**CITY OF SHERWOOD, OREGON**

**RESOLUTION NO. 88-404**

A RESOLUTION AUTHORIZING A BASIC 9-1-1 SERVICES CONTRACT WITH TUALATIN RURAL FIRE PROTECTION DISTRICT AND FURTHER DIRECTING CITY STAFF TO EXPLORE ALTERNATIVE OPTIONS FOR PROVISION OF BASIC AND ENHANCED 9-1-1 SERVICES.

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WHEREAS, the cities of Tigard, Tualatin, Sherwood, King City, and Durham, in cooperation with the Tualatin Rural Fire Department, desire to assure the provision of effective public safety communication services in an efficient and least-cost manner; and

WHEREAS, the cities contract with the Tualatin Rural Fire Protection District for Basic 9-1-1 emergency telephone system service; and

WHEREAS, the cities and the district wish to enter into a formal, written contract for the continued provision of Basic 9-1-1 services, defining responsibilities of the parties and setting a method for determining the cost of services provided; and

WHEREAS, the cities and the district have commissioned a joint study defining a methodology and formula for costing Basic 9-1-1 services from the Fire District to the cities; and

WHEREAS, the cities desire to further mutually explore other options to the future provision of 9-1-1 emergency telephone services.

NOW, THEREFORE, THE CITY OF SHERWOOD RESOLVES AS FOLLOWS:

Section 1: That the Sherwood City Council has received the "Cost-of-Services for Emergency Calls Study" report prepared by Economic Resource Associates, Inc., attached as Exhibit "A", and that city staff is directed to negotiate a Basic 9-1-1 Services contract with the Tualatin Rural Fire Protection District using the unit costs per call pricing as defined in the Study, said contract to be renewable annually with provision for a six month written notice submitted by either party of desire to renew, and a six month written price change notification from the District.

Section 2: That a 9-1-1 users board, composed of representatives from each participating city, be established to advise the District on contract policy and pricing issues relative to 9-1-1.

**Section 3**: That the City of Sherwood shall study, along with other participating jurisdictions, further alternative options for the provision of 9-1-1 services, including Enhanced 9-1-1, with the intent of making the results of this further study available to the Councils of participating jurisdictions no later than December, 1988.

**Section 4**: That a copy of this Resolution shall be forwarded to each participating City Council and the District Board upon enactment.

Passed the 27th day of April, 1988.

Norma Jean Oyler, Mayor
City of Sherwood

Polly Blankenbaker, City Recorder

**ECONOMIC RESOURCE**

ASSOCIATES, INC.

# Cost-of-Service for Emergency Calls

*for*

**City of Tigard,**
**City of Tualatin,**
**City of Sherwood,**
**City of King City, and**
**Tualatin Rural Fire Protection District**

March 3, 1988

# COST OF SERVICE

# for

# TAKING 9-1-1 EMERGENCY CALLS

# at

# TUALATIN RURAL FIRE PROTECTION DISTRICT

# COMMUNICATION/9-1-1 CENTER

MARCH, 1988

**Prepared by:**

**Economic Resource Associates, Inc.**

**Prepared for:**

**CITY OF TIGARD, OREGON**

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## SUMMARY AND CONCLUSIONS

The city of Tigard and other governmental entities providing emergency services participate in the Tualatin Rural Fire Protection District Communication/9-1-1 Center's 9-1-1 system and share in paying for the system's capital and operating costs. The purpose of this study is to review these costs and determine the appropriate share distributions among affected agencies.

The city of Tigard's participation in funding the Tualatin Rural Fire Protection District Communication/9-1-1 Center's 9-1-1 system began in 1982, when telephone excise tax receipts became available. Since that time, the city of Tigard and other jurisdictions have paid the Tualatin Rural Fire Protection District Communication/9-1-1 Center one hundred percent (100%) of the funds from this source. One of the primary questions to be addressed in the course of the work is what portion of these funds should be paid to the Tualatin Rural Fire Protection District Communication/9-1-1 Center for call taking services.

The Center provides distinct and separate services. It serves as a primary Public Safety Answering Point (PSAP) for six (6) separate telephone central offices. These offices serve most of Southeastern Washington County and Southwestern Clackamas County. Fire and medical calls coming to Tualatin Rural Fire Protection District Communication/9-1-1 Center are dispatched directly by the Center. In addition, the Center dispatched police calls for the city of Sherwood in 1986. The Tualatin Rural Fire Protection District Communication/9-1-1 Center also serves as a fire alarm office for the Fire District. This service involves dispatching fire and medical equipment for seven fire stations in a 110 square mile area.

However, the costs of the communication center have not been specifically assigned to each of the services provided. Thus, it is not readily apparent how much each of the jurisdictions should pay for the call taking function.

The approach employed in this study is to first determine the nature and function of the work to be accomplished. The work then determines staffing, equipment and other costs of the 9-1-1 center. Fair-cost shares to communities participating in the Center result from the tasks which are required to complete the work demanded. To this end, we have developed an analytical framework which relies upon the demands for service (work volumes) by communities in projecting and allocating costs to each of the

agencies receiving service from the Tualatin Rural Fire Protection District Communication/9-1-1 Center.

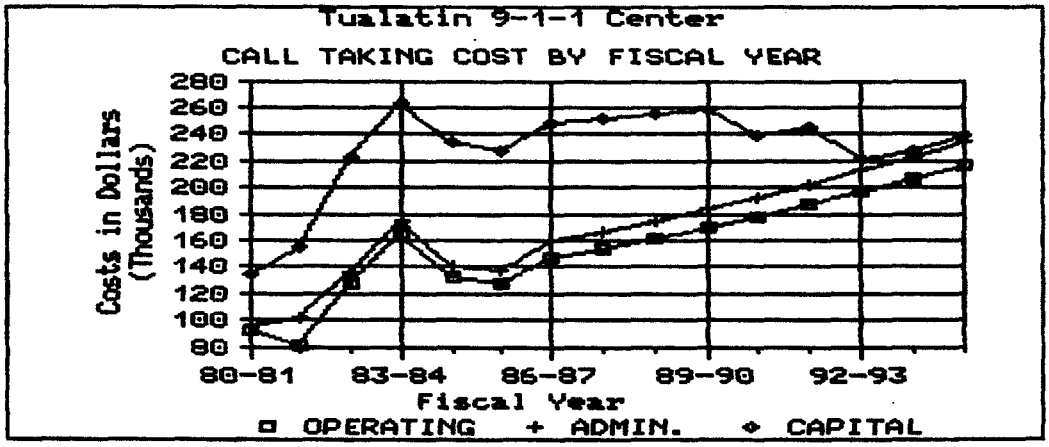
In the first part of the project, the work volumes which have occurred at the Center are reviewed, analyzed and associated with communities and participating agencies. Next, needed tasks and their time values are identified to establish a basis for separating "joint" costs into call taking and dispatching functions.

In the following section of the report, costs, resources, personnel and capital related information is gathered, analyzed and categorized. Operating expenses are separated from other costs and split into those needed for each of the Tualatin Rural Fire Protection District Communication/9-1-1 Center's functions. Capital costs receive special treatment to determine depreciation and return on equity.

"Cost-of-Service" estimates are made for the call taking functions of the Tualatin Rural Fire Protection District Communication/9-1-1 Center. Comparisons are then made between the estimated and projected cost assignments and the actual and projected receipts from the telephone excise tax.

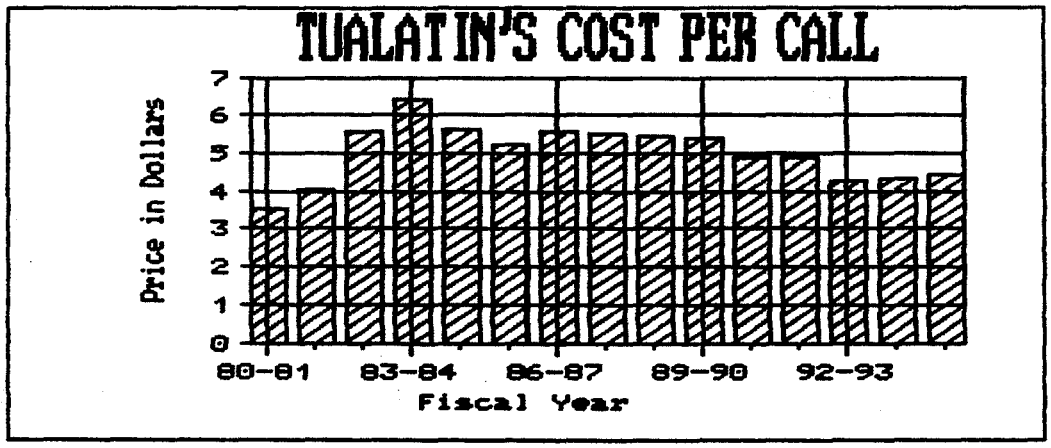
The primary conclusions of this report are:

. While the operating expenses of the Tualatin Rural Fire Protection District Communication/9-1-1 Center are

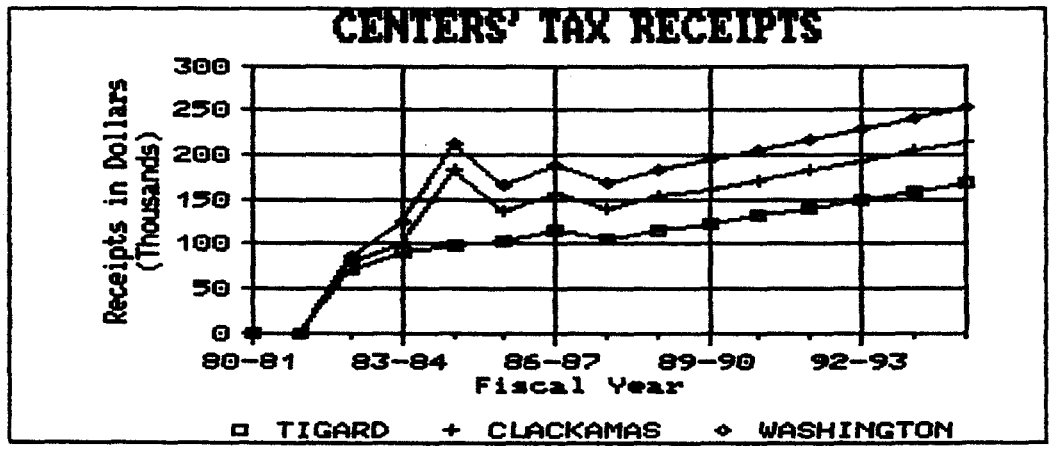


expected to increase with inflation, the total cost of providing call taking services to the participating jurisdictions is expected to remain at existing levels throughout the projection period.

- The cost per call handled by the Center initially increases. However, because of the decreasing cost of capital, the cost per call is expected to decrease throughout the projection period. By 1994-95, the cost per call will have fallen two dollars, from a high of $6.46 in 1983-84 to $4.46.




- The receipts to the participating centers from the



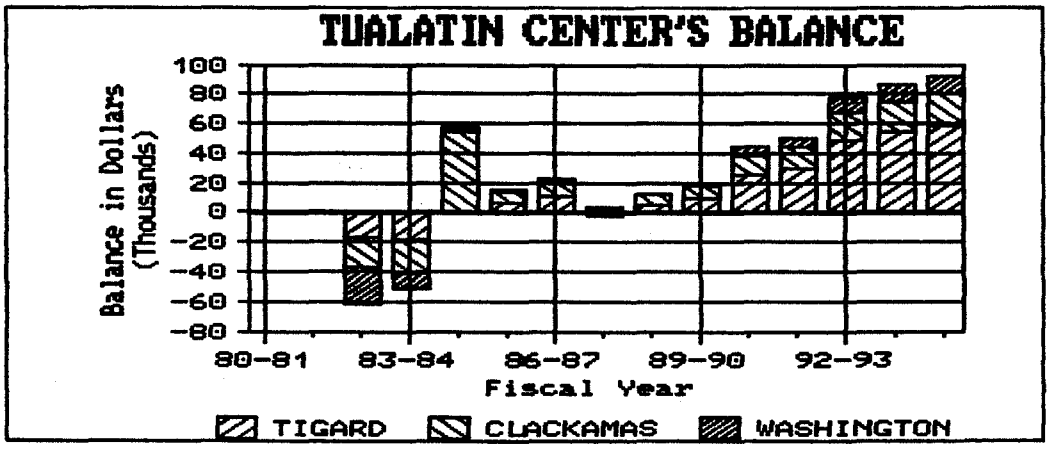
telephone excise tax are projected to increase from about one hundred seventy thousand dollars ($170,000) currently to almost two hundred and fifty thousand dollars ($250,000) by 1994-95. This projection assumes that the tax will be continued by the Oregon State Legislature beyond its current sunset of 1992.

- Charging jurisdictions for service on the basis of the telephone tax receipts collected has resulted in over and under charges.

- A more equitable means of charging for call taking service is to calculate the costs per call. Each center will then be charged for the number of calls handled.

- During the first two years of Tualatin Rural Fire Protection District Communication/9-1-1 Center operation after the telephone excise tax, the receipts from the jurisdictions were not sufficient to pay for the costs of the service provided.

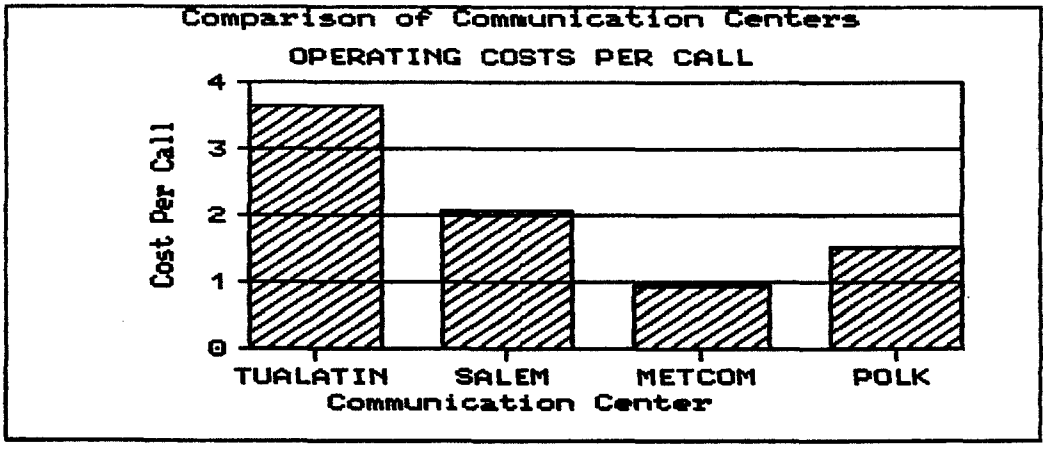
- Starting with the third year after the inception of the telephone excise tax, the Tualatin Rural Fire Protection District Communication/9-1-1 Center's actual and projected receipts exceed the estimated cost of call taking service.



- At the end of 1986-87, the prior call taking expenses and receipts were almost in balance. The Tualatin Rural Fire Protection District Communication/9-1-1 Center is estimated to have expended nineteen thousand dollars ($19,000) more than it received.

- The three communication centers receiving service from the Tualatin Rural Fire Protection District Communication/9-1-1 Center are projected to pay more than the cost of call taking service if all of the telephone excise tax receipts are contributed to the Center. In 1987-88, they are estimated to overpay the Tualatin Rural Fire Protection District Communication/9-1-1 Center by only one thousand three hundred and forty one dollars ($1,341). By 1994-95, a fifty seven percent (57%) surplus contribution will be made by the centers if the formula for contributing funds remains unchanged.

- The Oregon State Law specifically allows cities to spend less than the total telephone tax distribution on emergency telephone service. According to Section 20 (2), "moneys not then being used may be invested by a city or county."




- The costs per call of the Tualatin Rural Protection District Communication/9-1-1 Center were compared to some other centers in Oregon. On the Basis of some very cursory information, it appears the operating costs per call of the Center are higher.

Economic Resources recommends that:

- A pricing method for call taking be established by the Tualatin Rural Fire Protection District Communication/9-1-1 Center which is understood and agreed to by the purchaser of the service.

- A written contractual relationship between the Tualatin Rural Fire Protection District Communication/9-1-1 Center and the participating centers.

- Call taking prices be established each year prior to participating centers' budget preparation on the basis of then current cost of service.

- Participating centers be given the opportunity to review and comment on call taking prices prior to their adoption by the board of Tualatin Rural Fire Protection District.

- The Tualatin Rural Fire Protection District Communication/9-1-1 Center compare its costs to other centers in Oregon.

- The benefits and costs of consolidating and enhancing the communication centers in Washington County be undertaken in an effort to provide more effective and/or efficient service to residents of the County.

# EXISTING CONDITION AND METHODS

In this chapter of the report, work volumes, staffing, budgets and activities of the Tualatin Rural Fire Protection District Communication/9-1-1 Center are discussed. The information presented has been derived from a variety of sources. Much of it has been provided directly by the Center. The cooperation and openness of the Center's staff is very much appreciated. To our knowledge, the information is the best and most accurate data currently available. However, care should be taken in the sue of the information as in some cases it is derived from observations during brief periods of the year and some was derived through the application of experiences in other Oregon centers.

## TUALATIN RURAL FIRE DISTRICT OVERVIEW

The following information is intended to provide an overview of the facility, staffing, equipment design and capabilities of the Tualatin Rural Fire Protection District Communication/9-1-1 Center.

The Center provides three distinct and separate services. It serves as a primary Public Safety Answering Point (PSAP) for six (6) separate telephone central offices. These offices serve most of Southeaster Washington County and Southwestern Clackamas County. By name they are:

- Tigard,
- Stafford,
- Tualatin,
- Sherwood,
- Wilsonville, and
- Charbonneau.

There are currently fourteen (14) 9-1-1 circuits which come from the telephone central offices into the Tualatin Rural Fire Protection District Communication/9-1-1 Center's system. Law enforcement calls are transferred to the appropriate agency for screening and dispatching. Transfers are made to the following agencies:

- Washington County Dispatch (also serving Tualatin in 1986),
- Clackamas Dispatch (also serving Wilsonville and Rivergrove in 1986),
- Tigard Police Dispatch, (also serving King City and Durham in 1986),
- Lake Oswego 9-1-1 Center,

- Oregon State Police/Beaverton,
- Newberg 9-1-1 Center, and
- Other Centers and Agencies.

Fire and medical calls coming to Tualatin Rural Fire Protection District Communication/9-1-1 Center are dispatched directly by the Center. In addition, the Center dispatched police calls for the city of Sherwood in 1986.

The Tualatin Rural Fire Protection District Communication/9-1-1 Center also serves as a fire alarm office for the Fire District. This service involves dispatching fire and medical equipment for seven fire stations in a 110 square mile area.

Lastly, the Center has recently become a contract dispatch center for all the fire departments in Washington County except for the far Western portion of the County. The area includes 19 additional fire stations and approximately 225,000 citizens in about 500 square miles.

The Tualatin Rural Fire Protection District Communication/9-1-1 Center is staffed with twelve (12) positions each working 24 hour and then getting 48 hours off. For each shift, one of the positions is assigned to be Shift Supervisor. This position is responsible for shift activities and reports. According to Fire District Personnel, "one operator from each shift is dedicated to and funded by 9-1-1."

## POPULATION

The population of each of the jurisdictions served was provided by the Tualatin Rural Fire District as shown below.

At the start of the decade, the population of jurisdictions being served by the communication center currently stood at under 50,000. Because of the rapid growth in the cities, current (1987) population is just under 62,000.

TABLE 1

POPULATION OF JURISDICTIONS

| JURISDICTION | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY | 9,711 | 10,019 | 10,019 | 9,995 | 9,903 | 9,889 | 10,238 | 10,420 |
| TUALATIN | 7,483 | 8,700 | 8,700 | 9,464 | 9,752 | 10,154 | 10,364 | 10,625 |
| SHERWOOD | 2,386 | 2,425 | 2,427 | 2,554 | 2,520 | 2,595 | 2,694 | 2,880 |
| DURHAM | 707 | 700 | 700 | 700 | 680 | 685 | 720 | 785 |
| KING CITY | 1,853 | 1,860 | 1,860 | 1,860 | 1,800 | 1,800 | 1,830 | 1,965 |
| TIGARD | 14,799 | 15,500 | 16,094 | 18,004 | 18,221 | 19,111 | 20,265 | 20,782 |
| CLACKAMAS COUNTY | 8,630 | 8,657 | 8,573 | 8,664 | 8,613 | 8,694 | 8,725 | 8,857 |
| WILSONVILLE | 2,970 | 3,385 | 3,385 | 3,390 | 3,320 | 3,475 | 3,705 | 4,180 |
| RIVERGROVE | 314 | 325 | 325 | 325 | 320 | 320 | 310 | 310 |
| LAKE OSWEGO | 1,013 | 1,013 | 1,013 | 1,013 | 1,013 | 1,124 | 1,124 | 1,124 |
| | 49,866 | 52,584 | 53,096 | 55,969 | 56,142 | 57,847 | 59,975 | 61,928 |

In Table 2, the population of the jurisdictions participating in the Tualatin Rural Fire Protection District Communication/9-1-1 Center are projected. The projections were made on a trend line basis from the information provided in Table 1. The projections are, therefore, rough estimates of expected changes in the number of people served. By 1995, almost 75,000 people will be served by the Tualatin Rural Fire Protection District Communication/9-1-1 Center. It should be noted that these are only the jurisdictions which were served in 1986. Now allowances have been made to changes in service territory since that time.

The population figures shown above were obtained form the State of Oregon 9-1-1 Distribution reports for the first quarter of each year. Population figures were 1980 and 1982 are consistent with the Census of Population and the Official Population Estimates for Oregon Counties and Cities July 1, 1977-July 1, 1987 by the Center for Population Research and Census at Portland State University. Populations figures for Lake Oswego and Clackamas County were obtained from a population study conducted by Clackamas County and Portland State University in 1985 for 9-1-1 planning.

TABLE 2

POPULATION PROJECTIONS

| JURISDICTION | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY | 10,321 | 10,388 | 10,454 | 10,521 | 10,587 | 10,653 | 10,720 | 10,786 |
| TUALATIN | 11,262 | 11,678 | 12,095 | 12,511 | 12,927 | 13,343 | 13,760 | 14,176 |
| SHERWOOD | 2,836 | 2,899 | 2,961 | 3,024 | 3,087 | 3,150 | 3,212 | 3,275 |
| DURHAM | 748 | 755 | 762 | 769 | 776 | 783 | 789 | 796 |
| KING CITY | 1,874 | 1,878 | 1,883 | 1,888 | 1,892 | 1,897 | 1,902 | 1,907 |
| TIGARD | 21,868 | 22,761 | 23,653 | 24,546 | 25,439 | 26,331 | 27,224 | 28,116 |
| CLACKAMAS COUNTY | 8,800 | 8,827 | 8,853 | 8,880 | 8,907 | 8,933 | 8,960 | 8,987 |
| WILSONVILLE | 4,023 | 4,145 | 4,267 | 4,390 | 4,512 | 4,634 | 4,756 | 4,879 |
| RIVERGROVE | 321 | 319 | 318 | 316 | 315 | 313 | 312 | 310 |
| LAKE OSWEGO | 1,141 | 1,161 | 1,181 | 1,201 | 1,220 | 1,240 | 1,260 | 1,280 |
| | 63,194 | 64,811 | 66,428 | 68,044 | 69,661 | 71,278 | 72,895 | 74,512 |

## WORK VOLUME ESTIMATES AND PROJECTIONS

During the latter part of 1985, 1986 and 1987, the Tualatin Rural Fire Protection District Communication/9-1-1 Center staff has been tracking the number of phone calls coming into the center by the central telephone office from which they originate. In addition, they have recorded the PSAP to which each of the calls was transferred.

On average, during the three years the Tualatin Rural Fire Protection District Communication/9-1-1 Center received a total of almost thirty nine thousand (39,000) calls per year. The greatest proportion of the calls received were dealt with directly at the Center. The remainder (about 40%) were transferred to other agencies.

Every four (4) citizens called the center once a year on a police related matter which was transferred to another agency for dispatch. This level of demand is the same as 9-1-1 calls received and dispatched by the Salem Communication Center for police related incidents. However, there is a considerable diversity by agency in this statistic. The Washington County and Tigard PSAPs are within an acceptable range of this standard considering that they serve a more rural area than Salem. However, the Lake Oswego

experience of more than one call per person is very high and has not been explained.

TABLE 3

CALLS AND TRANSFERS

| PSAP | TELEPHONE CENTRAL OFFICE | | | | | | TOTAL | PER CAPITA |
|---|---|---|---|---|---|---|---|---|
| | TIGARD | SHERWOOD | WILSONVILLE | TUALATIN | STAFFORD | CHARBONNEAU | | |
| WASHINGTON COUNTY | 2,199 | 382 | 124 | 2,060 | 15 | 0 | 4,779 | 0.23 |
| CLACKAMAS COUNTY | 623 | 67 | 1,041 | 44 | 457 | 67 | 2,299 | 0.18 |
| LAKE OSWEGO | 882 | 0 | 2 | 18 | 651 | 0 | 1,552 | 1.38 |
| TIGARD | 4,128 | 170 | 0 | 756 | 0 | 0 | 5,054 | 0.22 |
| OREGON STATE POLICE | 501 | 45 | 307 | 131 | 21 | 0 | 1,005 | 0.02 |
| OTHER | 182 | 9 | 40 | 14 | 0 | 0 | 244 | 0.00 |
| TOTAL TRANSFERS | 8,514 | 672 | 1,514 | 3,022 | 1,144 | 67 | 14,934 | 0.25 |
| TOTAL HELD | 10,958 | 2,710 | 4,392 | 3,391 | 1,894 | 266 | 19,973 | 0.52 |
| TUALATIN | | | | | | | 3,638 | 0.06 |
| GRAND TOTAL | 19,473 | 3,382 | 5,906 | 6,413 | 3,038 | 333 | 38,545 | |

According to Tualatin Rural Fire Protection District Communication/9-1-1 Center staff, the number fire and ambulance calls during this period was 3,457 with another 181 calls handled for Sherwood police. On a per capita basis, one call was made for every sixteen (16) persons within the district. Once again this is comparable to the experience in Salem where one out of every thirteen (13) people called.

The values shown in the per capita column of Table 3 were used to make estimates of the work load of the Tualatin Rural Fire Protection District Communication/9-1-1 Center. The results are shown in Tables 4 and 5. It was assumed that the following agencies were served by the PSAPs:

- Washington County Dispatch - Washington County Sheriff,
- Clackamas Dispatch - Clackamas County Sheriff, Wilsonville and Rivergrove Police,
- Lake Oswego 9-1-1 Center - Lake Oswego Police,
- Tigard Police Dispatch- Tigard, King City, Durham and Sherwood Police,
- Oregon State Police/Beaverton - Oregon State Police, and
- Other Centers and Agencies.

TABLE 4

WORK VOLUME ESTIMATES

| COMMUNICATION CENTER | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY | 2,503 | 2,583 | 2,583 | 2,577 | 2,553 | 2,549 | 2,639 | 2,686 |
| CLACKAMAS COUNTY | 2,389 | 2,480 | 2,463 | 2,483 | 2,457 | 2,505 | 2,555 | 2,677 |
| LAKE OSWEGO | 1,554 | 1,554 | 1,554 | 1,554 | 1,554 | 1,725 | 1,725 | 1,725 |
| TIGARD | 6,703 | 7,185 | 7,332 | 8,021 | 8,117 | 8,455 | 8,831 | 9,118 |
| OREGON STATE POLICE | 929 | 979 | 989 | 1,042 | 1,046 | 1,077 | 1,117 | 1,153 |
| OTHER | 225 | 238 | 240 | 253 | 254 | 262 | 271 | 280 |
| TOTAL TRANSFERS | 14,304 | 15,019 | 15,161 | 15,930 | 15,981 | 16,573 | 17,138 | 17,639 |
| HELD CALLS | 19,131 | 20,087 | 20,276 | 21,305 | 21,374 | 22,164 | 22,921 | 23,590 |
| TUALATIN | 3,209 | 3,388 | 3,421 | 3,610 | 3,622 | 3,726 | 3,866 | 3,994 |
| GRAND TOTAL | 36,644 | 38,494 | 38,859 | 40,845 | 40,977 | 42,463 | 43,925 | 45,223 |

TABLE 5

WORK VOLUME PROJECTIONS

| COMMUNICATION CENTER | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY | 2,661 | 2,678 | 2,695 | 2,712 | 2,729 | 2,746 | 2,763 | 2,781 |
| CLACKAMAS COUNTY | 2,636 | 2,665 | 2,695 | 2,725 | 2,754 | 2,784 | 2,813 | 2,843 |
| LAKE OSWEGO | 1,751 | 1,782 | 1,812 | 1,842 | 1,873 | 1,903 | 1,934 | 1,964 |
| TIGARD | 9,500 | 9,840 | 10,181 | 10,521 | 10,862 | 11,202 | 11,543 | 11,883 |
| OREGON STATE POLICE | 1,177 | 1,207 | 1,237 | 1,267 | 1,297 | 1,327 | 1,357 | 1,388 |
| OTHER | 286 | 293 | 300 | 308 | 315 | 322 | 330 | 337 |
| TOTAL TRANSFERS | 18,010 | 18,465 | 18,920 | 19,375 | 19,830 | 20,285 | 20,740 | 21,195 |
| HELD CALLS | 24,087 | 24,695 | 25,304 | 25,912 | 26,521 | 27,130 | 27,738 | 28,347 |
| TUALATIN | 4,076 | 4,181 | 4,286 | 4,391 | 4,496 | 4,601 | 4,706 | 4,811 |
| GRAND TOTAL | 46,173 | 47,342 | 48,510 | 49,679 | 50,847 | 52,016 | 53,184 | 54,353 |

Over the fifteen year period from 1980 to 1995, the work volume of the Tualatin Rural Fire Protection District Communication/9-1-1 Center is expected to increase by almost fifty percent (50%). The most significant growth component results from the agencies served by the Tigard PSAP. The demand for communication service from this these areas is calculated to increase by almost eighty percent (80%) as a result of rapid increases in population.

## TASKS AND TIME VALUES OF DISPATCHER AND CALL TAKER POSITIONS

Tualatin Rural Fire Protection District Communication/9-1-1 Center personnel must carry out a variety of tasks when a call is received, transferred and/or dispatched. Not only do they need to answer the phone and dispatch police or fire agencies, they must make calls, monitor alarms, write reports, have conferences, operate the computer...etc.

Tasks shown in the Table 6 are the results of direct observation of people doing call taking and dispatching at METCOM Center (a communication center in the Salem, Oregon metropolitan area). Writewell Writing Services conducted this Task Performance Evaluation Project which was completed in April of 1984.

Economic Resources has since presented the results of this study to other center personnel for confirmation of the accuracy of Writewell's findings. While no other center contacted had precisely the same information, there was unanimity that the tasks and times shown in Table 6 were "reasonable" and consistent with their experience. In addition, the manager of Tualatin Rural Fire Protection District Communication/9-1-1 Center reviewed and concurred with the use of these statistics as reflective of the Center's operations.

The average amount of time required for each task is shown Table 6. For example, each computer operation requires 1.17 minutes and each report takes 1.75 minutes of an operators time.

The Metcom study went into great detail on the volume of work which is conducted by Center personnel. The amount of time and activity conducted by an individual actually at the work station was provided for each function.

TABLE 6

TASKS AND TIMES OF
CALL TAKERS AND DISPATCHERS

| TYPE OF ACTIVITY | UNIT TIME | NUMBER UNITS | TOTAL TIME |
|---|---|---|---|
| OTHER CALLS | 1.04 | 92.62 | 96.32 |
| INCIDENT CALLS | 2.00 | 33.01 | 66.02 |
| MAKE CALLS | 1.17 | 26.85 | 31.41 |
| COMPUTER OPERATION | 1.17 | 40.96 | 47.92 |
| RADIO OPERATION | 0.45 | 232.33 | 104.55 |
| ALARM MONITORING | 1.00 | 1.38 | 1.38 |
| REPORT WRITING | 1.75 | 22.92 | 40.11 |
| CONFERENCES | 3.50 | 6.54 | 22.89 |
| MISCELLANEOUS | 3.50 | 12.05 | 42.18 |
| PLUS REPORTS | 0.00 | 0.00 | 0.00 |
| | 1.02 | 468.66 | 480.00 |

Calls are separated into those which generate an incident and "other" calls. The reason for this is that incident calls generally require considerably more staff time than those which do not result in an incident. In the case of the Tualatin Rural Fire Protection District Communication/9-1-1 Center, the only incident calls are those assigned to Tualatin. These are the calls dispatched for fire or medical purposes. All other calls either do not result in dispatch (those are held and addressed directly by Center personnel) or they are transferred to other PSAPS such as the Tigard Police Communication Center.

Table 7 shows the assumptions made about activity to call relationships.

TABLE 7

UNITS PER KEY PARAMETER

| TYPE OF ACTIVITY | TOTAL CALLS | INCIDENT CALLS |
|---|---|---|
| OTHER CALLS | 1.00 | |
| INCIDENT CALLS | | 1.00 |
| MAKE CALLS | 0.21 | |
| COMPUTER OPERATION | 0.19 | 1.05 |
| RADIO OPERATION | | 7.04 |
| ALARM MONITORING | 0.01 | |
| REPORT WRITING | | 0.69 |
| CONFERENCES | 0.05 | |
| MISCELLANEOUS | 0.10 | |

For example, we could not decide whether making a call was more closely associated with an incident or another type of call. Making a call was thus associated with the total call volume (incident and other) coming into the Center. It is anticipated that approximately one (1) call will need to be made for every five (5) calls coming into the Consolidated Center. Items shown in the Incident Calls Column of Table 7 are more closely associated with an incident call than with other calls coming into the center. Thus it is expected that more than seven radio operations and more than one computer operation will be performed for every incident handled by dispatchers in the Consolidated Center.

Once again, the values and the assignment of activities to the type of call were discussed with the manager of the Tualatin Rural Fire Protection District Communication/9-1-1 Center.

To determine the number of positions by type in the Tualatin Rural Fire Protection District Communication/9-1-1 Center, each of the activities was assigned to call takers, dispatchers or administrative functions. For example, "other calls" are primarily the responsibility of call takers. Therefore, the time required for this activity was allocated to the call taker positions. Likewise, radio operations are primarily made in association with an incident. As incidents are the primary responsibility of

dispatchers, radio operations were also allocated to these positions.

Discussions have taken place with Center personnel regarding the staffing issue. One of the concerns expressed by other centers is that the dispatchers work is incident or emergency related. Furthermore, the work will not come to the center in the smooth manner. In order to address these concerns, one dispatch position has been added to each hour's work and is kept in reserve to assure the Center is able to process emergency and incident related work without interruption.

It is unreasonable to assume that every minute of each day will be filled with work for Center personnel. A forty percent (40%) factor has been built into the final call taker personnel components for "slack" time. In the case of dispatchers, the "slack" time has been incorporated into the added position assigned to this function.

Lastly for the purpose of this study, Center personnel are allowed eight (8) hours of sleep time for every twenty four (24) hours on duty. The sleep time hours are important in determining the total number of positions required by the Center. A lesser number (as suggested by some Center personnel) would not affect the distribution of costs between call taking and dispatching functions.

The results of the calculations are shown in Table 8. The distribution of work by time of day was taken from 9-1-1 call logs of the Salem Center. There is no reason to believe that emergencies would be distributed differently at Tualatin Rural Fire Protection District Communication/9-1-1 Center. Thus, at 1 o'clock in the morning (0100), 133.60 minutes of time are required to carry out all of the assigned functions and to provide for sleep and relief.

TABLE 8

TIME ALLOCATION BY FUNCTION

| HOURS | CALL TAKERS | DISPATCH | ADMIN. TIME | WITH SHIFT RELIEF | WITH SLEEP TIME |
|---|---|---|---|---|---|
| 0100 | 18.67 | 65.82 | 3.18 | 100.20 | 133.60 |
| 0200 | 15.37 | 64.80 | 2.62 | 94.62 | 126.16 |
| 0300 | 9.88 | 63.08 | 1.69 | 85.32 | 113.75 |
| 0400 | 10.43 | 63.25 | 1.78 | 86.25 | 115.00 |
| 0500 | 7.14 | 62.23 | 1.22 | 80.66 | 107.55 |
| 0600 | 4.39 | 61.37 | 0.75 | 76.01 | 101.35 |
| 0700 | 7.14 | 62.23 | 1.22 | 80.66 | 107.55 |
| 0800 | 15.37 | 64.80 | 2.62 | 94.62 | 126.16 |
| 0900 | 7.69 | 62.40 | 1.31 | 81.60 | 108.79 |
| 1000 | 20.31 | 66.34 | 3.46 | 102.99 | 137.32 |
| 1100 | 25.26 | 67.88 | 4.31 | 111.36 | 148.48 |
| 1200 | 17.57 | 65.48 | 3.00 | 98.34 | 131.12 |
| 1300 | 21.41 | 66.68 | 3.65 | 104.85 | 139.80 |
| 1400 | 31.30 | 69.76 | 5.34 | 121.60 | 162.13 |
| 1500 | 30.20 | 69.42 | 5.15 | 119.74 | 159.65 |
| 1600 | 26.35 | 68.22 | 4.49 | 113.22 | 150.97 |
| 1700 | 28.55 | 68.91 | 4.87 | 116.94 | 155.93 |
| 1800 | 26.35 | 68.22 | 4.49 | 113.22 | 150.97 |
| 1900 | 31.30 | 69.76 | 5.34 | 121.60 | 162.13 |
| 2000 | 39.53 | 72.33 | 6.74 | 135.55 | 180.73 |
| 2100 | 28.00 | 68.74 | 4.78 | 116.01 | 154.69 |
| 2200 | 24.16 | 67.54 | 4.12 | 109.50 | 146.00 |
| 2300 | 28.00 | 68.74 | 4.78 | 116.01 | 154.69 |
| 2400 | 30.75 | 69.59 | 5.24 | 120.67 | 160.89 |
| TOTAL | 505.12 | 1597.58 | 86.15 | 2501.55 | 3335.40 |

From this analysis, it would appear that twenty four percent (24%) of the time of the shift positions of the Center are dedicated to call taking with the remainder carrying out dispatching functions.

STAFFING OF THE CENTER

In Table 9 below, the Center staffing is presented

which results from the time commitments shown in Table 8. The positions shown are illustrative of the total level of staffing required for the Center given the current work volume and populations served. It is surprising how closely the estimated staffing conforms to the actual staffing which existed at the Center in 1986-87.

TABLE 9

TUALATIN COMMUNICATION CENTER POSITIONS

| | |
|---|---|
| SHIFT POSITIONS | 6.95 |
| VACATION AND SICK LEAVE | 0.96 |
| TRAINING (10%) | 0.69 |
| TURN OVER (5%) | 0.35 |
| DIRECTOR | 1.00 |
| TOTAL POSITIONS | 9.95 |

The position requirements shown in Table 9 were calculated on the following basis:

- The assumption is that out of each 2088 hours in a year for a position, actual on work time will be 1800 hours.
- Training time is estimated to take approximately ten percent of the time on shift.
- Allowances are made for a five percent (5%) Turn over in staff each year. Four positions will be needed to meet this requirement.

Thus, the Tualatin Rural Fire Protection District Communication/9-1-1 Center is estimated to be staffed with ten positions. This estimated result is consistent with the actual staffing of the Center prior to the current fiscal year.

In summary, using work volumes supplied by the staff of the Tualatin Rural Fire Protection District Communication/9-1-1 Center, task and time statistics developed from observations at the METCOM Communication Center and work load distributions from

the Salem Communication Center, Seven (7) shift positions are required to accomplish the 1986-87 work volume of the Center. The other three positions were required for training, turnover, vacation and sick leave relief and management of the Center. Just under one quarter of the shift positions work involved 9-1-1 call taking work. The remainder of the positions are required for dispatching activities.

CALLS HELD

To determine how the calls held should be distributed, Tualatin Rural Fire Protection District Communication/9-1-1 Center staff was requested to monitor the calls held for a one week period and record the purpose of the call. The following results were obtained.

TABLE 10

PURPOSE OF CALLS HELD BY CENTER

| PURPOSE | NUMBER | PERCENT |
|---|---|---|
| NO ONE ON LINE | 126 | 46.2 |
| PERSON CONFUSED | 41 | 15.0 |
| CHILDREN | 27 | 9.9 |
| GENERAL INFORMATION | 79 | 28.9 |
| TOTAL | 273 | 100.0 |

It appears that the "held" calls are not specific to any one center. They are as a result of the 9-1-1 system being available and should, therefore, be allocated to all of the users of the system on the basis of their service demands.

# HISTORICAL COST AND REVENUE ESTIMATES

In this chapter, the current costs and revenues of the Tualatin Rural Fire Protection District Communication/9-1-1 Center are analyzed to determine the appropriate per unit amounts. These are then used to estimate the historical costs and receipts of call taking by center.

## 9-1-1 OPERATING COSTS

The staff of Tualatin Rural Fire Protection District Communication/9-1-1 Center was requested to provide detailed information on the expenses incurred by the Fire District on communication services since 1980-81.

The communication operations were accounted for in two separate divisions. One was the General Fund Communication Division whose detailed expenses for each fiscal year are shown in Table 1 of the Appendix. The other was the 9-1-1 Fund of the Fire District. These expenses are shown in Table 2. Because the separation of monies was not maintained consistently since 1980-81, the operating expenses of the Communication Division and 9-1-1 Fund were combined and are shown in Table 3 of the Appendix.

The combined direct operating costs of the Tualatin Rural Fire Protection District Communication/9-1-1 Center are as follows:

TABLE 11

OPERATING EXPENSES OF THE COMMUNICATION CENTER

| FISCAL YEAR | AMOUNT |
|---|---|
| FY 80-81 | $318,858 |
| FY 81-82 | $315,753 |
| FY 82-83 | $464,628 |
| FY 83-84 | $555,740 |
| FY 84-85 | $478,572 |
| FY 85-86 | $512,941 |
| FY 86-87 | $534,130 |

To determine the amount of the Tualatin Rural Fire Protection District Communication/9-1-1 Center's operating expenses which are needed to carry out the call taking (rather than dispatching) function, the ratio of call time to total shift time required was used applied to these operating expenses. In other words, the ratio of the amount of time dedicated to each function by the

center. The ratio is 505 minutes out of every 2,102 or 24%. The one exception to the use of this ratio was for the TELEPHONES-EMERGENCY line item. This was allocated totally to the call taking function. The details of the computations are shown in Table 4 of the Appendix and are summarized in Table 12 below.

TABLE 12

CALL TAKING OPERATING EXPENSES

| FISCAL YEAR | AMOUNT |
|---|---|
| FY 80-81 | $ 92,104 |
| FY 81-82 | $ 81,527 |
| FY 82-83 | $129,191 |
| FY 83-84 | $166,152 |
| FY 84-85 | $132,544 |
| FY 85-86 | $128,695 |
| FY 86-87 | $147,399 |

COMMUNICATION RELATED CAPITAL OUTLAYS

Since 1980-81, the Fire District has expended funds for communication related equipment. The amounts expended for the equipment in the year of purchase is shown in Table 13.

TABLE 13

CAPITAL OUTLAY ITEMS

| | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| MICROWAVE SYSTEM | | | $871,548 | $33,968 | | | |
| COMPUTER SYSTEM | | $172,764 | $44,434 | $50,013 | $76,486 | $700 | $5,580 |
| 911 PHONE EQUIPMENT | $233,103 | | | | | | |
| OTHER 911 EQUIP | | | | $5,650 | $14,983 | | $26,016 |
| COMMUNICATIONS EQUIP | | $103,141 | $70,561 | $16,603 | $5,934 | $11,068 | $5,746 |
| TOTAL | $233,103 | $275,905 | $986,543 | $106,233 | $97,403 | $11,768 | $37,342 |

Thus since 1980-81, the Fire District has expended more than $1.7 million on communication related equipment. The following types of equipment are included within the items shown in Table

13.

- A Siemens SD192MX computer-controlled private exchange. It has a 192 station line capacity and 64 trunk line capacity.

- The Communication Center is equipped with plant telephone equipment, 100 button call directors (5). Currently, these are at 2/3 of their capacity.

- The radio system has the following configuration,

  - Washington County Fire Frequencies F1, F2, F3, F4 and State Fire Net with transmitters located at Mt. Road, Bald Peak and Cooper Mountain.

  - County receiver coverage on all frequencies.

  - Computer controlled tone encoder which contains all tones for Washington County fire and medical emergencies, as well as a 50 button plectron encoder at each position.

- A 20-channel Dictaphone recording system. This is a 24-hour continuous recording system for all telephone lines and all radio frequencies in the Communication Center.

- The communications Center is aided and functions totally on a computerized dispatch program. This dispatch program is part of an overall configuration of a district-wide management information system. The geographic base file of the computer is used to determine the appropriate police agency for a location given by a 9-1-1 caller. The computer aided dispatch function assigns the appropriate record keeping numbers and also keeps track of the responsible agency.

- The Fire District is totally operational with a 96 channel redundant microwave loop system. A total of 18 microwave channels are utilized for 9-1-1. This system has increased radio transmission capabilities from both Mountain Road and Bald Peak. Costs of many telephone radio and data lease lines have been eliminated through the use of the microwave system.

COMMUNICATION CENTER CAPITAL COSTS

The amounts shown above are the expenditures of the Fire District for communication related equipment. These line items do not represent the use of the equipment rather they are cash outlays. Such an accounting is adequate in most governmental operations because the commodities and services produced with the capital is either not sold or sold to people living within the same jurisdiction which bought the equipment.

However, when part of the service is sold to jurisdictions which did not directly pay for the equipment and these agencies have no ownership right to the capital, more appropriate means must be developed to recover the cost of capital. In addition to operating expenses, the owner of the capital (in this case Tualatin Rural Fire Protection District Communication/9-1-1 Center) is entitled to recover:

- Capital Depreciation Costs - This is a charge for the use of capital. In this case, it is assumed that all capital has a useful life of ten years. Thus the value of the depreciation is equal to one tenth (1/10) of the original cost of the equipment.

- Return on Equity - When capital is purchased, cash is invested in capital. This cash could be earning a return for the Fire District if it were put into financial instruments. The District is, therefore, entitled to earn a return on the equity (original cost less depreciation). In this study, we assume a seven percent (7%) rate of return on equity.

Using the above assumptions, the total cost of communication equipment in each of the years is shown in Table 14.

TABLE 14

COST OF COMMUNICATION EQUIPMENT BY YEAR

| | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| MICROWAVE SYSTEM | $0 | $0 | $87,155 | $90,552 | $90,552 | $90,552 | $90,552 |
| COMPUTER SYSTEM | $0 | $17,276 | $21,720 | $26,721 | $34,370 | $34,440 | $34,998 |
| 911 PHONE EQUIPMENT | $23,310 | $23,310 | $23,310 | $23,310 | $23,310 | $23,310 | $23,310 |
| OTHER 911 EQUIP | $0 | $0 | $0 | $565 | $2,063 | $2,063 | $4,665 |
| COMMUNICATIONS EQUIP | $0 | $10,314 | $17,370 | $19,030 | $19,624 | $20,731 | $21,305 |
| SUB-TOTAL DEPRECIATION | $23,310 | $50,901 | $149,555 | $160,178 | $169,919 | $171,096 | $174,830 |
| CAPITAL EQUITY | $209,793 | $434,797 | $1,271,785 | $1,217,840 | $1,145,324 | $985,997 | $848,509 |
| RETURN ON EQUITY | $14,685 | $30,436 | $89,025 | $85,249 | $80,173 | $69,020 | $59,396 |
| TOTAL CAPITAL COST | $37,996 | $81,337 | $238,580 | $245,427 | $250,091 | $240,115 | $234,225 |

The annual cost of communication equipment rises to approximately $240,000 in 1982-83 and then stays at approximately that level to the current time.

9-1-1 CALL TAKING RELATED CAPITAL COSTS

Only a portion of the capital costs shown in Table 14 are related to the call taking function. The following assumptions are made in allocating capital cost:

- As 18 of the 96 channels available in the microwave system are utilized for 9-1-1, the microwave costs were split on this basis.
- The computer line item includes costs for the purchase of two computers. One financial/administrative and the other for communication purposes. These computers back each other up. Computer costs were first split to isolate the communication computer. The ratio of call time to total shift time was then applied to this amount.
- All capital costs associated with equipment specifically

purchased for the 9-1-1 function are included.

- Other communication equipment was split on the basis of the number of consoles dedicated to the call taking function (1 out 5).

- Return on equity is assigned to the call taking function on the same basis as depreciation shares.

The result of these assumptions are shown below.

TABLE 15

9-1-1 PORTION OF CAPITAL COSTS

| | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| MICROWAVE | $0 | $0 | $16,342 | $16,978 | $16,978 | $16,978 | $16,978 |
| COMPUTER SYSTEM | $0 | $8,638 | $10,860 | $13,361 | $17,185 | $17,220 | $17,499 |
| 911 PHONE EQUIPMENT | $23,310 | $23,310 | $23,310 | $23,310 | $23,310 | $23,310 | $23,310 |
| OTHER 911 EQUIP | $0 | $0 | $0 | $565 | $2,063 | $2,063 | $4,665 |
| COMMUNICATIONS EQUIP | $0 | $2,063 | $3,474 | $3,806 | $3,925 | $4,146 | $4,261 |
| SUB-TOTAL DEPRECIATION | $23,310 | $34,011 | $53,986 | $58,020 | $63,462 | $63,718 | $66,713 |
| 9-1-1 SHARE OF EQUITY | $14,685 | $20,337 | $32,136 | $30,879 | $29,943 | $25,704 | $22,665 |
| 9-1-1 CAPITAL COST | $37,996 | $54,348 | $86,122 | $88,899 | $93,405 | $89,422 | $89,378 |

The call taking portion of the capital costs rise to approximately $90,000 a year and remains there for the remainder of the period.

ADMINISTRATIVE OVERHEAD COSTS

The Fire District incurs some costs for the Tualatin Rural Fire Protection District Communication/9-1-1 Center which are not included directly within their budgets. These are the costs of administering the operational units of the District. Among the costs which must be incurred are budgeting, finance, personnel administration....etc. The budgets for these activities are maintained in the Administrative Division of the General Fund.

Without a detailed analysis of the budgets and activities of

the Fire District, a common means used for allocating the administrative expenses to the components of an agency is to apply a percentage of administrative expense to total dollars spent. The activity budgets of the Fire District are shown in Table 5 of the Appendix. Overhead computations percentage computations were made using this information and are shown below in Table 16.

TABLE 16

OVERHEAD/ADMINISTRATIVE COSTS

| FISCAL YEAR | PERCENT |
|---|---|
| FY 80-81 | 4.83 |
| FY 81-82 | 25.15% |
| FY 82-83 | 6.01 |
| FY 83-84 | 5.49 |
| FY 84-85 | 7.00 |
| FY 85-86 | 7.54 |
| FY 86-87 | 8.75 |

The general overhead percentages appear to be in line with what can be expected for other units of government. However, it should be noted that there is an upward trend in the percentage of costs being allocated to this function. The amount shown in FY 81-82 is anomaly resulting from a one year change in the Fire District's accounting practices. In that year, it centralized all personnel benefit payments within the Administrative Division.

## TOTAL COST OF CALL TAKING

The various cost items noted above have been combined in Table 17 to demonstrate the total cost of call taking by fiscal year.

TABLE 17

9-1-1 TOTAL COSTS

| | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| DIRECT OPERATING | $92,104 | $81,527 | $129,191 | $166,152 | $132,544 | $128,695 | $147,399 |
| ADMINISTRATIVE | $4,451 | $20,505 | $7,769 | $9,129 | $9,283 | $9,698 | $12,903 |
| CAPITAL COSTS | $37,996 | $54,348 | $86,122 | $88,899 | $93,405 | $89,422 | $89,378 |
| TOTAL 9-1-1 COST | $134,551 | $156,380 | $223,082 | $264,181 | $235,232 | $227,816 | $249,681 |

## COST BY CENTER

The costs for call taking were allocated to the centers on the basis of the calls received by the Tualatin Rural Fire Protection District Communication/9-1-1 Center. The first step in the process of allocating the costs to the centers was to determine the cost per call. This was done by dividing call taking costs and calls in each fiscal year. The results are shown in Table 18.

TABLE 18

COSTS PER CALL

| FISCAL YEAR | COST/CALL |
|---|---|
| FY 80-81 | $3.58 |
| FY 81-82 | $4.04 |
| FY 82-83 | $5.60 |
| FY 83-84 | $6.46 |
| FY 84-85 | $5.64 |
| FY 85-86 | $5.27 |
| FY 86-87 | $5.60 |

The price per call shown in Table 18 was then applied to the

number of calls estimated to be received for each center (Table 4). The results of this computation are shown in Table 19.

TABLE 19

COST PER CENTER ONLY

| COMMUNICATION CENTER | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY | $9,108 | $10,443 | $14,441 | $16,562 | $14,384 | $13,683 | $14,915 |
| CLACKAMAS COUNTY | $8,720 | $9,994 | $13,843 | $15,949 | $13,988 | $13,342 | $14,652 |
| LAKE OSWEGO | $5,567 | $6,285 | $8,701 | $10,038 | $9,245 | $9,097 | $9,661 |
| TIGARD | $24,869 | $29,347 | $42,970 | $52,107 | $46,721 | $45,586 | $50,270 |
| OREGON STATE POLICE | $3,416 | $3,979 | $5,685 | $6,741 | $5,984 | $5,786 | $6,358 |
| OTHER | $829 | $966 | $1,380 | $1,637 | $1,453 | $1,405 | $1,544 |
| TOTAL TRANSFERS | $52,510 | $61,014 | $87,020 | $103,033 | $91,775 | $88,899 | $97,401 |
| HELD CALLS | $70,228 | $81,601 | $116,382 | $137,799 | $122,742 | $118,895 | $130,265 |
| TUALATIN | $11,813 | $13,766 | $19,680 | $23,349 | $20,715 | $20,022 | $22,015 |
| GRAND TOTAL | $134,551 | $156,380 | $223,082 | $264,181 | $235,232 | $227,816 | $249,681 |

Thus, for example, the cost of providing service for all calls transferred to the Tigard Center is estimated to be just under $25,000 in 1980-81. Because both the number and cost per call increased, by 1986-87 the direct service cost had risen to over $50,000.

The Tualatin Rural Fire Protection District Communication/9-1-1 Center holds a considerable number of calls. Most of them are "junk". The remainder are requests for information. These calls are part of a call answering system and are not specific to any one of the centers. In Table 20, the cost associated with the "held" calls are distributed to the centers on the number of calls received for each of the centers. As a result of this adjustment, the cost to the Tigard Center for the 9-1-1 call answering service has more than doubled.

TABLE 20

COST PER CENTER INCLUDING HELD CALLS

| COMMUNICATION CENTER | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY | $19,052 | $21,839 | $30,191 | $34,620 | $30,079 | $28,619 | $31,185 |
| CLACKAMAS COUNTY | $18,240 | $20,899 | $28,941 | $33,339 | $29,252 | $27,907 | $30,636 |
| LAKE OSWEGO | $11,645 | $13,144 | $18,192 | $20,982 | $19,332 | $19,027 | $20,200 |
| TIGARD | $52,021 | $61,371 | $89,839 | $108,920 | $97,699 | $95,346 | $105,108 |
| OREGON STATE POLICE | $7,146 | $8,320 | $11,885 | $14,091 | $12,514 | $12,102 | $13,294 |
| OTHER | $1,735 | $2,020 | $2,886 | $3,421 | $3,038 | $2,938 | $3,228 |
| TOTAL TRANSFERS | $109,840 | $127,593 | $181,935 | $215,374 | $191,915 | $185,939 | $203,651 |
| HELD CALLS | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| TUALATIN | $24,711 | $28,787 | $41,147 | $48,808 | $43,317 | $41,877 | $46,030 |
| GRAND TOTAL | $134,551 | $156,380 | $223,082 | $264,181 | $235,232 | $227,816 | $249,681 |

## REVENUE BY CENTER

The actual receipts to the Tualatin Rural Fire Protection District Communication/9-1-1 Center from jurisdictions currently served by the centers was used to construct Table 21.

TABLE 21

9-1-1 FUNDS BY CENTER

| CENTER | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| WASHINGTON | | | $5,280 | $24,506 | $27,415 | $29,496 | $32,918 |
| CLACKAMAS | | | $8,765 | $10,100 | $85,962 | $35,601 | $40,056 |
| TIGARD | | | $73,672 | $91,167 | $98,381 | $102,947 | $116,319 |
| TOTAL | | | $87,717 | $125,774 | $211,757 | $168,044 | $189,293 |

For example, Clackamas County, Wilsonville and Rivergrove receipts are shown in the row entitled Clackamas as these three

jurisdictions are being served by the Clackamas Center. In the same manner, the monies from Tigard, Durham, Tualatin, Sherwood, and King City are in the row called Tigard Center.

To verify our computations and for use in projections, per capita computations on Tualatin Rural Fire Protection District Communication/9-1-1 Center receipts from the centers were made and shown in Table 22.

TABLE 22

RECEIPTS PER CAPITA BY CENTER

| CENTER | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|
| WASHINGTON | $0.53 | $2.46 | $2.77 | $2.93 | $3.19 |
| CLACKAMAS | $0.71 | $0.82 | $6.95 | $2.82 | $3.07 |
| TIGARD | $2.36 | $2.78 | $2.92 | $2.93 | $3.19 |

Since 1985-86, the receipts of funds has been consistent among the centers. The Tigard and Washington centers contribute more per capita than the Clackamas Center. Clackamas County makes payment based on an intergovernmental agreement with a population figure fixed at 8,308. No provision has been made at this time to change the population figures.

BALANCE BY CENTER - THE BOTTOM LINE

To determine whether the Tualatin Rural Fire Protection District Communication/9-1-1 Center was overpaid for the services provided to the centers, the allocated estimated costs and receipts by center were subtracted from each other. The balances for the years in which the Tualatin Rural Fire Protection District Communication/9-1-1 Center was supported by contributions from the centers and not from property tax revenues are shown in Table 23.

TABLE 23

BALANCE/(OVER-EXPENDITURE) BY CENTER

| CENTER | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|
| WASHINGTON | ($24,912) | ($10,113) | ($2,664) | $877 | $1,733 |
| CLACKAMAS | ($20,177) | ($23,239) | $56,710 | $7,694 | $9,420 |
| TIGARD | ($16,167) | ($17,753) | $681 | $7,601 | $11,211 |
| TOTAL | ($61,255) | ($51,106) | $54,727 | $16,172 | $22,363 |

Because of non-payment by the Clackamas Center and payment for service less than estimated cost by the other two centers, the first two years of call taking operation resulted in significant "over-expenditures" by the Tualatin Rural Fire Protection District Communication/9-1-1 Center. The receipts were not sufficient to cover the estimated cost of providing service to the three centers.

Since 1984-85, the Tualatin Rural Fire Protection District Communication/9-1-1 Center has been receiving more monies than it costs to provide service to the three communication centers. In 1984-85 this occurred primarily because the Clackamas Center paid up its arrears. Since then, it has occurred because the receipts exceed the cost of service.

In summary, if all years over and under payments are aggregated, it appears that the Tualatin Rural Fire Protection District Communication/9-1-1 Center has been underpaid a total of $19,099.

## PROJECTED COSTS AND REVENUES

In this chapter, the costs, revenues and balances for call taking of the Tualatin Rural Fire Protection District Communication/9-1-1 Center and the participating centers are computed through 1994-95. Operating costs are inflated at a rate of five percent (5%) per year to offset the effect of inflation.

### COST PROJECTIONS

Current cost of call taking is projected in Appendix-Table 6 using a five percent (5%) rate of inflation for each year. Costs of the Tualatin Rural Fire Protection District Communication/9-1-1 Center might be understated slightly using this approach as some cost changes might occur with increases in expected work load. When 1994-95 work total work loads (including dispatching of calls) was placed into the model, the personnel requirements of the Center changed by less than one position. Thus, using only inflation adjustments is realistic in making the Centers cost projections.

Capital requirements are projected as indicated in the capital sections above. Depreciation of each capital line item was continued until the original value was entirely depleted. It was assumed that:

- No additional equipment would be needed over the projection, and
- Equipment, although depreciated, would continue to be available for use.

TABLE 24

CALL TAKING COSTS PROJECTED

| | FY 87-88 | FY 88-89 | FY 89-90 | FY 90-91 | FY 91-92 | FY 92-93 | FY 93-94 | FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| DIRECT OPERATING | $154,769 | $162,507 | $170,633 | $179,164 | $188,123 | $197,529 | $207,405 | $217,775 |
| ADMINISTRATIVE | $12,382 | $13,001 | $13,651 | $14,333 | $15,050 | $15,802 | $16,592 | $17,422 |
| CAPITAL COSTS | $84,708 | $80,038 | $75,369 | $46,862 | $43,493 | $8,421 | $4,990 | $4,638 |
| TOTAL 9-1-1 COST | $251,859 | $255,546 | $259,652 | $240,360 | $246,665 | $221,752 | $228,987 | $239,836 |

In spite of direct operating expenses rising at an estimated five percent (5%) per year over the projection period, the total cost of call taking is expected to decrease. The reason for this is that the cost of capital will fall over time as the Fire District's equity in the system decreases and expense recognition is discontinued on equipment fully depreciated.

PROJECTED COSTS BY CENTER

Once again, the total call taking cost were transformed into per unit costs and then applied to the projected work volumes by center to estimate the costs applicable to each of the participating communication centers.

TABLE 25

COSTS PER CALL

| FISCAL YEAR | COST/CALL |
|---|---|
| FY 87-88 | $5.51 |
| FY 88-89 | $5.47 |
| FY 89-90 | $5.42 |
| FY 90-91 | $4.90 |
| FY 91-92 | $4.91 |
| FY 92-93 | $4.31 |
| FY 93-94 | $4.35 |
| FY 94-95 | $4.46 |

The cost of handling a call at the Tualatin Rural Fire Protection District Communication/9-1-1 Center is expected to decrease by more than a dollar by 1994-95. The cost implications for each center are shown in Table 26. Once again, the cost for "held" calls were distributed to participating centers on the basis of their relative shares of the work load.

TABLE 26

PROJECTED COSTS BY CENTER

| COMMUNICATION CENTER | FY 87-88 | FY 88-89 | FY 89-90 | FY 90-91 | FY 91-92 | FY 92-93 | FY 93-94 | FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY | $30,803 | $30,499 | $30,426 | $27,669 | $27,909 | $24,673 | $25,067 | $25,843 |
| CLACKAMAS COUNTY | $30,604 | $30,284 | $30,354 | $27,732 | $28,100 | $24,954 | $25,464 | $26,365 |
| LAKE OSWEGO | $20,024 | $20,181 | $20,349 | $18,699 | $19,055 | $17,015 | $17,456 | $18,168 |
| TIGARD | $107,252 | $110,484 | $113,374 | $105,933 | $109,673 | $99,421 | $103,479 | $109,197 |
| OREGON STATE POLICE | $13,423 | $13,618 | $13,840 | $12,814 | $13,153 | $11,827 | $12,215 | $12,796 |
| OTHER | $3,259 | $3,306 | $3,360 | $3,111 | $3,193 | $2,871 | $2,966 | $3,107 |
| TOTAL TRANSFERS | $205,365 | $208,373 | $211,703 | $195,958 | $201,083 | $180,761 | $186,646 | $195,476 |
| HELD CALLS | $ 0 | $ 0 | $ 0 | $ 0 | $ 0 | $ 0 | $ 0 | $0 |
| TUALATIN | $46,494 | $47,174 | $47,949 | $44,402 | $45,582 | $40,991 | $42,341 | $44,360 |
| GRAND TOTAL | $251,859 | $255,546 | $259,652 | $240,360 | $246,665 | $221,752 | $228,987 | $239,836 |

Call handling costs for the Washington and Clackamas centers is expected to decrease by between fifteen and twenty percent (15%-20%). On the other hand, total call taking costs for the Tigard Center are anticipated to remain fairly constant because the increases in work volume offset the decreases in per unit costs.

PROJECTED CENTER REVENUES

Telephone tax revenues are derived from a three percent (3%) excise tax on phone charges. Section 10 to 20 of chapter 533, Oregon Laws 1981 provides:

- "There is imposed on the amount charged for exchange access services a tax equal to three percent of the amount charged."
- "This section shall apply to taxable years beginning on or after January 1, 1982, but before January 1, 1992."
- The distribution to be "to cities on a per capita basis and to counties on a per capita basis for each county's unincorporated area."

The amount of monies collected is therefore related to the charges imposed by the telephone company. As a result of the restructuring of the telephone industry, rates have risen dramatically since 1980 (about 18% per year). This trend is not expected to continue. According to sources at the telephone company, they estimate future price changes will be no more than 3% per year. After a one time adjustment in 1987-88 for downward adjustments in telephone access charges, we are projecting the following receipts per capita from the telephone excise tax.

TABLE 27

PER CAPITA EXCISE RECEIPTS BY CENTER

| COMMUNICATION CENTER | FY 87-88 | FY 88-89 | FY 89-90 | FY 90-91 | FY 91-92 | FY 92-93 | FY 93-94 | FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON | $2.79 | $2.96 | $3.05 | $3.14 | $3.23 | $3.33 | $3.43 | $3.53 |
| CLACKAMAS | $2.69 | $2.85 | $2.93 | $3.02 | $3.11 | $3.21 | $3.30 | $3.40 |
| TIGARD | $2.79 | $2.96 | $3.05 | $3.14 | $3.24 | $3.33 | $3.43 | $3.53 |

It should be noted that we have extended the excise tax receipts beyond the January 1, 1992 cut off. The reason for this is that there is a high probability that the tax will be continue in some form. If this does not happen, the local jurisdictions must find some other source of funds to offset the call taking costs. It is outside the scope of this report to devise such alternate funding sources.

Once again, the Clackamas excise fee is below that shown for the other two centers because of an imposed administrative fee by Clackamas County.

In Table 28, the telephone tax excise fees are applied to the estimated populations served by center to determine the amounts expected in each of the fiscal years.

TABLE 28

EXCISE RECEIPT PAYMENTS BY CENTER

| COMMUNICATION CENTER | FY 87-88 | FY 88-89 | FY 89-90 | FY 90-91 | FY 91-92 | FY 92-93 | FY 93-94 | FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON | $28,906 | $30,619 | $31,740 | $32,900 | $34,102 | $35,346 | $36,634 | $37,967 |
| CLACKAMAS | $35,574 | $37,660 | $39,223 | $40,845 | $42,530 | $44,279 | $46,094 | $47,979 |
| TIGARD | $105,520 | $116,290 | $123,996 | $132,061 | $140,497 | $149,321 | $158,548 | $168,194 |
| TOTAL | $170,000 | $184,569 | $194,959 | $205,806 | $217,129 | $228,945 | $241,275 | $254,139 |

PROJECTED BALANCE BY CENTER-THE BOTTOM LINE

To determine whether the telephone excise fee receipts are sufficient to pay for the cost of call taking in the future, the balances (receipts less costs) were calculated for each of the centers. The results are shown in Table 29.

TABLE 29

PROJECTED BALANCE/(OVER-EXPENDITURE) BY CENTER

| COMMUNICATION CENTER | FY 87-88 | FY 88-89 | FY 89-90 | FY 90-91 | FY 91-92 | FY 92-93 | FY 93-94 | FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON | ($1,897) | $120 | $1,314 | $5,232 | $6,193 | $10,673 | $11,567 | $12,124 |
| CLACKAMAS | $4,970 | $7,376 | $8,868 | $13,113 | $14,430 | $19,325 | $20,631 | $21,614 |
| TIGARD | ($1,732) | $5,806 | $10,622 | $26,128 | $30,824 | $49,900 | $55,068 | $58,997 |
| TOTAL | $1,341 | $13,302 | $20,805 | $44,473 | $51,446 | $79,897 | $87,266 | $92,734 |

The three communication centers receiving service from the Tualatin Rural Fire Protection District Communication/9-1-1 Center are projected to pay more than the cost of call taking service if all of the telephone excise tax receipts are used to pay for this service. In 1987-88, they are estimated to overpay the Tualatin Rural Fire Protection District Communication/9-1-1 Center only slightly more. By 1994-95, a fifty seven percent (57%) surplus contribution will be made by the centers if the formula for contributing funds remains unchanged.

PROJECTED BALANCE BY JURISDICTION

To assess the impact of a change in pricing on the jurisdictions being served by the participating centers, population and calls are projected in Appendix Tables 7 and 8. These values were then applied to the telephone tax receipts per capita and the cost per call. The results are shown in Table 30.

The accumulated balance of telephone tax receipts between 1982-83 and 1994-95 would be more than eight hundred thousand dollars ($800,000) after payment of the cost of call taking. It is important to emphasize that the amounts below refer only to the portion of the population served by the Tualatin Rural Fire Protection District Communication/9-1-1 Center.

what happened to the overage on receipts

TABLE 30
PROJECTED FINANCIAL VALUES BY JURISDICTION

| | FY 87-88 | FY 88-89 | FY 89-90 | FY 90-91 | FY 91-92 | FY 92-93 | FY 93-94 | FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY | | | | | | | | |
| RECEIPTS | $28,906 | $30,619 | $31,740 | $32,900 | $34,102 | $35,346 | $36,634 | $37,967 |
| COSTS | $30,803 | $30,499 | $30,426 | $27,669 | $27,909 | $24,673 | $25,067 | $25,843 |
| BALANCE | ($1,897) | $120 | $1,314 | $5,232 | $6,193 | $10,673 | $11,567 | $12,124 |
| TUALATIN | | | | | | | | |
| RECEIPTS | $30,539 | $33,959 | $36,247 | $38,641 | $41,147 | $43,769 | $46,510 | $49,377 |
| COSTS | $31,041 | $32,263 | $33,142 | $30,996 | $32,120 | $29,142 | $30,356 | $32,057 |
| BALANCE | ($501) | $1,695 | $3,105 | $7,645 | $9,027 | $14,626 | $16,154 | $17,320 |
| SHERWOOD | | | | | | | | |
| RECEIPTS | $7,975 | $8,488 | $8,934 | $9,400 | $9,885 | $10,390 | $10,918 | $11,467 X |
| COSTS | $8,106 | $8,065 | $8,169 | $7,540 | $7,716 | $6,918 | $7,126 | $7,445 X |
| BALANCE | ($131) | $424 | $765 | $1,860 | $2,169 | $3,472 | $3,792 | $4,022 |
| DURHAM | | | | | | | | |
| RECEIPTS | $2,139 | $2,225 | $2,312 | $2,404 | $2,498 | $2,596 | $2,698 | $2,803 |
| COSTS | $2,174 | $2,114 | $2,114 | $1,928 | $1,950 | $1,729 | $1,761 | $1,820 |
| BALANCE | ($35) | $111 | $198 | $476 | $548 | $868 | $937 | $983 |
| KING CITY | | | | | | | | |
| RECEIPTS | $5,356 | $5,554 | $5,735 | $5,922 | $6,115 | $6,314 | $6,519 | $6,731 |
| COSTS | $5,444 | $5,277 | $5,244 | $4,750 | $4,773 | $4,204 | $4,255 | $4,370 |
| BALANCE | ($88) | $277 | $491 | $1,172 | $1,342 | $2,110 | $2,264 | $2,361 |
| TIGARD | | | | | | | | |
| RECEIPTS | $59,510 | $66,064 | $70,768 | $75,694 | $80,852 | $86,252 | $91,903 | $97,815 |
| COSTS | $60,487 | $62,766 | $64,705 | $60,718 | $63,114 | $57,429 | $59,982 | $63,505 |
| BALANCE | ($977) | $3,298 | $6,063 | $14,976 | $17,738 | $28,824 | $31,921 | $34,310 |
| CLACKAMAS CTY | | | | | | | | |
| RECEIPTS | $23,711 | $25,112 | $25,944 | $26,803 | $27,690 | $28,606 | $29,552 | $30,530 |
| COSTS | $20,399 | $20,194 | $20,078 | $18,198 | $18,295 | $16,121 | $16,325 | $16,777 |
| BALANCE | $3,312 | $4,918 | $5,866 | $8,605 | $9,395 | $12,485 | $13,227 | $13,753 |
| WILSONVILLE | | | | | | | | |
| RECEIPTS | $11,016 | $11,637 | $12,345 | $13,085 | $13,858 | $14,666 | $15,510 | $16,391 |
| COSTS | $9,477 | $9,358 | $9,554 | $8,884 | $9,156 | $8,265 | $8,568 | $9,007 |
| BALANCE | $1,539 | $2,279 | $2,791 | $4,201 | $4,702 | $6,401 | $6,942 | $7,384 |
| RIVERGROVE | | | | | | | | |
| RECEIPTS | $847 | $911 | $934 | $958 | $982 | $1,007 | $1,032 | $1,058 |
| COSTS | $728 | $733 | $723 | $650 | $649 | $567 | $570 | $582 |
| BALANCE | $118 | $178 | $211 | $308 | $333 | $439 | $462 | $477 |
| TOTAL | $1,341 | $13,302 | $20,805 | $44,473 | $51,446 | $79,897 | $87,266 | $92,734 |

# APPENDIX

APPENDIX-TABLE 1
EXPENDITURES FOR COMMUNICATIONS DIVISION- GENERAL FUND

| | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| COMMUNICATIONS SPECIALIST | $159,250 | $128,877 | $141,323 | $231,952 | $229,197 | $235,510 | $167,851 |
| RESOURCE SPECIALIST | | | | $0 | $0 | $0 | $0 |
| COMMUNICATIONS OFFICER | $0 | $28,557 | $22,326 | $29,786 | $33,672 | $32,695 | $14,842 |
| ELECTRONICS TECH | | $0 | $26,439 | $27,180 | $0 | $32,520 | $31,018 |
| COMM. SHIFT SUPERVISOR | | | | $0 | $0 | $0 | $2,833 |
| OVERTIME & CALLBACK | $4,883 | | $16,693 | $34,630 | $31,162 | $43,442 | $41,652 |
| SOCIAL SECURITY | $14,208 | | $12,175 | $22,189 | $22,606 | $24,718 | $18,245 |
| WORKMAN'S COMP | $1,108 | | $1,416 | $6,226 | $9,046 | $0 | $0 |
| UNEMPLOYMENT COMPENSATION | $280 | | | $4,728 | $2,825 | $0 | $0 |
| RETIREMENT | $31,771 | | $31,792 | $45,952 | $46,816 | $48,443 | $33,161 |
| HEALTH/LIFE/DISABILITY IN | $13,420 | | $22,311 | $30,722 | $25,796 | $25,233 | $15,310 |
| PHYSICALS | $526 | | $724 | | $182 | | |
| GENERAL MATERIALS & SERVICES | | | | | | | $0 |
| OFFICE SUPPLIES | | | $2,414 | $3,923 | $355 | $5 | $752 |
| STATION SUPPLIES | | | | $139 | $104 | $55 | $259 |
| PHOTO SUPPLIES | | | | | $35 | $45 | $17 |
| GAS & OIL AUTOS | | | $919 | | | | |
| MAPPING PROJECT | | | | | $0 | $8,575 | $2,423 |
| FOOD | | | | | $45 | $0 | |
| R&M STATION EQUIPMENT | | | $48 | | $0 | $32 | |
| R&M COMMUNICATIONS EQUIP. | $10,705 | $24,153 | $22,791 | $61,460 | ($2,023) | $13,157 | $16,692 |
| CONTRACT DSPATCH SERVICES | | | | | $0 | $3,147 | $2,322 |
| R&M STATIONS | | | | $938 | $123 | $508 | |
| R&M STATION EQUIPMENT | $75 | | $188 | $257 | $24 | $82 | $184 |
| PROFESSIONAL SERVICES | | | | | $0 | $116 | $4,055 |
| UNIFORMS | $1,236 | | $404 | $859 | $300 | $289 | |
| PHYSICALS | | | | $1,116 | $1,197 | $1,597 | $1,390 |
| TELEPHONES-BUSINESS | $8,865 | $10,556 | $11,476 | $12,885 | $13,427 | $30,757 | $13,547 |
| TELEPHONES-EMERGENCY | $20,153 | $7,561 | $23,175 | $38,397 | $0 | $7,355 | $3,044 |
| ELECTRICITY-MICROWAVE | | | | | | | |
| SOFTWARE | $1,429 | $3,413 | $2,438 | | | | |
| TRAVEL | $1,834 | | $185 | $1,292 | $258 | $898 | $915 |
| CONFERENCE EXPENSES | | | $23 | $131 | $1,790 | $619 | $295 |
| LIVING EXPENSES | $1,362 | | $651 | $775 | $1,868 | $1,298 | $1,115 |
| DUES & SUBSCRIPTIONS | $184 | | $211 | $203 | $236 | $75 | $125 |
| TUITION | $613 | | $115 | $0 | $609 | $1,583 | $1,689 |
| MICROWAVE EQUIPMENT | | $43,251 | $67,195 | | | | |
| TELEPHONE EQUIPMENT- LEASE | | | | | | | |
| AUTOMOTIVE EQUIPMENT | | | $5,543 | | | | |
| COMMUNICATIONS EQUIP | | $103,141 | $70,561 | $16,603 | $5,934 | $11,068 | $5,746 |
| TOTAL | $271,902 | $349,509 | $483,536 | $572,343 | $425,585 | $523,822 | $379,481 |

APPENDIX-TABLE 2
EXPENDITURES COMMUNICATIONS- 911 FUND

| | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| WAGES & FRINGES | $46.956 | $96,409 | $121,273 | | | | |
| COMMUNICATIONS SPECIALISTS | | | | | | | $85,951 |
| RESOURCE SPECIALIST | | | | | | | |
| COMMUNICATIONS OFFICER | | | | | | | $1,649 |
| ELECTRONICS TECH | | | | | $24,172 | | $3,446 |
| COMM. SHFT SUPERVISOR | | | | | | | $1,417 |
| OVERTIME & CALLBACK | | | | | | | $14,786 |
| SOCIAL SECURITY | | | | | | | $7,639 |
| WORKMAN'S COMP | | | | | | | |
| UNEMPLOYMENT COMPENSATION | | | | | | | |
| RETIREMENT | | | | | | | $14,155 |
| HEALTH/LIFE/DISABILITY INSURANCE | | | | | | | $7,655 |
| PHYSICALS | | | | | | | |
| GENERAL MATERIALS & SERVICES | | $16,227 | $3,118 | | | | |
| OFFICE SUPPLIES | | | | | | | |
| STATION SUPPLIES | | | | | | | |
| PHOTO SUPPLIES | | | | | | | |
| GAS & OIL AUTOS | | | | | | | |
| MAPPING PROJECT | | | | | | | |
| FOOD | | | | | $26 | | |
| R&M STATION EQUIPMENT | | | | | | | |
| R&M COMMUNICATIONS EQUIPMENT | | | | | $14,111 | | $1,467 |
| CONTRACT DSPATCH SERVICES | | | | | | | |
| R&M STATIONS | | | | | | | |
| R&M STATION EQUIPMENT | | | | | | | |
| PROFESSIONAL SERVICES | | | | | | | |
| UNIFORMS | | | | | | | |
| PHYSICALS | | | | | | | |
| TELEPHONES-BUSINESS | | | | | | | |
| TELEPHONES-EMERGENCY | | | | | $20,425 | | $22,230 |
| ELECTRICITY-MICROWAVE | | | | | $187 | $187 | |
| SOFTWARE | | | | | | | |
| TRAVEL | | | | | | | |
| CONFERENCE EXPENSES | | | | | | | |
| LIVING EXPENSES | | | | | | | |
| DUES & SUBSCRIPTIONS | | | | | | | |
| TUITION | | | | | | | |
| MICROWAVE EQUIPMENT | | | | | | | |
| TELEPHONE EQUIPMENT-LEASE | $82,037 | $75,458 | $75,608 | | | | |
| AUTOMOTIVE EQUIPMENT | | | | | | | |
| COMMUNICATIONS EQUIP | $29,519 | $285 | | $6,404 | $23,187 | | $24,500 |
| TOTAL | $158,512 | $188,379 | $199,999 | $6,404 | $82,108 | $187 | $184,894 |

APPENDIX-TABLE 3
OPERATING EXPENDITURES COMBINED GENERAL FUND AND 911 FUND

| | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| WAGES & FRINGES | $46,956 | $96,409 | $121,273 | $0 | $0 | $0 | $0 |
| COMMUNICATIONS SPECIALIST | $159,250 | $128,877 | $141,323 | $231,952 | $229,197 | $235,510 | $253,802 |
| RESOURCE SPECIALIST | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| COMMUNICATIONS OFFICER | $0 | $28,557 | $22,326 | $29,786 | $33,672 | $32,695 | $16,491 |
| ELECTRONICS TECH | $0 | $0 | $26,439 | $27,180 | $24,172 | $32,520 | $34,464 |
| COMM. SHFT SUPERVISOR | $0 | $0 | $0 | $0 | $0 | $0 | $4,250 |
| OVERTIME & CALLBACK | $4,883 | $0 | $16,693 | $34,630 | $31,162 | $43,442 | $56,439 |
| SOCIAL SECURITY | $14,208 | $0 | $12,175 | $22,189 | $22,606 | $24,718 | $25,884 |
| WORKMAN'S COMP | $1,108 | $0 | $1,416 | $6,226 | $9,046 | $0 | $0 |
| UNEMPLOYMENT COMPENSATION | $280 | $0 | $0 | $4,728 | $2,825 | $0 | $0 |
| RETIREMENT | $31,771 | $0 | $31,792 | $45,952 | $46,816 | $48,443 | $47,317 |
| HEALTH/LIFE/DISABILITY | $13,420 | $0 | $22,311 | $30,722 | $25,796 | $25,233 | $22,964 |
| PHYSICALS | $526 | $0 | $724 | $0 | $182 | $0 | $0 |
| GEN. MATERIAL & SERVICES | $0 | $16,227 | $3,118 | $0 | $0 | $0 | $0 |
| OFFICE SUPPLIES | $0 | $0 | $2,414 | $3,923 | $355 | $5 | $752 |
| STATION SUPPLIES | $0 | $0 | $0 | $139 | $104 | $55 | $259 |
| PHOTO SUPPLIES | $0 | $0 | $0 | $0 | $35 | $45 | $17 |
| GAS & OIL AUTOS | $0 | $0 | $919 | $0 | $0 | $0 | $0 |
| MAPPING PROJECT | $0 | $0 | $0 | $0 | $0 | $8,575 | $2,423 |
| FOOD | $0 | $0 | $0 | $0 | $71 | $0 | $0 |
| R&M STATION EQUIPMENT | $0 | $0 | $48 | $0 | $0 | $32 | $0 |
| R&M COMMUNICATIONS EQUIP. | $10,705 | $24,153 | $22,791 | $61,460 | $12,088 | $13,157 | $18,158 |
| CONTRACT DSPATCH SERVICES | $0 | $0 | $0 | $0 | $0 | $3,147 | $2,322 |
| R&M STATIONS | $0 | $0 | $0 | $938 | $123 | $508 | $0 |
| R&M STATION EQUIPMENT | $75 | $0 | $188 | $257 | $24 | $82 | $184 |
| PROFESSIONAL SERVICES | $0 | $0 | $0 | $0 | $0 | $116 | $4,055 |
| UNIFORMS | $1,236 | $0 | $404 | $859 | $300 | $289 | $0 |
| PHYSICALS | $0 | $0 | $0 | $1,116 | $1,197 | $1,597 | $1,390 |
| TELEPHONES-BUSINESS | $8,865 | $10,556 | $11,476 | $12,885 | $13,427 | $30,757 | $13,547 |
| TELEPHONES-EMERGENCY | $20,153 | $7,561 | $23,175 | $38,397 | $20,425 | $7,355 | $25,273 |
| ELECTRICITY - MICROWAVE | $0 | $0 | $0 | $0 | $187 | $187 | $0 |
| SOFTWARE | $1,429 | $3,413 | $2,438 | $0 | $0 | $0 | $0 |
| TRAVEL | $1,834 | $0 | $185 | $1,292 | $258 | $898 | $915 |
| CONFERENCE EXPENSES | $0 | $0 | $23 | $131 | $1,790 | $619 | $295 |
| LIVING EXPENSES | $1,362 | $0 | $651 | $775 | $1,868 | $1,298 | $1,115 |
| DUES & SUBSCRIPTIONS | $184 | $0 | $211 | $203 | $236 | $75 | $125 |
| TUITION | $613 | $0 | $115 | $0 | $609 | $1,583 | $1,689 |
| MICROWAVE EQUIPMENT | | | | | | | |
| TELEPHONE EQUIPMENT - LEASE | | | | | | | |
| AUTOMOTIVE EQUIPMENT | | | | | | | |
| COMMUNICATIONS EQUIP | | | | | | | |
| GRAND TOTAL | $318,858 | $315,753 | $464,628 | $555,740 | $478,572 | $512,941 | $534,130 |

APPENDIX-TABLE 4
9-1-1 OPERATING COSTS

| | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| WAGES & FRINGES | $11,269 | $23,138 | $29,106 | $0 | $0 | $0 | $0 |
| COMMUNICATIONS SPECIALIST | $38,220 | $30,930 | $33,918 | $55,668 | $55,007 | $56,522 | $60,912 |
| RESOURCE SPECIALIST | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| COMMUNICATIONS OFFICER | $0 | $6,854 | $5,358 | $7,149 | $8,081 | $7,847 | $3,958 |
| ELECTRONICS TECH | $0 | $0 | $6,345 | $6,523 | $5,801 | $7,805 | $8,271 |
| COMM. SHIFT SUPERVISOR | $0 | $0 | $0 | $0 | $0 | $0 | $1,020 |
| OVERTIME & CALLBACK | $1,172 | $0 | $4,006 | $8,311 | $7,479 | $10,426 | $13,545 |
| SOCIAL SECURITY | $3,410 | $0 | $2,922 | $5,325 | $5,425 | $5,932 | $6,212 |
| WORKMAN'S COMP | $266 | $0 | $340 | $1,494 | $2,171 | $0 | $0 |
| UNEMPLOYMENT COMPENSATION | $280 | $0 | $0 | $4,728 | $2,825 | $0 | $0 |
| RETIREMENT | $7,625 | $0 | $7,630 | $11,028 | $11,236 | $11,626 | $11,356 |
| HEALTH/LIFE/DISABILITY | $3,221 | $0 | $5,355 | $7,373 | $6,191 | $6,056 | $5,511 |
| PHYSICALS | $175 | $0 | $241 | $0 | $61 | $0 | $0 |
| PERSONAL SERVICES | $65,638 | $60,922 | $95,221 | $107,601 | $104,278 | $106,215 | $110,786 |
| GEN. MATERIAL & SERVICES | $0 | $3,894 | $748 | $0 | $0 | $0 | $0 |
| OFFICE SUPPLIES | $0 | $0 | $579 | $941 | $85 | $1 | $180 |
| STATION SUPPLIES | $0 | $0 | $0 | $33 | $25 | $13 | $62 |
| PHOTO SUPPLIES | $0 | $0 | $0 | $0 | $8 | $11 | $4 |
| GAS & OIL AUTOS | $0 | $0 | $221 | $0 | $0 | $0 | $0 |
| MAPPING PROJECT | $0 | $0 | $0 | $0 | $0 | $2,058 | $581 |
| FOOD | $0 | $0 | $0 | $0 | $17 | $0 | $0 |
| R&M STATION EQUIPMENT | $0 | $0 | $12 | $0 | $0 | $8 | $0 |
| R&M COMMUNICATIONS EQUIP. | $2,569 | $5,797 | $5,470 | $14,750 | $2,901 | $3,158 | $4,358 |
| CONTRACT DSPATCH SERVICES | $0 | $0 | $0 | $0 | $0 | $755 | $557 |
| R&M STATIONS | $0 | $0 | $0 | $225 | $29 | $122 | $0 |
| R&M STATION EQUIPMENT | $18 | $0 | $45 | $62 | $6 | $20 | $44 |
| PROFESSIONAL SERVICES | $0 | $0 | $0 | $0 | $0 | $28 | $973 |
| UNIFORMS | $297 | $0 | $97 | $206 | $72 | $69 | $0 |
| PHYSICALS | $0 | $0 | $0 | $268 | $287 | $383 | $334 |
| TELEPHONES-BUSINESS | $2,128 | $2,533 | $2,754 | $3,092 | $3,222 | $7,382 | $3,251 |
| TELEPHONES-EMERGENCY | $20,153 | $7,561 | $23,175 | $38,397 | $20,425 | $7,355 | $25,273 |
| ELECTRICITY - MICROWAVE | $0 | $0 | $0 | $0 | $45 | $45 | $0 |
| SOFTWARE | $343 | $819 | $585 | $0 | $0 | $0 | $0 |
| TRAVEL | $440 | $0 | $44 | $310 | $62 | $216 | $220 |
| CONFERENCE EXPENSES | $0 | $0 | $6 | $31 | $430 | $149 | $71 |
| LIVING EXPENSES | $327 | $0 | $156 | $186 | $448 | $312 | $268 |
| DUES & SUBSCRIPTIONS | $44 | $0 | $51 | $49 | $57 | $18 | $30 |
| TUITION | $147 | $0 | $28 | $0 | $146 | $380 | $405 |
| MATERIAL & SERVICES | $26,466 | $20,605 | $33,970 | $58,552 | $28,267 | $22,481 | $36,613 |
| GRAND TOTAL | $92,104 | $81,527 | $129,191 | $166,152 | $132,544 | $128,695 | $147,399 |

APPENDIX-TABLE 5

TOTAL EXPENDITURES ALL DIVISIONS (EXCLUDED ARE INTERFUND TRANSFERS)

| | FY 80-81 | FY 81-82 | FY 82-83 | FY 83-84 | FY 84-85 | FY 85-86 | FY 86-87 |
|---|---|---|---|---|---|---|---|
| ADMIN | $268,454 | $1,345,761 | $382,218 | $303,383 | $488,479 | $510,344 | $618,728 |
| OPERATIONS | $2,518,781 | $1,989,389 | $2,607,579 | $3,320,543 | $3,912,760 | $4,257,619 | $4,454,785 |
| FIRE PREVENTION | $286,767 | $228,112 | $368,459 | $391,464 | $519,343 | $497,689 | $489,150 |
| COMMUNICATIONS | $271,902 | $349,509 | $483,536 | $572,343 | $425,540 | $523,822 | $379,481 |
| TRAINING | $127,083 | $87,958 | $176,656 | $188,860 | $155,099 | $169,871 | $234,078 |
| EMS | $486,341 | $432,068 | $680,031 | $101,234 | $109,941 | $94,790 | $67,245 |
| SUPPORT SVCS | $431,969 | $340,822 | $440,843 | $472,617 | $693,992 | $546,069 | $478,270 |
| TOTAL GEN FUND | $4,391,297 | $4,773,619 | $5,139,322 | $5,350,446 | $6,305,154 | $6,600,206 | $6,721,738 |
| CAP PROJECTS FUND | $839,577 | $217,886 | $850,857 | | | | |
| UNEMP & SICK RESERVE | $0 | $0 | $0 | $0 | $0 | $1,709 | $3,636 |
| BONDED DEBT FUND | $165,470 | $168,270 | $166,053 | $164,596 | $168,296 | $166,603 | |
| 911 FUND | $158,512 | $188,379 | $199,999 | $6,404 | $82,108 | $0 | $184,894 |
| FIRST AID FUND | $334 | $0 | $0 | | $0 | $0 | |
| FIRE & LIFE SAFETY | $0 | $34 | $0 | | $0 | $0 | |
| BOX ALARM FUND | $0 | $2,500 | $0 | | $0 | $0 | |
| PROPERTY RESERVE | $0 | $0 | $0 | $0 | $0 | $3,660 | $109,779 |
| COMMUNICATION EQUIP. | $0 | $0 | $0 | $0 | $0 | $0 | $31,243 |
| COMPUTER EQUIPMENT | $0 | $0 | $0 | $0 | $0 | $0 | $16,608 |
| APPARATUS RESERVE | $0 | $0 | $0 | $0 | $419,059 | $0 | $0 |
| TOTAL ALL FUNDS | $5,555,190 | $5,350,688 | $6,356,231 | $5,521,446 | $6,974,617 | $6,772,178 | $7,067,898 |
| ADMINISTRATIVE % | 4.83% | 25.15% | 6.01% | 5.49% | 7.00% | 7.54% | 8.75% |

APPENDIX-TABLE 6
DETAILED COST PROJECTIONS

| | FY 87-88 | FY 88-89 | FY 89-90 | FY 90-91 | FY 91-92 | FY 92-93 | FY 93-94 | FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| WAGES & FRINGES | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| COMMUNICATIONS SPEC. | $63,958 | $67,156 | $70,514 | $74,039 | $77,741 | $81,629 | $85,710 | $89,995 |
| RESOURCE SPECIALIST | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| COMMUNICATIONS OFF. | $4,156 | $4,363 | $4,582 | $4,811 | $5,051 | $5,304 | $5,569 | $5,847 |
| ELECTRONICS TECH | $8,685 | $9,119 | $9,575 | $10,054 | $10,557 | $11,084 | $11,639 | $12,221 |
| COMM. SHFT SUPER. | $1,071 | $1,125 | $1,181 | $1,240 | $1,302 | $1,367 | $1,435 | $1,507 |
| OVERTIME & CALLBACK | $14,223 | $14,934 | $15,680 | $16,464 | $17,288 | $18,152 | $19,060 | $20,013 |
| SOCIAL SECURITY | $6,523 | $6,849 | $7,191 | $7,551 | $7,928 | $8,325 | $8,741 | $9,178 |
| WORKMAN'S COMP | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| UNEMPLOYMENT COMP. | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| RETIREMENT | $11,924 | $12,520 | $13,146 | $13,803 | $14,493 | $15,218 | $15,979 | $16,778 |
| HEALTH/LIFE/DIS.INS. | $5,787 | $6,076 | $6,380 | $6,699 | $7,034 | $7,386 | $7,755 | $8,143 |
| PHYSICALS | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| GENERAL M & S | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| OFFICE SUPPLIES | $190 | $199 | $209 | $219 | $230 | $242 | $254 | $267 |
| STATION SUPPLIES | $65 | $68 | $72 | $75 | $79 | $83 | $87 | $92 |
| PHOTO SUPPLIES | $4 | $5 | $5 | $5 | $5 | $6 | $6 | $6 |
| GAS & OIL AUTOS | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAPPING PROJECT | $611 | $641 | $673 | $707 | $742 | $779 | $818 | $859 |
| FOOD | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| R&M STATION EQUIP. | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| R&M COM. EQUIP. | $4,576 | $4,805 | $5,045 | $5,297 | $5,562 | $5,840 | $6,132 | $6,439 |
| CON. DSPTCH SERV. | $585 | $614 | $645 | $677 | $711 | $747 | $784 | $823 |
| R&M STATIONS | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| R&M STATION EQUIP. | $46 | $49 | $51 | $54 | $56 | $59 | $62 | $65 |
| PROFESSIONAL SERVICE | $1,022 | $1,073 | $1,127 | $1,183 | $1,242 | $1,304 | $1,369 | $1,438 |
| UNIFORMS | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| PHYSICALS | $350 | $368 | $386 | $406 | $426 | $447 | $469 | $493 |
| TELEPHONES-BUSINESS | $3,414 | $3,585 | $3,764 | $3,952 | $4,150 | $4,357 | $4,575 | $4,804 |
| TELEPHONES-EMERGENCY | $26,537 | $27,864 | $29,257 | $30,720 | $32,256 | $33,869 | $35,562 | $37,340 |
| ELECTRICITY-MICRO. | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| SOFTWARE | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| TRAVEL | $231 | $242 | $254 | $267 | $280 | $294 | $309 | $324 |
| CONFERENCE EXPENSES | $74 | $78 | $82 | $86 | $90 | $95 | $100 | $105 |
| LIVING EXPENSES | $281 | $295 | $310 | $325 | $342 | $359 | $377 | $395 |
| DUES & SUBSCRIPTIONS | $32 | $33 | $35 | $36 | $38 | $40 | $42 | $44 |
| TUITION | $426 | $447 | $469 | $493 | $517 | $543 | $570 | $599 |
| DIRECT OPERATING | $154,769 | $162,507 | $170,633 | $179,164 | $188,123 | $197,529 | $207,405 | $217,775 |
| ADMINISTRATIVE | $12,382 | $13,001 | $13,651 | $14,333 | $15,050 | $15,802 | $16,592 | $17,422 |
| CAPITAL COSTS | $84,708 | $80,038 | $75,369 | $46,862 | $43,493 | $8,421 | $4,990 | $4,638 |
| TOTAL 9-1-1 COST | $251,859 | $255,546 | $259,652 | $240,360 | $246,665 | $221,752 | $228,987 | $239,836 |

APPENDIX-TABLE 7

POPULATION PROJECTIONS BY JURISDICTION

| | FY 87-88 | FY 88-89 | FY 89-90 | FY 90-91 | FY 91-92 | FY 92-93 | FY 93-94 | FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY CENTER | | | | | | | | |
| WASHINGTON COUNTY | 10,371 | 10,355 | 10,421 | 10,487 | 10,554 | 10,620 | 10,687 | 10,753 |
| TIGARD CENTER | | | | | | | | |
| TUALATIN | 10,944 | 11,470 | 11,887 | 12,303 | 12,719 | 13,135 | 13,552 | 13,968 |
| SHERWOOD | 2,858 | 2,867 | 2,930 | 2,993 | 3,055 | 3,118 | 3,181 | 3,244 |
| DURHAM | 766 | 751 | 758 | 765 | 772 | 779 | 786 | 793 |
| KING CITY | 1,919 | 1,876 | 1,881 | 1,885 | 1,890 | 1,895 | 1,900 | 1,904 |
| TIGARD | 21,325 | 22,315 | 23,207 | 24,100 | 24,992 | 25,885 | 26,777 | 27,670 |
| CLACKAMAS COUNTY CENTER | | | | | | | | |
| CLACKAMAS CTY | 8,828 | 8,813 | 8,840 | 8,867 | 8,893 | 8,920 | 8,947 | 8,973 |
| WILSONVILLE | 4,101 | 4,084 | 4,206 | 4,329 | 4,451 | 4,573 | 4,695 | 4,818 |
| RIVERGROVE | 315 | 320 | 318 | 317 | 315 | 314 | 312 | 311 |
| OTHERS | | | | | | | | |
| LAKE OSWEGO | 1,133 | 1,151 | 1,171 | 1,191 | 1,211 | 1,230 | 1,250 | 1,270 |
| TOTAL | 62,561 | 64,002 | 65,619 | 67,236 | 68,853 | 70,470 | 72,087 | 73,703 |

APPENDIX-TABLE 8

CALL RESPONSIBILITY BY JURISDICTION

| | FY 87-88 | FY 88-89 | FY 89-90 | FY 90-91 | FY 91-92 | FY 92-93 | FY 93-94 | FY 94-95 |
|---|---|---|---|---|---|---|---|---|
| WASHINGTON COUNTY CENTER | | | | | | | | |
| WASHINGTON COUNTY | 5,589 | 5,580 | 5,616 | 5,651 | 5,687 | 5,723 | 5,758 | 5,794 |
| TIGARD CENTER | | | | | | | | |
| TUALATIN | 5,632 | 5,903 | 6,117 | 6,331 | 6,545 | 6,759 | 6,973 | 7,187 |
| SHERWOOD | 1,471 | 1,476 | 1,508 | 1,540 | 1,572 | 1,605 | 1,637 | 1,669 |
| DURHAM | 394 | 387 | 390 | 394 | 397 | 401 | 404 | 408 |
| KING CITY | 988 | 966 | 968 | 970 | 973 | 975 | 977 | 980 |
| TIGARD | 10,975 | 11,484 | 11,943 | 12,402 | 12,861 | 13,320 | 13,778 | 14,237 |
| CLACKAMAS COUNTY CENTER | | | | | | | | |
| CLACKAMAS CTY | 3,701 | 3,695 | 3,706 | 3,717 | 3,728 | 3,739 | 3,750 | 3,761 |
| WILSONVILLE | 1,720 | 1,712 | 1,763 | 1,815 | 1,866 | 1,917 | 1,968 | 2,019 |
| RIVERGROVE | 132 | 134 | 133 | 133 | 132 | 132 | 131 | 130 |
| OTHERS | | | | | | | | |
| LAKE OSWEGO | 3,633 | 3,693 | 3,756 | 3,819 | 3,883 | 3,946 | 4,010 | 4,073 |
| OSP | 2,436 | 2,492 | 2,554 | 2,617 | 2,680 | 2,743 | 2,806 | 2,869 |
| OTHERS | 591 | 605 | 620 | 635 | 651 | 666 | 681 | 696 |
| TRFD | 8,436 | 8,631 | 8,850 | 9,069 | 9,288 | 9,507 | 9,726 | 9,945 |
| TOTAL | 45,698 | 46,757 | 47,926 | 49,094 | 50,263 | 51,431 | 52,600 | 53,768 |