

# **Division of Emergency Medical Services**



## ***2004 Annual Report to the King County Council***

**September 2004**



## **Preface**

I am pleased to present the Emergency Medical Services (EMS) Division 2004 Annual Report to the King County Council.

Although we are in the third year of the current EMS levy, this report represents the sixth EMS Annual Report to the King County Council. The Council originally requested the document to enable the EMS Division to systematically update the Council on the status of a number of operational, program, financial, and planning aspects of the regional EMS system. Although King County Ordinance (#12849) initially defined the content of this report, the EMS Annual Report has grown considerably beyond those requirements.

The EMS Annual Report now represents an excellent regional summary of major EMS programs and services, progress on EMS strategic initiatives, and the status of the EMS Financial Plan. The report has provided the opportunity to relay this progress to the entire region. The success that has been documented over the past six years in these Annual Reports is due to the regional cooperative work of fire department and paramedic providers, medical directors, fire chiefs, the EMS Division program and administrative staff, and the EMS Advisory Committee. This document will represent a key element in the planning that goes into the next EMS Levy and will demonstrate to elected officials a clear record of the progress and success in the regional approach to providing EMS care.

I see several major themes in this year's report. First, it clearly documents a strong regional effort by all the partners in the EMS system. This report is not the work of one division, but reflects the cooperative efforts of providers, physicians, and local communities. Second, this region has achieved substantial success in carrying out the identified strategic initiatives, and implementing new ones to continue the strong efforts made heretofore. These continuing efforts meet the challenges presented by elected officials in 2002 when the EMS Strategic Plan was implemented. Third, the linkages between EMS data and population-based data continue into some intriguing areas. I would recommend to you the Public Health Highlight on 'EMS and Teen Pregnancy' (page 52).

The regional EMS system is complex and multi-faceted, funded by a regional EMS levy that will be up for renewal in 2007, requiring the ongoing cooperation of communities across the county. Planning for the next levy is already in its initial stages, and a few main issues are beginning to emerge. This year's Annual Report begins to outline some of those items.

The citizens of King County receive excellent EMS service from the fire departments, paramedic providers, and staff who provide essential support services and programs. This year's Annual Report conveys the excellence of that service and the commitment of the people who deliver it. The EMS Division 2004 Annual Report is available online through the Public Health - Seattle & King County website located at the following address: ([www.metrokc.gov/health/ems](http://www.metrokc.gov/health/ems))

---

Dr. Alonzo L. Plough, Director and Health Officer  
Public Health - Seattle & King County

### **Acknowledgements:**

The Emergency Medical Services (EMS) Division would like to thank all of the individuals who contributed to the *EMS 2004 Annual Report*, including managers of the various EMS projects and programs depicted in the report, **Craig Coulsen**, Seattle Fire Department, **David Solet**, Epidemiology, Planning and Evaluation Unit, Public Health - Seattle & King County, and the EMS Division data analysis team of **Linda Becker**, **Dan Henwood**, **Tom Rea**, and **Dmitry Sharkov**.

The EMS Division would also like to thank **Dr. Leonard Cobb** and **Dr. Michael Copass** of the Seattle Medic One program and **Earl Sodemán**, Deputy Chief for the Seattle Fire Department, for their support and collaborative efforts in partnering with the EMS Division.

### **Writing Credits:**

|                           |  |
|---------------------------|--|
| <b>Editor:</b>            | <b>Michele Plorde</b> , EMS Division   |
| <b>EMS System Review:</b> | <b>Tom Hearne</b> , EMS Division       |
| <b>Financial Report:</b>  | <b>Cynthia Bradshaw</b> , EMS Division |

|                |  |
|----------------|--|
| <b>Photos:</b> | <b>EMS Division</b> (unless otherwise indicated) |
|----------------|--|

## **Table of Contents**

|  |         |
|--|---------|
| Preface .....  | page 3  |
| Table of Contents .....  | page 5  |
| Executive Summary .....  | page 7  |
| A Brief Description of the EMS/ Medic One Tiered System .....                    | page 9  |
| Part I: EMS System Review .....  | page 11 |
| Part II: Status of EMS Division Programs and Activities .....                    | page 18 |
| 2002 - 2007 Strategic Initiative - Summary Table .....                           | page 33 |
| Summary of 2003 EMS Statistics .....   | page 46 |
| Part III: EMS Funding and 2004 Financial Plan .....                              | page 53 |
| Appendix A: Regional Map of the Basic Life Support (BLS) Provider Areas .....    | page 67 |
| Appendix B: Regional Map of the Advanced Life Support (ALS) Provider Areas ..... | page 69 |
| Appendix C: Regional Map of the EMS Dispatch Center Service Areas .....          | page 71 |
| Appendix D: Regional Map of EMS Hospitals .....                                  | page 73 |
| Appendix E: 2004 EMS Advisory Committee Listing .....                            | page 75 |
| Appendix F: EMS Division Revenue/Expenditure Summary .....                       | page 77 |
| Appendix G: EMS Division Contact Information .....                               | page 79 |
| Appendix H: Complete Bibliography .....  | page 81 |

### **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:** The theme for the 2004 EMS Annual Report to the King County Council is analysis of the EMS system in King County which is at the midway point of the six-year EMS levy. The following summary is a broad overview of the major issues that remain in the current EMS levy cycle, but also presents some of the regional themes and future challenges emerging for the next EMS levy in 2008.

**Current Levy Period:** The *2002-2007 EMS Strategic Plan Update* set the major policy directions and initiatives for the regional EMS system in King County. It identified new challenges, established important new initiatives, provided funding linked to Consumer Price Index (CPI), and anticipated essential paramedic service needs. At this mid-point year:

- Paramedic *Advanced Life Support (ALS)* services are the regional priority in the EMS Strategic Plan. The equivalent of 2.3 medic units have been added since 2002 and another 0.5 unit is scheduled for addition in 2006. Conversion of the two EMT/P units to full paramedic units and provision of ALS services in rural areas with longer response times and low call volumes are two EMS challenges (see page 12).
- The EMS Levy supports a portion of *Basic Life Support (BLS) first response activities* in King County. The BLS allocation is increased annually by local CPI and distributed between fire departments based on a complex funding formula. Reducing the 'hold harmless' amount within the formula and the impact on fire departments by voter-approved legislation designed to limit tax growth are two EMS challenges (see page 13).
- *Regional Programs and Services* are fully funded by the EMS levy and increase annually by CPI. At this halfway point through the levy period, excellent progress has been made in the implementation of the identified *Strategic Initiatives*. Adequate funds have been reserved to meet the identified commitments for the second half of the levy (see page 14).

**Next Levy Period:** Although we are only halfway through the current levy, discussions are already underway to initiate the early steps in the planning process for the next EMS levy in 2008. Given that the current EMS Strategic Plan has proven to be so successful as a regional policy directive, it is anticipated that a general regional process will be implemented again. The following are a few of the anticipated issues for discussion during the planning process:

- How long should the next EMS levy last?
- How many cities over 50,000 will be needed to approve the levy?
- Are there other sources of revenue for support of EMS activities?
- What new directions can this region take to continue to build on the successful regional medical model?
- How do we plan for increasing workloads and services in more remote rural areas?
- Should the BLS funding level be increased in the EMS levy?

**Year 2003 Statistics:** In Seattle and King County, the Emergency Medical Services system responded to 152,619 calls with a continued three-year decline in ALS calls volumes, due in part to the success of the ALS Dispatch Criteria Revisions (see page 22).





## 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 2,134 square miles and serving a population of more than 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 9-1-1 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 9-1-1 for medical assistance.
- **Dispatcher Triage:** Calls to 9-1-1 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 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.

### Tiered EMS Response System

**Access to EMS System:  
Bystander Calls 911**

**Triage by Dispatcher:  
Use of Medical Response  
Assessment Criteria**

**First Tier of Response:  
Basic Life Support (BLS)  
by Firefighter/ EMTs**

**Second Tier of Response:  
Advanced Life Support (ALS)  
by Paramedics**

**Additional Medical Care:  
Transport to Hospital**



## Part I: EMS System Review

### EMS Levy Mid-point Review: Major Themes and Ongoing Challenges

Thomas Hearne, Ph.D., Division Director

The year 2004 represents the end of the third year of the current six-year EMS levy that started in January 2002 and will end in December 2007. At this mid-point year, it is very useful to present a broad overview of the major issues and future challenges that remain for regional planning, EMS operations and service, and financial management in the current EMS levy cycle. It also presents an opportunity to begin to anticipate and discuss some of the regional themes emerging for the next EMS levy in 2008.

#### EMS Strategic Plan

The EMS strategic planning process was the result of events that occurred prior to and immediately after the EMS Levy failure in 1997. The *2002-2007 EMS Strategic Plan Update*, the most current version, was a product of regional consensus and policy guidance by elected officials, fire department staff in cities and fire districts, physicians, and King County, on a number of broad directions the EMS system should take during the levy period. It established goals and specific initiatives designed to make an already effective EMS system more efficient and cost-effective.

The EMS Strategic Plan emerged from the regional planning process as a document that set out the major policy directions and initiatives for the regional EMS system, and it has been successful in defining and implementing those directions. The plan set new challenges, established important new initiatives, provided funding formulas linked to Consumer Price Index, and anticipated essential paramedic service needs. The EMS Strategic Plan established an EMS Advisory Committee, a representative group which has been very effective in serving as a forum for system review, program updates, and ongoing decision-making regarding EMS programs and policies. The plan was historic in providing detailed policies and guidelines, yet included built-in flexibility in program implementation.

The EMS Strategic Plan identified five critical, integrated components of the regional EMS system, including:

- Paramedic (Advanced Life Support) service
- Basic Life Support first response by fire departments and districts
- Regional Programs and Services managed by the EMS Division
- Strategic Initiatives designed to accomplish four major goals:
  - Manage the rate of growth in calls, particularly paramedic responses
  - Use existing resources more efficiently
  - Enhance existing programs and add new ones to meet community needs
  - Develop an EMS Advisory Committee

- A six-year financial plan for the EMS levy funds that support these major activities and provides for planned service increases over the course of the levy period

It is helpful to review this matrix of elements supported by the levy, including the primary strategic initiatives, and to identify current issues and challenges for the future.

### Paramedic Services

The current EMS strategic and financial plans provide for both the maintenance of existing paramedic services as well as the potential addition of new paramedic service during the remaining years of the current levy period. This potential ensures that the addition of new paramedic services will keep pace with the growth in workload, lengthening paramedic unit response times, and other paramedic service and operational factors. Paramedic services are the regional priority in the EMS Strategic Plan, and the EMS Financial Plan aims to fully support these services.

Per the *2002 EMS Strategic Plan Update*, funding for paramedic services increases annually by the regional Consumer Price Index (CPI), however, there are built-in review mechanisms for modest increases above CPI based on paramedic provider needs, as can be accommodated within existing levy funds. The primary purpose of this increase is to avoid or minimize - to the extent possible - cost shifting to paramedic providers. One such increase occurred in 2003 and small paramedic allocation increases are anticipated for 2005 and 2006, all provided within the limitations of the EMS Financial Plan.

Due to the failure of the EMS levy in 1997, no ALS units were added between 1999 and 2001. Consistent with the *2002 EMS Strategic Plan Update*, ALS units have been added during the first three years of the 2002-2007 levy period. They included a new 12-hour (0.5 allocation) unit in Shoreline (2002), and the expansion of existing 12-hour units to 24-hour service in Bothell (2002), Issaquah (2003), and southeast King County (2004). Funding for Vashon was also increased to a 0.5 allocation beginning in 2002.

The *2002 EMS Strategic Plan Update* also forecasts the need for an additional 0.5 paramedic unit in 2006 in South King County, if warranted. A detailed study - based on specific data and performance measures around workload, response times, unit backup, and other factors - will be completed in 2005 to determine if this service is needed in 2006 or 2007, and if warranted, where the unit should be deployed to be most effective. This study will also review potential service requirements in light of the success in managing growth in paramedic calls achieved through the safe and effective changes in paramedic dispatch guidelines. This study will be conducted over the next several months by a representative regional study group, and recommendations will be taken to the EMS Advisory Committee for review and approval. The findings and any recommendations for service will be included in the EMS Division's 2006 Budget Proposal.

Since the EMS Strategic Plan was last updated, the Regional EMS Medical Directors and the EMS Advisory Committee recommended the conversion of EMT-Paramedic (EMT-P) units, staffed by one paramedic and one emergency medical technician, to units staffed by two

paramedics. Two EMT-P units were originally put in place, one in North Bend and the other in Woodinville, as a way of improving paramedic service in outlying areas of the county. No specific funding for the conversion of this service was included in the updated Strategic Plan as it was originally thought that these units would remain in their current staffing model through the end of the current levy period. However, through a cooperative effort between the Bellevue Fire Department, Eastside Fire & Rescue, and the EMS Division, the North Bend unit has been converted to a two paramedic-staffing model. There are also plans to convert the Woodinville EMT-P unit to two paramedic staffing in 2006, if possible, and discussions to achieve this goal are underway.

There is ongoing regional discussion about increasing the level of paramedic service funding in outlying rural areas. A proposal to fund supplemental winter paramedic service in Fire District #50 (Skykomish area) was uniformly not supported by the EMS Medical Directors and the EMS Advisory Committee. A systematic review of potential grant sources is currently being conducted, however, to assist in locating support for enhanced rural paramedic service. This funding source review may also help identify other grant sources to help support other unanticipated emergency medical services in the region.

In summary, ALS demands on the EMS system continue to grow in ways not anticipated in the financial projections of the *2002 EMS Strategic Plan Update*. The most financially challenging of these are the conversion of the two units staffed by one paramedic and one EMT, as recommended by the EMS Medical Program Directors and the EMS Advisory Committee. In addition, costs for existing services – especially in areas of salaries, benefits, pharmaceuticals, and medical supplies and equipment, indirect costs, and others - continue to increase at a rate higher than the local CPI. This suggests that additional means of anticipating these increases should be discussed as part of the next EMS levy.

### Basic Life Support Services (BLS)

The EMS levy supports a portion of BLS first response activities provided by 34 fire departments and fire districts in King County. Most of the cost for providing this service is supported by local tax dollars. In urban or suburban areas, levy support represents approximately 10 per cent or less of the cost to provide local fire department EMS response. In more outlying areas, levy support may represent a much more substantial percentage of the cost to provide EMS services.

The overall BLS allocation increases annually by local CPI, and is then distributed between fire departments based on a formula that includes assessed valuation of property and the number of calls. The formula also includes a mechanism for increasing the amount of funding available to small outlying departments. This formula shift, recommended by the BLS Subcommittee and approved by the EMS Advisory Committee, represents a strong regional statement of support for maintaining and protecting EMS services in outlying, largely volunteer, departments.

A primary issue in the allocation of BLS funds has been the concentrated effort to reduce the ‘hold harmless’ amounts allocated to fire departments. ‘Hold harmless’ is the policy that has

been sustained over many EMS levies of holding BLS allocations of individual departments at the previous year's level to prevent allocations from any year to year reductions. The amount necessary to ensure that this occurs is deducted from other departments on a proportional basis. Early in the current levy period, it became apparent that unless some changes were made to the formula, most growth in BLS allocations would be distributed as 'hold harmless' amounts and potentially limiting any growth in the BLS allocations. This issue was identified early on in this levy period and formula changes, approved in advance by the EMS Advisory Committee, have made it possible to gradually reduce the negative impacts of the hold harmless policy and allow allocation increases in areas where growth is occurring. Based on annual review of these trends by the BLS Subcommittee, it appears that that trend of reducing 'hold harmless' will continue through the remainder of this levy period.

Fire departments, paramedic providers, and other public safety agencies have been heavily impacted by voter-approved legislation designed to limit tax growth. As a result, fire departments are reviewing a wide spectrum of efficiencies and potential revenue-producing alternatives. These include discussions regarding shared administrative functions, potential agency consolidations, and charging fees for patient transports. These issues will continue to be important discussions through the remainder of this levy and will influence strategies for the next EMS levy in 2008.

### Regional Programs and Strategic Initiatives

Regional Programs and Services, provided by the EMS Division, represent an extremely rich and varied set of activities and includes specific research or evaluation activities supported by grants as well as levy-supported programs. Per the *2002 EMS Strategic Plan Update*, funding for these programs and services is increased annually by local CPI. The richness and variety of these programs is described in detail in Part II: Status of EMS Division Programs and Activities (pages 18-45). However, below are some notable highlights and themes:

- There is increased reliance on technology-based programs to conduct EMS business in King County. For example, the continuing education program for the more than 4,000 EMTs in the region, also known as Competency Based Training, is now conducted using a highly interactive, realistic web-based program. This project was initiated in 2001 with grant support from the Medic One Foundation. While this web-based approach does not cover all training requirements - especially hands-on practical skills - it offers a substantial improvement over historical approaches to continuing education and is being reviewed for potential marketing beyond King County. Emphasis on technology-based learning in dispatch training, paramedic continuing education, and data collection is very likely to be a strong part of EMS in the future (see page 23).
- The Regional Purchasing Program continues to provide a cost-saving approach to purchasing medical equipment and supplies. One of the first strategic initiatives to be implemented, this program is now a regular regional program. Since April 1999, it is estimated that this program has saved EMS agencies nearly \$1,000,000 (see page 36).

- Emergency Medical Dispatch has been one of the most critical components for strategic initiative and program development during this levy. In this regional system, emergency medical dispatchers play a very critical role in determining when paramedic units are sent, and in referring minor, non-urgent calls to a nurse referral line. Although there have been changes and improvements in training and continuing education, careful changes in dispatch criteria have resulted in strong and appropriate management of paramedic responses. It is very significant that paramedic call volumes in this region have decreased over the past three years while population continues to increase, due in large part to the safe changes in dispatch criteria (see page 22).
- When the *1998-2003 EMS Strategic Plan* was drafted, it was difficult to accurately or uniformly describe EMS activities or depict trends across the entire region. Some questions posed by the planning committee could only be partially answered. The Regional Electronic Data Collection Project, initially started five years ago as a strategic initiative, created a system to collect and distribute EMS data electronically across the county. There are currently sixteen departments representing about 70% of EMS incidents per year, and it is anticipated that nineteen agencies reporting over 80% of EMS incidents will be in this system by the end of 2004 (see page 24).
- Critical Incident Stress Management (CISM) has been providing support and debriefings to emergency services workers for more than 15 years. Largely volunteer, members of this team donate their time to respond to incidents. It is indicative of the spirit of this group that when challenged by issues regarding validity of CISM itself, they voluntarily carried out a scientific assessment of their activities and strengthened the program (see page 40).
- Grant-funded research and evaluation activities continue to be a strong part of both the EMS Division's and the region's activities thanks to the close association of the EMS Division with the University of Washington and Harborview Medical Center. The results of the Heart Attack Survival Kit (HASK) indicate that utilizing EMS personnel to assist in providing public information may be a very effective model for favorably influencing behavior in seniors and helping them call 911 when experiencing chest pain (see page 42).

In summary, the EMS Division manages a variety of innovative programs to further the effectiveness and efficiency of EMS responses in King County. The EMS Strategic Plans have offered exceptional regional direction in targeting specific areas for improvement and developing a financial plan to forecast the impacts of changes in expenditures and revenues. This is complemented by the outstanding scientific research conducted within the EMS Division. At this halfway point through the levy period, excellent progress has been made in implementing the identified strategic initiatives and adequate funds have been reserved to meet the identified commitments for the second half of the levy.

#### 2008 Levy Planning

Although we are only halfway through the current levy, discussions are already underway to initiate the early steps in the planning process for the next EMS levy in 2008. Given that the

current EMS Strategic Plan has proven to be so successful as a regional policy directive, it is anticipated that a broad regional process will be implemented again. We expect that the process will require about one-and-a-half to two years to complete, and will again include a wide range of elected officials, physicians, fire department and paramedic provider leaders, and citizen and labor representatives. This discussion will again be a mechanism for reviewing our EMS system, providing an opportunity to review our accomplishments, and building a strong future direction.

There are already a number of important themes that may appear in these regional discussions, even though their final resolution is not entirely clear. Some of the themes may include:

- How long should the next EMS levy last? Historically, EMS levies in King County have been approved for six years. State law now allows longer EMS levies, including a permanent levy.
- If we have a longer levy, will it be useful to have some type of regional EMS governance structure to ensure regional input, participation, and oversight? The EMS Advisory Committee currently fulfills that regional role.
- How many cities over 50,000 will be needed to approve the levy? Current state law requires that all cities over 50,000 in population and the King County Council must approve the levy in order for it to appear on the ballot countywide. In 2001, there were six cities over 50,000. The King County Annual Growth Report indicates that there could be seven cities, or possibly nine cities over 50,000 by 2008, depending on population growth and annexations.
- Are there other sources of revenue for support of EMS activities? In 1999, a detailed financial evaluation of twelve potential revenue sources was carried out in order to review the feasibility of other options. The EMS levy emerged from this review as the most financially practical way of supporting regional services.
- The EMS levy has historically supported nearly all of the costs of providing paramedic services and EMS regional support services, and a portion of BLS costs for fire departments. In the *2002 EMS Strategic Plan Update*, strategic initiatives were added to increase the efficiency and cost-effectiveness of EMS services, and to manage the growth in responses. These initiatives have been very successful. What new directions can this region take to continue to build on the successful regional medical model?
- How do we plan for increased workloads and services in more remote, rural areas? Some of these efforts may include cross-county planning along major highways like Highway 2, Interstate 90, and Highway 12, where current services are provided by largely volunteer departments with limited resources.



- Should we increase the BLS funding level in the EMS levy? How many new paramedic units will we need in the future? What support should be provided to regional support programs, and how do we prioritize those?
- What will be the impact of emerging illnesses such as West Nile Virus, as well as ongoing all-hazards emergency management, and continuing challenges in Homeland Security preparation. These issues imply a closer relationship with Public Health. Should that be included in the EMS levy planning?

These are just a few of the major questions that will emerge in the next few years as we begin the regional discussion in preparation for the next levy period. It will require a countywide effort and consensus to provide the answers in ways that maintain the successful regional EMS system we now enjoy and also benefits EMS patients.

### Summary

The past three years have seen substantial progress in the challenges that were set out in the original EMS Strategic Plan. The initial set of strategic initiatives have been completed and implemented, and this achievement has been a regional success. There has been additional regional consensus regarding new strategic initiatives that will continue the progress we have made so far. At the same time, we have been able to work effectively as a region in addressing new issues that were not anticipated in the *2002 EMS Strategic Plan Update*. We are gradually seeing the emergence of issues that will guide the discussion regarding the next EMS levy and the next phase of regional planning and service delivery.

## 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 in the region 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 70 paramedics and support staff, and provides emergency medical response to patients in the south



King County region (see Appendix B: Regional Map of the ALS Provider Areas). The KCM1 service area covers 544 square miles with a population of over 750,000 people. In the year 2003, KCM1 responded to nearly 12,000 dispatch-selected paramedic alarms in their primary service area, in addition to responding to mutual aid requests in neighboring jurisdictions.

Each day of the year, King County Medic One deploys seven full-time medic units. Each unit is placed strategically throughout the service area to minimize response times and maximize cost-efficiencies. KCM1 operates out 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 and puts approximately 250,000 fleet miles on the vehicles each year. Medic units are staffed with two paramedics working 24-hour shifts and utilizing five area hospitals for medical direction.

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 efficiencies are obtained by rotating crews into headquarters for several hours of training every other month.

Educational Opportunities: 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 for 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.

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 and exercises like the May 2003 TOPOFF weapons of mass-destruction event in Seattle, 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, regional hospital, trauma and emergency preparedness committees, 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). In addition, KCM1 is participating in a study investigating the use of 'hypertonic' IV solutions to determine whether concentrated saline improves outcomes from blunt trauma.

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 KCM1 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 standard. The personnel who provide this core service are dedicated to public service at the highest level.

King County Medic One Donations: King County Medic One, like most paramedic providers, has a separate account for donations from citizens. These funds are used to supplement EMS levy funds and are specifically targeted to purchase equipment or support training of paramedics. The funds are kept separately from the EMS levy fund. In 2003, KCM1 received 61 donations. The majority of donations received are under \$100. In 2003, there were two larger donations (approximately \$50,000 and \$98,000), and fifty-nine smaller donations ranging from \$10 to \$1,000 averaging \$72 per donation.

In 2003, donated funds were used to purchase laryngoscopes, capnography, bullet proof vests, and a laptop computer to support paramedic training continuing education. The fiber optic laryngoscopes upgraded existing equipment and allowed paramedics to better intubate (placement of a tube for the patient to breath through) patients with compromised airways. The electronic capnography was a software and hardware upgrade to the current defibrillators. It allowed for measurement of exhaled carbon dioxide from both intubated and non-intubated patients and permits paramedics a secondary means of assessing endotracheal tube placement, ventilation rate, and a quantitative measurement of carbon dioxide. These two items help to insure the patient is well ventilated and oxygenated.

#### **KING COUNTY MEDIC ONE DONATIONS**

Fund 6980; SubAccount 06204

*2003 Account Balance*

|                            |                       |
|----------------------------|-----------------------|
| Beginning Balance Account  | \$ 214,483.20         |
| Donations through 12/11/03 | \$ 155,841.22         |
| Expenditures               | <u>\$ (90,582.11)</u> |
| Ending Balance             | \$ 279,742.30         |

#### **B. 2002 - 2007 Strategic Initiatives**

**IN PROGRESS**

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, partners in providing EMS services, and elected officials to help maintain this high quality public service.

The *2002-2007 EMS Strategic Plan Update* supports both currently implemented programs and the development of new projects in order to meet identified objectives characterized as 'strategic directions.' The EMS Strategic Directions 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.
- Use existing resources more efficiently to improve operations of the system to help contain costs.

The *2002-2007 EMS Strategic Plan Update* developed a cohesive, broad reaching, long-term plan for the region, however, a more detailed vision of how these directions might be implemented was necessary. In late 2003, the **2003 Supplemental Plan** was created following a thorough process of review and discussion by EMS Division senior staff, the EMS Advisory Committee, and EMS agency representatives. During this process of review, several broad themes emerged, including the following three areas of interest:

- Dispatch Enhancements
- Advanced Technology Projects
- EMS System Efficiencies

The term 'strategic initiative' was introduced in the *1998-2003 EMS Strategic Plan* and used almost exclusively to describe a handful of new and innovative approaches to improving the EMS system in King County, including the Regional Purchasing Program (see page 36) and the Review and Revision of the Criteria Based Dispatch (CBD) ALS Triage Criteria (see page 22). These twelve strategic initiatives were allocated specific funds to ensure their successful implementation and were completed in 2002.

The *2003 Supplemental Plan* continued in this manner by supporting the continuation of projects already in progress and identifying new programs that are thought to have a significant impact on the success of the Strategic Directions. The current set of strategic initiatives were again allocated dedicated funds to ensure adequate financial support. In June 2004, the EMS Advisory Committee amended the plan and approved additional Strategic Initiative funding for enhancements to the Web-based Training for EMS Personnel, Paramedic and EMT Procedure and Patient Treatment Evaluations, Enhanced Care for Specific EMS Patients projects and EMS Levy Planning for 2007, and the newly developed Regional EMS Tracking Resource - Online (RETRO) Project.

## **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 EMS Strategic Plan Update* was to determine ways to decrease the rate of growth of ALS calls in the EMS system. A major component of this effort was the revision of the Criteria Based Dispatch (CBD) Guidelines that determined if ALS care was required.

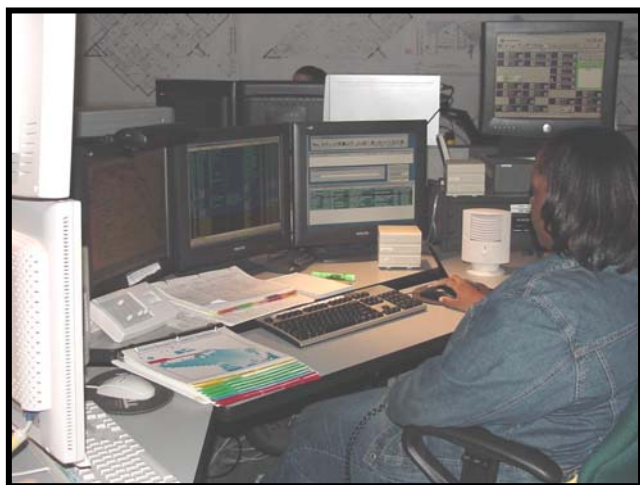


During the year 2000, the EMS Division implemented comprehensive revisions to the CBD Guidelines. A comparative analysis was conducted in 2002 to measure the impact of the 2000 CBD Guidelines revisions. As a result of the findings in the evaluation of the 2000 CBD Revisions, the EMS Division concluded that ALS was less likely to be dispatched during 2001 compared to

1999. 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 3,800 additional ALS dispatches during 2001.

In 2003, the EMS Division and the King County Dispatch Review Committee conducted a subsequent review of the CBD Guidelines. These revisions were approved by the King County Medical Directors in November 2003. Training for dispatchers, EMTs and paramedics was conducted in the spring of 2004. The Fourth Edition of the King County CBD Guidelines was implemented at all dispatch centers in King County, outside the city of Seattle, on June 20, 2004. These revisions were relatively minor and the significant reductions in ALS response observed after the year 2000 changes are not anticipated.

**EMD Quality Improvement:** The development of an Emergency Medical Dispatch Quality Review Program is an integral part of the *2002-2007 EMS Strategic Plan Update*. In 2001, the EMS Division in cooperation with King County Dispatch centers, began a formal process for



Eastside Communications Center

review of dispatch tapes and associated EMS reports for the purpose of EMD quality improvement. As of June 2004, approximately 2,900 cases have been reviewed. The process includes 1) identification of cases meeting particular review criteria, 2) retrieval of dispatch tapes and reports from the dispatch centers, and 3) 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, when appropriate, and is also used in continuing education when systemwide 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 2004.

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 pilot stage and is a requirement prior to attendance in the Basic Criteria Based Dispatch course. This 8-hour class provides the dispatcher with a basic understanding of human anatomy and physiology. The Basic CBD course continues to provide the students with a review of anatomy and physiology, including aspects of pathophysiology. The objective is to provide EMDs with additional medical training to enhance their good decision-making skills.

2) *Problem/Scenario-Based Method of Delivery:* One of the main projects for 2004/5 is to update and revise the method of training delivery in the Basic EMD Course to include more student-centered learning activities such as problem-based scenarios, role-playing, and other methods that involve students in the learning process. Continuing Education courses were revised to include this format in 2003. Instructors in the program are now required to attend a revised EMD Instructor Recertification workshop.

The first EMD Instructor Recertification 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 those they have used in the past (lecture to more scenario/problem-based). 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 participants are able to apply the knowledge and seek out information more effectively than those students receiving the lecture-based method.

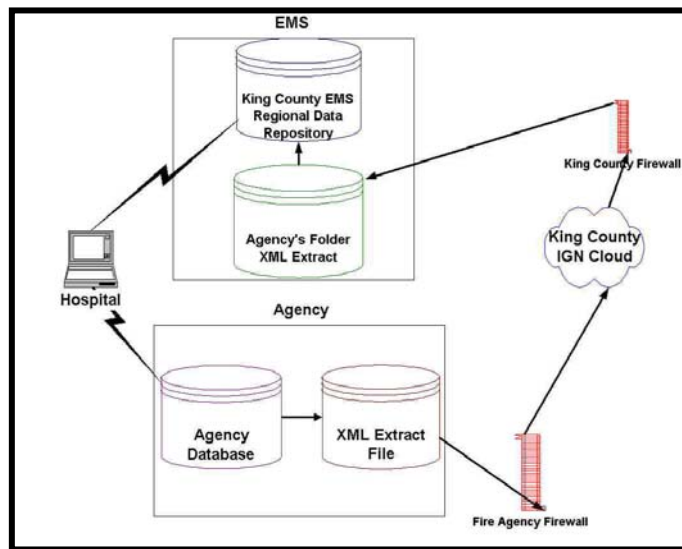
3) *Online Web-based Training:* In June 2004, the first module of web-based continuing education was delivered to dispatchers. The topic was Cardiac Arrest/Dispatcher-Assisted Telephone CPR. The training was a 90-minute web-based module followed by two hours of classroom discussion and question and answer period with instructors. More information on this project is provided in the next section.

## **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 electronic data collection, on-line training of personnel, and electronic record-keeping. 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 three major technology-related Strategic Initiatives.



**Regional Electronic Data Collection Project:** One of the Strategic Initiatives identified in the *1998-2003 EMS Strategic Plan* and supported in the *2002-2007 EMS Strategic Plan Update* 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** was a five-year countywide effort to implement a system that allowed for electronic collection and distribution of EMS data. The goal of the project was 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 central EMS database. The collection and consolidation of data via electronic means improves the accuracy and completeness of the data, provides access to the aggregate data by individual service providers, allows for

more intensive analysis of the data and facilitates the assembly of system reports.

The RDC Project was completed as a pilot project in December 2003 and integrated into the regular programs and activities within the EMS Division. Project accomplishments include:

1. Establishment of a defined standardized EMS data set.
2. Review of the data management system and selection of appropriate design changes.
3. Establishment of a central data server with network connectivity to participating agencies.
4. Development of a pathway for the electronic transfer of data.
5. Development of a method for electronic access to aggregate data by agencies.
6. Completion of the project using 66% of the allocated budget.

There are currently sixteen EMS agencies collecting data electronically across King County, including Auburn Fire Department, Bellevue Fire Department, Federal Way Fire Department, Fire District #40, Kent Fire & Life Safety, Kirkland Fire Department, Maple Valley Fire & Life Safety, Mercer Island Fire Department, North Highline Fire District (#11), Port of Seattle Fire Department, Redmond Fire Department, SeaTac Fire Department, Seattle Fire Department, Shoreline Fire Department, Woodinville Fire and Life Safety, and Vashon Fire & Safety. These departments represent 69.6% of the forms generated in a year. Three additional agencies are expected to begin electronic data collection by the end of 2004, increasing electronic reporting by EMS agencies to 80.5%.

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. In accordance with the Washington State Uniform Health Care Information Act (RCW 70.02) and Health Insurance Portability and Accountability Act (HIPAA) regulations, the EMS Division is evaluating any possible additional areas for improvement.

As a subset of the Regional Data Collection Project, the **Alternate Input Device (AID) Pilot Project** is evaluating the implementation of a custom-designed, fully electronic medical incident report form (E-MIRF) installed on tablet devices for use in the field. Phase I of the AID Project sought to design an early E-MIRF prototype and test the software on a variety of tablets.

This portion of the project was completed in March 2003. A final report was presented at the EMS Advisory Committee meeting in June 2003 and the committee approved the AID Project Oversight Committee recommendations to develop and implement Phase II. Phase II of the AID Pilot Project will continue to evaluate hardware and software solutions for electronic data collection in the field. The AID Oversight Committee recommended the following focus areas for Phase II:

The screenshot displays the 'Electronic Medical Incident Report Form' (E-MIRF) software interface. The title bar indicates it is running on a Windows XP system. The interface includes a menu bar with options like 'File', 'Tools', 'Incident', and 'Help'. Below the menu is a toolbar with icons for 'Log In', 'All Incidents', 'New Incident', 'Save Incident', 'Print Incident', and 'Print Library'. The main form area is divided into several sections for data entry. The 'Patient' section includes fields for 'Date of Incident' (05/28/2004), 'Agency Incident Number' (12345678), 'Agency Number' (Shoreline FD (17D04)), 'Street Number' (45321), 'Street Name' (Sunnycrest), 'City' (Renton), 'State' (WASHINGTON (WA)), 'ZIP' (98059), 'County' (King), 'Last Name' (Test), 'First Name' (Case), 'Date of Birth' (5/28/1966), 'Age' (38), 'Age Units' (Years (Y)), and 'Gender' (Male (M)). The 'Incident' section includes fields for 'Street Number' (45321), 'Street Name' (Sunnycrest), 'City' (Renton), 'State' (WASHINGTON (WA)), 'ZIP' (98059), 'County' (King), 'Street Type' (Road), and 'Street Suffix' (Apartment). A 'Recognize Handwriting' section is visible on the right side of the form. The bottom status bar shows 'Sheet Prefix: incidentreport' and 'RS: DEFAULT1'.

- Update and modify the software product based on feedback from Phase I.
- Purchase one tablet type for continued testing of the software product and develop hardware specification for future hardware purchases.
- Enhance utilization of the tablets with improved handwriting capabilities, retention of data, printing capabilities, and an ability to export to the King County data standard.
- Continue evaluation and possible implementation of second priority items such as connectivity to CAD (dispatch), transfer of data between tablets, and integration with local agency RMS systems.

The consulting firm that developed the original E-MIRF in Phase I completed the recommended changes to the software in July 2004. The form is expected to be available for evaluation by EMS agencies in September 2004. Pilot testing in the field is expected to last three to six months and includes the following EMS agencies: Bellevue Fire Department (FD), Federal Way FD, Kent FD, SeaTac FD, and Shoreline FD.

**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 new basic and continuing education modules for dispatchers and ongoing development of continuing education modules

for EMTs. This method of delivery allows project participants an opportunity to log onto the Web and access training modules during non-peak service hours and receive training in intervals that best meets the needs of the participant. Lessons are interactive with a focus on application of the objectives and include a participant feedback mechanism built into the lesson plan allowing students immediate response on both test questions and scenario responses.

A proposal requesting additional Strategic Initiative funds for the development of the next phase of the web-based EMS personnel training project was reviewed and approved by the EMS Advisory Committee in June 2004. Enhancements include the addition of streaming audio/video options, additional interactive content, and improved access to training records by local agency administrators. Please refer to page 35 for more details on the web-based training for EMTs.

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. This pilot study has led to a grant funded by the National Heart, Lung, and Blood Institute.

### **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 four levy-supported ALS, BLS, Regional Services and Strategic Initiative sub-funds, review of EMS standards of practice, continuation of injury prevention programs, and analysis of particular EMS sub-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 system's effectiveness.

ALS Sub-Fund: As recommended in the *2002-2007 EMS Strategic Plan Update*, ALS funding is evaluated periodically to minimize cost shifting to ALS providers. Each year, a subset of the EMS Advisory Committee meets to review current and projected ALS costs and compares these to the current ALS allocation. Significant cost drivers leading to this recommendation included rising labor costs associated with recently settled union contracts, and increased costs of medical supplies.

Based on individual agencies experience, an increase above CPI was recommended and implemented for 2003 (5.5% above CPI) and increases of 2.1% above CPI are currently budgeted for 2005 and 2006. Please see page 56 for more details. The advantage with two smaller increases rather than one projected larger increase would be to better meet the cash flow needs of ALS providers. This will be reviewed by the ALS Subcommittee prior to finalizing contracts for 2005.

BLS Sub-Fund: The mechanism for allocating the BLS fund to individual EMS agencies uses a complex formula reflecting agency contributions in assessed valuations, percent of unincorporated area in the jurisdiction, and the number of EMS responses. The formula also incorporates the principle that no agency will receive less funding than the previous year, a concept known as 'holding harmless.' The BLS funding formula was revised in 2002 to address the soaring hold harmless amounts and to provide a more standardized method for defining formula elements. A key element of the revision process was a commitment on the part of the EMS Division to review and evaluate the formula on an annual basis to ensure it was operating as expected.

The BLS Subcommittee convened in May 2004 to review the 2005 BLS allocations and evaluate the status of the hold harmless amount. Two minor adjustments to the BLS funding formula were recommended to maximize reduction of the hold harmless amount, in addition to continued annual review of the BLS funding formula.

Regional Services Fund: The EMS Division began review of the current Regional Services Program budget in early 2004 as part of the King County 2005 budget preparation. Like other city and county departments, Regional Services faced challenges in increased overhead allocations. Along with cooperation from the Public Health Department itself, these increases were met through the utilization of small program reductions and rebudgeting. These changes permit the Regional Services Fund to stay within its CPI allocation. These proposals were reviewed and approved by the EMS Advisory Committee in June 2004.

Strategic Initiative Fund: Although the *2003 Supplemental Plan* provided adequate detail for the development and implementation of the current EMS Strategic Initiatives, project plans evolved to better reflect intended project objectives. Proposals for changes to the Strategic Initiatives were presented and approved at the EMS Advisory Committee in June 2004.

**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.

The following items represent the variety of areas pursued as part of this strategic initiative:

Pulse Oximetry: In the last year, EMT pulse oximetry was evaluated and is now an approved EMT procedure in King County. This non-invasive procedure provides a measurement of oxygen saturation and can be helpful in the assessment of patients with respiratory complaints.

Glucometry: Another EMT skill evaluated in the last year includes glucometry. This minimally invasive procedure provides rapid measurement of blood glucose levels and can be helpful in the assessment of patients with an altered level of consciousness. The evaluation concluded that no harm came to patients as a result of the procedure and appeared to enhance the efficiency of the EMS system. As a result, EMT glucometry is now an approved procedure in King County.

Emesis in Cardiac Arrest: Some evidence exists that excessive ventilation during cardiac arrest may lead to emesis. In order to see if this is a problem in the EMS system in King County, measurements of cardiac arrest associated emesis, including when the emesis occurred, is being conducted. Depending on the results, corrective steps may be made in the training of bag-valve mask ventilation.

A proposal requesting additional Strategic Initiative funds to support the development of these types of projects was reviewed and approved by the EMS Advisory Committee in June 2004. These funds will be used to carry out further reviews and evaluations of EMS procedures and patient treatment plans.

### **Injury Prevention and Public Education on the Use of 9-1-1:**

Unintentional injuries are the leading cause of death for people of all ages! Injury prevention focuses on four approaches: Education, Environment, Engineering, and Enforcement to reduce injuries. The goal of the injury prevention and public education unit is to reduce 9-1-1 calls by reducing unintentional injuries. Among children ages 5 to 9, motor vehicle occupant injury is the leading cause of unintentional injury-related death, followed by pedestrian injury, drowning, fire and burns, and bicycle injury. Teenage drivers are the highest risk age group and are five times more likely than older drivers to crash. Falls are a leading cause of injury and death to older adults 65 years and older. More than one-third of all adults aged 65 and older fall each year.

Injuries are preventable! The following programs were designed to address specific high risk populations to help reduce injuries: **Smart Kids! Safe Kids!** - a pre-school fire & injury prevention program, **Think Again** - an education program for high school students that discusses the consequences of drinking and driving, **Child Passenger Safety** - an education program for the public that demonstrates how to correctly install child car seats, **Fall Factors** - a fall prevention program for older adults, **Randomized Fall Pilot Study** - a research project designed to test the fall factors procedures, **Special Community Events** - fire department and corporate supported community events with injury prevention themes.

With the successful implementation of the **Smart Kids! Safe Kids!** curriculum, topics such as burns and scaldings, pedestrian safety, helmet safety, and poison safety are discussed. A one-day workshop for early child educators (i.e. preschool teachers, Head Start, daycare providers, fire and life safety educators) was held in March 2004.

The event was sponsored by the EMS Division, Region 4 Life Safety Council, King County Fire and Life Safety Association (KCFLSA), BIC Corporation, Fire Proof Children, Pierce and Snohomish Safe Kids, Central Region Trauma and EMS Council, and the Puget Sound Education Service Districts. The workshop was held at the Shoreline Conference Center in Shoreline and video conferencing was made available in the Wenatchee and Olympia Educational Service Districts for other educators. The workshop was extremely successful. There were over 200 participants from 15 counties throughout the state of Washington, representing over 185 agencies. It is estimated that there is a potential to reach over 7,000 children with valuable fire and injury prevention education and participants learned the importance of providing these lessons throughout the school year, rather than once a year during fire prevention week.



Seattle Fire Department

The **Think Again Program** is sponsored by the EMS Division, Washington State Traffic Safety Commission (WTSC), and the King County Fire & Life Safety Association (KCFLSA). The KCFLSA has set goals to reach our most vulnerable young adolescents using the Think Again classroom presentation targeting 15-19 year olds. Local and national statistics indicate that motor vehicle crashes are the leading cause of injury and/or death for adolescents. All too often these preventable crashes involve reckless driving, lack of seatbelt use, and the use of alcohol and/or drugs.



King County Fire & Life Safety Association

Many fire departments in King County participate in Think Again, but only four local agencies applied for funding of the program for 2004: Eastside Fire & Rescue, Kirkland Fire, Kent Fire Department, and King County Fire District #40. Participating fire departments received a total of \$6,800 in grants from the Washington Traffic Safety Commission (WTSC) and the EMS Division for the year. Additional participating departments include: Auburn, Bellevue, Bothell, Federal Way, Maple Valley, Northshore, Redmond, Shoreline, and Woodinville.

The Think Again program was presented to 4,400 high school students in 2003 and has reached over 35,000 students in King County schools since the program began in 1998. Since the inception of the Think Again program, the number of injuries and/or deaths in King County has dropped by one-third. The Think Again program has been recognized over the years by the WTSC Superstar Award in Educational Outreach and M.A.D.D. Washington State in Outstanding Community Education.



Washington State Safety Restraint Coalition

The **Child Passenger Safety (CPS) Program** took a giant step forward when it received approval by the Public Health - Seattle & King County Director's Office, allowing employees to participate in Child Passenger Safety activities. A pilot project at the Federal Way Public Health Clinic has proven to be a valuable tool in educating Public Health providers as well as WIC patients in properly installing child car seats. On the second Thursday of each month, child passenger safety classes are offered to WIC patients and taught by NHTSA Certified Passenger Safety Technicians. These classes are offered in English, Spanish and Ukrainian, and when possible, child car seats are provided to needy families. This model Child Passenger Safety Program is slowly being expanded to include other Public Health Centers, such as the Springwood Public Health Center. In addition, various CPS car seat check-up events are conducted throughout the county with local fire departments, AAA of Washington, and the Washington State Safety Restraint Coalition.



Fire District #40

The **Fall Factors Program** involves multiple agencies and fire departments that conduct free home and patient assessments of fall hazards, and appropriately installs free fall reduction devices in the homes of low-income seniors. Examples of fall reduction devices include tub grab bars, hand held showers, transfer benches, toilet seat risers and frames, bed assist frames and others.

To date the program has assessed a total of 1,070 homes of participants in the Fall Factors Program since the program's inception in 1996. Over the life of this program, it is estimated that this program may have saved approximately \$300,000 in Medicare hospital costs by reducing future falls of people over 65 years old.

A randomized falls pilot study, started in the Bellevue Fire Department service area in 2003, has been expanded to include other areas of the county. This program will continue to be supported until approval from a National Institutes of Health (NIH) grant is received for a larger fall prevention study, hopefully in mid-2005.

Each year, the EMS Division participates in fire department and corporate-supported **Special Community Events**. This year, the division participated in the 'Fire Department Day at the Boeing Flight Museum' event, providing free child car seat check-ups and reduced-price bicycle helmets. This regional event involved fourteen fire departments participating in the education of preschoolers and elementary school students regarding fire and injury prevention.

**Enhanced Care for Specific Populations:** 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 often occur. 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 efficiency of service delivery. This Strategic Initiative was approved by the EMS Advisory Committee in June 2004 to receive additional Strategic Initiative funds to support the development of these types of projects. The following items represent the variety of projects pursued as part of this strategic initiative:

Nursing Home/ Adult Family Facilities: The Community Programs and Education Section in the EMS Division has identified an area in which community education in nursing homes and adult care facilities would result in better, more efficient use of Advanced Life Support (ALS) resources. In coordination with the ALS providers in the county, an educational video and job aide was developed for delivery to health care providers working in these types of facilities. The objective of the training is to reduce unnecessary requests for ALS services from nursing homes, adult care facilities, and medical clinics. Several educational sessions were piloted in June 2004. It is expected that the pilot will be completed by the end of 2004 and evaluated in 2005.

Cardiac Arrest in Dialysis Centers: A joint study with Seattle Medic One was undertaken in 2004 to evaluate the incidence of cardiac arrest in dialysis centers and suggest strategies for improving survival rates.

Cardiac Arrest in Children less than 8 Years Old: An epidemiologic study was undertaken to decide if children less than 8 years old should receive an assessment of rhythm by EMTs using an AED or receive continued CPR until paramedics arrive. Preliminary results suggest that children from 1-8 years old who have a witnessed cardiac arrest should have an AED placed and a defibrillatory shock provided if indicated.

End of Life Decisions: Special emphasis will be placed on creating a single policy for managing end of life decisions among patients in cardiac arrest for whom EMS is called.

**Assessment of the Impact of State Budget Cuts on the EMS System:** The recent financial crisis in Washington State has created unprecedented budget cuts to critical health care programs for children and families. This affects support of the Basic Health Care program, Medicaid reimbursements, and a variety of other resources. The EMS Division has started to evaluate the impact of these cuts on access to and use of the EMS system in King County. Evaluation activities include an examination of the prevalence and severity of selected medical conditions treated by EMS personnel. In addition, EMS will analyze the relationships between demographic factors and changes in conditions over time.

**Regional EMS Tracking Resource - Online (RETRO) Project:** Ensuring that EMS personnel meet the State and King County certification and recertification requirements is critical in maintaining or improving current standards of patient care. The RETRO Project is a newly approved Strategic Initiative to build a centralized database to track and store information related to EMS personnel. Development of the database will enhance the existing EMS agencies' program of tracking the educational requirements of EMS personnel.

Types of EMS personnel records include: dates and requirements related to certification and recertification, reciprocity requirements, and teaching certification requirements. The multi-systems database will collect and track information for each EMS individual entering into the EMS system in King County and eliminate the intensive, time-consuming use of paper files. A proposal requesting the Strategic Initiative funds to support the development of the RETRO database was reviewed and approved by the EMS Advisory Committee in June 2004.

#### **IV. Strategic Planning for Next EMS Levy Period**

The *2002-2007 EMS Strategic Plan Update* to the *1998-2003 EMS Strategic Plan* outlines 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).

Development of a Strategic Plan for the next EMS levy period will require significant coordination and collaboration with EMS agencies and elected officials in King County. Identifying this as a separate strategic initiative with associated funds will expedite the process and early project planning is expected to begin in late 2004.

Discussions regarding all aspects of the EMS system, including ALS services, BLS services, Regional Services and Strategic Initiatives will begin in early 2005. A final document for delivery to the King County Council is expected in late 2006. This plan includes a request for additional Strategic Initiative funds and the EMS Advisory Committee reviewed and approved the proposal in June 2004.

The table below summarizes the status of each strategic initiative and is followed by brief project descriptions.

#### **2002-2007 Strategic Initiative - Summary Table**



| Strategic Initiative   | Current Status                             |
|--|--|
| <b>I. Dispatch Enhancements:</b>   |  |
| Review and Revision of the Criteria Based Dispatch (CBD) ALS Triage Criteria | Ongoing                                    |
| EMD Quality Improvement  | Ongoing                                    |
| Enhanced CBD Basic Training and Continuing Education Curricula               | Ongoing                                    |
| <b>II. Advanced Technology Projects:</b>                                     |  |
| Web-based Training for EMS Personnel and Dispatchers*, and AED Users         | Ongoing                                    |
| Continuation of the Regional Electronic Data Collection Project              | Incorporated into Regional Services: 12/03 |
| <b>III. EMS System Efficiencies:</b>   |  |
| Financial Review of EMS Sub-Funds  | Ongoing                                    |
| Paramedic and EMT Procedure and Patient Treatment Evaluations*               | Ongoing                                    |
| Injury Prevention Programs   | Ongoing                                    |
| Enhanced Care for Specific EMS Patients*                                     | Ongoing                                    |
| Assessment of the Impact of State Budget Cuts on the EMS System              | Initial Development Phase                  |
| Regional EMS Tracking Resource - Online (RETRO) Project*                     | Initial Development Phase                  |
| <b>IV. Strategic Plan*</b>   |  |

\* Approved by the EMS Advisory Committee as a new or enhanced project (June 2004)

## C. EMS Division Programs and Activities

### Introduction

In addition to the specific Strategic Initiative projects outlined in the *2003 Supplemental Plan*, the EMS Division plays a significant role in developing, coordinating, managing, and evaluating many 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 9-1-1 dispatchers receiving calls for medical assistance and by the EMTs and paramedics responding to the scene. The importance of developing and supporting regional programs is often underemphasized. The following section describes the many varied programs managed by the EMS Division.

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

*Helping you become the best through Training and Education!*

The **Basic Life Support (BLS) Training and Education Program** provides initial training, continuing education, and oversight of the recertification process for over 4,000 Emergency Medical Technicians (EMTs) 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 training 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 following **BLS Training and Education Projects** highlight activities for 2004:

Patient Care Guidelines: The protocols used by EMTs to direct the pre-hospital care of patients are derived from the Patient Care Guidelines (PCG). The EMS Medical Program Director (MPD) is required by Washington Administrative Code (WAC) to draft and distribute these guidelines to all EMTs 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.

The PCG are again under revision in 2004 for a January 2005 distribution. The new look and design will for the first time allow each EMT in King County to place this valuable resource tool literally in their front pocket. This compact version of the Patient Care Guidelines is designed to provide easy access to pertinent patient care information. The EMS system in King County is considered a national leader in EMS research and education, and as such, is committed to updating and distributing the PCG every two years to incorporate new and innovative techniques that EMTs can incorporate into overall patient care.

**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. Seattle/King County Police and King County Search and Rescue applicants are also permitted to participate in this educational opportunity. Each course consists of 120 hours of classroom and practical instruction, in addition to 10 hours of hospital observation time, and utilizes the U.S. Department of Transportation EMT-Basic curriculum. In 2004, 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 develops, writes, and implements the curriculum each year. Additionally, the staff also reviews and performs final draft summaries of all developed curriculum within the Training Section. The 2005 Competency Based Training curriculum is currently being developed for the following selected topics: Orthopaedic Injuries, Respiratory Emergencies, OB/GYN Emergencies, Behavioral Emergencies, Environmental Emergencies, and Infectious Disease (infectious disease is a yearly requirement).

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. Eighteen modules are now available online with 4,056 EMTs enrolled in the program, 100% of the EMTs in the county. Over 32,000 courses have been completed, resulting in a dramatic reduction of CBT training costs to agencies 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 Training 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 2005 curriculum and will add improvements to this state-of-the-art training system including improved interactivity and advanced reporting features.

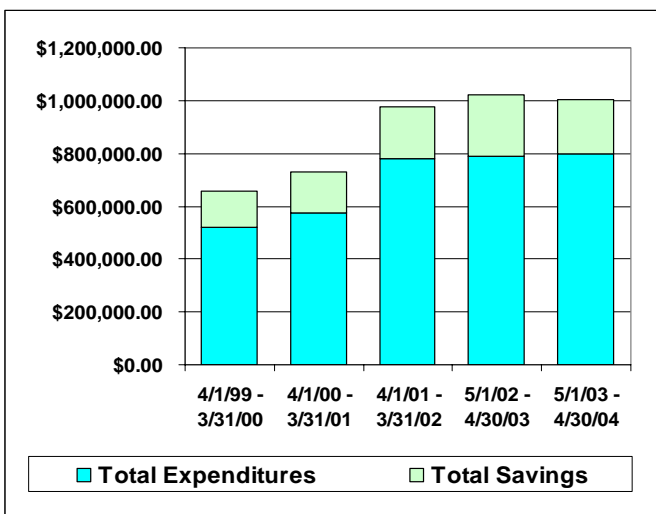
The CBT Online Website was presented to the Washington State EMS and Trauma Licensing and Recertification committee in June 2003 and was approved for use in EMT continuing education. Additionally, the King County MPD and BLS Training Supervisor presented the CBT Online Website at the annual Washington State MPD symposium and received strong support for program innovation and excellence. A number of county MPDs expressed a high degree of interest in expanding the King County CBT Online program into other counties and throughout the state of Washington. The site earned high praise from the committee as an innovative and cost-effective method of delivering EMT continuing education. The on-line CBT program is slated to open statewide in January 2005.

**Early Defibrillation Program:** The goal of the Early Defibrillation Program is to resuscitate the greatest number of people in cardiac arrest using 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.

Beginning in 2005, the EMTs in King County will enter into a new study to collect scientific evidence regarding the relationship and quantity of CPR and use of Automated External Defibrillators (AEDs). Quality assurance is a high priority within the AED Defibrillation Program. All resuscitations that occur in King County are evaluated in detail and the information gathered is used to provide timely feedback to each individual EMT and their training officers. In aggregate, the data is used for improved EMT resuscitation 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 joint purchasing agreements.



An annual review of the cost savings during the May 1, 2003 - April 30, 2004 contract period with Life Assist, Inc.

was conducted. Comparisons were made between total agency expenditures and Life Assist, Inc. catalogue prices. Total agency expenditures from the Regional Purchasing Program continue to remain high, \$797,847 in the last contractual year with continued savings of over \$200,000. This program remains a shining example of how innovation and simplicity can produce exceptional results.

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 status 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 paramedics and EMTs a cost-savings option for purchasing patient medications in King County. Representatives from each of the paramedic programs met over a period of 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 2004.

### **III. Emergency Medical Dispatch (EMD)**

The EMS Division provides **Basic and Continuing Education Training** in Emergency Medical Dispatch (EMD) to approximately 175 emergency 9-1-1 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, 36 dispatchers from King County completed the 40-hour Basic EMD Training class. In addition, 152 dispatchers were provided 8 hours of Continuing Education in EMD related topics. The EMD Instructor Course (train-the-trainer) is being redesigned to meet the standards of a problem-based delivery. This course will be piloted in 2005. The *2002-2007 EMS Strategic Plan Update* identified a number of **enhancements to emergency medical dispatch**, focusing on enhanced dispatch training:

Basic Training: Changes to the EMD Basic curricula this year will focus on two areas. Additional training has been, and will continue to be, provided in the area of Basic Anatomy and Physiology to the dispatch students. This has been accomplished by adding one full day of training and testing prior to the existing 32-hour class. Another goal is to enhance the current 40-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. This latter goal, development of a curriculum in a problem-based format, is in the development stage.

Continuing Education Training: To meet the 8-hour per year minimum requirement for continuing education, EMD training staff designed and developed several instructional modules for Emergency Medical Dispatchers. The Spring curriculum for 2003 focused on Chest Pain and Stroke, and the Fall 2003 class targeted Diabetes and special patient care issues not covered in the Quality Improvement Process. In the Spring of 2004, a web-based course on Cardiac Arrest

and Telephone CPR was piloted, supplemented with an in-class delivery of tape and scenario-based instruction.

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 method of delivery has enabled the dispatchers to log on from their own Communications Center consoles and receive training at their convenience when call load volumes permit. This method of training is used only when appropriate for the desired lesson objectives and is expected to be a long-term project during this levy period. The first course was delivered in Spring 2004.

The **Telephone Referral Program** continues to provide emergency medical dispatchers in King County with an alternative method for handling non-urgent calls to 9-1-1. From January 1, 2003, to December 31, 2003, the 24-hour staffed nursing telephone line received 800 call referrals from 9-1-1 Call Receivers to the nurse line, including 472 calls from Valley Communications Center serving South King County, and 378 calls from Eastside Communications Center serving east and north King County. This program provides a safe and efficient way to handle minor medical emergencies that do not require Emergency Medical Technicians to respond to the scene.

## **V. Regional Medical Control**

The **Medical Program Director** 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 Medical Program Director 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 interest often arise from discussions initiated as part of implementation of two Strategic Initiatives - 'Paramedic and EMT Procedure and Patient Treatment Evaluations' and 'Enhanced Care for Specific EMS Patients.' Specific areas of interest this year have been Pulse Oximetry, Glucometry, and Emesis in Cardiac Arrest (see page 28 for details).

## **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 forum for discussion of important EMS issues. The

committee played an integral role in development of the *2003 Supplemental Plan*, financial assessment of the EMS Sub-Funds, and review of the strategic initiatives.

This year, the EMS Advisory Committee played a critical role in the direction of Emergency Medical Services in King County by making recommendations to various political bodies concerning a few key EMS issues. These included implementation of the feasibility study in south King County, discussion of the periodic ALS allocation increases, and Strategic Initiative oversight. A copy of the current EMS Advisory Committee membership on the committee and their respective representation can be found in Appendix E on page 75.

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

Seattle-King Community Responder AED Program: The goal of the Community Responder AED Program is to have all AED devices located in public places and private homes in King County registered with the EMS Division. The EMS Division keeps a registry with information on devices to provide dispatch agencies and fire departments with AED type and location. This information is then available when a cardiac arrest occurs in the community and 9-1-1 units respond to the scene.

The Community Responder AED Program is a cooperative effort between Seattle Fire Department and Public Health - Seattle & King County. The 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 (PAD) program is continually growing. There are approximately 803 devices registered in the Community Responder AED Program as of July 2004.



SeaTac International Airport is one of the biggest sites to have AEDs in their facility. There are 250 devices placed throughout the airport with easy access to staff and lay responders. Public Health - Seattle & King County has AEDs in most Public Health Centers, the Medical Examiners Office and in the Jail Health locations at both criminal justice centers in Seattle and King County. Many local police units carry AEDs in their vehicles.

The outcome for cardiac arrest is thought to improve when an AED is used within a short time following collapse. A study conducted by the EMS Division showed the proportion of cardiac arrest patients treated by a public access AED has increased each year from .82% in 1999 to 2.05% in 2002.<sup>1</sup> The authors concluded that public access AED devices were used in a small, but increasing proportion of out-of-hospital cardiac arrests over the four-year study period. While the study was not designed to show improved outcomes from use of the devices, the results showed half of the 50 persons treated with a PAD device survived to hospital discharge.



Student CPR Program: The EMS Division conducts nationally-recognized American Heart Association training for school teachers and firefighters to become CPR Instructors. Last year, 15,646 students (grades 6-12) were trained in CPR in King County. The EMS Division contracted with nine school districts and six fire districts to provide CPR training in the schools. The fall and spring instructor training classes focused on the American Heart Association's CPR/AED and First Aid curriculum. The First Aid course has become very popular as teachers and fire fighters enjoy being able to teach CPR and First Aid as one course. Eighty AEDs have been placed in schools in King County. Funding for these devices is generally supplied by private or not-for-profit providers (Public Health does not fund the school devices).

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 regular workday. The average number of County employees trained in CPR/AED each year is 3,000. Approximately, forty AEDs have been placed in King County-owned facilities.

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, the family also receives AED training. Last year, 32 people were trained in CPR and/or AED in their homes through this program.

<sup>1</sup> Culley LL, Rea TD, Murray JA, Welles B, Fahrenbruch CE, Olsufka M, Eisenberg MS, Copass MK. Public Access Defibrillation in Out-of-Hospital Cardiac Arrest: A Community-Based Study. *Circulation* 2004 Apr 20; 109(15):1859-63.

## **VIII. Critical Incident Stress Management (CISM) Program**



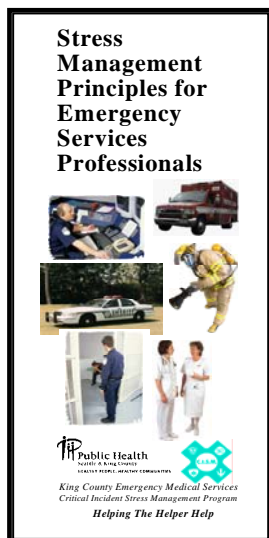
King County CISM Program celebrated its 15th year anniversary in 2003. It also saw the conclusion of its two year long self-assessment and CISM services evaluation. In 2001, questions were raised regarding the validity of CISM (debriefings) and the CISM movement in general. CISM staff and consultants reviewed over 100 articles and texts on the subject of critical incident stress management and debriefings. The primary focus of the effort was to identify the philosophy, strategies, and goals of the CISM and CISM services provided by the EMS

Division. A position and vision statement was published, and the program's motto - *Helping the Helper Help* - more than ever described the program's purpose of providing services to



individuals and agencies, and supporting other health management initiatives offered by King County CISM.

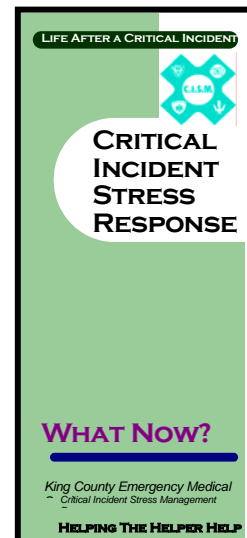
The position paper concluded that CISM services provided by peer emergency service professionals and mental health professionals to emergency service personnel and their families are based on a public health model of: *Primary Prevention* - Increasing resilience to extreme stressors; *Secondary Prevention* - Mitigating the impact of occupational exposure to extreme



stressors by incorporating Psychological First Aid; and *Tertiary Prevention* - Follow-up referrals for treatment when a higher level of support care beyond psychological debriefing/crisis intervention is required. A renewed vision brought about renewed informational and instructional materials.

The King County CISM program assists emergency services personnel, including police officers, firefighters, EMTs, paramedics, dispatchers, and corrections officers to remain psychologically healthy. The CISM program is supported by a team of 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 provider agencies' Peer Support Teams who provide immediate direct care to co-workers.



There were approximately thirty-eight post-incident CISM related requests during the year which included debriefings, defusings, one-on-one interventions, and referrals to mental health services. The King County CISM Team also participates in a Washington State and international network of CISM teams. 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.

Fire Chief Tom Barrett, a founding member of the King County CISM Team and charter CISM Advisory Board Member retired in 2003. He has contributed over 20 years to this cause.

## IX. Administrative Functions

The EMS Division operates under the guidelines presented in 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.

The EMS Division is responsible for the coordination of services with the other divisions of Public Health - Seattle & King County in addition to 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 administers 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. The EMS Division's administrative section is responsible for maintaining 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 in compliance with Washington Administrative Code (WAC) 246-976-420. The EMS Division provides rapid response to data requests from external and EMS agencies in King County; provides data analysis and reports for pilot projects, EMS programs, and research projects; and supports network connectivity and management for EMS Division employees. Duties related to the oversight of this dataset include management of the cardiac database and the entire MIRF data warehouse system, collection and processing of over 120,000 MIRFs per year, and regular quality review of the EMS data set and data system. A quality assurance effort began in 2003 which relates 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)**

The Center for the Evaluation of Emergency Medical Services centers research efforts in the field of pre-hospital emergency care. CEEMS 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 9-1-1 among seniors experiencing chest pain and increasing self-administration of aspirin. Twenty-seven thousand heart attack survival kits (identifying the symptoms of a heart attack and including a single aspirin) were delivered to seniors by emergency medical technicians (EMTs) in thirty of the thirty-four fire departments in King County. Along with the delivery of the kits, the EMTs spent about 3-5 minutes at home with the

seniors going over barriers they may have in calling 9-1-1 for chest pain and educating them about taking an aspirin once they have called 9-1-1.

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. The HASK Data collection of 9-1-1 calls and aspirin use prior to EMS arrival for chest pain complaints ended December 31, 2003. Data analysis and final report writing are currently underway and the study is expected to be funded through the end of 2004.

Preliminary results of the HASK trial suggest that using EMS personnel may be an effective model for favorably influencing behavior among older adults experiencing symptoms of cardiac chest pain. The intervention showed a statistically significant increase in 9-1-1 calls for chest pain as well as aspirin use for such symptoms among seniors in King County, Washington. The effect was maintained over 2 years following the intervention, at least for calling 9-1-1, suggesting that this relatively labor-intensive intervention produced short as well as longer term effects on behavior.

The HASK findings are especially significant in a research field that for decades has spent literally hundreds of thousands of dollars in attempting to design public education interventions to educate the public in recognizing the signs and symptoms of a heart attack and how to act appropriately without finding positive results. The HASK study had two main advantages over other approaches that have been tried to date. First, the use of the kit as a vehicle for the message makes the somewhat abstract message tangible. This tangible product, attractive and useful enough to keep somewhere visible, will function as a continuous reminder of how to respond appropriately to a heart emergency long after the intervention is over. Second, the interpersonal nature of kit delivery was thought to enhance the credibility and persuasiveness of the message.

**The At Home Study:** The AED Training in the Home study has been funded by NIH and began in April 2004. The randomized controlled trial study will evaluate four types of AED training on 300 families of high risk patients recruited from hospitals in King County following coronary syndrome admissions. The study will determine the most effective training method in terms of skills retention and psychological impact on both patient and family member(s).

**Cardiac Arrest Outcomes:** This is a privately funded grant that involves interviewing survivors of cardiac arrest and review of hospital medical records. The goal is to evaluate the care and outcome of survivors of cardiac arrest in King County to determine whether current practice at community hospitals regarding implanted defibrillators is consistent with American Heart Association and American College of Cardiology guidelines. The study is expected to start in September 2004.

**The Resuscitation Consortium:** The National Institutes of Health (NIH) recently funded the building of a consortium of select communities across North America to evaluate important research questions involving pre-hospital care. The agenda will consist of evaluating EMS care for life-threatening trauma and cardiac arrest. Seattle/King County has been identified as one of the select participating communities.

## 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 2003, Central Region (King County) hospitals treated 6,438 persons with injuries severe enough to require hospitalization, 314 of those patients died.*

The Central Region's jurisdiction equates to King County boundaries as established by The Statewide Emergency Medical Services and Trauma Care System Act of 1990 (RCW 70.168). Over the past fourteen years, the Trauma Council has worked with local hospitals and EMS agencies to incorporate the elements mandated by the act into the local EMS and trauma care system. Achievements for 2004 include:



- Awarded a \$5,000 grant to 'Docs, Cops, and Bullies,' a program developed by medical professionals and police to encourage student reporting of weapon carrying and bullying within schools.
- Awarded a \$5,000 grant for 'Smart Kids! Safe Kids!,' an injury prevention curriculum that pre-school teachers can use to teach children head/helmet safety, poison prevention, pedestrian safety, and scalds/burn safety (see page 29 for more details).
- Through a partnership with Washington State Department of Health and HRSA, three Automatic External Defibrillators (AEDs) were donated to Washington State Patrol units operating in the Skykomish area, and one AED was given to Steven's Pass Ski Patrol.
- Awarded a \$4,370 grant to the EMS Division Training Section for development of web-based trauma training.
- Amended Patient Care Procedures (PCPs) to define the circumstances in which private ambulances can travel code red (lights and sirens). This amendment was requested by the Medical Program Director in King County in response to an incident involving a private ambulance collision with a private vehicle. The driver of the car was killed and the passenger severely injured. The private ambulance was transporting a non-emergent patient code-red to a local hospital. The amended PCPs disallow private BLS ambulance to travel code red unless mandated by contract or requested by ALS providers at the scene. The revised PCPs became effective May 1, 2004 following review and approval by the Governor's EMS and Trauma Steering Committee. The Trauma Council is monitoring the effect of this change on out-of-service times that may result when the primary responding EMS unit has to wait for private ambulance to arrive on scene and transport a patient.
- Reviewed trauma system data and made recommendations to the State Department of Health on the number and level of trauma centers needed in the region. This year the Trauma Council recommended adding a level V trauma center.

- The Central Region Trauma Registry developed two important studies in trauma care in the region:
  - Transfers in the Central Region Trauma Registry: Changes Over Time 1995-2003. This report supported the Washington State Medical Association and the Washington State Hospital Association efforts to address access to healthcare issues.
  - Traumatic Brain Injuries in the Washington State Central Region Trauma Registry: 1995-2002. This study helped to better define traumatic brain injury and changes in treatment in the region.

Trauma Regions are grant-funded through the Washington State Department of Health. The current contract expires in June 2005.

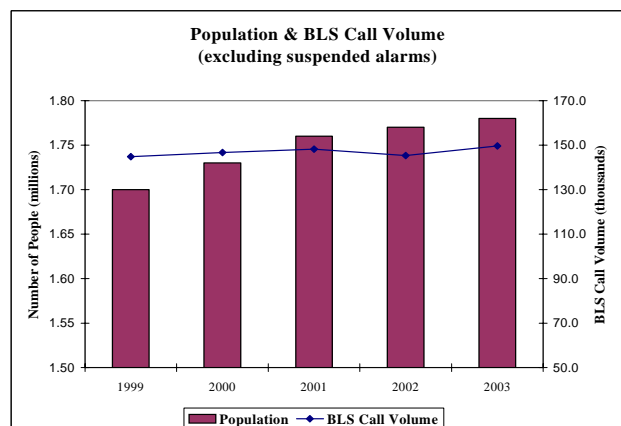
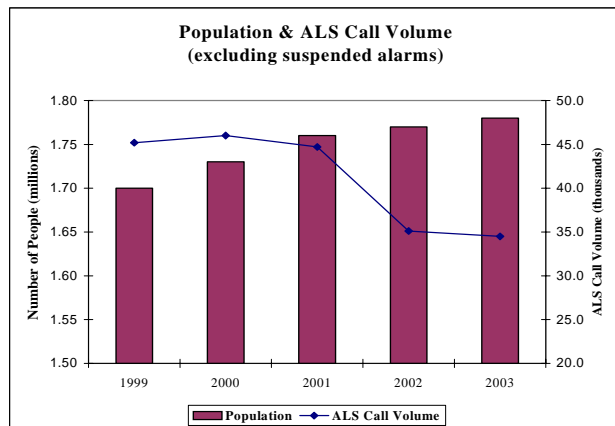
## Summary of 2003 EMS Statistics (Seattle and King County)\*

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 2003.

| <u>Population</u> | <u>Seattle-King County</u> | <u>% Growth</u> |
|-------------------|----------------------------|-----------------|
| <b>1980</b>       | 1,269,898                  |                 |
| <b>1990</b>       | 1,507,305                  | 18.7% (10 yr)   |
| <b>2000</b>       | 1,730,504                  | 14.8% (10 yr)   |
| <b>2001</b>       | 1,758,321                  | 1.6% (1 yr)     |
| <b>2002</b>       | 1,774,300                  | 0.9% (1 yr)     |
| <b>2003</b>       | 1,779,300                  | 0.3% (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% and the rate continued to decline in 2003. Population has often been a factor in EMS call volume growth. The two graphs below depict the population growth relative to both BLS and ALS call volume patterns. Of interest is the continued three-year actual decline in ALS calls volumes due in part to the success of the ALS Dispatch Criteria Revisions (see page 22).

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



### Operations:

**Number of Responses**

### ALS

48,963

### BLS

152,619

**Average Response Time**

### ALS

10.8 minutes / 7.4 minutes

### BLS

5.8 minutes / 5.0 minutes

6 Minutes or less

72.9% / 81.8%

8 Minutes or less

47.3% / 69.8%

10 Minutes or less

62.0% / 84.7%

12 Minutes or less

72.3% / 92.3%

14 Minutes or less

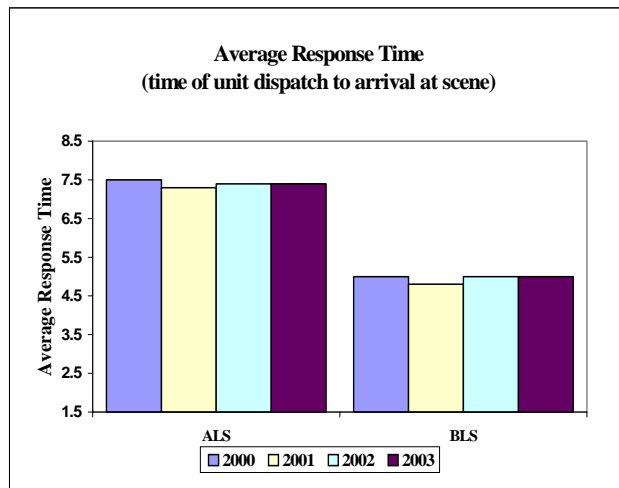
79.0% / 95.9%

**Suspended Alarms**

29.6%

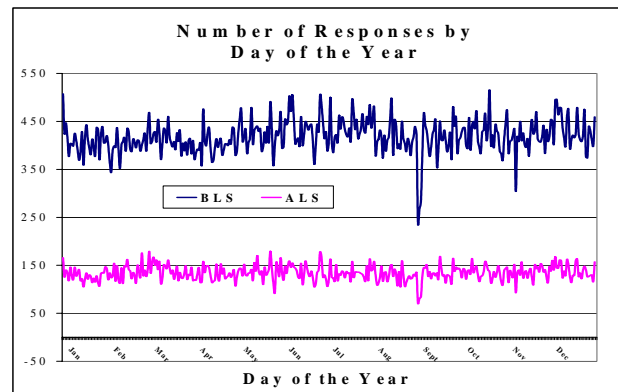
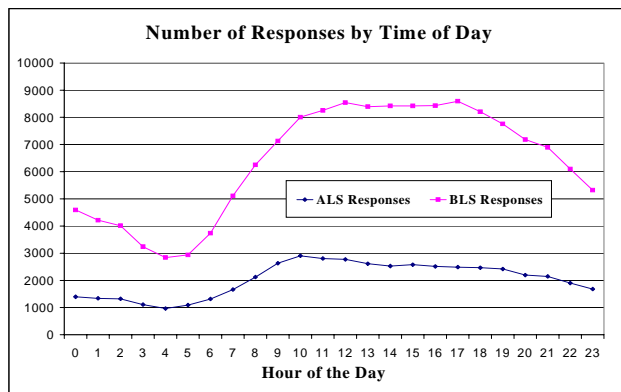
2.0%

\*The 2003 EMS data uses a fully integrated EMS Division and Seattle dataset, although a comparison of data between years may be limited. 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 (~230-510 calls) in comparison to ALS responses (~70-180 calls).

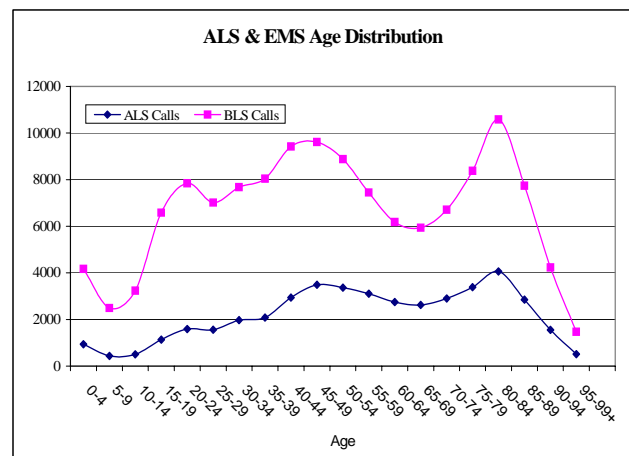


## Characteristics of Responses:

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:

|                  | <u>ALS</u>     | <u>BLS</u>     |
|------------------|----------------|----------------|
| <b>0-17 yrs</b>  | 2,481 (5.7%)   | 13,349 (10.0%) |
| <b>18-24 yrs</b> | 2,126 (4.9%)   | 10,984 (8.2%)  |
| <b>25-44 yrs</b> | 8,559 (19.6%)  | 32,148 (24.1%) |
| <b>45-64 yrs</b> | 12,713 (29.0%) | 32,113 (24.0%) |
| <b>65+ yrs</b>   | 17,898 (40.9%) | 45,051 (33.7%) |
| <b>Total</b>     | <b>43,777</b>  | <b>133,645</b> |



**Responses by Type:**

Cardiac  
Neurologic  
Respiratory  
Trauma  
Abdominal/GU  
Metabolic / Endocrine  
Other Illness

**ALS**

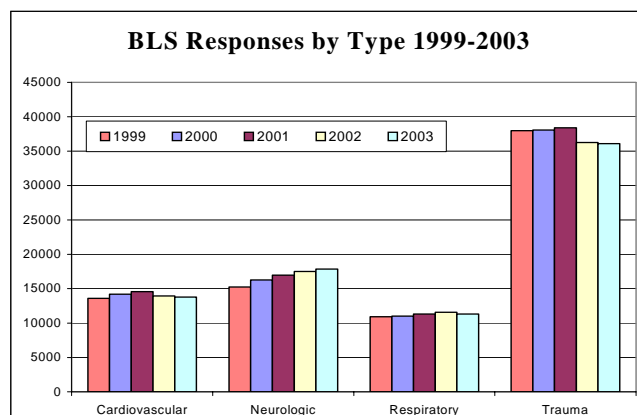
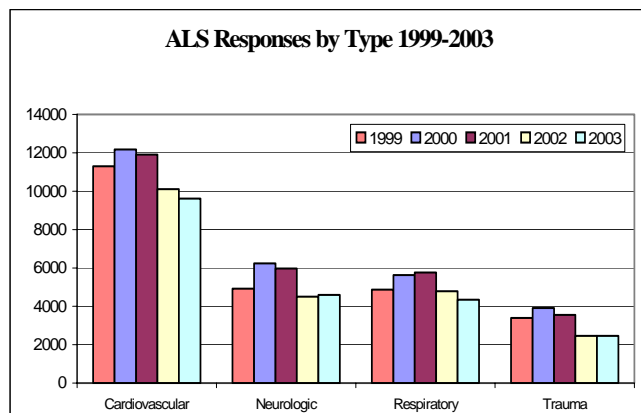
9,614 (29.9%)  
4,598 (14.3%)  
4,343 (13.5%)  
2,461 (7.6%)  
1,897 (5.9%)  
1,914 (5.9%)  
7,377 (22.9%)

**BLS**

13,774 (11.1%)  
17,848 (14.3%)  
11,318 (9.1%)  
36,102 (29.0%)  
8,810 (7.1%)  
3,733 (3.0%)  
32,936 (26.5%)

**Total****32,204****124,521**

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



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

**Incident Locations:**

Home/Residence  
Nursing Home  
Clinic / MD Office  
Street/Highway  
Other/Unknown Location

**ALS**

23,967 (59.5%)  
2,616 (6.5%)  
1,841 (4.6%)  
1,953 (4.8%)  
9,872 (24.5%)

**BLS**

71,053 (53.7%)  
6,171 (4.7%)  
2,770 (2.1%)  
16,799 (12.7%)  
35,440 (26.8%)

**Total****40,259****132,233**

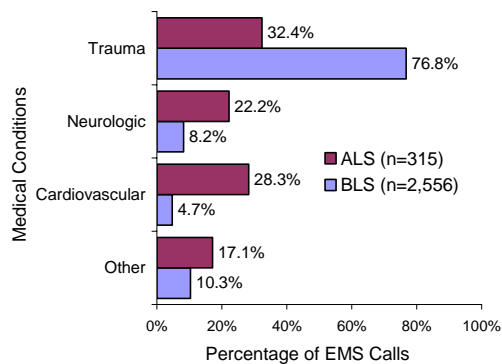


## ALS/BLS Highlight: EMS and Sports Emergencies

The Emergency Medical Services (EMS) system in King County provides care to people calling 9-1-1 from playfields, recreation centers, and other sports locations. These patients are treated by BLS and/or ALS personnel depending on the type of medical condition and presenting level of severity. For example, some calls consist of a badly sprained ankle during a soccer game, while others involve a heart attack triggered from overexertion on a basketball court.

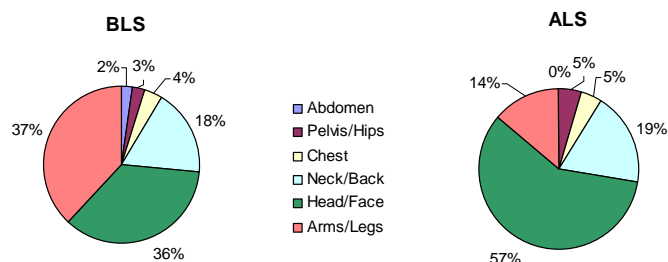
Although the level of care for a call is always determined on a case by case basis, there are some trends in the types of cases that EMS responders typically see. As shown in Figure 1, over three-quarters of the cases treated by BLS personnel were trauma cases. In contrast, traumas accounted for less than one-third of the calls requiring ALS services from recreation areas. ALS agencies were more likely than BLS agencies to respond to calls for neurological or cardiovascular emergencies.

**Figure 1: Types of Calls from Recreation/Sport Locations**



Another key distinction between the care provided by BLS and ALS personnel is the rate at which different types of trauma from recreation locations are treated. As shown in Figure 2, more than half (57%) of the ALS calls involved a head or face injury, in contrast to 36% of BLS calls. Over one-third (37%) of the traumas to which BLS agencies responded had arm or leg injuries, while 14% of the ALS calls involved arm or leg injuries.

**Figure 2: Types of Trauma Calls from Recreation/Sport Locations**



The EMS system in King County strives to provide the most appropriate and efficient emergency medical care possible. One of the critical elements in this process is the rapid and accurate medical assessment by dispatchers. Once dispatched, EMS personnel provide timely and expertly delivered treatment at the scene based on skilled evaluation and selection of post-treatment transport options.

## Cardiac Arrest Statistics:

The Cardiac Arrest Surveillance System (CASS) 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 Bystander:

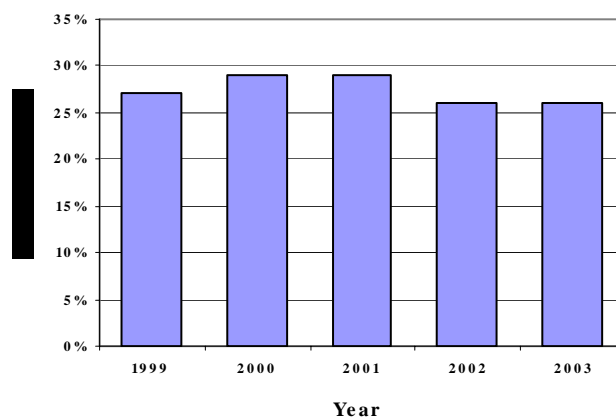
| <u>Year</u> | <u>Rate</u>    |
|-------------|----------------|
| 2003        | 500/993 (50%)  |
| 2002        | 540/1097 (49%) |

### Cardiac Survival Rate: \*

| <u>Year</u> | <u>Rate</u>    |
|-------------|----------------|
| 2003        | 72/260 (28%)   |
| 1999-2003   | 446/1586 (28%) |

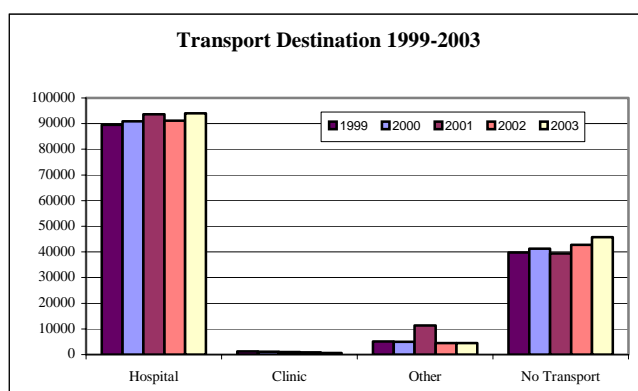
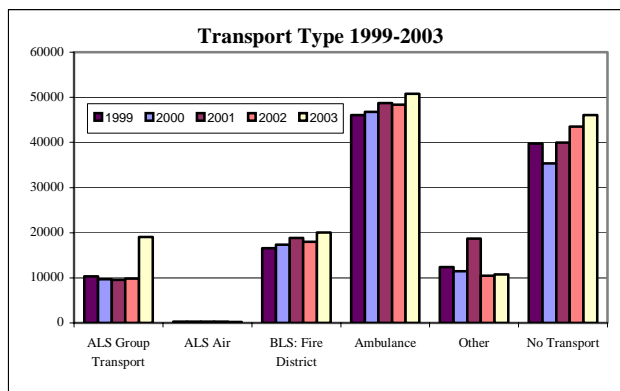
\* Definition: discharged from hospital alive / treated patients in cardiac arrest on arrival of EMS, with a rhythm of ventricular fibrillation.

**Percent Survival From Ventricular Fibrillation  
Cardiac Arrest, Seattle and King County**



## Transport Type and Destination:

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

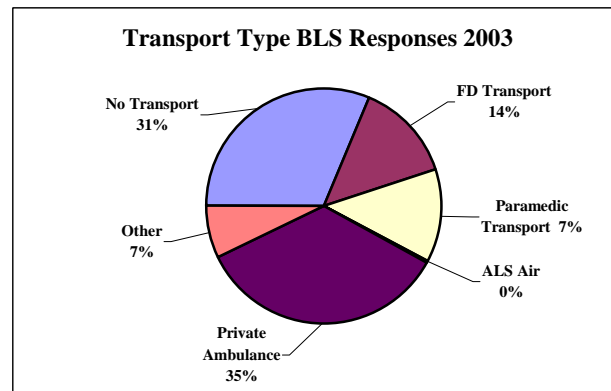
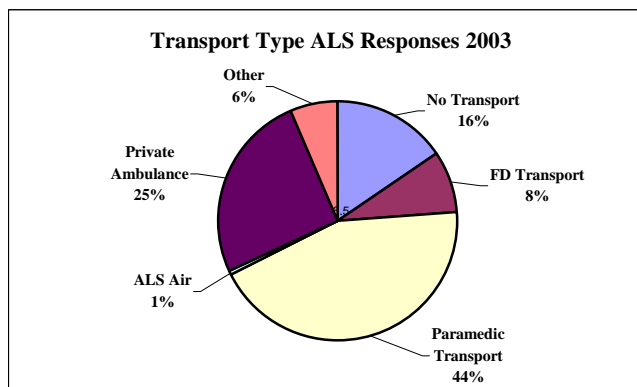


### Transport Type:

|                     |                |
|---------------------|----------------|
| ALS Transport       | 19,033 (13.0%) |
| ALS Air             | 224 (0.2%)     |
| BLS - Fire District | 20,025 (13.6%) |
| BLS - Ambulance     | 50,824 (34.6%) |
| Other               | 10,796 (7.3%)  |
| No Transport        | 46,046 (31.3%) |
| <b>Total</b>        | <b>146,948</b> |

### Transport Destination:

|              |                |
|--------------|----------------|
| Hospital     | 93,964 (64.9%) |
| Clinic       | 685 (0.5%)     |
| Other        | 4,532 (3.1%)   |
| No Transport | 45,704 (31.5%) |
| <b>Total</b> | <b>144,885</b> |



### **CPR Highlight: EMS Calls to Cardiac Arrest for Persons with Do Not Resuscitate Orders - A Dilemma**

Efficient use of emergency medical services requires that it be used for patients with urgent medical conditions for whom useful interventions can be made. Despite the presence of signed Do Not Resuscitate (DNR) orders, some staff members in nursing homes, adult family homes and assisted living centers call 9-1-1 when a resident experiences cardiac arrest.

To determine the magnitude of EMS use in these situations, we undertook a retrospective case review. To find the reasons why EMS is called for nursing home residents in cardiac arrest with DNR orders, we conducted a telephone survey of facilities to determine their policies for calling 9-1-1. We found that **29 of 139 residents in cardiac arrest (21%)** who had DNR orders had CPR by EMS. Most of the calls to 9-1-1 came from adult family homes, and none of the 29 residents survived. Results of the telephone survey by type of facility are as follows:

|  | Nursing Homes n=30 | Assisted Living/Adult Family Homes n=36 |
|--|--------------------|---|
| Would call 9-1-1 for residents with DNR orders | 4 (13%)            | 34 (94%)                                |
| Would check for presence of DNR before calling | 26 (28%)           | 3 (8%)                                  |
| Would start CPR for residents with DNR orders  | 2 (7%)             | 16 (44%)                                |

In the nursing homes, the interviewees said a reason for calling 9-1-1 was a concern for the validity of the orders for persons just transferred to their facility. Other reasons were poor staff training and use of temporary staff. In the adult family homes, nearly all the interviewees said they wanted paramedics to confirm death, feeling that they would be out of compliance with regulations if they did not.

Residents with DNR orders in long-term care facilities should receive compassion and respect for their wishes. To help prevent unwanted and inappropriate use of EMS, the Community Programs section has developed a videotape designed for nursing homes and adult family homes. It clarifies when it is appropriate to call 9-1-1. EMS personnel are visiting nursing homes and viewing it with the staff.

### **Public Health Highlight: EMS and Teen Pregnancy**

Teen pregnancy is a serious public health issue due to the adverse health, social, and economic risks to which teen mothers and their children are exposed. Much of this excess morbidity and mortality occurs during the perinatal period. Ideally, higher risk births occur in a controlled hospital setting.



## Part III: EMS Funding and Financial Plan

**Introduction:** This section of the EMS 2004 Annual Report focuses on EMS revenues and expenditures for 2003, and projections for 2004. 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:

- Current EMS Revenues
- Current EMS Expenditures
- King County Medic One Donations
- EMS Expenditure and Revenue Trends
- The 2004 Financial Plan
- Recommendations for Fund Balance and 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. These discussions focus on the EMS fund within the remainder of King County, excluding the City of Seattle.

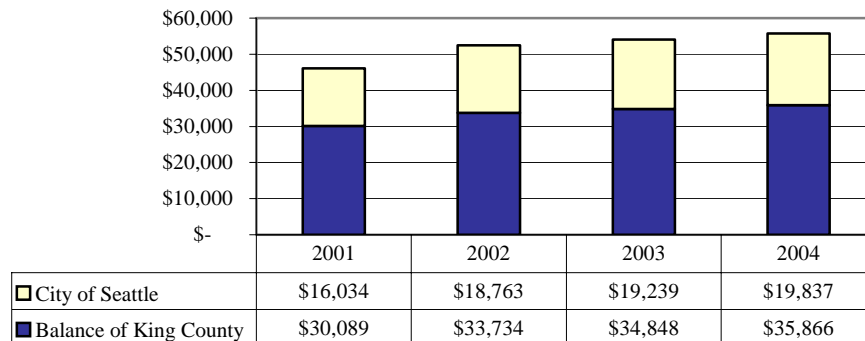
### A. EMS Revenues

**EMS Levy:** The EMS levy is a regular property tax levy subject to the limitations contained in Chapter 84.55.010 RCW. EMS levy funds are restricted by RCW and can only be spent on EMS-related activities. In November 2001, King County voters approved an EMS levy to provide funding for the 2002-2007 period. Also passed in November 2001, Initiative 747 limits total levy funds to a 1% increase for existing properties, except for new construction. The EMS levy rate began at \$.25 per \$1,000 assessed value in 2002. The 2003 effective levy rate was \$0.24134 per \$1,000 assessed value with a total assessment of \$54,087,223. The 2004 effective levy rate is \$.23706 per \$1,000 assessed value with a total assessment of \$55,703,623.

#### AMOUNT ASSESSED FOR CURRENT LEVY

**ACTUAL 2001, 2002, 2003, 2004**

*(All numbers in thousands -- 000 omitted)*



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. Total revenues in 2003 for the balance of King County were \$35.5 million. The regional levy and associated taxes generated 98% of the total revenues, with current expense and other income combining to generate the remaining 2%.

The 2003 beginning fund balance was \$5.9 million; the year-end fund balance was \$7.8 million. Funds in excess of the required ending fund balance of \$2.7 million were placed in a reserve to pay for planned services in 2006 and 2007 when expenses are forecast to exceed revenues.

**2003 EMS Revenue (balance of King County)**

| <b>Revenue Source</b>  | <b>2003</b>         | <b>%</b>    |
|------------------------|---------------------|-------------|
| Property Taxes Current | \$33,838,109        | 95.4%       |
| Delinquent Taxes       | \$695,378           | 2.0%        |
| Other Taxes            | \$112,764           | .3%         |
| Other Revenues         | \$165,286           | .5%         |
| Interest Income        | \$291,664           | .8%         |
| CX Contribution        | \$375,000           | 1.1%        |
| <b>Total</b>           | <b>\$35,478,201</b> | <b>100%</b> |

Revenues for 2004 are estimated at \$36.8 million. The regional levy and associated taxes represent 98% of total estimated revenue. Projected end fund balance for 2004 is \$9.97 million. Funds in excess of the required fund balance are needed to cover expenditures above revenue in years 2005 through 2007.

| <b>Revenue Source</b>  | <b>2004</b>         | <b>%</b>    |
|------------------------|---------------------|-------------|
| Property Taxes Current | \$35,059,476        | 95.3%       |
| Delinquent Taxes       | \$909,514           | 2.4%        |
| Other Taxes            | \$83,902            | .22%        |
| Other Revenues         | \$66,000            | .17%        |
| Interest Income        | \$291,664           | .79%        |
| CX Contribution        | \$375,000           | 1.0%        |
| <b>Total</b>           | <b>\$36,785,556</b> | <b>100%</b> |

Total revenue grew 2% from 2002 to 2003 and is projected to grow 3.7% in 2004. The increase is primarily due to property taxes on new construction. While assessed valuation increased 6.8% from 2002 to 2003 and 4.8% to 2004, property taxes revenues increased 3% a year from 2002 to 2004. 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 60).

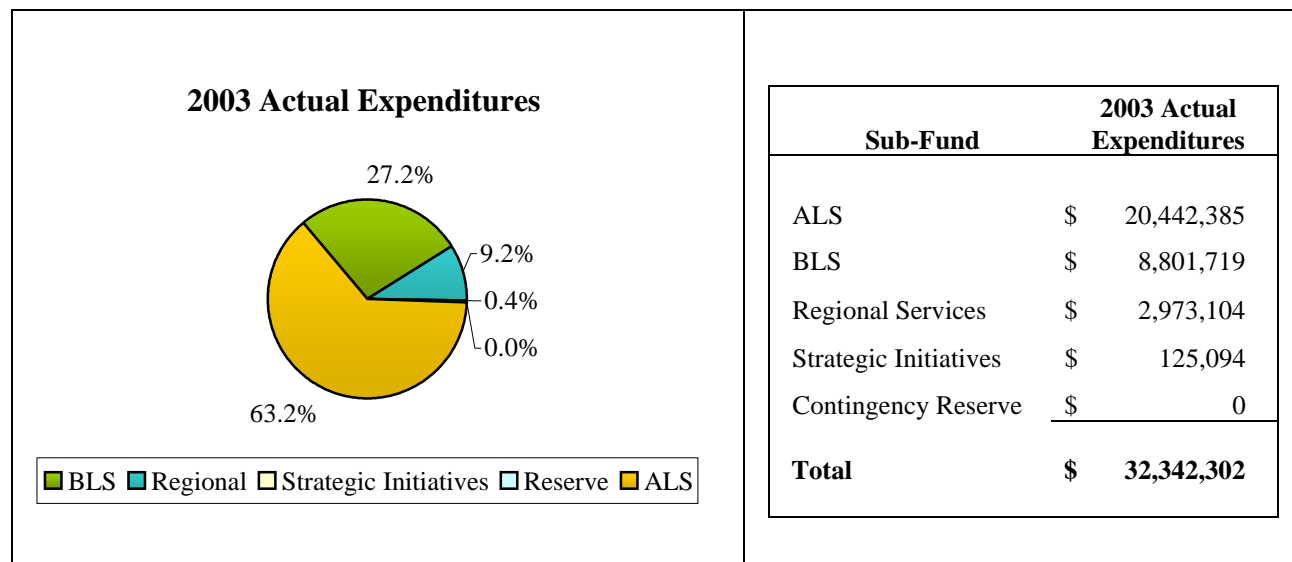
## B. EMS Expenditures

EMS revenues support four 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
- Strategic Initiatives

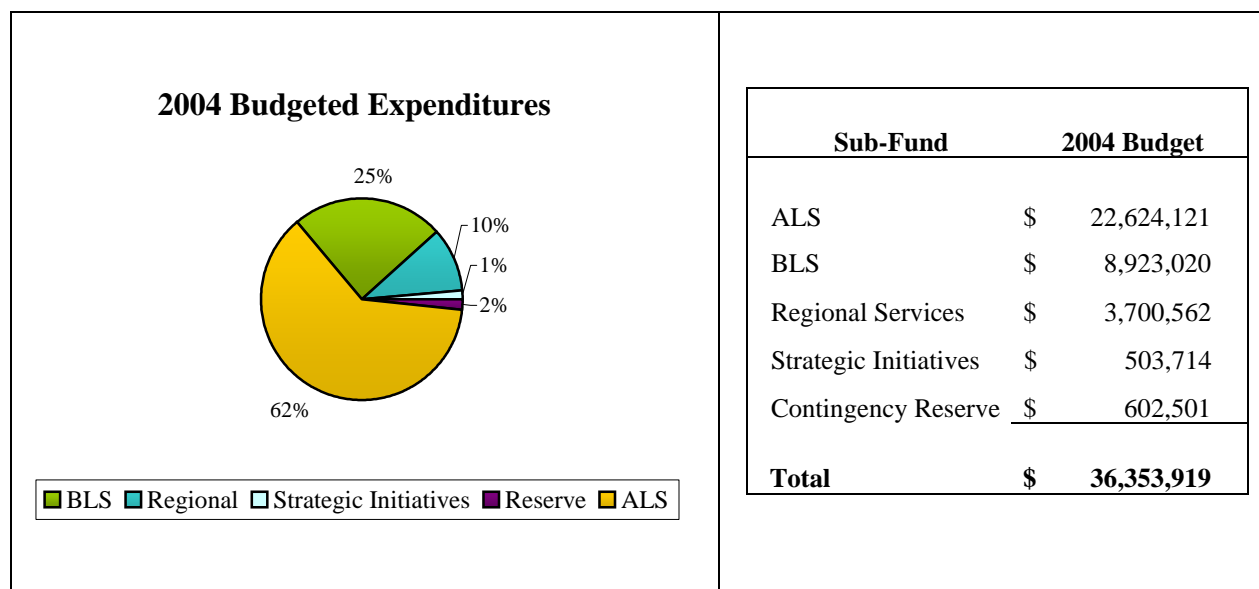
The 2002 EMS Strategic Plan Update of the 1998-2003 Emergency Medical Services Strategic Plan limits expenditure increases for all ALS, BLS and Regional Service areas to the local area Consumer Price Index (CPI). Increases for ALS services can be raised above CPI if there is 'sufficient funding available 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; Regional Support Programs are based on cost of services limited to increases based on forecast CPI; and Strategic Initiatives are based on approved budgets and estimated cash flow. Yearly reserves to provide for unanticipated expenses are also budgeted. The primary use of the contingency fund in 2003 was for costs related to the transition of Evergreen Medic One to Redmond Fire Department.



Expenditures for 2003 were budgeted using a forecast CPI increase of 2.5%. In 2003, 83% of the total budget amount of \$3.575 million was spent. Some ALS providers and Regional Services placed unexpended budget in designated reserves for future years where expenses are projected to exceed designated budgets.

Budgeted expenditures for 2004 are based on a CPI forecasted increase of 2.1%. Cash flows for Strategic Initiatives increased over 2003 based on individual project plans.



**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: Bellevue Fire Department (Bellevue Medic One), Public Health - Seattle & King County (King County Medic One), Redmond Fire Department (Redmond Medic One), Shoreline Fire Department (Shoreline Medic One), and Vashon Island Fire & Rescue.

The EMS levy funds ALS services using a standard unit cost methodology based on the full costs of operating one paramedic unit staffed with two Harborview-trained paramedics, 24 hours a day, 365 days a year. These expenditures include personnel, medical equipment and supplies, support costs for dispatch, paramedic supervision, medical direction, continuing medical education, and other EMS-related expenses.

In 2003, the standard unit cost allocation was \$1.3 million per paramedic unit. This allocation reflects an 8% increase over the 2002 allocation of \$1.2 million per unit (or a 5.5% increase over forecast CPI-U of 2.5%).

The EMS Strategic Plan calls for an annual review of ALS costs to minimize cost shifting of ALS expenses to provider agencies. An ALS task force comprised of representatives of the different ALS providers meets each year to review costs and provide recommendations to the EMS Advisory Committee. This group recommended a one-time increase of 5.5% above the CPI rate of 2.5% (for a total of 8%) for 2003. The recommendation for the 2004 allocation was based on forecast CPI. Significant cost drivers that contributed to the need for an increase in 2003 included rising labor costs associated with recently settled union contracts and increased costs of medical supplies.



Medic Unit Allocation: 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 are added separately (including personnel, medical equipment and supplies, vehicles, radios, and other items).

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, although EMT/P units are additionally supported with local fire department funds. Vashon Medic One is funded at a 0.5 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. Four vehicles were funded in 2003; five vehicles were funded in 2002.

Unit Additions: One 0.5 unit expansion was added to the system in 2003. Medic 14 in Issaquah was expanded from a 12-hour half-time 2-paramedic unit to a full 24-hour 2-paramedic unit. In addition to the 0.5 unit allocation increase, \$70,000 was provided for start-up costs. An additional .5 unit expansion was added to the system in 2004. Medic 12 in Enumclaw was expanded from a 12-hour 2-paramedic half-time unit to a full 24-hour 2-paramedic unit. These increases were anticipated in the EMS Strategic Plan and implemented after a review that looked at workloads, response times, and percent back-up provided by other medic units.

Another significant increase in ALS service was the transition of Medic 3, the EMT/Paramedic unit located in North Bend. This change was requested by the Medical Program Directors who identified clear advantages in having a full 2-paramedic unit responding in the area. Their concerns were related to the high level of serious trauma patients paramedics treated, the long response times from other back-up units responding along the I-90 corridor, the poor winter conditions, and geographic-related communication problems.

Although the Medical Program Directors recommended the change, it was not apparent where the funding for the ALS unit increases would be obtained. A substantial amount of the existing fund balance had already been targeted for existing and planned service increases, including one-time increases to the ALS allocation. A partnership was developed with Eastside Fire & Rescue, Bellevue Fire Department and the EMS Division to transition Medic 3 to a full 2-paramedic unit. Eastside Fire & Rescue contributes \$100,000 per year and the levy fund provides funding from the reserve that is equivalent to a .25 unit or ½ the funding needed for a medic unit. All contributions are to increase by CPI-U each year. It is anticipated that this unit will be provided full funding during the next levy.

Due to limited available funding to support both EMT/P unit upgrades, the EMS Advisory Committee recommended that Medic 35, an EMT/P unit located in Woodinville, be converted to a 2-paramedic unit when feasible. Based on a financial analysis, the committee recommended funding the equivalent to Medic 3 beginning in 2006.

A significant change for ALS services in 2003 was the smooth transition of paramedic service to Shoreline and Redmond fire departments, provided previously for 28 years by Evergreen Hospital. Redmond Fire took over operation of 2.5 units and Shoreline Fire added one unit to the 1.5 existing units.

The **total number of ALS units in 2004** is shown in the following chart:

|                         | Full Units<br>(2 paramedic<br>/ 24 hour) <sup>(1)</sup> | Half Units<br>(EMT-P or<br>12 hour) <sup>(2)</sup> | Total<br>Funding<br>Units |
|-------------------------|---|--|---------------------------|
| Redmond                 | 2   | 1  | 2.5                       |
| King Co.                | 7   |  | 7.0                       |
| Bellevue <sup>(4)</sup> | 3   | 1  | 3.5                       |
| Shoreline               | 2   | 1  | 2.5                       |
| Vashon <sup>(3)</sup>   |   | 1  | .5                        |
| <b>Total</b>            | <b>12</b>   | <b>4</b>   | <b>16.0</b>               |

<sup>(1)</sup> Full Units are funded at 100% of the Standard Unit Cost of \$1,303,942.

<sup>(2)</sup> Half Units are funded at 50% of the Standard Unit Cost of \$651,971.

<sup>(3)</sup> Vashon funding is currently set at .5 of 24-hour unit.

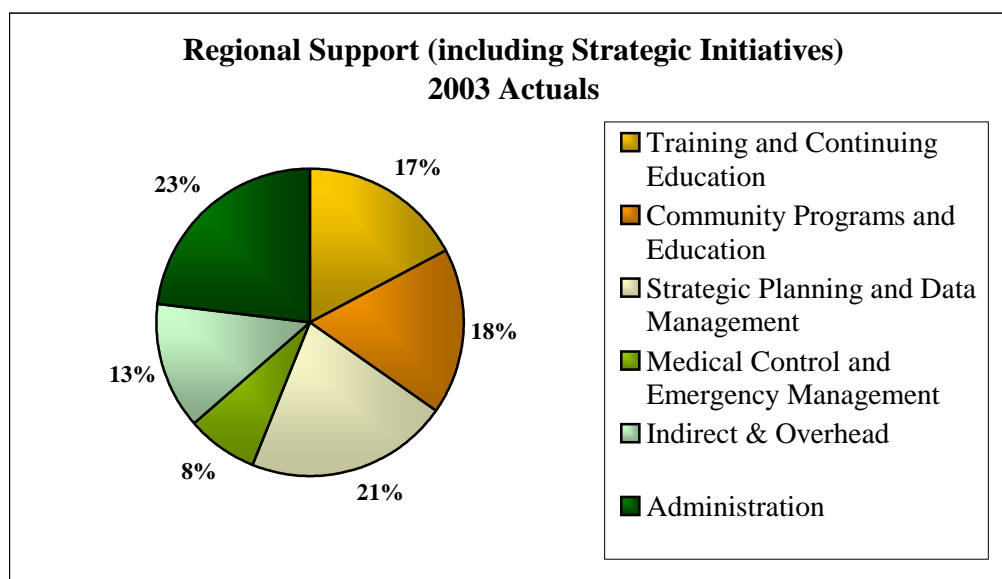
<sup>(4)</sup> Does not include additional funding .25 unit funding for Medic 3.

**Basic Life Support (BLS) Services:** The levy provides partial funding to BLS providers to help ensure uniform and standardized patient 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 was \$8.75 million; the total for 2004 is \$8.9 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 and May of 2004 to monitor the impacts and validate the assumptions. The intended effects were evident and the review committee recommended continued use of the new formula. Minor improvements were recommended and implemented.

**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 (including management of ALS and BLS contracts). 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 *2002-2007 EMS Strategic Plan Update* 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 was \$3.6 million. Approximately \$3 million (or 83% of the budget) was expended in 2003. Approximately \$650,000 was placed in reserves to cover future costs, particularly labor and indirect and overhead costs that are projected to increase higher than CPI.



The 2004 budget for Regional Services was increased by the forecast CPI of 2.1%. In addition and as planned, \$50,000 budgeted for maintenance related to the Regional Data Collection Project (RDC) was transferred from the Strategic Initiative budget to Regional Services.

**Strategic Initiatives:** The term 'Strategic Initiative' is used to describe a handful of new and innovative 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 18). The 2003 budget for Strategic Initiatives was \$439,000. Strategic Initiatives approved in 2004 are shown in the following chart:

## EMS Strategic Initiatives

| <u>2003 Supplement Budget/Cashflow</u>      | 2003              | 2004              | 2005              | 2006              | 2007              | Total               |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|
| <b>Dispatch Initiatives</b>                 |                   |                   |                   |                   |                   | -                   |
| CBD ALS Triage Criteria                     | 58,000            |                   |                   | 20,000            |                   | 78,000              |
| EMD QI                                      | 24,000            | 31,000            | 32,000            | 33,000            | 34,000            | 154,000             |
| Enhanced CBD                                | 90,000            | 92,000            | 95,500            | 98,400            | 101,400           | 477,300             |
| <b>Technology Initiatives</b>               |                   |                   |                   |                   |                   |                     |
| Web-based Training for Dispatch             | 15,000            | 20,000            | 20,000            | 25,000            | 25,000            | 105,000             |
| Web-based Training for EMS                  | 25,000            | 50,000            | 20,000            | 20,000            | 20,000            | 135,000             |
| Regional Electronic Data Collection Project | 172,000           |                   |                   |                   |                   | 172,000             |
| <b>EMS System Efficiencies</b>              |                   |                   |                   |                   |                   | -                   |
| Procedure & Patient Treatment Evals         | 10,000            | 20,000            | 21,000            | 22,000            | 23,000            | 96,000              |
| Enhanced Care for EMS Patients              | 10,000            | 10,000            | 10,000            | 10,000            | 10,000            | 50,000              |
| Injury Prevention Programs                  | 35,000            | 36,000            | 37,000            | 38,000            | 39,000            | 185,000             |
| <b>Levy Planning</b>                        |                   |                   |                   | 50,000            | 50,000            | 100,000             |
| <b>TOTAL</b>                                | <b>\$ 439,000</b> | <b>\$ 259,000</b> | <b>\$ 235,500</b> | <b>\$ 316,400</b> | <b>\$ 302,400</b> | <b>\$ 1,552,300</b> |

## C. EMS Revenue and Expenditure Trends

**Revenue Trends:** The primary revenue source for the EMS system in King County is the 2002-2007 EMS property tax levy. Levy revenue growth is limited by a voter-approved tax initiative (Initiative 747). This initiative limits revenue growth from existing properties to 1% per year plus new construction. 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 \$59.8 million in 2007. This is a total increase of 14% or an average of 2.8% per year. Growth over 1% is primarily due to property taxes on new construction. The following chart shows forecast levy assessments for both Seattle and the remainder of King County:

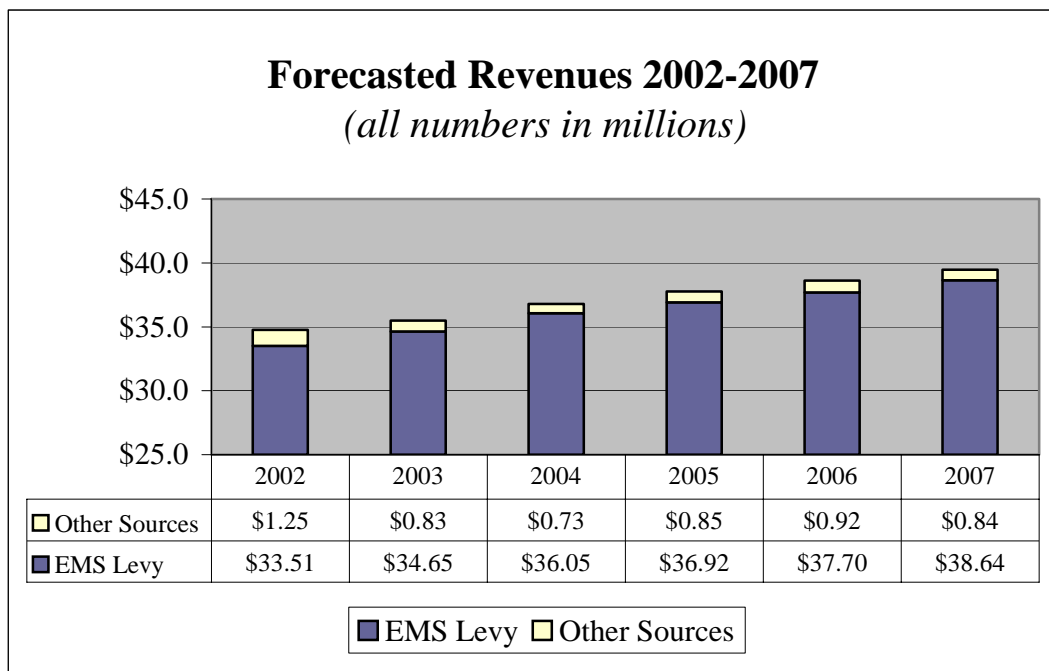
## Forecast Levy Assessment

(amount billed in millions)



Total EMS Division tax revenues, including real estate and personal taxes, leasehold taxes and timber taxes are projected to increase 14% from 2002 to 2007 (or an average of 2.7% per year). Total revenues are projected to increase from \$35 million in 2002 to \$39.5 million in 2007.

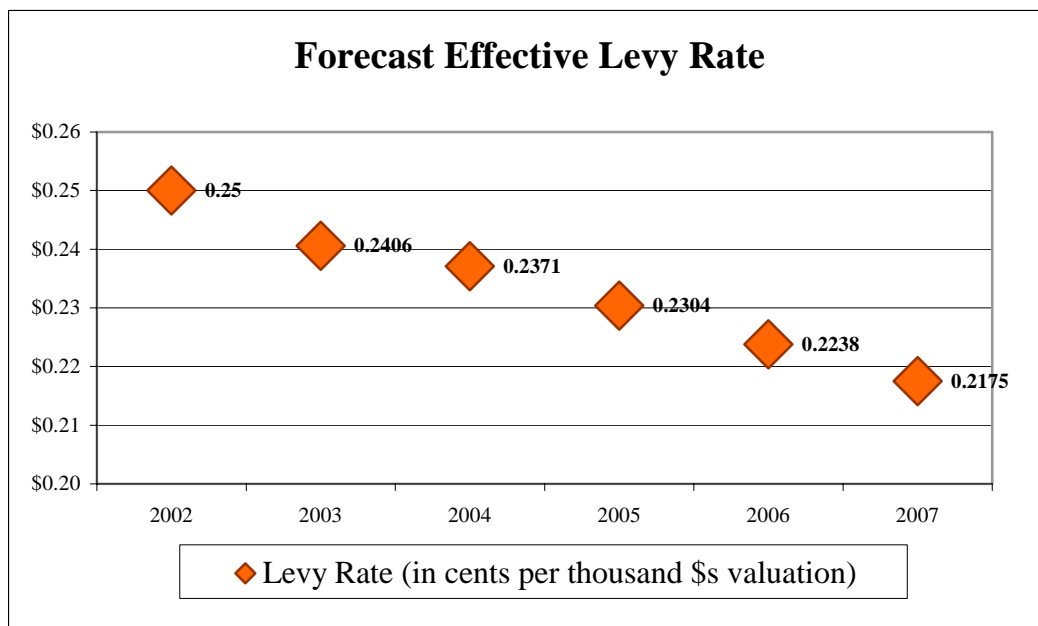
Most other revenues are projected to remain stable, including current expense contributions of \$375,000 per year. The following chart shows actual and projected revenues for King County EMS Fund (excluding Seattle) through 2007:



While revenues are projected to increase, the effective levy rate will decrease. Initiative 747's limit to 1% total yearly levy increase is less than average increases in individual property's assessed value. Since assessed values on existing properties are increasing at a rate higher than the increase in the total EMS assessment, the effective levy rate is projected to decrease from \$0.25 per thousand dollars of valuation in 2002 to \$0.2175 in 2007.

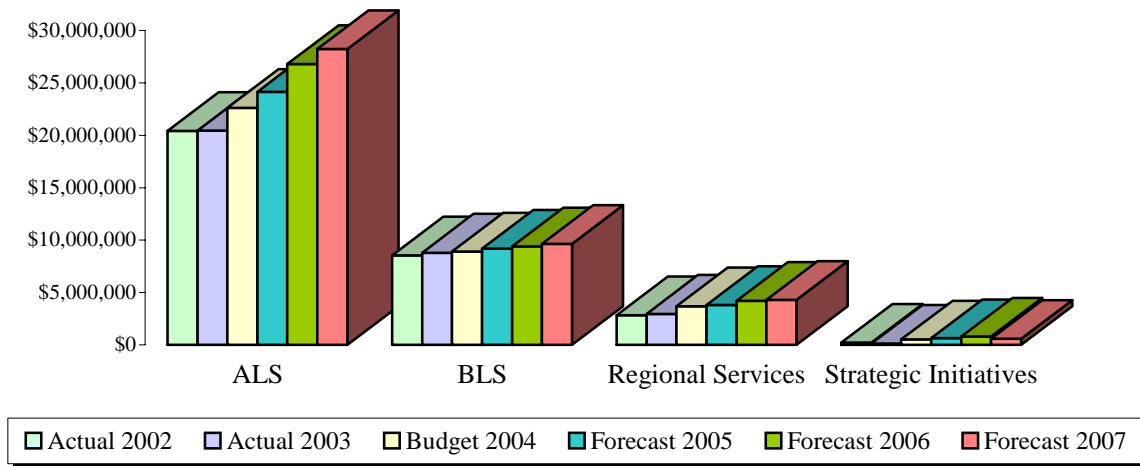
In 2004, based on recommendations from the King County Economist, both forecasted new construction growth and forecasted CPIs were increased for the remainder of the levy. The increased revenues cover the increase in projected expenses. Forecast revenues are sufficient to cover forecast expenditures through the end of the levy period. It appears there is a sufficient fund balance to accommodate one or two future one-time increases in the ALS allocation if it is needed to minimize cost shifting to ALS providers or other unanticipated but necessary strategic initiative program support.

Discussion at the EMS Advisory Committee meeting in June 2004 was to plan for two smaller increases of 2.1% in both 2005 and 2006 rather than waiting for one larger increase in 2006. It was felt that this better met the ALS provider's projected expenditures. Funds for addressing needs not included in the EMS Strategic Plan, such as desired service increases to outlying areas, are limited.

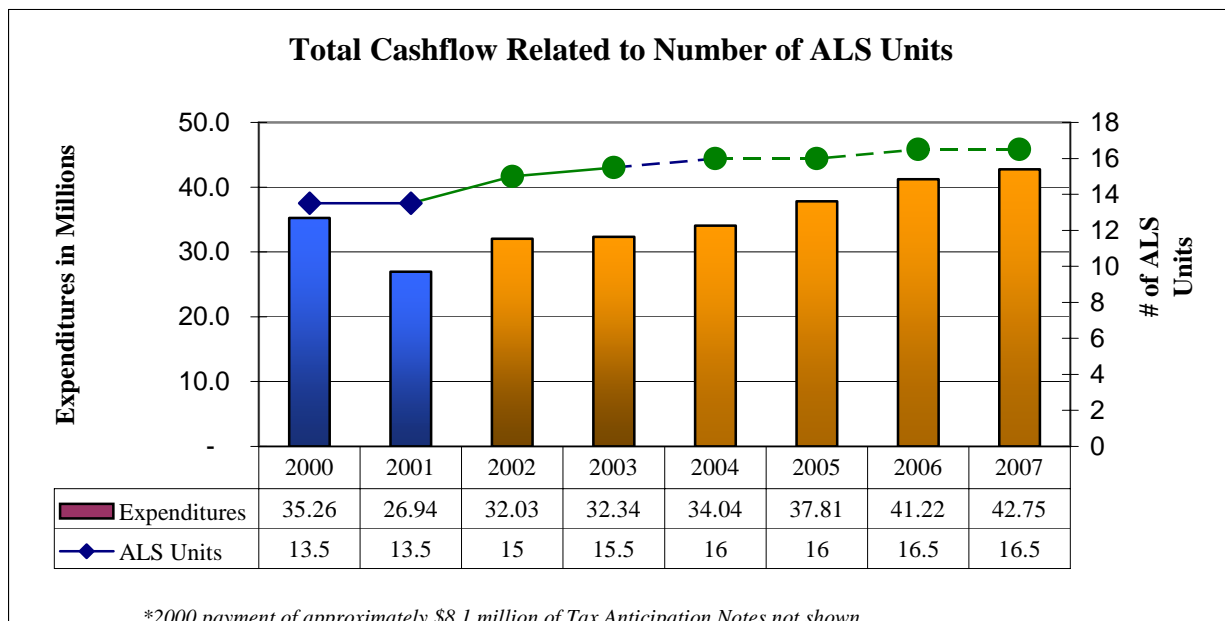


**Expenditure Trends:** There are two main factors affecting expenditure trends, increased costs and the addition of new ALS service. Expenditures are projected to increase from \$32 million in 2002 to \$42.8 million in 2007. This is a 33% increase or an average increase of 6.7% per year. Since ALS is the largest recipient of EMS levy funds, increases in ALS due to new units and allocations increases above forecast CPI have a large affect on expenditures. The following chart shows projected expenditures by sub-fund for the current levy period.

## EMERGENCY MEDICAL SERVICES Actuals, Budgets & Projections 2002 - 2007



Since expenditure increases in each area are tied to the forecast local CPI-U, long term changes in the CPI-U rate can have a significant effect. The forecast CPI was increased to 2.9% for 2005 and 2.5% for 2006 and 2007. This change increased forecast expenditures by approximately \$3 million and is offset by projected increases in property taxes due to new construction. One new 0.5 medic unit equivalent is projected to be added for the remainder of the levy period. The EMS Strategic Plan anticipated the potential need for additional ALS services in South County in 2006. A review of the need for this increase will occur in 2005. Other anticipated needs include the recommended addition of 0.25 unit funding towards increasing Medic 35 in Woodinville from an EMT/P to a full two paramedic unit in 2006. The following chart shows how expenditure growth correlates to the number of ALS units in service:



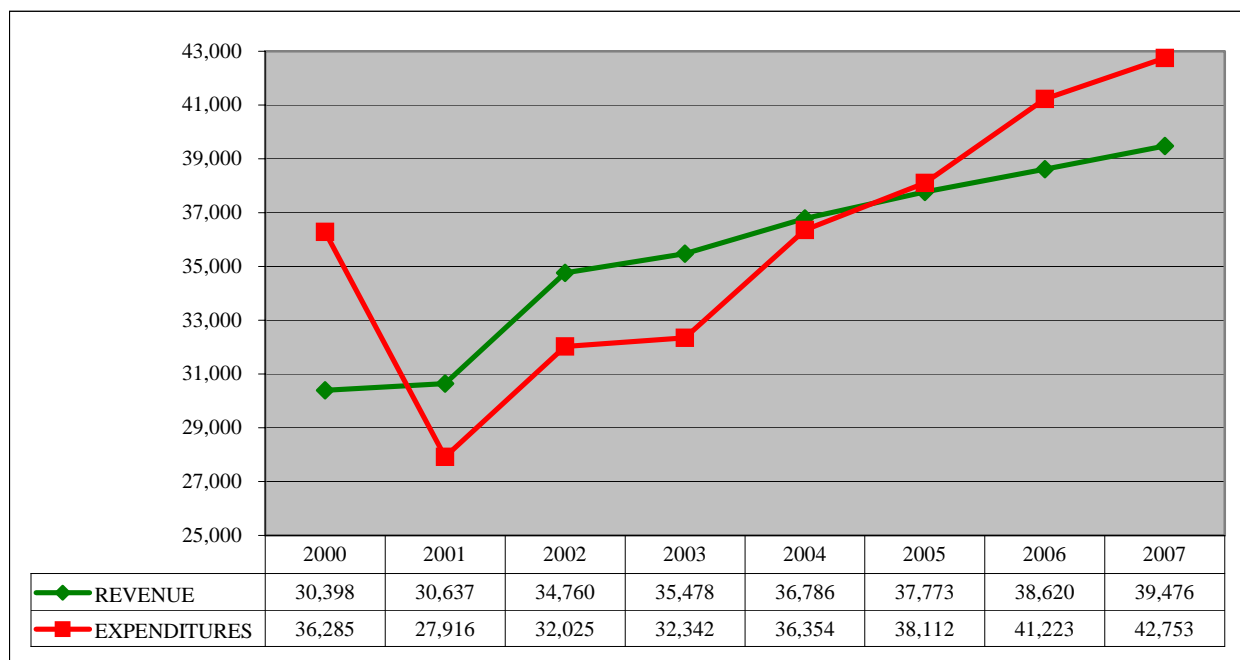
BLS and Regional Support funding is projected to remain steady and not exceed CPI. BLS funding is projected to increase from \$8.53 million in 2002 to \$9.6 million in 2007. Regional Support funding is projected to increase from \$3.55 in 2002 to \$3.96 in 2007. Expenses for Regional Services, particularly personnel and indirect and overhead charges are increasing higher than CPI. To accommodate these increase, Regional Services is planning on using under-expenditures from 2003 (placed in a designated reserve). It is anticipated that there will be continued limited use of contingency reserve each year.

Significant revenue trends to monitor include growth of new construction, interest rates related to income, and delinquent taxes. Current forecast and past economic trends appear to indicate that new construction growth may increase in the remaining years of the levy. Interest rates also appear to be rising. Expenditure trends to monitor 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 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 this service.

The following chart shows actual and projected revenues and expenses from 2000 to 2007. Revenues are projected to exceed expenditures through 2004. Expenditures are projected to exceed revenues by a small amount in 2004 (less than \$350,000). It is currently projected that revenues placed in the fund balance between 2002 and 2004 will be sufficient to fund expenses in 2005, 2006 and 2007.

### EMS FUND – EXPENDITURES VS. REVENUES

*All numbers in thousands (000 omitted)*





#### **D. 2002 EMS Financial Plan**

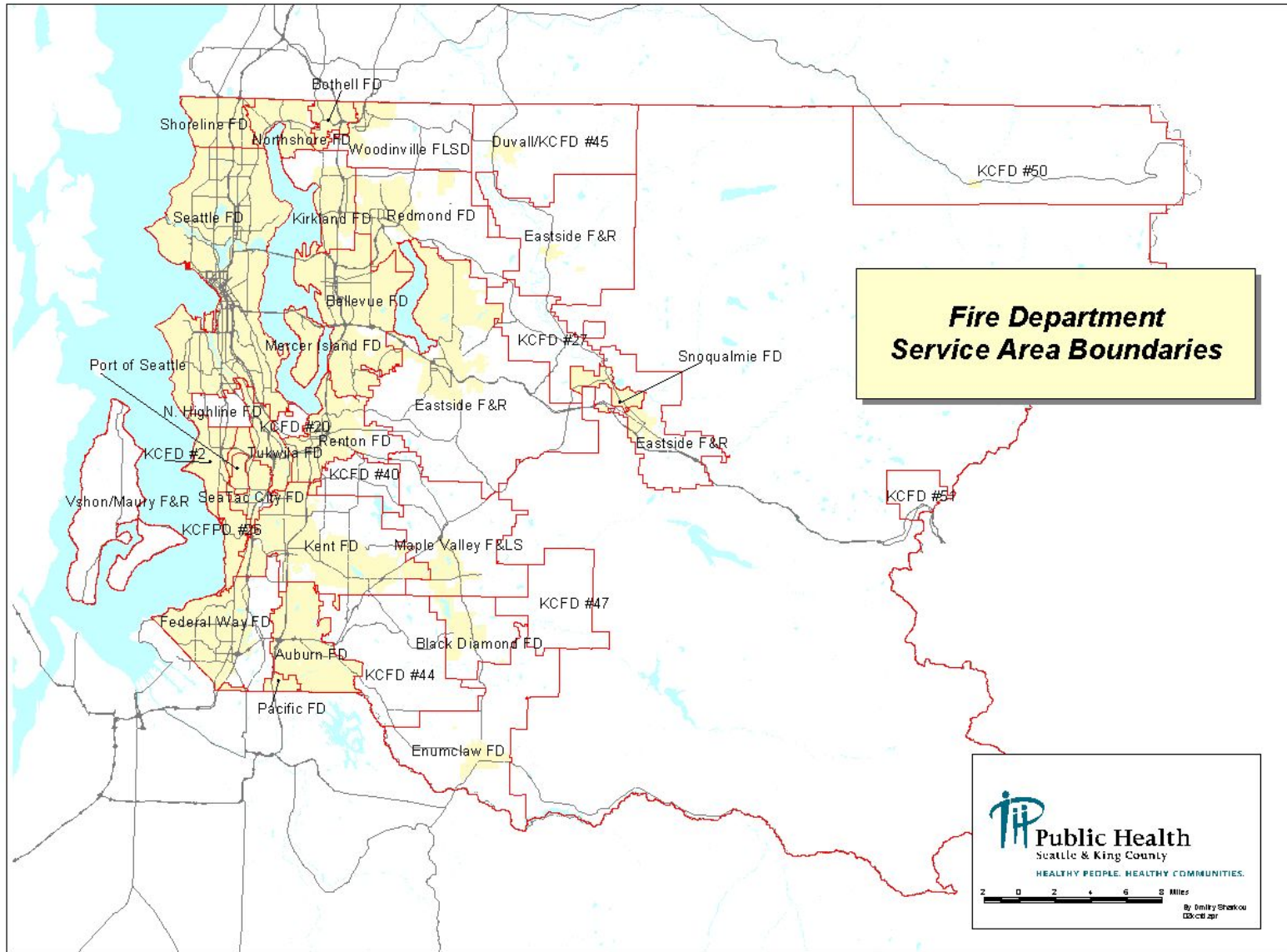
The 2003-2005 EMS Financial Plan summarizes actual and projected revenues and expenditures for core EMS Division programs and services, major strategic initiative directions, and other additions. The EMS Financial Plan shows the current status of the undesignated fund balance in relationship to a target 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 77 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) by only \$187,000. 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 third 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 unfunded needs highlighted in this report, specifically provision of ALS service in outlying areas.

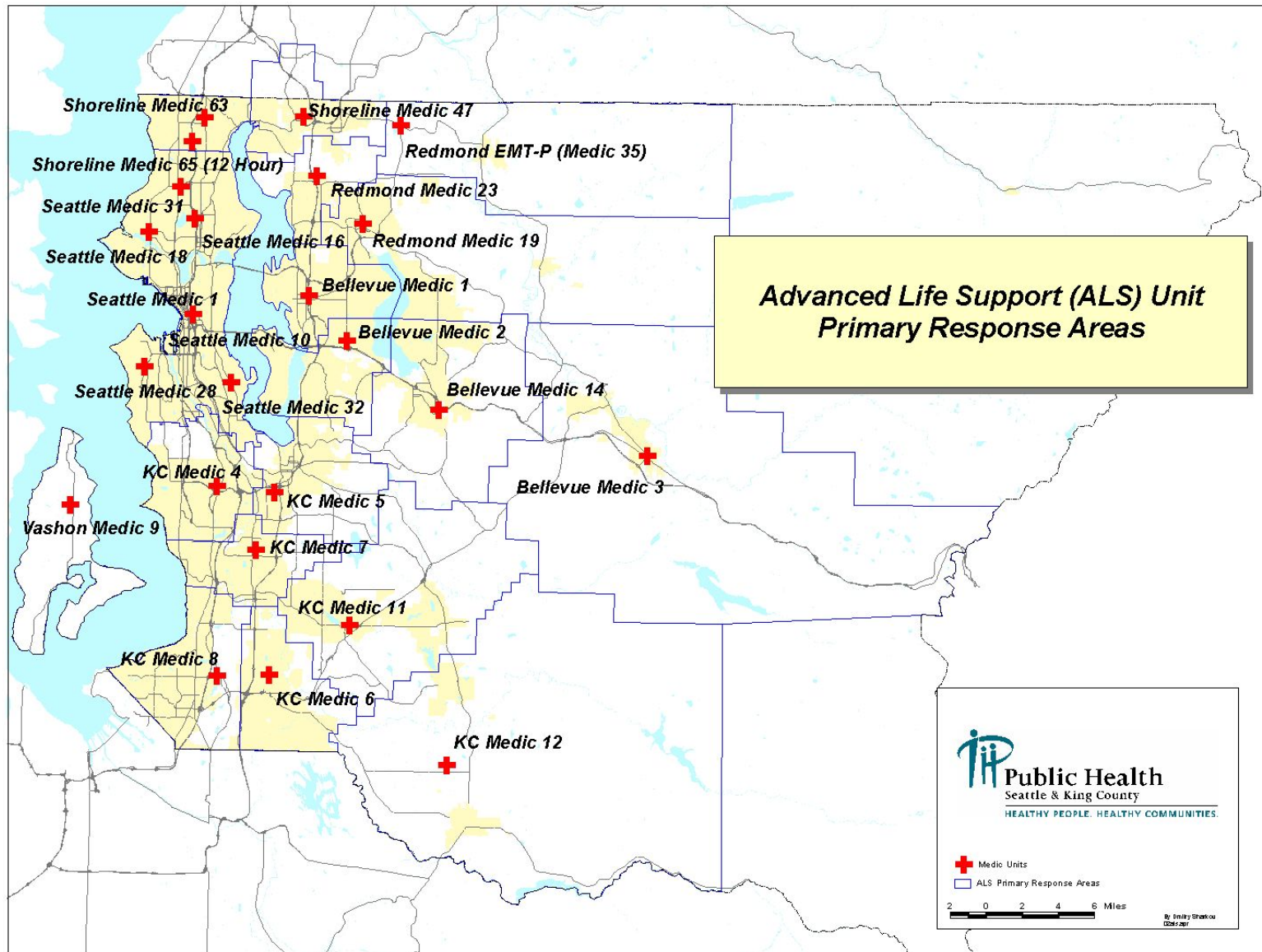


## Appendix A: Regional Map of the Basic Life Support (BLS) Provider Areas



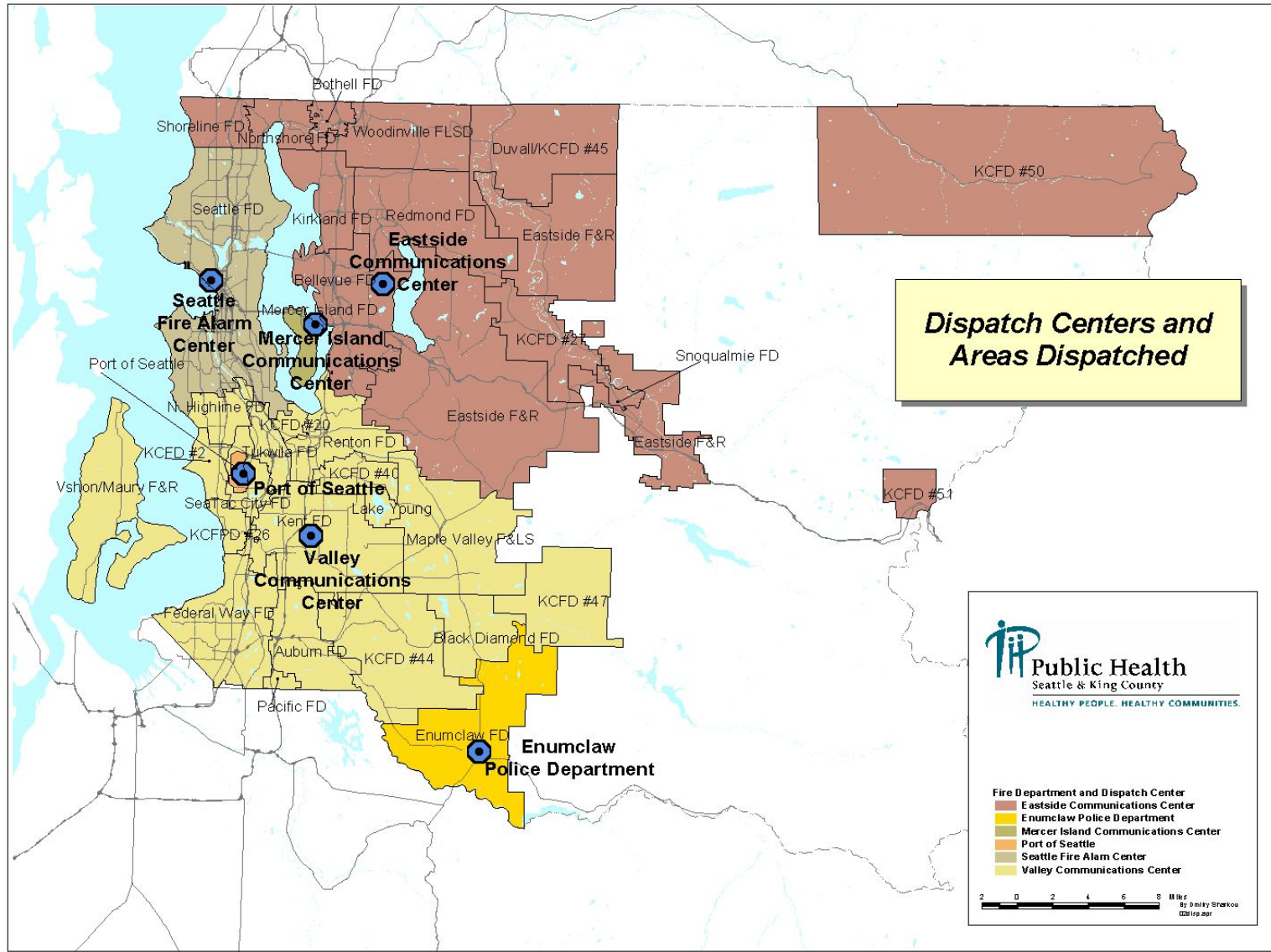


## Appendix B: Regional Map of the Advanced Life Support (ALS) Provider Areas





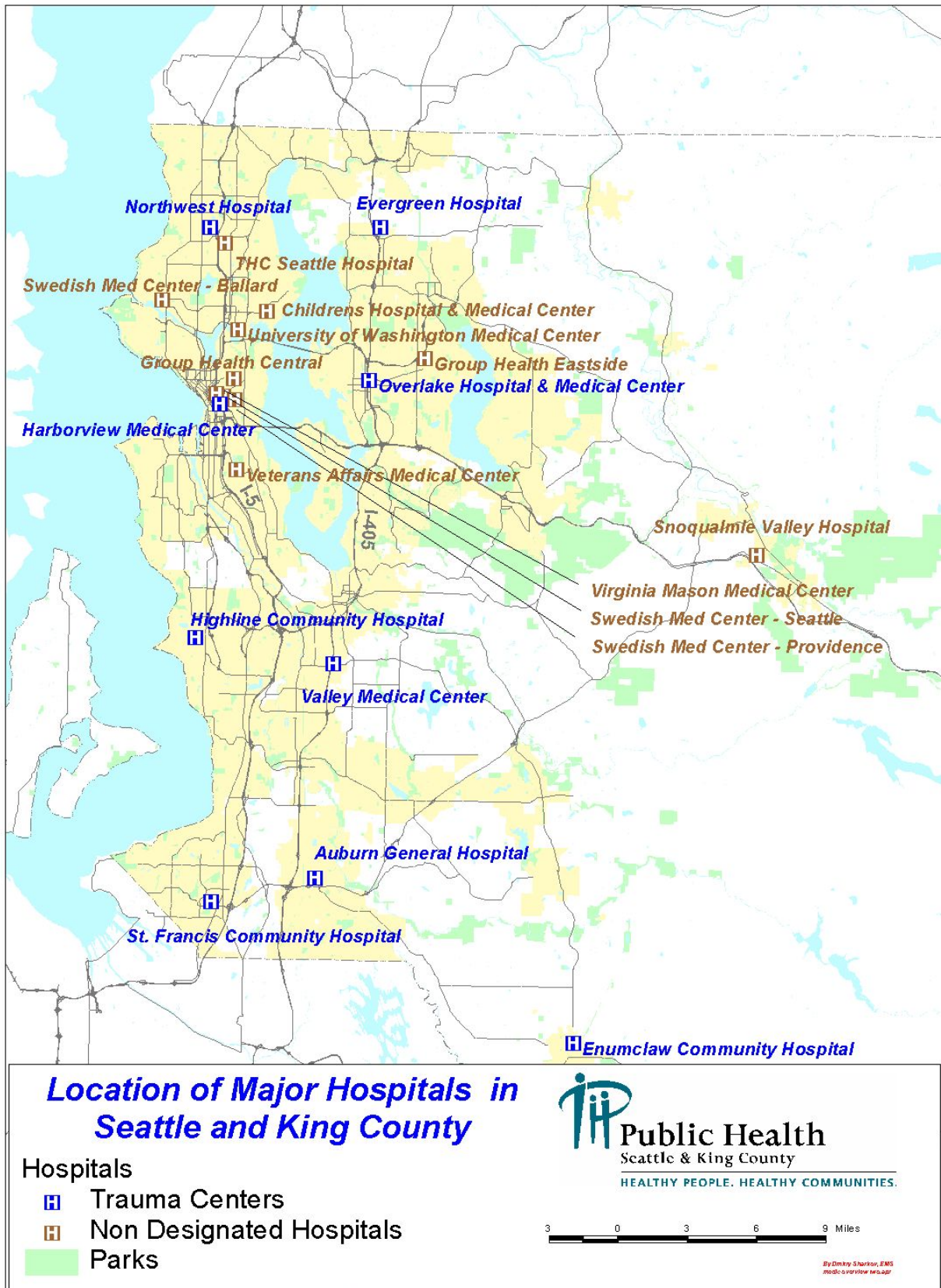
## Appendix C: Regional Map of the EMS Dispatch Center Service Areas







## Appendix D: Regional Map of the EMS Hospitals





## Appendix E: 2003 EMS Advisory Committee Listing

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

|                                |             |  |
|--------------------------------|-------------|--|
| <b>Not filled at this time</b> | Labor - BLS |  |
|--------------------------------|-------------|--|



**Appendix F: EMS Division Revenue/Expenditure Summary**  
**Financial Plan 2003 through 2005**

|   | <u>2003</u><br><u>Actual</u> | <u>2004</u><br><u>Estimate</u> | <u>2005</u><br><u>Requested</u> |
|---|------------------------------|--------------------------------|---------------------------------|
| <b><u>BEGINNING FUND BALANCE:</u></b>         | <b>\$5,909,202</b>           | <b>\$7,824,567</b>             | <b>\$9,971,000</b>              |
| <b><u>REVENUES:</u></b>                       |                              |                                |                                 |
| Property Taxes                                | \$34,646,252                 | \$36,052,892                   | \$36,920,639                    |
| Other Revenue (includes Interest Income)      | \$456,950                    | \$357,664                      | \$477,000                       |
| General Fund (CX)                             | \$375,000                    | \$375,000                      | \$375,000                       |
| <b>TOTAL REVENUES</b>                         | <b>\$35,478,202</b>          | <b>\$36,785,556</b>            | <b>\$37,772,639</b>             |
| <b><u>EXPENDITURES:</u></b>                   |                              |                                |                                 |
| <b><u>CORE SERVICES</u></b>                   |                              |                                |                                 |
| Paramedic Services                            | (\$20,442,385)               | (\$22,624,121)                 | (\$24,158,263)                  |
| Basic Life Support                            | (\$8,801,719)                | (\$8,923,020)                  | (\$9,181,788)                   |
| EMS Division Regional Services                | (\$2,973,104)                | (\$3,700,562)                  | (\$3,807,428)                   |
| Strategic Initiatives                         | (\$125,094)                  | (\$503,714)                    | (\$664,700)                     |
| <b><u>SUBTOTAL Operating Expenditures</u></b> | <b>(\$32,342,302)</b>        | <b>(\$35,751,418)</b>          | <b>(\$37,812,179)</b>           |
| Contingency Reserve                           |                              | (\$602,501)                    | (\$300,000)                     |
| <b>TOTAL EXPENDITURES</b>                     | <b>(\$32,025,049)</b>        | <b>(\$36,353,919)</b>          | <b>(\$38,112,179)</b>           |
| Encumbrance Carry Over                        | (\$1,220,536)                | 1,714,796                      |                                 |
| <b><u>ENDING FUND BALANCE:</u></b>            | <b>\$7,824,567</b>           | <b>\$9,971,000</b>             | <b>\$9,631,460</b>              |



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





## Appendix H: Complete Bibliography for 2004

1. Bartimus HA, Rea TD, Eisenberg MS. Prevalence of automated external defibrillators at cardiac arrest high-risk sites. *Prehosp Emerg Care*. 2004 Jul-Sep;8(3):280-3.
2. Carpenter J, Rea TD, Murray JA, Kudenchuk PJ, Eisenberg MS. Defibrillation waveform and post-shock rhythm in out-of-hospital ventricular fibrillation cardiac arrest. *Resuscitation* 2003 Nov; 59(2): 189-96
3. Culley LL, Rea TD, Murray JA, Welles B, Fahrenbruch CE, Olsufka M, Eisenberg MS, Copass MK. Public Access Defibrillation in Out-of-Hospital Cardiac Arrest: A Community-Based Study. *Circulation* 2004 Apr 20; 109(15):1859-63.
4. Eisenberg MS, Culley LL, Rea TD. Does the Emperor of CPR Wear Clothes? Pre-hospital Emergency Care. July/Sept 2004; 8-3:339-340.
5. Hauff SR, Rea TD, Culley LL, Becker L, Kerry F, Eisenberg MS. Factors Impeding Dispatcher-Assisted Telephone Cardiopulmonary Resuscitation. *Ann Emerg Med*. December 2003; 42:731-737.
6. Meischke H, Diehr P, Rowe S, Cagle A, Eisenberg M: Evaluation of a Public Education Program Delivered by Firefighters on Early Recognition of a Heart Attack. *Eval & Health Professions*. Vol 27, Number 1: 3-21.
7. Paredes VL, Rea TED, Eisenberg MS, et al: Out of Hospital Care of Critical Drug Overdoses Involving Cardiac Arrest. *Acad Emerg Med*. January 2004; Vol II, No 1: 71-74.
8. Rea TD, Crouthamel M, Eisenberg MS, Becker LJ, Lima AR. Temporal Patterns in Long-Term Survival following Resuscitation from Out-of-Hospital Cardiac Arrest. *Circulation* 2003; 108: 1196-1201.