**121,775**

Incident Locations:	**ALS**	**BLS**
Home/Residence	23,451 (59.2%)	71,169 (54.9%)
Nursing Home	2,573 (6.5%)	5,032 (3.9%)
Clinic / MD Office	1,811 (4.6%)	2,565 (2.0%)
Street/Highway	1,993 (5.0%)	15,868 (12.2%)
Other/Unknown Location	9,774 (24.7%)	35,069 (27.0%)
Total	**39,602**	**129,703**





ALS/BLS Highlight: The Role of EMS Personnel in the 'Chain of Survival'

King County has one of the highest survival rates for out-of-hospital cardiac arrest in the United States. This is attributable to many factors, including high rates of bystander CPR, quick EMS response, and high quality of EMS care. The following will highlight the role of ***early defibrillation*** provided by EMTs and ***early advanced cardiac care*** provided by highly trained paramedics.

Early defibrillation is the third link in the 'Chain of Survival,' performed by Basic Life Support (BLS) responders, or Emergency Medical Technicians (EMTs). Defibrillators shock a chaotic pulseless cardiac rhythm back into a regular pulsing rhythm. For cardiac arrest patients in ventricular fibrillation, the only 'shockable' rhythm, a large majority are defibrillated by EMTs.

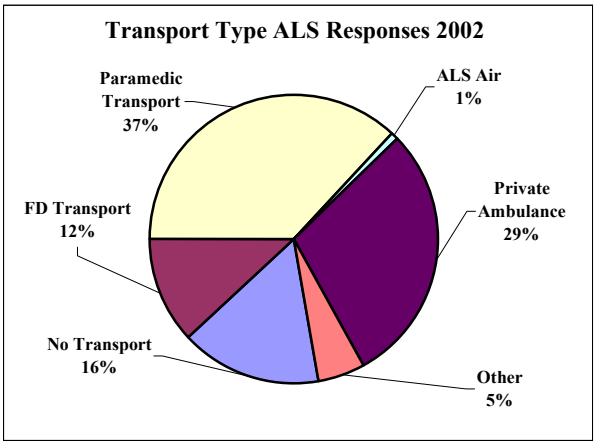
Early advanced cardiac care is the fourth link in the 'Chain of Survival,' performed by paramedic Advanced Life Support (ALS) responders. Paramedics bring a 'mobile emergency room' to the scene and provide life-saving therapies to cardiac arrest patients, including intubation and heart medications that can reverse the effects of an abnormal hearth rhythm.

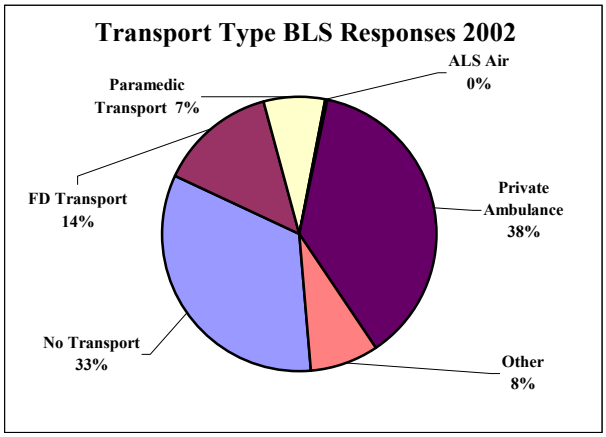
Transport Type:

ALS Transport	9,866	(7.6%)
ALS Air	248	(0.2%)
BLS - Fire District	17,985	(13.8%)
BLS - Ambulance	48,385	(37.1%)
Other	10,491	(8.0%)
No Transport	43,494	(33.3%)
Total	**130,469**	

Transport Destination:

Hospital	91,177	(65.5%)
Clinic	917	(0.7%)
Other	4,503	(3.2%)
No Transport	42,706	(30.7%)
Total	**139,303**	





Cardiac Arrest Statistics:

The Cardiac Arrest Surveillance System (CASS) located in the EMS Division has evaluated cardiac arrest statistics for almost thirty years (see page 39 for more details about the Center of Evaluation of EMS). Similar data is collected within the City of Seattle. The following information depicts the combined cardiac arrest survival rates.

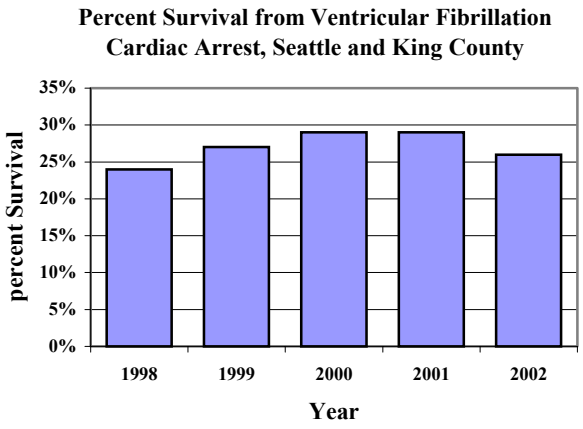
CPR Initiated by (for all calls):

CPR Initiated by Bystander 540/1097 (49%)

Cardiac Survival Rate: *

Year	Rate
2002	79/309 (26%)
1998-2002	468/1740 (27%)

* Definition: discharged from hospital alive / treated patients in cardiac arrest on arrival of EMS, with a rhythm of ventricular fibrillation.



CPR Highlight: Long-Term Survival from Out-of-Hospital Cardiac Arrest

Emergency Medical Services has worked hard over the years to maintain high standards of care for cardiac arrest patients. As a result of the strong community and EMS links in the chain of survival, many persons are resuscitated from out-of-hospital cardiac arrest and are subsequently discharged alive from the hospital. However, their long-term survival is uncertain.

Over the last quarter century, advances in the treatment of heart disease have occurred that may potentially benefit the survivors of cardiac arrest. Using data from the years 1976-2001, the long-term prognosis of persons successfully resuscitated and discharged from the hospital was compared over time to evaluate whether more recent survivors were benefiting from advances in the treatment of heart disease. On average, persons lived for approximately 6 more years following resuscitation and discharge from the hospital. However, survival improved steadily and considerably over time. For example, only 39% of persons successfully resuscitated during the 1976 – 1980 time period were still alive five years after hospital discharge compared to 65% for the 1996-2001 time period (Table 1).

Table 1. Five-year survival following successful resuscitation by EMS for out-of-hospital cardiac arrest

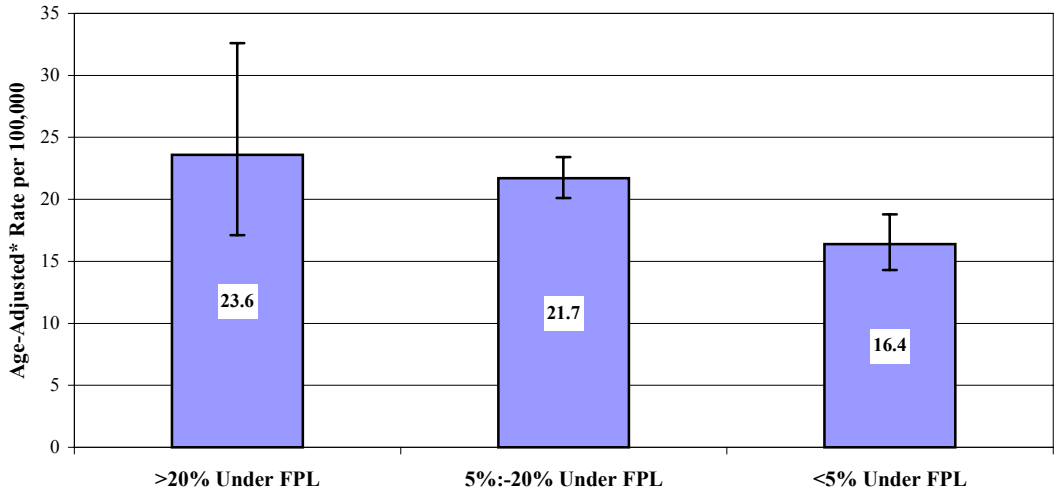
	1976-80	1981-85	1986-1990	1991-1995	1996-2001
5-year survival	39%	47%	52%	60%	65%

Conclusions: Persons who are resuscitated from out-of-hospital cardiac arrest will on average live many more years following hospital discharge. Moreover, the improved long-term survival over time supports ongoing efforts to strengthen the chain of survival and achieve better resuscitation; suggesting that if victims of cardiac arrest can be successfully resuscitated, they will experience a better prognosis than their predecessors.

Public Health Highlight: **Poverty Status, Diabetes, and Use of Emergency Medical Services (EMS)**

Poor health outcomes have been linked to a variety of socio-economic factors, including poverty. Both upstream factors (e.g, access to healthy nutrition and safe outdoor areas for exercising) and downstream factors (e.g., access to high quality health care) probably contribute to this disparity. The management of chronic diseases such as diabetes requires a multi-disciplinary approach that educates patients about diabetes care and warning signs of potential complications. Complications can result in premature morbidity and mortality for persons with diabetes. A prevention-based approach can help patients avoid complications through a healthy diet, increased exercise, lowered blood pressure, and blood sugar control. *Figure 1* illustrates that the death rate for persons with diabetes in King County increases with increased levels of poverty.

Figure 1. Death Rates* for Diabetes in High, Medium, and Low Poverty Neighborhoods, King County, 1999-2001



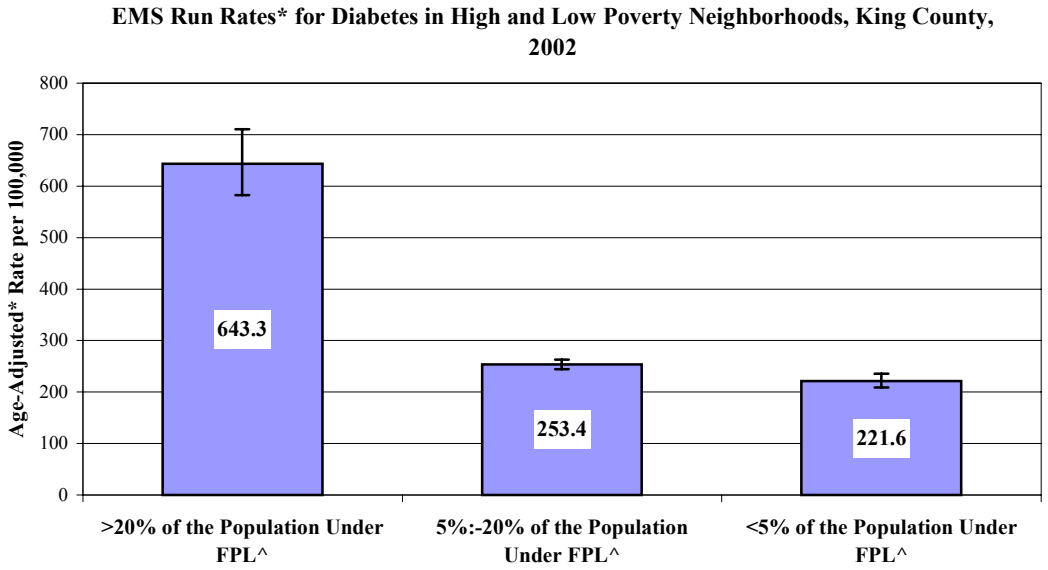
*Rates are age-adjusted to the 2000 U.S. Population standard.
^FPL is Federal Poverty Level

The ability to measure access to routine, preventive care for diabetes is difficult. One measure of access might be the use of emergency medical services for diabetes-related conditions. The use emergency medical services may represent poor access in two ways. First, the use of emergency medical services may serve as the primary gateway into the healthcare system. If a person does not receive routine preventative care, he or she must rely on emergency services, including EMS, to access care that might otherwise be delivered more cost-effectively by a clinic-based rather than emergency-based provider. Secondly, the use of emergency medical services may represent an excess of acute diabetes complications that truly require emergent attention with increased use of emergency medical services for diabetes. *cont. on next page*

Use of emergency medical services for diabetes-related health conditions was assessed in association with levels of poverty in King County. As shown in *Figure 2*, the use of emergency medical services for diabetes-related issues during 2002 was highly associated with income level. There is a statistically significant and consistent gradient with higher EMS response rates in higher poverty neighborhoods.

Neighborhoods where more than 20% of the population lives below the Federal Poverty Line had significantly higher rates than mid-poverty neighborhoods (5% to 20% of the population live below the Federal Poverty Line); these, in turn, have significantly higher rates than low-poverty neighborhoods (<5% of the population below the Federal Poverty Line). The difference is particularly great between the highest poverty group and the other two categories. The rate in the high-poverty neighborhoods is 2.5 times the mid-poverty neighborhoods, and almost three times the rate in the low-poverty neighborhoods.

Figure 2. EMS Response Rates for Diabetes in High, Medium and Low Poverty Neighborhoods, King County, 2002



*Rates are age-adjusted to the 2000 U.S. Population standard.

^FPL is Federal Poverty Level

Conclusion: On average, persons living in low income neighborhoods are more likely to use emergency medical services for diabetes-related health conditions. This result may indicate that persons with low income have less access to routine health care and/or have more urgent health complications from diabetes. This is consistent with higher death rates seen in low-income neighborhoods and suggests that poverty is related to the occurrence of preventable diabetes complications and deaths. The findings support efforts to identify and improve methods that address health barriers related to income.

Part III: EMS Funding and the 2003 Financial Plan

Introduction: This section of the EMS 2003 Annual Report focuses on EMS revenues and expenditures for 2003. Some historical and forecast information is incorporated for context, including information on the current EMS funding mechanism and the projected status of the EMS Financial Plan through the current levy period. Components include the following:

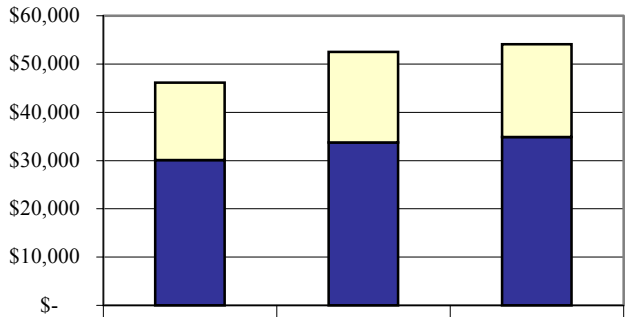
- EMS Revenues for 2003
- EMS Expenditures for 2003
- EMS Expenditure and Revenue Trends
- The 2004 Financial Plan
- Recommendations for Fund Balance and 2004 levy rate

Please note that under terms of an inter-local agreement between King County and the City of Seattle, EMS levy funds collected within Seattle go directly to the City. The majority of the discussion of EMS revenues and expenditures is limited to King County, excluding the City of Seattle.

A. EMS Revenues

EMS Levy: The EMS levy is a regular property tax levy subject to the limitations contained in Chapter 84.55.010 RCW. Passed in November 2001, Initiative 747 limits total levy funds to a 1% increase for existing properties, except for new construction. EMS levy funds are restricted by RCW and can only be spent for EMS-related activities. In November 2001, King County voters approved an EMS levy to provide funding for the 2002-2007 period. The EMS levy rate began at $.25 per $1,000 assessed value in 2002. The 2003 effective levy rate is $0.24134; the total assessment for 2003 is $54,087,223.

AMOUNT ASSESSED FOR CURRENT LEVY
ACTUAL 2001, 2002, 2003
(All numbers in thousands -- 000 omitted)



	2001	2002	2003
City of Seattle	$16,034	$18,763	$19,239
Balance of King County	$30,089	$33,734	$34,848

In addition to real and personal property taxes, other revenues include miscellaneous taxes, interest earnings, and fees for reimbursable services. King County contributes $375,000 annually in Current Expense Fund monies to King County Medic One. In 2003, it is projected that the regional levy will generate 98% of the total revenues, with current expense and other income combined to generate the remaining 2%.

Total estimated revenues in 2003 for the balance of King County are $35.7 million. The 2003 beginning fund balance was $5.9 million. The projected year-end fund balance is $6.8 million. Funds in excess of the required ending fund balance of $2.9 million are placed in a designated reserve to pay for planned services in 2006 and 2007 when expenses are forecast to exceed revenues. Additional information on projected revenues through the end of the current 2002-2007 levy period is included in Section C. EMS Revenue and Expenditure Trends (page 56).

2003 Estimated EMS Revenue (balance of King County)

Revenue Source	2003	%
Property Taxes Current	$34,064,128	95%
Delinquent Taxes	$834,958	2%
Other Taxes	$101,000	0%
Other Revenues	$60,000	0%
Interest Income	$290,000	1%
CX Contribution	$375,000	1%
Total	**$35,725,087**	100%

B. EMS Expenditures

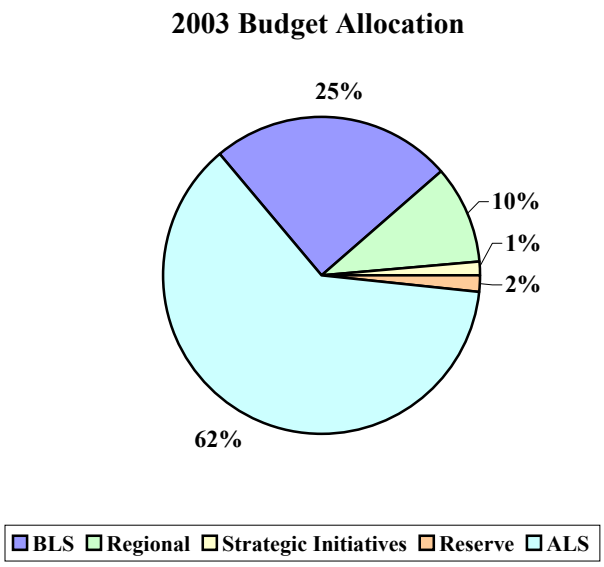
EMS revenues support three major EMS activities related to direct service delivery or support programs. These programs are:

- Advanced Life Support (ALS) Services
- Basic Life Support (BLS) Services
- Regional Support Programs (including Strategic Initiatives)

The *2002 Strategic Plan Update of the 1998-2003 Emergency Medical Services Strategic Plan (EMS Strategic Plan)* limits increases to all three areas to the local area Consumer Price Index (CPI). Increases only for ALS services can be raised above CPI if there is 'sufficient funding available to alleviate any dramatic increase in provider contribution' (*EMS Strategic Plan* - page 49).

Advanced Life Support (ALS) Services funding is based on a standard allocation per unit, BLS funding is based on an allocation formula per agency, and Regional Support Programs are based on cost of services and cash flow for Strategic Initiatives. Yearly reserves to provide for

unanticipated expenses are also budgeted. The primary use of the contingency fund in 2003 is for unplanned ALS expenses.



Sub-Fund	
2003 Revised Budget	
ALS	$ 22,014,103
BLS	$ 8,751,690
Regional Services	$ 3,575,477
Strategic Initiatives	$ 439,000
Contingency Reserve	$ 590,109
Total	**$ 35,370,379**

Advanced Life Support (ALS) Services: Since the first EMS levy in 1979, regional paramedic services have been largely supported by the EMS levy. The EMS Division manages contracts that provide funds directly to five paramedic provider agencies in King County: Shoreline Fire Department (Shoreline Medic One), Redmond Fire Department (Redmond Medic One), Bellevue Fire Department (Bellevue Medic One), Public Health - Seattle & King County (King County Medic One), and Vashon Island Fire & Rescue.

EMS levy funds for ALS services are allocated using a standard unit cost methodology based on the full costs of operating one paramedic unit, 24 hours a day, 365 days a year, staffed with two Harborview-trained paramedics. In 2003, the standard unit cost allocation was $1.3 million per paramedic unit. The 2003 allocation reflects an 8% increase (or a 5.5% increase over forecast CPI-U of 2.5%) over the 2002 allocation of $1.2 million per unit. These expenditures included personnel, medical equipment and supplies, support costs for dispatch, paramedic supervision, medical direction, continuing medical education, and other EMS-related expenses.

The EMS Strategic Plan calls for a yearly review of ALS costs to minimize cost shifting of ALS costs to provider agencies. An ALS task force comprised of representatives of the different ALS providers reviewed costs last year. During this review it became apparent that agencies were

experiencing and anticipating increases higher than the standard CPI-U allocation called for in the EMS Strategic Plan. Significant cost drivers were labor costs associated with recently settled union contracts and the costs of medical supplies.

A series of options that looked at increased funding within the constraints of the EMS Financial Plan were developed and reviewed. The 8% increase, or an increase of 5.5% over the forecast CPI-U of 2.5%, was recommended. While it was less than some providers were forecasting, it was deemed prudent to leave a sufficient amount in the levy fund balance for a second potential ALS increase during the levy period. The recommendation, made by the ALS task force, was approved by the EMS Advisory Committee and included in the 2003 budget request for approval by the King County Council.

Two types of paramedic units qualify for half of the standard unit cost funding. Emergency Medical Technician/paramedic (EMT/P) units are staffed 24-hours per day with one EMT trained in defibrillation and one paramedic. Part-time (or 12-hour) paramedic units are staffed with two paramedics for twelve hours during peak workload periods. Each EMT/P and 12-hour unit received $651,971 in 2003. Vashon Island Fire & Rescue is funded at a .5 unit allocation.

Paramedic vehicle replacement is funded separately from the standard unit cost allocation and follows a paramedic vehicle replacement plan. Medic units are currently replaced every three years and then placed in a backup vehicle status for three additional years. The allocation for vehicle replacement costs in 2003 was $120,421 per vehicle. Five vehicles were funded in 2002.

The total annual EMS levy allocation for each paramedic provider is determined by the number of units staffed with two paramedics, the number of EMT/P units, the number of 12-hour 2-paramedic units, and the number of vehicles due for replacement that year. Start-up costs for any new paramedic units (including personnel, medical equipment and supplies, vehicles, radios, and other items) are added separately.

In 2003, one 0.5 unit expansion was added to the system. Medic 14 in Issaquah was expanded from a 12-hour half-time unit to a full 24-hour unit. In addition to the 0.5 unit allocation increase, $70,000 was provided for start-up costs. The EMS Strategic Plan anticipated increases in paramedic units based on workloads, response times, and percent back-up provided by other units. An increase from 12-hour to 24-hour service for Medic 14 serving Issaquah and the Sammamish Plateau area was planned in the EMS Strategic Plan to better serve the growing population and provide better back-up to other units in the I-90 corridor.

Another significant increase in service is the transition of Medic 3, the EMT/paramedic unit in North Bend, to a full 2-paramedic unit as mentioned in Part I of this report. This change was specifically requested by the Medical Directors who identified clear advantages to having a regular 2-paramedic unit related to concerns about the type of cases and conditions the paramedics were responding to in the area, the long back-up from other units coming from the west along the I-90 corridor, the poor winter conditions, and geographic-related communication problems for both radios and cells phones.

As mentioned in Part I, it was not apparent where the funding to increase this unit would be obtained. A substantial amount of the existing fund balance was already targeted towards supporting existing and planned service increases, including one-time increases to the ALS allocation. After a series of meetings with affected agencies and review of a series of financial options, a partnership was developed with Eastside Fire & Rescue, Bellevue Fire Department and the EMS Division to convert Medic 3 to a two paramedic unit. Eastside Fire & Rescue would contribute $100,000 per year, the levy fund would provide funding from the reserve, equivalent to a .25 unit or ½ of the funding needed for the unit. All contributions would increase by CPI-U each year. The first year funding from the levy also included start-up costs. The total increased cost to the levy fund for the duration of the levy is projected to be $1.6 million. It is anticipated that this unit would be provided full funding with the next levy.

Another significant ALS change for 2003 was the smooth transition, effective January 1, 2003 of paramedic service, provided by Evergreen Hospital for 28 years, to Shoreline and Redmond fire departments. Redmond Fire took over operation of units at Evergreen Hospital, Redmond, and the EMT/P unit in Woodinville. Shoreline Fire added the paramedic unit in Bothell to the 2 units it already ran in Shoreline.

The total number of ALS units in 2003 is shown on the following chart:

	Full Units (2 paramedic / 24 hour)[1]	Half Units (EMT-P or 12 hour)[2]	Total Funding Units
Redmond	2	1	2.5
King Co.	6	1	6.5
Bellevue[4]	3	1	3.5
Shoreline	2	1	2.5
Vashon[3]		1	.5
Total	**12**	**6**	**15.5**

[1] Full Units are funded at 100% of the Standard Unit Cost of $1,303,942.
[2] Half Units are funded at 50% of the Standard Unit Cost of $651,971.
[3] Vashon funding is currently set at .5 of 24-hour unit.
[4] Does not include additional funding for Medic 3 in North Bend; additional levy funding at .25 unit for 2003 was $254,225 including start-up and training costs.

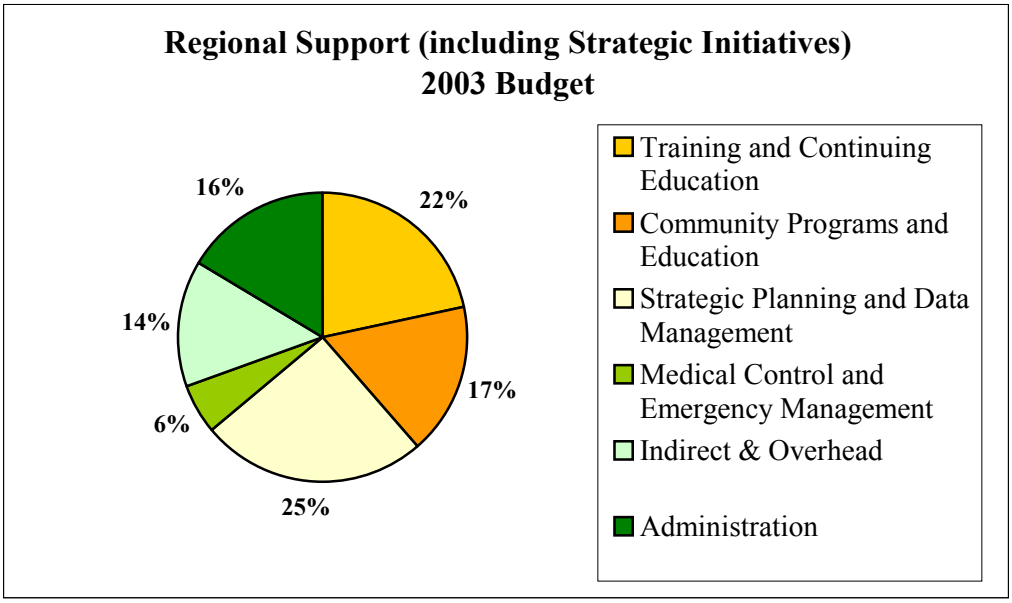
At the request of jurisdictions in south King County, the EMS Strategic Plan Update includes a feasibility study to examine a transfer of the King County Medic One Program to the fire service. The feasibility study began in earnest in April 2003 and will evaluate the feasibility of such a transfer using specific criteria developed by participating agencies. A recommendation to the King County Executive is expected in the fall of 2003.

Basic Life Support (BLS) Services: The levy provides partial funding to BLS providers to help ensure uniform and standardized BLS care and to enhance BLS services. Basic Life Support services are provided, outside the City of Seattle, by thirty-three local fire departments and fire districts. Beginning in 2002, the total amount of BLS funding was increased by the local area

CPI (CPI-U) each year as noted in the *2002 Strategic Plan Update of the 1998-2003 EMS Strategic Plan*. The total annual BLS dollar allocation for 2003 is $8.75 million.

The task force that completed the Strategic Plan Update also recommended a thorough review of the BLS funding formula and in early 2002 a BLS Funding Formula Review Committee convened to discuss the critical issues. The group was able to attain consensus on the new criteria for allocating BLS funds and the revised formula was used to calculate the 2003 BLS allocations. The new formula was again reviewed in May 2003 to monitor the impacts and validate the assumptions. The intended effects were indeed evident and the review committee recommended continued use of the new formula.

Regional Services: The primary purpose for regional EMS programs and services is to provide support to critical functions essential to providing the highest quality out-of-hospital emergency care available. This includes uniform training of EMTs and dispatchers, regional medical control, regional data collection and analysis, quality improvement activities, and financial and administrative management. Regional coordination of these various activities is important in supporting a standard delivery of pre-hospital patient care, developing regional policies and practices that reflect the diversity of needs within King County, and maintaining the balance of local area service delivery with centralized interests.



The *EMS Strategic Plan* limits increases in funding for Regional Services to the local CPI (CPI-U). Expenditures, particularly labor expenditures related to resolution of labor agreements, have increased higher than the CPI-U. The 2003 budget for Regional Support is $3.6 million. The 2002 expenditures for Regional Services were less than budgeted and the funds were placed in the EMS fund reserve for use by other programs.

Strategic Initiatives: The term 'Strategic Initiative' is used to describe a handful of new and innovative approaches to improving the EMS system in King County and already existing

programs that are thought to have significant impact on the success of the Strategic Directions (see Part II - Status of EMS Division Programs and Activities for details - page 16). The 2003 budget for Strategic Initiatives is $439,000.

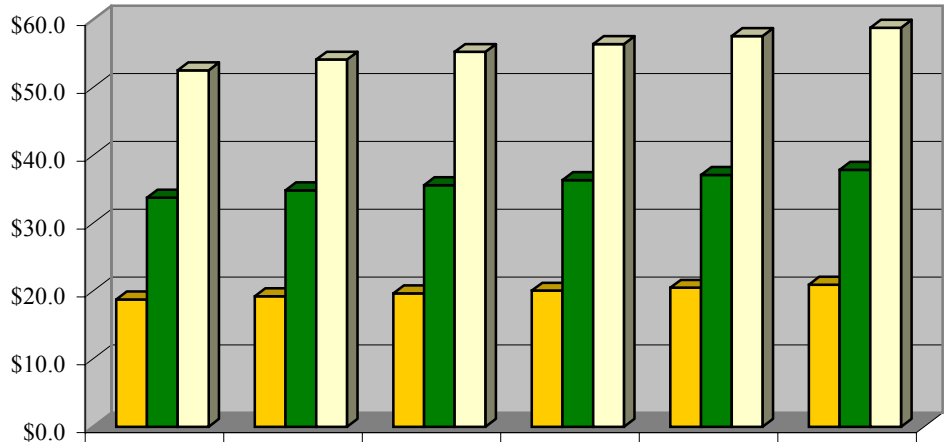
C. EMS Revenue and Expenditure Trends

Revenue Trends: The primary revenue source for EMS is the 2002-2007 EMS property tax levy. Levy revenue growth is limited by the terms of Initiative 747 which limits revenue growth from existing properties to 1% per year. The 2002 Update to the EMS Financial Plan assumed modest growth in property values, continued low inflation, a one-percent limit on fund growth from existing properties, growth in expenditures related to anticipated regional demand for Advanced Life Support Services (ALS), and stable growth in other services at the level of local consumer price index (CPI-U).

Forecasted total levy assessment including both the City of Seattle and the remainder of King County is projected to increase from $52.5 million in 2002 to $58.8 million in 2007. This is a total increase of 11.9% or an average of 2.4% per year. Growth over 1% is due to new construction. The following chart shows forecast levy assessments for both Seattle and the remainder of King County:

Forecast Levy Assessment

(amount billed in millions)

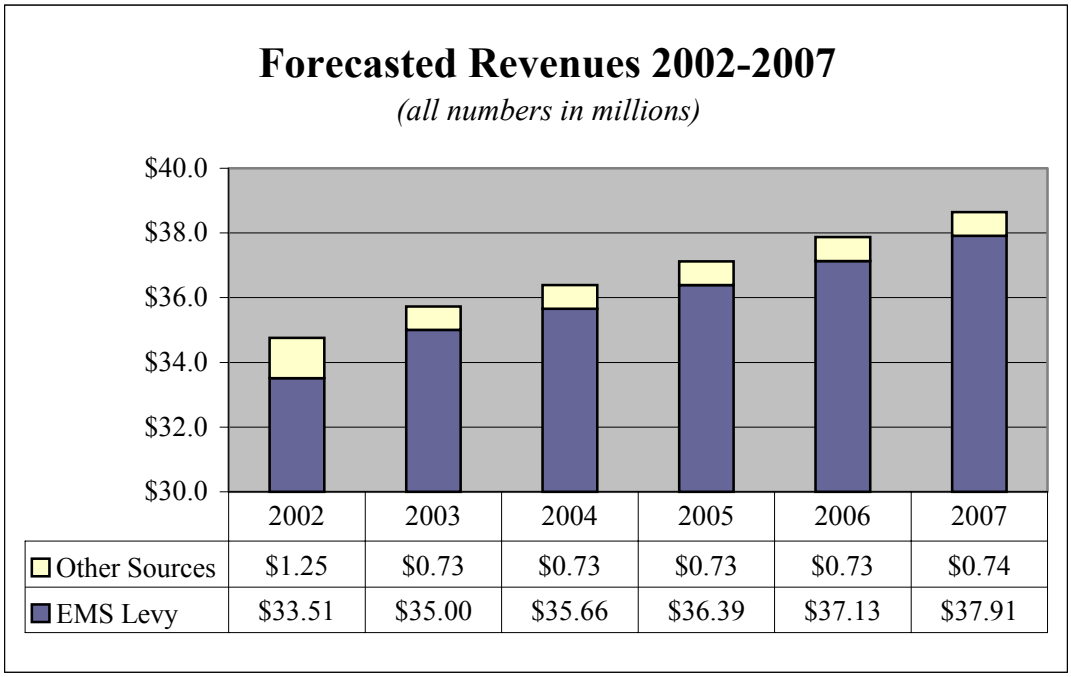


	2002	2003	2004	2005	2006	2007
Seattle	$18.76	$19.24	$19.64	$20.05	$20.48	$20.91
King County	$33.73	$34.85	$35.58	$36.33	$37.09	$37.87
Total Levy	$52.50	$54.09	$55.22	$56.38	$57.56	$58.77

Total EMS Division tax revenues, including real estate and personal taxes, leasehold taxes and timber taxes were projected to increase 14% from 2002 to 2007 (or an average of 2.7% per year). However, due to the downturn in the economy, new construction growth projections have been revised from 1.6% to 1.1% by the King County economist. The reduction resulted in a decrease of $1.9 million in revenue over the levy period. Lowered forecast CPI-U partially offset this reduction. The end result was a reduction in the 2007 ending fund balance of approximately $.9

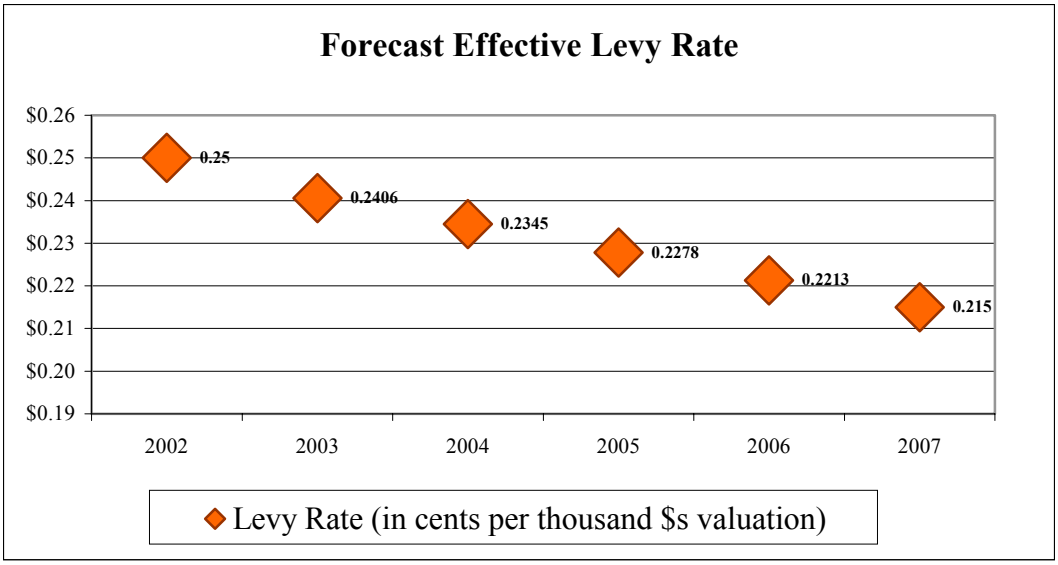
million. Total revenues are projected to increase from $32 million in 2002 to $39.8 million in 2007. This is an increase of approximately 11.2% or 2.2% per year.

Growth beyond the 1% limit, based on existing properties, is primarily due to projected new construction. Other revenues, primarily interest and reimbursable income, are projected to remain stable, including current expense contributions of $375,000 per year. The following chart shows actual and projected revenues for King County EMS Fund (excluding Seattle) through 2007:



	2002	2003	2004	2005	2006	2007
Other Sources	$1.25	$0.73	$0.73	$0.73	$0.73	$0.74
EMS Levy	$33.51	$35.00	$35.66	$36.39	$37.13	$37.91

While revenues are projected to increase, the effective levy rate is projected to decrease. Initiative 747's limit to 1% total yearly levy increase is less than average increases in individual property's assessed value. To stay in compliance with Initiative 747, the effective levy rate is projected to decrease from $0.25 per thousand dollars of valuation in 2002 to $0.2150 in 2007.

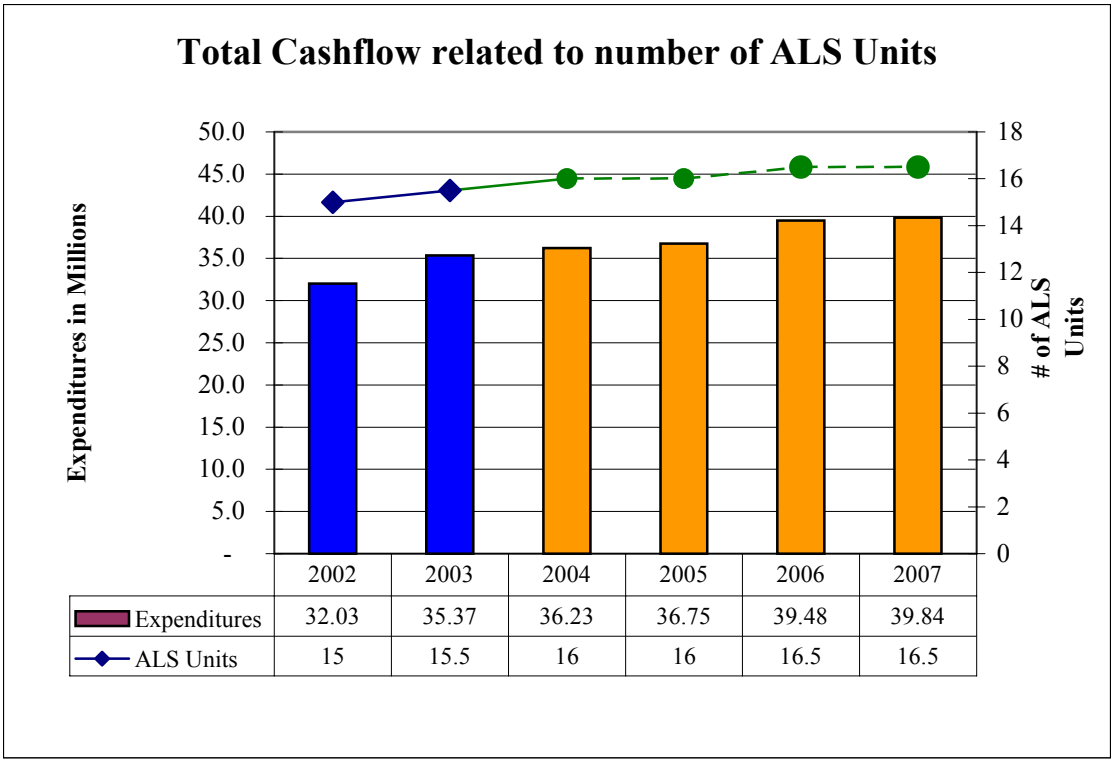


Even though projected revenues have decreased, this decrease is partially offset with lower expenditure projections related to a reduction in the forecast CPI rate. Therefore, forecast revenues are sufficient to cover forecast expenditures through the end of the levy period. It appears there is a sufficient fund balance to accommodate a future one-time increase in ALS allocation if it is needed to minimize cost shifting to ALS providers or other unanticipated but necessary strategic initiative program support. Funds for addressing needs not included in the EMS Strategic Plan, such as desired service increases to outlying areas, are limited.

Expenditure Trends: There are two main factors affecting expenditure trends: increased costs and addition of new ALS service. Expenditures are projected to increase from $32 million in 2002 to $39.8 million in 2007. This is a 24% increase overall or an average increase of 2.4% per year.

Since expenditure increases in each area are tied to the forecast local CPI-U, long term changes in its rate can have a significant affect of expenditure trends. The forecast CPI was reduced to 2.1% for 2004 and 2.2% for 2005-2007. This reduced forecast expenditures by approximately $1 million (and partially offsetting the $1.9 million reduction in revenues).

Two new half units (1.0 unit equivalent) are projected to be added between 2004 and 2007. Expanding Medic 12 in the Enumclaw Plateau area from 12-hours to 24-hours is scheduled for 2004. The EMS Strategic Plan anticipates the potential need for another 0.5 unit in South County in 2006. The following chart shows expenditure growth related to the number of ALS units in service:



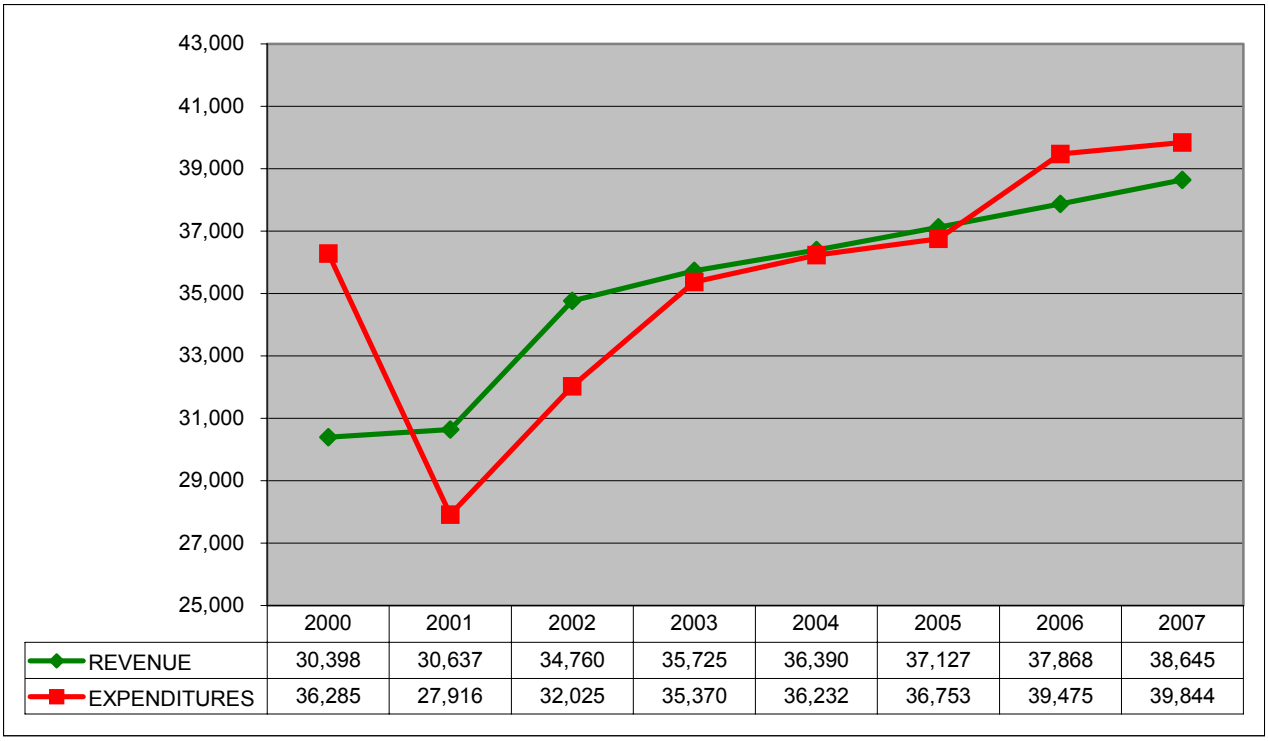
Historically, costs incurred by EMS providers have increased at a rate higher than CPI due to increases in labor agreements and the rising cost of medical supplies and equipment. To minimize this cost shifting to agencies, a one-time eight percent increase was proposed and approved in 2003. It is projected that there will be sufficient reserves in the fund for an additional one-time increase higher than CPI-U prior to 2007 if needed to minimize cost shifting to agencies.

BLS and Regional Support funding is projected to remain steady and not exceed CPI. BLS funding is projected to increase from $8.53 million in 2002 to $9.68 million in 2007. Regional Support funding is projected to increase from $3.55 in 2002 to $3.96 in 2007. It is anticipated that there will be continued use of the contingency reserve each year.

The following chart shows actual and projected revenues and expenses from 2000 to 2007. Revenues are projected to exceed expenditures through 2005. In 2006, revenues exceed expenditures while revenues approximately match expenditures in 2007. It is currently projected that revenues placed in the fund balance between 2002 and 2005 will be needed to fund expenses in 2006 and 2007.

EMS FUND – EXPENDITURES VS. REVENUES

All numbers in thousands (000 omitted)



	2000	2001	2002	2003	2004	2005	2006	2007
REVENUE	30,398	30,637	34,760	35,725	36,390	37,127	37,868	38,645
EXPENDITURES	36,285	27,916	32,025	35,370	36,232	36,753	39,475	39,844

Significant trends to track include growth of new construction, interest rates related to income, and delinquent taxes (which have remained at forecast rates to date). Current forecast appear to indicate that new construction growth will remain at the lower levels currently forecast. However, interest rates appear to be rising. With the downturn in the economy there is concern that the delinquent tax rate would increase. However, delinquent taxes and the repayment of delinquent taxes have remained been consistent with the financial plan forecast.

Expenditure trends to track include changes, particularly increases in the local CPI, and labor and medical supply costs for paramedic services. Currently, it is anticipated that if funds are available from fund balance that they will be used to address paramedic service improvements in the Highway 2/ Stevens Pass area and move towards converting Medic 35, the EMT/P unit in Woodinville, to a full 2-paramedic unit. Significant unanticipated costs in other areas will decrease funds available to supplement these services.

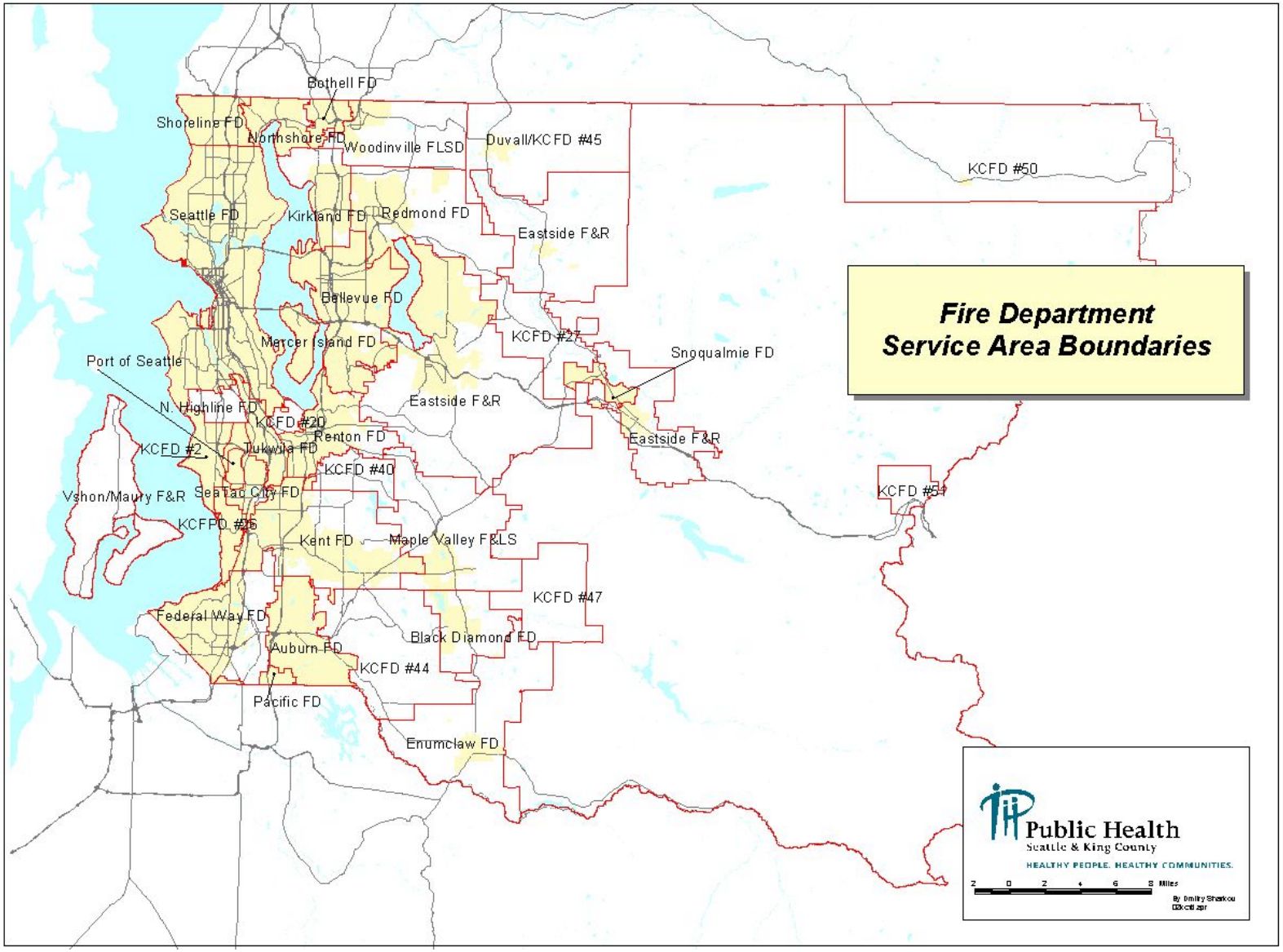
D. 2002 EMS Financial Plan

The 2002-2003 EMS Financial Plan summarizes actual and projected revenues, and expenditures for core EMS Division programs and services, major strategic initiative directions and other additions. The EMS Financial Plan shows the current status of the undesignated fund balance in relationship to a target fund balance. The target fund balance is the equivalent of one month's operating costs for EMS activities. Please refer to Appendix F: EMS Division Revenue/ Expenditure Summary on page 71 for details.

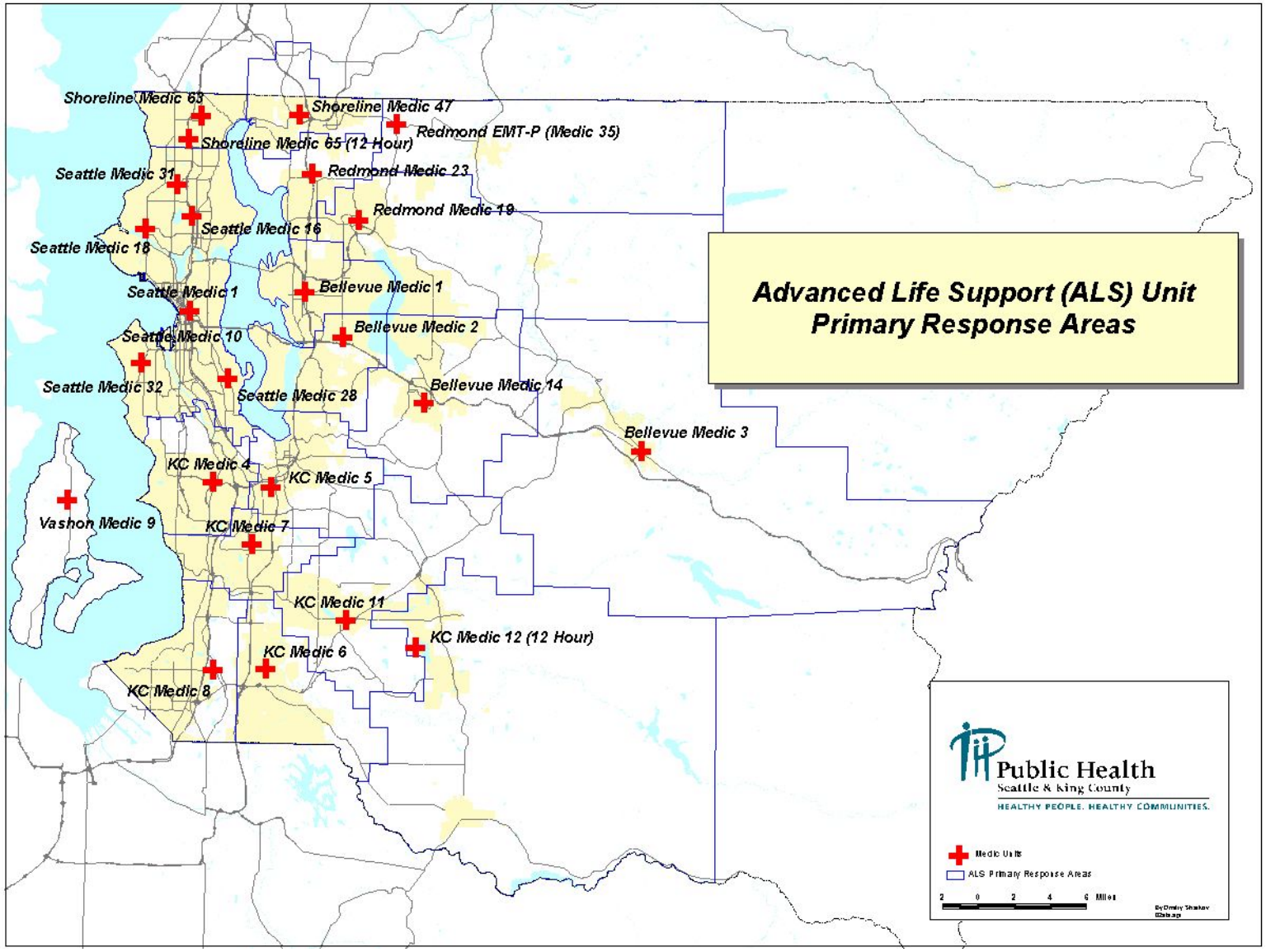
E. Recommendations for Fund Balance

The EMS Financial Plan currently projects a fund balance in 2007 that exceeds the EMS Fund required end fund balance (EFB). Due to the ALS challenges mentioned in the EMS System Review section, ALS costs that are projected to exceed CPI, and a desire to minimize cost shifting to ALS providers, it is recommended that the EMS levy rate be set at the maximum allowable rate of the levy. In addition, EMS is in the second year of a six-year levy. It is prudent to set rates to maximize revenues to support needed ALS/paramedic services. If additional funds are collected, they will be used to address the unfounded needs highlighted in this report – specifically provision of ALS service in outlying areas.

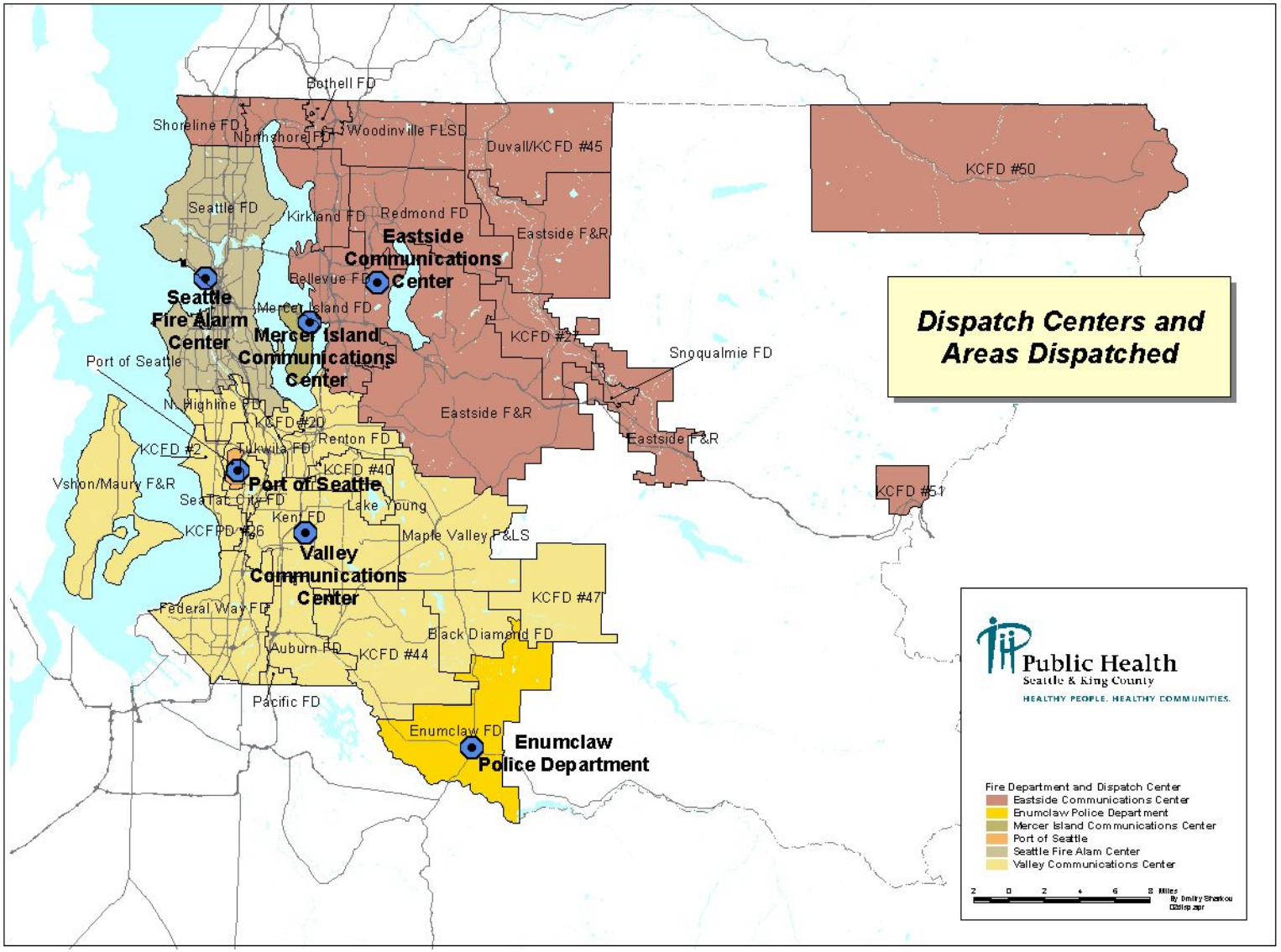
Appendix A: Regional Map of the Basic Life Support (BLS) Provider Areas



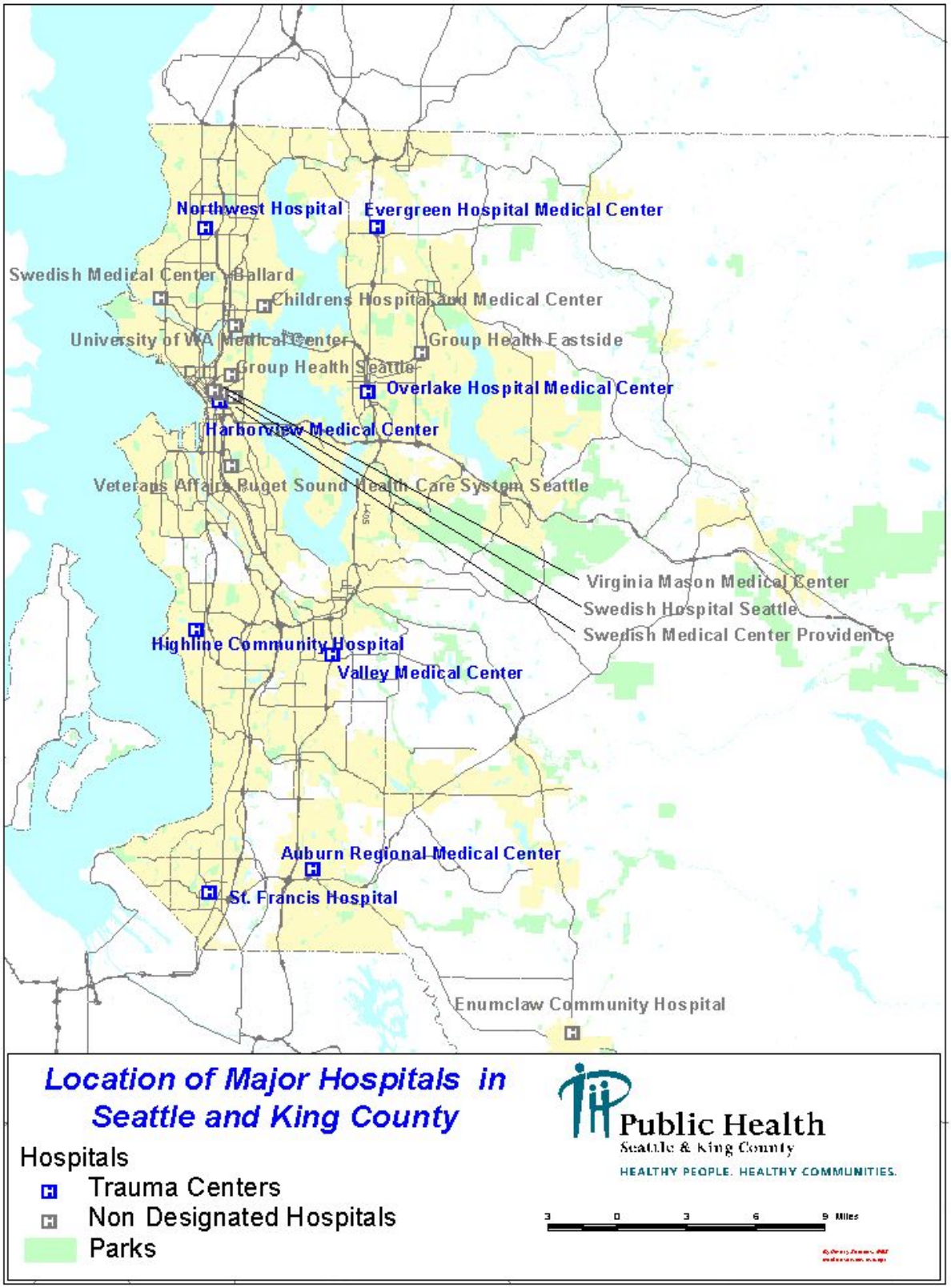
Appendix B: Regional Map of the Advanced Life Support (ALS) Provider Areas



Appendix C: Regional Map of the EMS Dispatch Center Service Areas



Appendix D: Regional Map of the EMS Hospitals



Appendix E: 2003 EMS Advisory Committee Listing

Name	Representation	Title/ Organization
Tom Hearne, Chair	Emergency Medical Services Division	Manager
Deb Ayrs	ALS Providers - Redmond Medic One	Medical Services Administrator
Bob Berschauer	Ambulance Service	Director of Operations, American Medical Response
Al Church	BLS in Cities > 50,000	Chief, Federal Way Fire Department
Michael Copass, M.D.	Medical Program Director - Seattle	Seattle Medic One
Mickey Eisenberg, M.D.	EMS Medical Program Director	Medical Program Director
Chris Fischer	Dispatch	Director, Valley Comm. Center
Roger Hershey	KC Fire Commissioner's Assn. - Urban	Fire Commissioner, Federal Way
Jon Kennison	KC Fire Commissioner's Assn. - Rural	Fire Commissioner, Shoreline
Michael Loehr	Emergency Management, Public Health - Seattle & King County	Manager
Pete Lucarelli	ALS Providers - Bellevue Medic One	Chief, Bellevue Fire Department
Ron Mehlert	ALS Providers - Shoreline Medic One	Chief, Shoreline Fire Department
Chris Merrit	Labor - ALS	Paramedic, King County Medic One
Gary Morris	ALS Providers - Seattle Medic One	Chief, Seattle Fire Department
Steve Olmstead, M.D.	Chair, Medical Directors' Committee	Medical Director, King County Medic One
Dr. Alonzo Plough	Public Health - Seattle & King County	Director
Jim Schneider	BLS in Cities > 50,000	Chief, Kent Fire Department
Lee Wheeler	BLS in Cities > 50,000	Chief, Renton Fire Department
Tracey White	ALS Providers - King County Medic One	Medical Services Administrator
Jim Wilson	ALS Providers - Vashon Medic One	Chief, Vashon Fire Department
Not filled at this time	Citizen Representative	

Not filled at this time	Labor - BLS	

Appendix F: EMS Division Revenue/Expenditure Summary
Financial Plan 2002 through 2004

	2002 Actual	2003 Estimate	2004 Requested
BEGINNING FUND BALANCE:	**$3,668,828**	**$5,909,202**	**$6,758,171**
REVENUES:			
Property Taxes	$33,508,955	$35,000,086	$35,656,839
Other Revenue (includes Interest Income)	$419,660	$350,000	$356,000
General Fund (CX)	$831,067	$375,000	$375,000
6 month interim funding	-	-	
TOTAL REVENUES	**$34,759,683**	**$35,725,086**	**$36,387,839**
EXPENDITURES:			
CORE SERVICES			
Paramedic Services	($20,422,422)	($22,014,103)	($22,747,247)
Basic Life Support	($8,538,208)	($8,923,020)	($8,923,020)
EMS Division Regional Services	($3,064,419)	($3,959,562)	($3,959,562)
SUBTOTAL Operating Expenditures	**($32,025,049)**	**($34,896,685)**	**($35,629,829)**
Contingency Reserve		($590,109)	($602,501)
TOTAL EXPENDITURES	**($32,025,049)**	**($35,370,379)**	**($36,232,330)**
Encumbrance Carry Over	($494,260)		
ENDING FUND BALANCE:	**$5,909,202**	**$6,758,171**	**$6,913,679**

Appendix G: EMS Division Contact Information

Mailing Address: **Emergency Medical Services Division**
Public Health – Seattle & King County
999 3rd Avenue, Suite 700
Seattle, WA 98104-4039
(206) 296-4693 (206) 296-4866 (fax)

Web Address: http://www.metrokc.gov/health/ems

Specific Program Contacts:

King County Medic One http://www.metrokc.gov/health/medicone/	(206) 296-8550
BLS/EMT Training and Education Program http://www.metrokc.gov/health/ems/training.htm	(206) 296-4861
CPR/AED Training Programs http://www.metrokc.gov/health/ems/aed.htm	(206) 205-5582
Emergency Medical Dispatch Programs http://www.metrokc.gov/health/ems/emdprogram.htm	(206) 296-4559
Injury Prevention and Public Education Programs http://www.metrokc.gov/health/ems/community.htm	(206) 296-0202
Medical Control http://www.metrokc.gov/health/ems/quality.htm	(206) 296-4553
Strategic Initiatives http://www.metrokc.gov/health/ems/planning.htm	(206) 205-1056
Regional Data Collection Project http://www.metrokc.gov/health/ems/planning.htm	(206) 205-1056
Center for the Evaluation of EMS (CEEMS) http://www.metrokc.gov/health/ems/CEEMS.HTM	(206) 296-4862
Trauma Registry http://www.metrokc.gov/health/ems/trauma.htm	(206) 205-6293

Appendix H: Complete Bibliography

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