

August 19, 1992
JWC/lk 304D.2

Introduced by:

Proposed No.: 92-621

ORDINANCE NO. **10547 1**

AN ORDINANCE making a supplemental appropriation of \$212,500 to emergency medical services from the Emergency Medical Services Fund and amending Ordinance 10182, Section 66, as amended.

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

SECTION 1. There is hereby approved and adopted an appropriation of \$212,500 to emergency medical services for start-up costs associated with establishing a new emergency medical technician/paramedic unit from the Emergency Medical Services Fund.

SECTION 2. Ordinance No. 10182, Section 66, as amended, is hereby amended by adding thereto and inserting therein the following:

EMERGENCY MEDICAL SERVICES ((FUND)) - From the Emergency Medical Services Fund there is hereby appropriated to:

Emergency Medical Services \$212,500

The maximum number of additional FTEs for Emergency Medical Services shall be: 1.0

INTRODUCED AND READ for the first time this 24th day of August, 1992

PASSED this 8th day of September, 1992

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON

Audrey Inger
Chair

ATTEST:

Gerald A. Peterson
Clerk of the Council

APPROVED this 18th day of September, 1992

Jim Hill
King County Executive

10547

ATTACHMENT I

**ENHANCEMENT OF PARAMEDIC SERVICES
IN N.E. KING COUNTY**

**Request for the addition of
Emergency Medical Technician/Paramedic Services
in the Woodinville-Duvall area of North East King County**

**Submitted by the Seattle-King County Department of Public Health
King County Emergency Medical Services Division
David Lurie, Director
Steven Call, Division Manager**

July 1992

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ENHANCEMENT OF PARAMEDIC SERVICES IN N.E. KING COUNTY

PART I: INTRODUCTION AND BACKGROUND

A. Purposes

The purposes of this request are:

1. Summarize and review the current status of paramedic services in N.E. King County;
2. Demonstrate the need for enhanced paramedic services in the North Central and eastern portions of King County Fire District 36, and in the lower Snoqualmie River Valley (including Duvall/Fire District 45, and Carnation/FD 10);
3. Recommend addition of an EMT/P unit in this area in 1993.

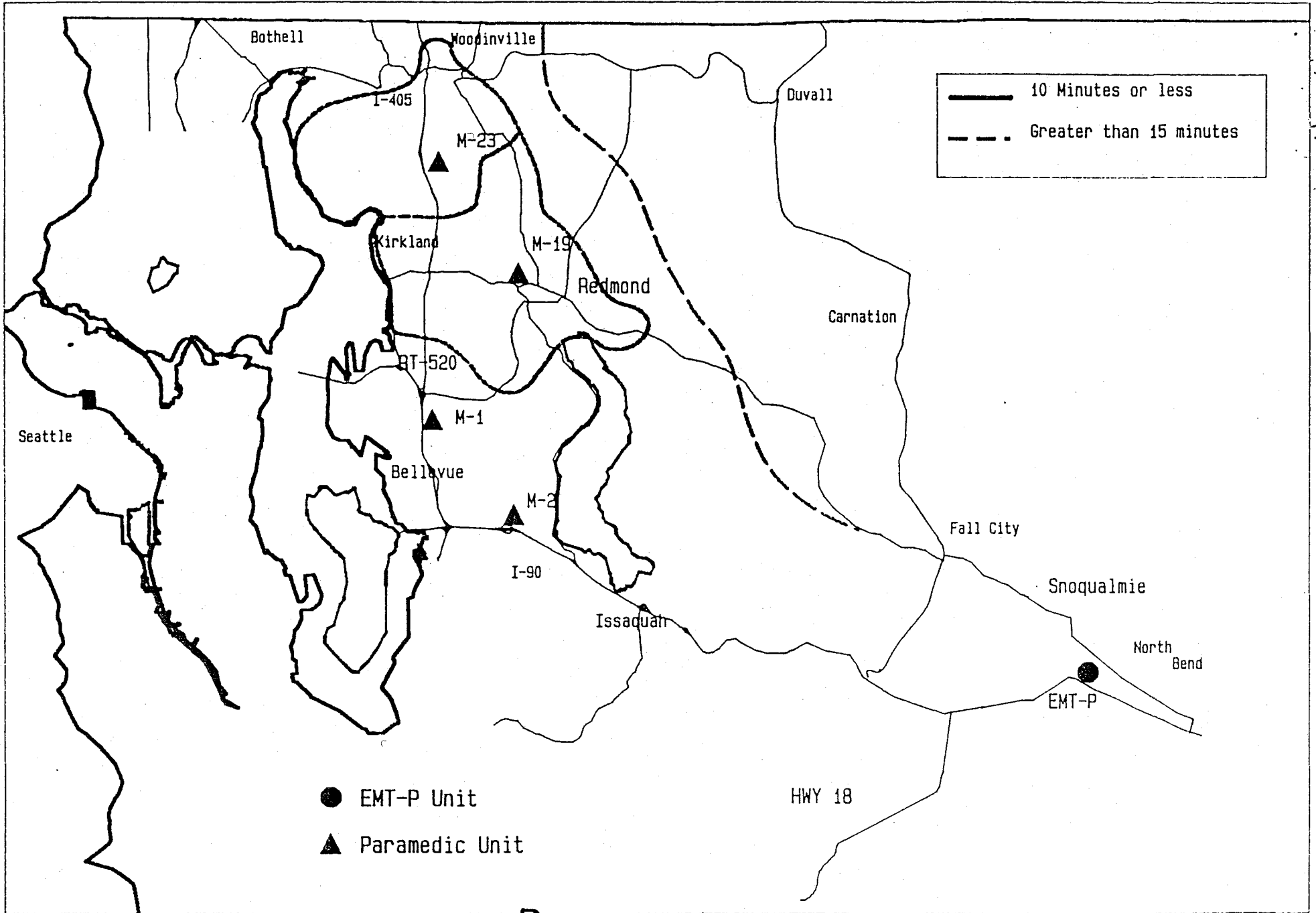
B. Problem Statement

Outlying, rural areas of N.E. King County are characterized by relatively low paramedic call volumes and long paramedic response times frequently exceeding fifteen minutes. Paramedic units are typically deployed such that the largest number of calls are served in the shortest average response time. Outlying areas consequently have longer response times, since paramedic units are located further away in more densely populated urban and suburban areas. Response times of paramedic units can be a critical factor in survival when life threatening emergencies occur, and patients require paramedic interventions (including defibrillation, endotracheal intubation, and emergency medications).

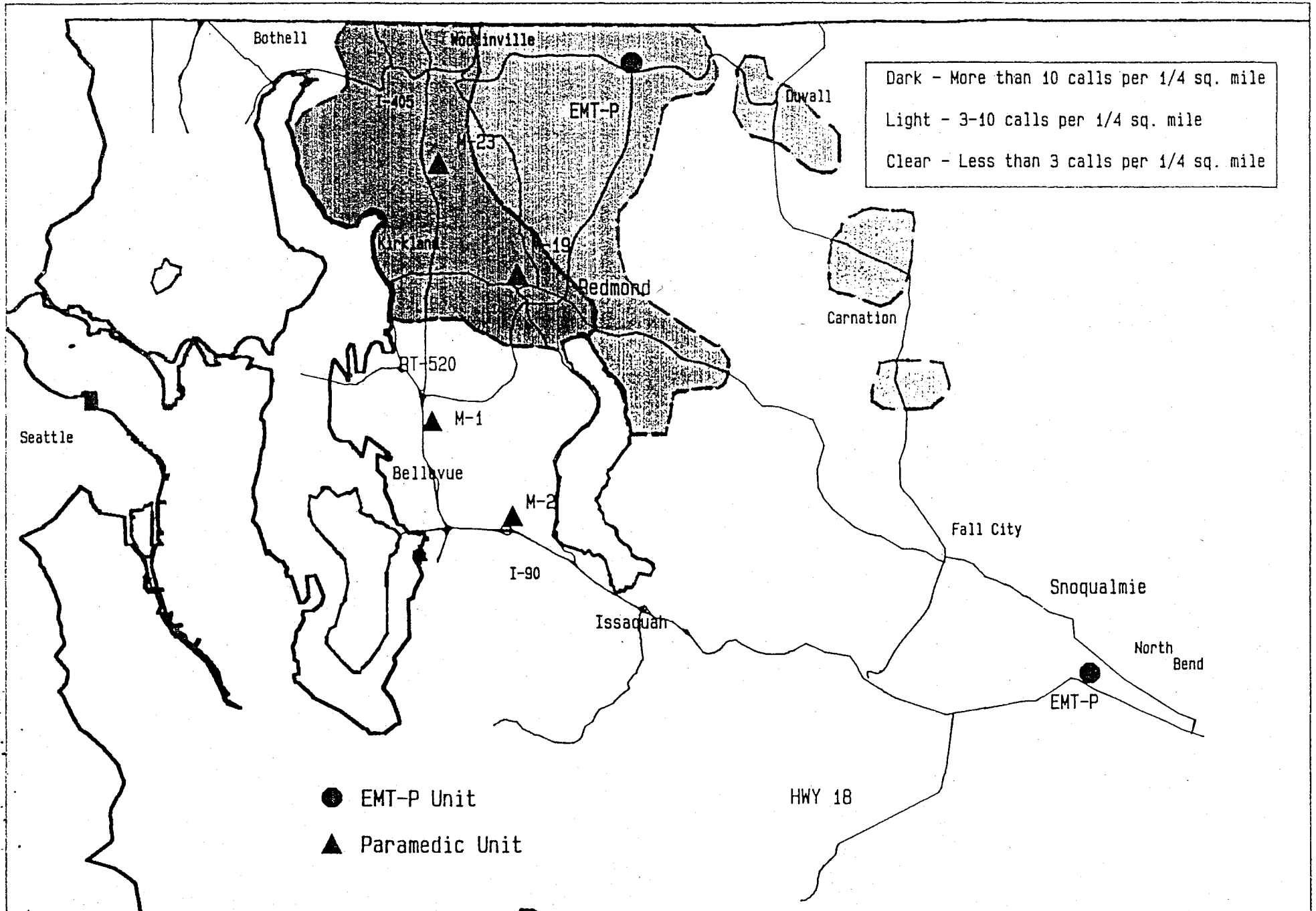
Response times in the 12-15 minute range in the vicinity of the Woodinville-Duvall Road and the Avondale Road, and generally exceed 15 minutes east of the Avondale Road (see Maps 1 and 2). The north central and eastern portions of Fire District 36, Duvall, and all of the lower Snoqualmie River Valley served by Evergreen Medic 19 have response times in excess of 15 minutes. It is estimated that an EMT/P unit located to serve this area could respond to approximately 200 - 400 responses depending where the unit is deployed, with this number projected to increase to approximately 650 calls by 1997. Discussion of optimal location for an EMT/P unit is presented later in this proposal.

Several types of programs have developed in outlying areas in attempts to offset lengthy paramedic response times. Fire department emergency medical technicians (EMTs) countywide have been trained in defibrillation to treat patients in cardiac arrest, but such training has not decreased the need for rapid provision of additional paramedic care that cardiac patients need. In some communities, off-duty paramedics

Approximate Response Time Contours - NE King County



Core ALS Response Area - NE King County



have volunteered to respond with local, usually volunteer, fire department EMTs, and backed up by a full-time paramedic unit. While this type of volunteer service offers some improvements, it is dependent on the availability of the paramedic, and does not provide full-time coverage of the community.

C. EMS Master Plan Recommendations

In 1988, the King County Emergency Medical Services Division was directed by the King County Council to carry out an EMS Master Plan. The major purposes of this Master Plan were to review the efficiency and cost-effectiveness of prehospital care delivery in King County, and provide recommendations concerning the future planning, organization, anticipated costs, and service delivery options necessary to ensure the continued provision of high-quality emergency medical services to the citizens of King County. The EMS Master Plan Final Report was submitted to the King County Executive by the Master Plan Steering Committee in May 1991, and approved by the King County Council in September 1991.

The EMS Master Plan made several findings and recommendations for paramedic services and for improving or enhancing paramedic services in outlying rural, low-density population areas. These included:

- 1, Fully-staffed paramedic units, manned by University of Washington trained paramedics, were most productive and efficient in heavily populated suburban and urban areas of the County.
2. Paramedic calls in outlying, lesser populated areas are increasing, and response times to these calls by suburban-based paramedic units are long - frequently over 20 minutes. However, locating , two-paramedic staffed units in these areas would not be an efficient or cost-effective use of resources. These units would experience low utilization and would be expensive to operate on a cost per call basis, and not significantly improve response times since the geographic areas remain large with a low density population.
3. Develop alternative staffing patterns for addressing the need for enhancing paramedic services in outlying, low-density, or rural areas. Alternative options for consideration included pairing an emergency medical technician (EMT) with a paramedic, enhancing EMT skills, or other staffing combinations which build upon existing resources in these communities, and meet specific growth needs over time.

It was felt that pairing an EMT and a paramedic offered the best option for achieving improved paramedic service and effective utilization of existing resources in a cost-effective manner.

II. The Emergency Medical Technician/Paramedic (EMT/P) Concept

EMT/P concept is characterized by a number of elements:

1. The **staffing pattern** provides one full-time, University of Washington-trained paramedic, and one full-time, firefighter/EMT trained in defibrillation (EMT-D).
2. The unit is deployed geographically to provide enhanced paramedic services to a **response area** characterized by:
 - a. Routinely long response times from fully-staffed paramedic units based some distance away in urban/suburban core areas.
 - b. Outlying or rural location with low population and/or call density.
3. **Dispatch protocols** which provide for the EMT/P unit to respond to **all** calls for paramedic services in their response area **as well as** calls for basic life support services typically provided by fire department aid cars staffed by EMTs. The dispatch protocols also identify some types of paramedic responses which require additional backup by fully-staffed paramedic units in order to provide the necessary skilled manpower to properly and quickly treat the emergency patient.
4. **Medical control** is provided through the existing medical director for the paramedic service currently covering the area and the King County Medical Program Director.
5. An EMT/P unit is designed to **complement** rather than replace paramedic services, and to utilize existing fire department, paramedic, physician, and dispatch resources in a cost effective manner.

The EMT/P concept is designed to provide the several service and operational benefits to response areas, as well as to have beneficial effects on the fully-manned paramedic units. These benefits include:

1. Improves paramedic response times and paramedic services in rural, outlying areas with low call and population densities, since units are located closer to the occurrence of calls. Rather than continue to wait the arrival of fully-staffed paramedic units, patients in these areas can now receive more rapid paramedic response.
2. Enhances paramedic services in areas which may never have sufficient call volume for a fully-staffed paramedic unit.

3. Improves the availability of existing two-person paramedic units. EMT/P units decrease the number of calls in outlying areas to which fully-staffed units would ordinarily respond. This lowers both the average response times and the out-of-service times of fully-staffed units since these units respond less frequently to distant areas.
4. The EMT/P unit also improves basic life support skills in outlying departments through both formal and informal training of EMTs by paramedics.

A. Results from the EMT/Paramedic Demonstration Project: North Bend

In February 1992, an EMT/P demonstration project was started in North Bend through cooperation between King County, the Bellevue Paramedic Program, the North Bend Fire Department, and other communities and unincorporated fire districts along the Interstate 90 corridor. The North Bend EMT/P unit responds to a wide area in the upper Snoqualmie Valley including North Bend, Snoqualmie, Fall City, and I-90 corridor east of Preston as far as Snoqualmie Pass. Paramedic response times to this area averaged 15 to 25 minutes prior to implementation of the EMT/P unit. It was projected that this unit would respond to approximately 200 paramedic calls per year, as well as basic life support calls in North Bend fire department's response area.

The EMT/P unit at North Bend has thus far been very successful in achieving the service goals anticipated for it. The unit is responding to an average of 1.3 paramedic calls per day, an annualized rate of over 450 calls, with an average 7 minute response time of the unit to paramedic calls. This is a very substantial improvement in the provision of paramedic response times to the communities being served. Prior to the demonstration project, for example, paramedic calls to the City of North Bend averaged 25 minutes. EMT/P response time is about 6 minutes. Average response time of the EMT/P unit to basic life support calls is 3-4 minutes, similar to those achieved prior to the demonstration project.

In addition, the EMT/P unit has had a positive benefit is reducing the need for response by fully-staffed paramedic units, and increasing the availability of the unit in the core suburban and urban areas. It is estimated that the out-of-service time of Bellevue Medic 2 was decreased by about one hour per day. service since the EMT/P unit went in service.

III. EMT/P Services in N.E. King County

Current paramedic and potential EMT/P services in the Bear Creek/Lower Snoqualmie Valley Areas were analyzed utilizing the King County Emergency Medical Services Information and Mapping System (EMSIMS). This analytical, computer-mapping model was developed by Jerry Schneider, Ph.D., Department of Engineering, University of Washington.

The model is designed to simulate the emergency medical response coverage of units in the suburban and rural King County area, given a particular configuration of unit locations and the spatial distribution pattern of paramedic responses. The model then calculates and displays, in map form, the coverage patterns provided by the units, including average response times, unit workload, and other operational features. This model allows considerable flexibility in examining a number of possible paramedic locations and quickly obtaining an assessment of the relative operational features.

EMSIMS has been used in planning the need for and location of paramedic units (Medic 19 in 1988, South King County Medic 11 in 1991, and the North Bend EMT/P unit in 1992), as well as more routine analyses regarding setting or revising paramedic service boundaries. A more complete description of EMSIMS is found in Evaluation of Paramedic Service Areas in King county, Washington (March 1988), and will not be presented here in more detail.

A. Location Options for an EMT/P unit in N.E. King County

Several essential issues need to be addressed in making a recommendation regarding the location. These issues include:

1. What is optimal location for this unit, such that it will serve the largest number of people with the shortest response time, and meet the criteria described for EMT/P units?
2. What is the projected growth in calls for the unit?
3. What is the projected impact of this unit on fully-staffed units (especially Medic 19)?

Four fire stations were selected as possible location options, including 3 existing stations and one site scheduled for construction (see Map 3). These potential sites include:

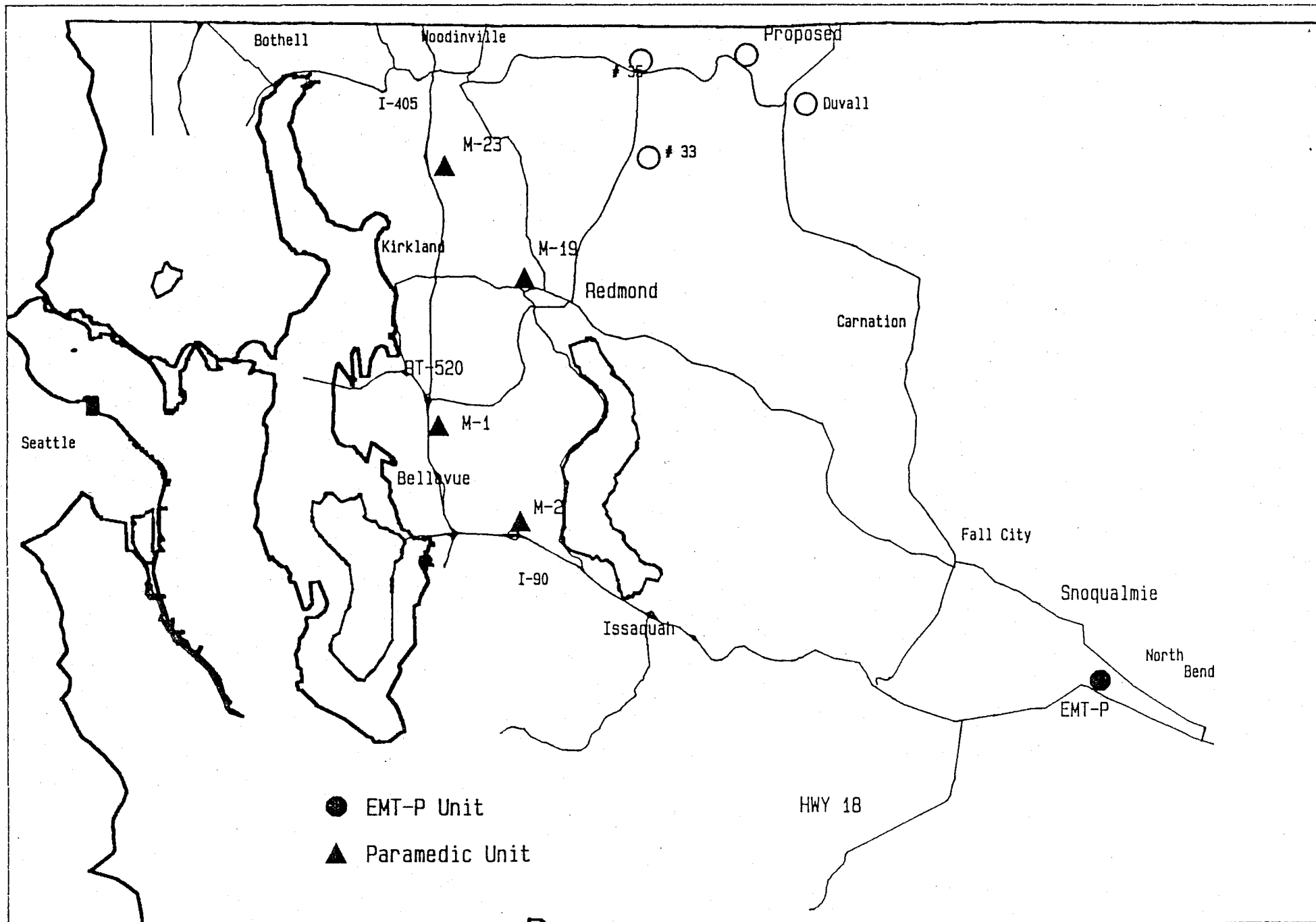
Fire District 36:

1. Station 33 (located at NE 133 St. and 194th Ave. NE)
2. Station 35 (located at Avondale Road. and Woodinville-Duvall Road).
3. Proposed Station located in eastern Fire District 36 on the Woodinville-Duvall Road.

Duvall/Fire District 45:

1. Station 1 (HQ) located in downtown Duvall.

EMT-P Candidate Locations - NE King County



No feasible locations exist in the eastern portions of Redmond (Fire District 34). This area is currently well served by Evergreen Medic 19. There are no stations located in Redmond/Fire District 34 near the area where most of Medic 19's long responses occur. Similarly, fire stations located in Fire District 10 (Carnation area) are well to the south of where most of the demand occurs for this area.

B. EMT/P Workload Projections: 1991

The EMSIMS model was used to develop data showing the comparative impact of an EMT/P unit in all of these locations using actual response data for workloads and response times from calendar year 1991. EMSIMS allows paramedic services in the area to be reviewed as if an EMT/P unit were actually in service. The model assumes that there would be 9,056 responses by all paramedic units, and redistributes those responses as if the EMT/P unit were in service at the candidate sites, with the actual EMT/P workload dependent upon the specific candidate location. This data is shown in Table 1 below:

**Table 1
1991 Workload Projections for N.E. King county EMT/P Unit**

Unit	Actual 1991	EMSIMS No EMT/P*	FD 36 Sta. 33*	FD 36 Sta. 35*	FD 36 Prop.*	DUVALL HQ*
EMT/P	0	0	370	410	299	239
Medic 19**	1,532	1,605	1,473	1,474	1,452	1,441
Medic 23	2,320	2,462	2,335	2,306	2,404	2,458
Totals	3,852	4,067	4,178	4,190	4,155	4,138

*EMSIMS projected responses are higher than 1991 actuals because actual paramedic response boundaries do not exactly match those utilized by the model.

**Medic 19 responses include back up responses to the EMT/P unit, assuming a 30% back up rate based on experience with the North Bend EMT/P unit.

These data show several major points regarding optimal location for an EMT/P unit based on actual data:

1. An EMT/P unit located at Fire District 36, Station 35 offers the most optimal site for an EMT/P unit in this area in terms of workload, able to serve more than 4100 paramedic responses per year.

2. An EMT/P unit in this area can respond to more paramedic calls than the EMT/P unit based in North Bend, illustrating the relative importance of adding an EMT/P unit in this area.
3. An EMT/P unit in the area primarily impacts responses now served by Medic 19, Medic 23, with little or no impact on Bellevue Medic 1 or Medic 2 or the North Bend EMT/P unit. This results in the model from a "domino effect" in which the EMT/P unit provides primary response to some calls now served by the Evergreen paramedic units (particularly Medic 19).

C. EMT/P Workload Projections 1992-1997

Workload projections for 1992 through 1997 were estimated for an EMT/P unit based at Fire Station 35 using a linear regression method based on the actual number of paramedic calls occurring in Fire District 36 and Duvall/Fire District 45 between 1985 and the first quarter of 1992. This data is summarized in Table 2 below.

**Table 2
EMT/P Workload Projections 1992-1997**

	1992	1993	1994	1995	1996	1997
Projected EMT/P Responses	442	505	541	577	613	649

Increases in paramedic responses have been remarkably steady and uniform in the Fire District 36 and Fire District 45/Duvall areas since 1985. The projected responses for the EMT/P unit in this area are expected to increase by about 6% to 7% per year. in

D. Projected Average Response Times

The EMSIMS model also allows a projection of average response times to the proposed response area, and potential impact on existing fully-staffed units. Data on average response times are shown in Table 3, below.

**Table 3
Projected Average Response Times for Paramedic Services in N.E. King Co.**

Unit	Actual 1991*	Projected No EMT/P**	FD 36 Sta. 33**	FD 36 Sta. 35**	FD 36 Proposed**	Duvall HQ**
EMT/P	N/A	N/A	14	11.8	12.6	11.5
Medic 19	11.6	11.3	8.5	8.6	8.6	8.7
Medic 23	10.5	8.9	8.5	8.4	8.7	8.8

*1991 figures include all responses.

**Projected response times from quarters only.

This table first presents a comparison between actual response times for all paramedic responses and the response times projected by the EMSIMS model. The planning model, however, treats each call as if the unit were responding from quarters. Some variation in response times thus exists between observed response times and those projected by the EMSIMS model. The variation between actual and projected response times is less for Medic 19 (11.6 minutes to 11.3 minutes), with a larger variation for Medic 23 (10.5 minutes to 8.9 minutes). In order to evaluate the effects of projected EMT/P unit, response times from the candidate locations should be compared to each other as well as to the projected average response time figure

This data show the following major conclusions:

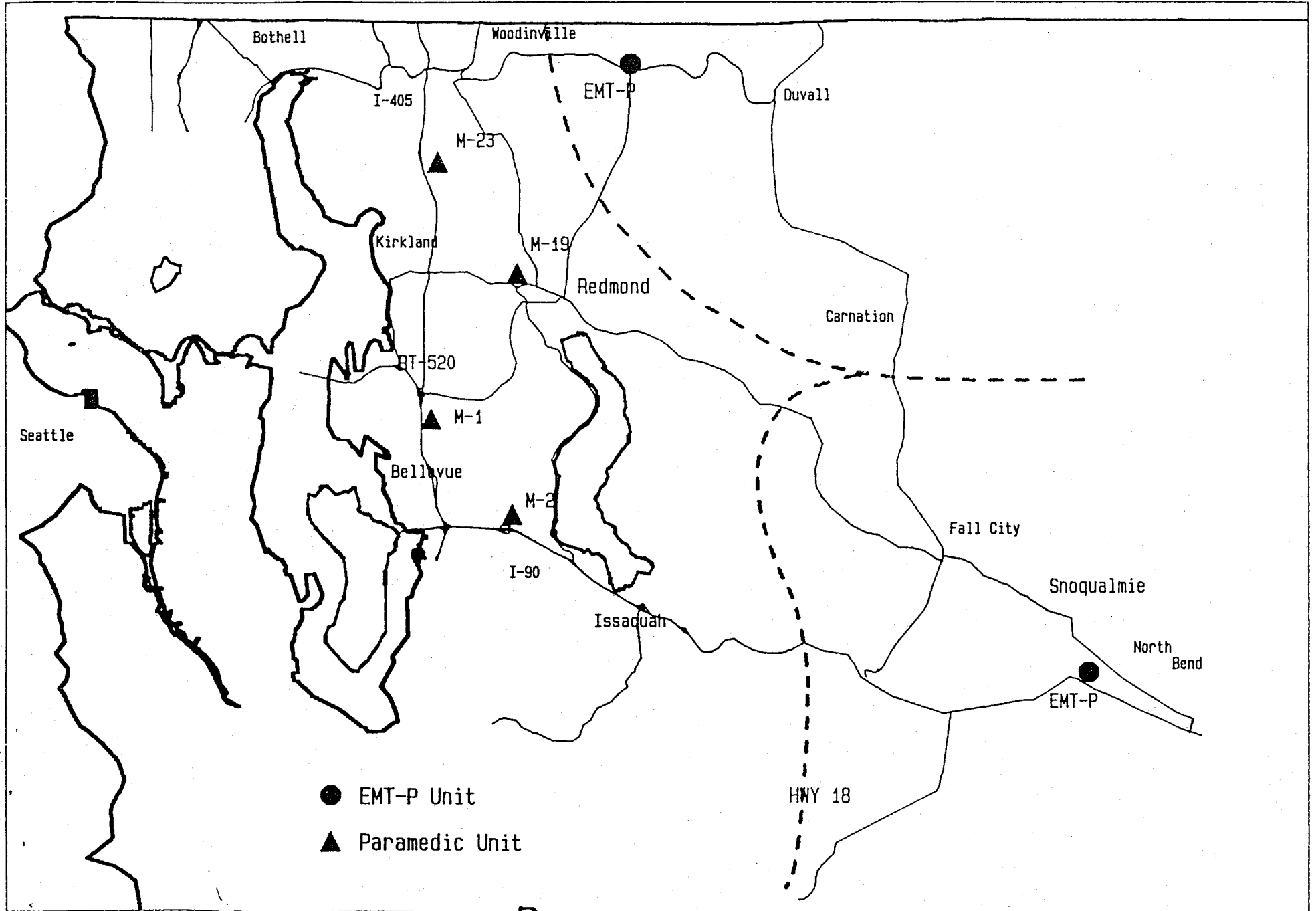
1. Station 35 provides the fastest average response time (11.8 minutes) to the largest number of calls (410) of all the location candidates. Duvall Fire Department Headquarters has the shortest average response time (11.5 minutes) but to a smaller projected workload (239 responses).
2. An EMT/P unit at Fire Station 35 will have a positive effect in shortening average response times for the fully-staffed units, particularly Medic 19, since the EMT/ P unit's workload will be largely taken from an area now served by Medic 19. The overall effect of the EMT/P unit on average response times for Medic 23 will be slight.

Map 4 shows the approximate response boundary for the proposed EMT/P unit responding from Fire Station 35, and the relationship to the response boundary of the EMT/P unit operating from North Bend.

RECOMMENDATIONS

1. A full-time EMT/P unit staffed by one defibrillator-trained EMT and one paramedic be added in Northeast King County, and located at King County Fire Protection District 36, Station 35, located near Cottage Lake. Addition of these services, in conjunction with existing EMT/P operations in North Bend, will result in enhanced paramedic services to a wide area including the eastern portion of Fire District 36, and the communities and unincorporated areas of the Snoqualmie Valley from North Bend to Duvall.
2. This recommendation should be approved as soon as possible in order for personnel to be selected and placed in the ten-month University of Washington Paramedic Training Program.

Approximate Coverage of Snoqualmie Valley by EMT-P Units



Attachment 2

**PROPOSED START-UP COSTS
Evergreen EMT/Paramedic Unit in Fire District 36**

1. Paramedic Vehicle	\$81,430
2. Paramedic Selection and Training	
A. Paramedic candidate selection and testing	\$ 2,670
B. Training costs:	
Tuition @ \$12,000 ea.	\$ 48,000
Student stipends @ \$19,750 per student	\$ 79,000
Uniform allowance @ \$300 per student	\$ 1,200
<u>Subtotal</u>	<u>\$128,400</u>
TOTAL	\$212,500