An Analysis of the Stroud Emergency Service Provider in Lincoln County, Oklahoma

Oklahoma Cooperative Extension Service,
Oklahoma State University

Oklahoma State Department of Health,
Office of Rural Health & EMS Division

August 1999
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RURAL DEVELOPMENT
COOPERATIVE EXTENSION SERVICE
OKLAHOMA STATE UNIVERSITY

August 1999
The Stroud Emergency Medical Service (EMS) provider currently services the residents of Stroud and the surrounding rural area. Due to the tornado in May 1999, Stroud lost their hospital and subsequently, the hospital management group, Integris. In order to continue to provide uninterrupted emergency medical service, the City of Stroud has taken over the service and the employees have been placed on the City of Stroud payroll. Due to these drastic changes in the EMS service and due to the increasing costs of providing emergency medical services, the officials of the City of Stroud are seeking more efficient ways of providing EMS and/or additional sources of revenue.

The overall purpose of this study is to provide those officials with information about alternative EMS systems and revenues in order to continue to provide quality EMS services to the residents. More specifically, the study will:

1. Review the number of EMS calls by call category for the Stroud EMS service for 1997 and 1998;
2. Estimate costs of alternative delivery systems; and
3. Project revenue from alternative sources.

No recommendations will be made.
Stroud EMS Runs by Category and Estimated Mileage

The City of Stroud has been dealing with so many unexpected emergency situations, that due to the time and funding constraints, a formal analysis of EMS runs has not been done. A summary of the number of runs by category for 1997 and 1998 is available in Table 1. For 1997, the Stroud EMS serviced a total of 338 calls. These were classified as 74 emergency calls, 219 non-emergency calls, and 45 cancelled calls. For 1998, Stroud EMS serviced a total of 425 calls. These were categorized as 20 calls that were pre-hospital emergencies and 10 calls that were interfacility emergencies (hospital interfacility only). There were an additional 257 pre-hospital non-emergency calls and 138 interfacility non-emergency calls (again, hospital interfacility only).

The number of loaded miles for 1998 was available from the Stroud EMS service and totaled 9,434 miles. The total mileage for the Stroud EMS system for 1998 has been estimated to be 19,340 miles.

Estimated Costs of Funding Alternative Delivery Systems

Two funding alternatives for the Stroud EMS service will be presented for the Stroud EMS decision makers to consider. The first alternative (Alternative 1) shows the EMS system as a basic EMS service. The second alternative (Alternative 2) shows the EMS system as an advanced life support EMS service. A third alternative (Alternative 3) is left blank for the convenience of the decision makers to add another budget alternative, if desired. These alternatives are not recommendations but rather an analysis of different methods for funding the Stroud EMS system in Lincoln County.
### Table 1
Stroud Emergency Medical Service
Runs by General Category, 1997 and 1998

<table>
<thead>
<tr>
<th></th>
<th>1997 Runs</th>
<th></th>
<th>1998 Runs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency</td>
<td></td>
<td></td>
<td>Pre-Hospital Emergency</td>
<td>20</td>
</tr>
<tr>
<td>Non-Emergency</td>
<td></td>
<td>219</td>
<td>Pre-Hospital Non-Emergency</td>
<td>257</td>
</tr>
<tr>
<td>Cancelled</td>
<td></td>
<td>45</td>
<td>Interfacility Emergency</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>338</td>
<td>Interfacility Non-Emergency</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>425</td>
</tr>
</tbody>
</table>
Capital and operating budgets are developed based on information derived from Sloggett et al. (1988) [1] and information derived from Kleinholz et al. (1990) [2]. Capital and operating costs are based on the average known replacement or operating costs. All cost data have been updated and used with the methodology in these studies. Annual capital costs are defined as the annual depreciation of the capital equipment (ambulance, radios, equipment, buildings, etc.). These annual capital costs are important since they act as a **sinking fund** to replace worn capital items and are needed to purchase additional capital items in the future. Annual operating costs are the day-to-day expenses of operating the EMS system (salaries, benefits, fuel, oil, maintenance, supplies, insurance, etc.).

**Alternative 1 - Basic Stroud EMS System**

The first funding alternative (**Alternative 1**) is based on providing basic EMS coverage, 24 hours/day, 365 days per year. **Table 2** shows the estimated capital costs for **Alternative 1**. The system has two ambulance vehicles, one Type II vehicle and one Type III vehicle. The approximate cost for a Type II vehicle is $50,000 and for a Type III vehicle, $70,000. Both vehicles are equipped with vehicle radios, for a cost of $2,000. Oxygen sets are available, at a cost of $700 each for three, totaling $2,100. Two cellular phones are available for the EMT-Basics or Intermediates to utilize for communications, for a total of $500. Pagers or portable radios may be needed for the backup on-call crew to utilize; however, telephones can also be utilized. The total capital costs of the current system are approximately $124,600.
<table>
<thead>
<tr>
<th>Capital Items</th>
<th>Alternative 1</th>
<th></th>
<th></th>
<th>Alternative 2</th>
<th></th>
<th></th>
<th>Alternative 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unit Cost</td>
<td>No.</td>
<td>Capital Costs</td>
<td>Unit Cost</td>
<td>No.</td>
<td>Capital Costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type II Vehicles</td>
<td>50,000</td>
<td>1</td>
<td>$50,000</td>
<td>50,000</td>
<td>1</td>
<td>$50,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type III Vehicles</td>
<td>70,000</td>
<td>1</td>
<td>70,000</td>
<td>70,000</td>
<td>1</td>
<td>70,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALSE</td>
<td>25,000</td>
<td>0</td>
<td>0</td>
<td>25,000</td>
<td>2</td>
<td>50,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Radios</td>
<td>1,000</td>
<td>2</td>
<td>2,000</td>
<td>1,000</td>
<td>2</td>
<td>2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen Sets</td>
<td>700</td>
<td>3</td>
<td>2,100</td>
<td>700</td>
<td>3</td>
<td>2,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Phones</td>
<td>250</td>
<td>2</td>
<td>500</td>
<td>250</td>
<td>2</td>
<td>500</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Capital Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$124,600</strong></td>
<td></td>
<td></td>
<td><strong>$174,600</strong></td>
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</tbody>
</table>
A sinking fund or capital equipment replacement fund is necessary to provide for the long-term needs of an EMS system. For the Alternative 1 system, the annual capital costs (or annual replacement costs) are shown in Table 3. According to [1], ambulance vehicles are depreciated based on 75,000 miles or seven years, whichever comes first. The annual depreciation cost for the ambulance vehicles is based on annual total miles of 19,340, which averages 9,670 miles per vehicle per year (19,340/2 = 9,670). With 9,670 miles per vehicle per year and a maximum recommended mileage per vehicle of 75,000 OR seven years, the vehicle turnover rate will be 7 years (75,000/9,670 = 7.76 OR 7 years). For the Type II vehicle the depreciation is $7,143 ($50,000/7 = $7,143) and for the Type III vehicle the depreciation is $10,000 ($70,000/7 = $10,000). The radios, oxygen sets, and portable radios are all depreciated over five years, resulting in an annual replacement cost of $400, $420, and $100, respectively. The estimated total annual capital costs for the basic Stroud EMS system (Alternative 1) are $18,063.

The estimated annual operating costs for Alternative 1 are shown in Table 4. The City of Stroud provides (at no cost) the EMS service with a storage facility for the ambulance vehicles. The EMS service is currently operating from the Stroud Police Department and, therefore, no expenses are incurred for an EMS facility. The only utility cost the service pays is the telephone, estimated at $200 per month, for an annual cost of $2,400. The vehicle expenses include gasoline costs of $2,418, maintenance, repairs, and inspections of $2,925, and vehicle insurance of $4,200. Gasoline is based on total miles driven of 19,340 and based on an average of 8 miles per gallon, for a total of 2,418 gallons of gasoline (19,340/8 = 2,418). Gasoline is estimated at a cost of $1 per gallon for a total estimated cost of $2,418. Gasoline may be obtained at a lower cost from local government
Table 3  
Stroud Emergency Medical Services  
Estimated Annual Capital Costs

<table>
<thead>
<tr>
<th>Capital Items</th>
<th>Alternative 1</th>
<th></th>
<th>Alternative 2</th>
<th></th>
<th>Alternative 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Annual</td>
<td>Yrs.</td>
<td>Annual</td>
<td>Yrs.</td>
<td>Annual</td>
<td>Yrs.</td>
</tr>
<tr>
<td></td>
<td>Costs</td>
<td>Costs</td>
<td>Costs</td>
<td>Costs</td>
<td>Costs</td>
<td>Costs</td>
</tr>
<tr>
<td>Type II Vehicle</td>
<td>7</td>
<td>$7,143</td>
<td>7</td>
<td>$7,143</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type III Vehicles</td>
<td>7</td>
<td>10,000</td>
<td>7</td>
<td>10,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALSE</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>5,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radios</td>
<td>5</td>
<td>400</td>
<td>5</td>
<td>400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen Sets</td>
<td>5</td>
<td>420</td>
<td>5</td>
<td>420</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cellular Phones</td>
<td>5</td>
<td>100</td>
<td>5</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Estimated</td>
<td></td>
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<td></td>
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<tr>
<td>Annual Capital Costs</td>
<td></td>
<td>$18,063</td>
<td></td>
<td></td>
<td>$23,063</td>
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</table>
Table 4
Stroud Emergency Medical Service
Estimated Annual Operating Costs

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Alternative 1</th>
<th></th>
<th>Alternative 2</th>
<th></th>
<th>Alternative 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unit Cost</td>
<td>Annual Costs</td>
<td>Unit Cost</td>
<td>Annual Costs</td>
<td>Unit Cost</td>
<td>Annual Costs</td>
</tr>
<tr>
<td>Telephone</td>
<td>200</td>
<td>2,400</td>
<td>$200</td>
<td>2,400</td>
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<tr>
<td>Vehicle Expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>$1.00</td>
<td>2,418</td>
<td>$1.00</td>
<td>2,418</td>
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<tr>
<td>Maint./Repairs/Insp.</td>
<td></td>
<td>2,925</td>
<td></td>
<td>2,925</td>
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<tr>
<td>Insurance</td>
<td>$2,100</td>
<td>4,200</td>
<td>$2,100</td>
<td>4,200</td>
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<tr>
<td>Billing Expense</td>
<td>$2.50</td>
<td>1,063</td>
<td>$2.50</td>
<td>1,063</td>
<td></td>
<td></td>
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<tr>
<td>Vehicle Radios</td>
<td>$60</td>
<td>120</td>
<td>$60</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cellular Phones</td>
<td>40</td>
<td>80</td>
<td>$40</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Licensing Expense</td>
<td></td>
<td>520</td>
<td></td>
<td></td>
<td>980</td>
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<tr>
<td>Medical Supply Exp.</td>
<td></td>
<td>1,543</td>
<td></td>
<td></td>
<td>1,543</td>
<td></td>
</tr>
<tr>
<td>Labor Costs</td>
<td></td>
<td>167,979</td>
<td></td>
<td></td>
<td>184,233</td>
<td></td>
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<tr>
<td>Office Supply Exp.</td>
<td>25</td>
<td>300</td>
<td>25</td>
<td>300</td>
<td></td>
<td></td>
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<tr>
<td>Training Expense</td>
<td>150</td>
<td>1,800</td>
<td>300</td>
<td>12</td>
<td>3,600</td>
<td></td>
</tr>
<tr>
<td>Wrkrs. Comp./Ins./Benefits</td>
<td>25%</td>
<td>39,995</td>
<td>25%</td>
<td></td>
<td>43,865</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2,500</td>
<td></td>
<td></td>
<td></td>
<td>5,000</td>
<td></td>
</tr>
<tr>
<td>Total Annual Operating Costs</td>
<td></td>
<td>$227,842</td>
<td></td>
<td></td>
<td>$252,726</td>
<td></td>
</tr>
<tr>
<td>Total Annual Capital &amp; Operating Costs</td>
<td>$245,905</td>
<td></td>
<td>$275,789</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost Per Call</td>
<td></td>
<td>$579</td>
<td></td>
<td>$649</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
officials if local arrangements can be made. Maintenance and repair expenses include tires, oil, filters, and lubrications, vehicle licensing, and all other maintenance and repairs on the vehicle. Insurance expense is estimated at a cost of $2,100 per vehicle. Insurance may be acquired at a lower cost by checking with appropriate insurance carriers or by contacting the Director, EMS Division, Oklahoma State Department of Health, at (405) 271-4027.

The billing expenses are estimated at $2.50 per call, for a total cost of $1,063 per year. Maintenance for vehicle radios is calculated at $60 per year for a total of $120 for two vehicle radios and maintenance for the cellular phones is calculated at $40 per year for a total of $80 for two cellular phones. Licensing expenses are estimated to be $520 per year. The medical supply expenses are estimated to be $1,543 annually. This is based on a cost of $2.50 per call for all 425 calls ($1,063) and a cost of $16.00 per call for emergency calls of 30 ($480), for a combined total of $1,543.

The labor costs are detailed in Table 5 for Alternative 1. An EMS Administrator is employed full-time at an annual salary of $24,960. Overtime for the EMS Administrator is estimated to be $1,872 per year. The EMS Administrator is responsible for the administration of the service, as well as functioning as a crew member during the 8-hour day shift. One full-time crew is budgeted with one on-call backup crew for Alternative 1.

The first crew consists of two EMT-Basics or Intermediates working 24 hours per day, 365 days per year. The EMS Administrator works 40 hours per week as a crew member, usually Monday through Friday from 8 am - 4 pm. The average wage paid for an EMT-Basic or Intermediate is estimated to be $7.25. One EMT-Basic or Intermediate would be working 24 hours per day for a total cost of $63,510; the other crew member would be working 16 hours per day (the EMS Administrator is working the other 8 hours) for a total
Table 5
Alternative 1
Based on the Stroud EMS system, 24 hour Basic Service, with 1 crew per 12 hour shift (2 EMT-Basics or Intermediates) and a second on-call crew per 24 hour shift (2 EMT-Basics or Intermediates)

<table>
<thead>
<tr>
<th>FTE's</th>
<th>Description</th>
<th>Labor Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Administration (and daytime EMT-Intermediate crew member)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>EMS Administrator (Full-Time, $12/hr., 40 hrs./wk, 52 wks./yr.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 x $12.00 x 40 x 52</td>
<td>$24,960</td>
</tr>
<tr>
<td></td>
<td>Overtime (2 hrs./wk., $18/hr. [Time &amp; Half], 52 wks./yr.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 x $18.00 x 52</td>
<td>$1,872</td>
</tr>
<tr>
<td></td>
<td>Crew 1</td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>1 - EMT-Basic or Intermediate ($7.25/hr. x 24 hrs./day x 365 days/yr.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 x $7.25 x 24 x 365</td>
<td>$63,510</td>
</tr>
<tr>
<td>2.8</td>
<td>1 - EMT-Basic or Intermediate ($7.25/hr. x 16 hrs./day x 365 days/yr.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 x $7.25 x 16 x 365</td>
<td>$42,340</td>
</tr>
<tr>
<td>0.4</td>
<td>1 - EMT-Basic or Intermediate ($7.25/hr. x 16 hrs./weekend x 52 weekends)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 x $7.25 x 16 x 52</td>
<td>$6,032</td>
</tr>
<tr>
<td></td>
<td>Crew 2 (Backup On-Call)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 - EMT-Basic or Intermediate ($25/shift x 1 shift/day x 365 days/yr.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 x $25.00 x 1 x 365</td>
<td>$18,250</td>
</tr>
<tr>
<td></td>
<td>Crew 2 (Pay for Actual Call-Ins)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 - EMT-Basic or Intermediate ($7.25/ hr., 2 hrs./ call, 2 calls/wk. x 52 wks./yr.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 x $7.25 x 4 x 52</td>
<td>$3,016</td>
</tr>
<tr>
<td>8.4</td>
<td>TOTAL BASE SALARIES</td>
<td>$159,980</td>
</tr>
<tr>
<td></td>
<td>Overtime Pay (Estimated at 5% of base salaries)</td>
<td>$7,999</td>
</tr>
<tr>
<td></td>
<td>TOTAL BASE SALARIES AND OVERTIME</td>
<td>$167,979</td>
</tr>
<tr>
<td></td>
<td>BENEFITS (25% of base salaries)</td>
<td>$39,995</td>
</tr>
<tr>
<td></td>
<td>TOTAL LABOR COSTS FOR ALTERNATIVE 1</td>
<td>$207,974</td>
</tr>
</tbody>
</table>
cost of $42,340. On the weekends, when the EMS Administrator is not working, another 16 hours per week of EMT-Basic or Intermediate personnel time would be needed, for an estimated cost of $6,032.

The second crew would be the backup on-call crew. For each 24 hour period, on-call pay of $25 per person for two EMT-Basics or EMT-Intermediates would total $18,250. When the second crew is actually called in, an hourly wage of $7.25 per hour would be paid. It is estimated that this would occur for 2 calls/week, approximately 2 hours/call, for a total cost of $3,016 in hourly wages.

The total base salaries for Alternative 1 are estimated to total $159,980. Overtime pay for the EMTs is estimated at 5% of base salaries, for a total of $7,999. The cost of base salaries and overtime totals $167,979 (shown in Table 4, 4th column, Labor Costs). The benefits are calculated at 25% of total base salaries for a total of $39,995 (shown in Table 4, 4th column, Workers Compensation/Insurance/Benefits). The total labor costs and benefits for Alternative 1 are $207,974.

Returning to Table 4, the office supply expense is estimated to be $300. Training expenses are estimated at $1,800 and miscellaneous expenses are estimated at $2,500. The total annual operating expenses for Alternative 1 are estimated at $227,842. With the annual capital expenses of $18,063 from Table 3, this brings the total of annual capital and operating expenses to $245,905. The cost per call for Alternative 1 is approximately $579 per call.


**Alternative 2 - Advanced Life Support Stroud EMS System**

The second funding option (**Alternative 2**) would provide paramedic service, 24 hours a day, seven days a week. Only those items that are different from **Alternative 1** will be discussed. In **Table 2** the capital equipment items for **Alternative 2** are estimated in the seventh column. The only difference is the addition of the advanced life support equipment for the two ambulance vehicles. This will cost an additional estimated $25,000 per vehicle, for a total of $50,000. The advanced life support equipment includes rear radio control, cardiac monitor and defibrillator, and heart lung resuscitator. The total capital costs for **Alternative 2** would be $174,600 (**Table 2**).

The annual capital costs (replacement costs) would subsequently increase (**Table 3**). The ALSE is estimated to depreciate over a ten-year period, for an annual replacement cost of $5,000. The total annual capital costs for **Alternative 2** are estimated to be $23,063 (**Table 3**, fifth column).

The annual operating costs for **Alternative 2** are shown in the seventh column of **Table 4**. Again, only those items that differ from **Alternative 1** will be discussed. The licensing expense for the advanced life support system will increase to $980.

The labor costs have increased and are explained in detail in **Table 6**. Crew 1 now includes one EMT-Paramedic and one EMT-Basic or Intermediate on duty for 24 hours per day to provide Advanced Life Support (Paramedic) coverage round the clock, 24 hours per day every day of the year. The EMT-Basic or Intermediate for 24 hours per day remains the same. Having an EMT-Paramedic crew member for 16 hours per day (the EMS Administrator is a Paramedic crew member the other 8 hours per day) increases costs.
Table 6
Alternative 2
Based on the Stroud EMS system, 24 hour Advanced Life Support Service, with 1 crew/12 hour shift (1 EMT-Paramedic and 1 EMT-Basic or Intermediate) and 1 backup on-call crew/24 hour shift (1 EMT-Paramedic and 1 EMT-Basic or Intermediate)

<table>
<thead>
<tr>
<th>FTE's</th>
<th>Description</th>
<th>Labor Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Administration (and daytime EMT-Paramedic crew member)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>EMS Administrator (Full-Time, $12/hr., 40 hrs./wk, 52 wks./yr.)</td>
<td>1 x $12.00 x 40 x 52 $24,960</td>
</tr>
<tr>
<td></td>
<td>Overtime (2 hrs./wk., $18/hr. [Time &amp; Half], 52 wks./yr.)</td>
<td>2 x $18.00 x 52 $1,872</td>
</tr>
<tr>
<td></td>
<td>Crew 1</td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>1 - EMT-Basic or Intermediate ($7.25/hr. x 24 hrs./day x 365 days/yr.)</td>
<td>1 x $7.25 x 24 x 365 $63,510</td>
</tr>
<tr>
<td>2.8</td>
<td>1 - EMT-Paramedic ($9.50/hr. x 16 hrs./day x 365 days/yr.)</td>
<td>1 x $9.50 x 16 x 365 $55,480</td>
</tr>
<tr>
<td>0.4</td>
<td>1 - EMT-Paramedic ($9.50/hr. x 16 hrs./weekend x 52 weekends)</td>
<td>1 x $9.50 x 16 x 52 $7,904</td>
</tr>
<tr>
<td></td>
<td>Crew 2 (Backup On-Call)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 - EMTs (1 Paramedic &amp; 1-Basic or Int. ($25/shift x 365 days)</td>
<td>2 x $25.00 x 1 x 365 $18,250</td>
</tr>
<tr>
<td></td>
<td>Crew 2 (Pay for Actual Call-Ins)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 - EMT-Paramedic ($9.50/hr., 2 hrs./call, 2 calls/wk., 52 wks./yr.)</td>
<td>1 x $9.50 x 4 x 52 $1,976</td>
</tr>
<tr>
<td></td>
<td>1 - EMT-Basic or Intermediate ($7.25/hr., 2 hrs./call, 2/wk., 52 wks./yr.)</td>
<td>1 x $7.25 x 4 52 $1,508</td>
</tr>
<tr>
<td>8.4</td>
<td>TOTAL BASE SALARIES</td>
<td>$175,460</td>
</tr>
<tr>
<td></td>
<td>Overtime Pay (Estimated at 5% of base salaries)</td>
<td>$8,773</td>
</tr>
<tr>
<td></td>
<td>TOTAL BASE SALARIES AND OVERTIME</td>
<td>$184,233</td>
</tr>
<tr>
<td></td>
<td>BENEFITS (25% of base salaries)</td>
<td>$43,865</td>
</tr>
<tr>
<td></td>
<td>TOTAL LABOR COSTS FOR ALTERNATIVE 1</td>
<td>$228,098</td>
</tr>
</tbody>
</table>
to $55,480, with an hourly wage of $9.50 per hour. The weekend Paramedic (available 16
hours per weekend to replace the EMS Administrator) increases the costs to $7,904.

The second or backup on-call crew cost remains the same for the $25 per day call
pay. The pay for actual call-ins will increase with the addition of an EMT-Paramedic to the
crew; the EMT-Paramedic cost will be $1,976 and the EMT-Basic or Intermediate cost will
be $1,508.

The total base salaries for Alternative 2 are $175,460. Overtime pay is calculated
based on 5% of the base salaries, for an annual total of $8,773. The total of base salaries and
overtime is $184,233 (shown in Table 4, seventh column, as Labor Costs). The benefits are
based on 25% of the base salaries for an annual total of $43,865 (shown in Table 4, seventh
column, as Workers Compensation/Insurance/Benefits. The total labor costs for Alternative
2 are $228,098.

Returning to Table 4, the seventh column continues with the annual operating costs
for Alternative 2. The training expenses have increased to $3,600 and the miscellaneous
expenses have increased to $5,000. The miscellaneous category is to assist with covering
any unexpected expenses. The total annual operating costs for Alternative 2 are $252,726.
With total annual capital costs of $23,063, the total annual capital and operating costs for
Alternative 2 are $275,789. This results in an estimated cost per call of $649 for
Alternative 2.

Alternative 3 - Blank
Blank columns are available in Tables 2, 3, and 4 for the local decision makers to
build their own funding alternative.
An Analysis of Alternative Revenue Sources

Decision makers for the Stroud EMS service have several ways to raise revenues. Some of these ways, like community fund-raisers, are commendable but not reliable. More reliable sources are user fees, third party reimbursement, fee collected on local utility bill, sales taxes, subscription/membership fees, and special taxation districts.

User fees are generally charged for EMS services; however, these fees generally do not cover costs and have not kept up with EMS costs and inflation. Thus, they are often supplemented with other forms of revenues. For this study, user fees, mileage fees, fee collected on local utility bill, millage levies from formation of a special taxation district, and sales tax revenues are presented. Tables 7, 8, 9, and 10 illustrate these methodologies.

Table 7 shows the revenues possible for user fees with alternative collection rates. Base rates for ambulance user fees, starting at $400, and continuing with $400, $450, $500, $525, $550, $600, $650, $700, $750, and ending with $800, are shown. These are shown based on emergency calls and non-emergency calls, so that an EMS service could charge different rates for these two types of calls. Table 7 illustrates the user fees for the Stroud EMS service with 425 total calls, of which 30 are emergency and 395 are non-emergency.

Mileage charges (Table 8) are shown for $4.00 per mile, $4.50 per mile, $5.00 per mile, $5.50 per mile, and $6.00 per mile for one-way (loaded) miles. For Stroud, loaded miles are approximately 48% of the total miles, for a total of 9,434 loaded miles. Calculations are shown on how much revenue could be generated if 50, 60, 70, 80, or 90 percent of the total fees were collected.
Table 7
Stroud Emergency Medical Service
Estimated Revenues - User Fee Per Call

<table>
<thead>
<tr>
<th>Total Calls</th>
<th>425</th>
<th>Total Miles</th>
<th>19,340</th>
<th>Non-Emergency</th>
<th>395</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loaded Miles</td>
<td>9,434</td>
<td>Total Calls</td>
<td>425</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EMERGENCY CALLS**

<table>
<thead>
<tr>
<th>Estimated User Fee Per Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>$400</td>
</tr>
</tbody>
</table>

| Emergency Calls | 30 | $12,000 | $13,500 | $15,000 | $15,750 | $16,500 | $18,000 | $19,500 | $21,000 | $22,500 | $24,000 |
| 90% Collections | 90% | $10,800 | $12,150 | $13,500 | $14,175 | $14,850 | $16,200 | $17,550 | $18,900 | $20,250 | $21,600 |
| 80% Collections | 80% | 9,600 | 10,800 | 12,000 | 12,600 | 13,200 | 14,400 | 15,600 | 16,800 | 18,000 | 19,200 |
| 70% Collections | 70% | 8,400 | 9,450 | 10,500 | 11,025 | 11,550 | 12,600 | 13,650 | 14,700 | 15,750 | 16,800 |
| 60% Collections | 60% | 7,200 | 8,100 | 9,000 | 9,450 | 9,900 | 10,800 | 11,700 | 12,600 | 13,500 | 14,400 |
| 50% Collections | 50% | 6,000 | 6,750 | 7,500 | 7,875 | 8,250 | 9,000 | 9,750 | 10,500 | 11,250 | 12,000 |

**NON-EMERGENCY CALLS**

<table>
<thead>
<tr>
<th>Estimated User Fee Per Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>$400</td>
</tr>
</tbody>
</table>

| Non-Emerg. Calls | 395 | $158,000 | $177,750 | $197,500 | $207,375 | $217,250 | $237,000 | $256,750 | $276,500 | $296,250 | $316,000 |
| 90% Collections | 90% | $142,200 | $159,975 | $177,750 | $186,638 | $195,525 | $213,300 | $231,075 | $248,850 | $266,625 | $284,400 |
| 80% Collections | 80% | $126,400 | $142,200 | $158,000 | $165,900 | $173,800 | $189,600 | $205,400 | $221,200 | $237,000 | $252,800 |
| 70% Collections | 70% | $110,600 | $124,425 | $138,250 | $145,163 | $152,075 | $165,900 | $179,725 | $193,550 | $207,375 | $221,200 |
| 60% Collections | 60% | $94,800 | $106,650 | $118,500 | $124,425 | $130,350 | $142,200 | $154,050 | $165,900 | $177,750 | $189,600 |
| 50% Collections | 50% | $79,000 | $88,875 | $98,750 | $103,688 | $108,625 | $118,500 | $128,375 | $138,250 | $148,125 | $158,000 |
## Table 8
Stroud Emergency Medical Services
Estimated Revenues - Mileage Fees

<table>
<thead>
<tr>
<th>Mileage Fees</th>
<th>$4.00</th>
<th>$4.50</th>
<th>$5.00</th>
<th>$5.50</th>
<th>$6.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loaded Miles Only</td>
<td>9,434</td>
<td>$37,736</td>
<td>$42,453</td>
<td>$47,170</td>
<td>$51,887</td>
</tr>
<tr>
<td>90% Collections</td>
<td>90%</td>
<td>33,962</td>
<td>38,208</td>
<td>42,453</td>
<td>46,698</td>
</tr>
<tr>
<td>80% Collections</td>
<td>80%</td>
<td>30,189</td>
<td>33,962</td>
<td>37,736</td>
<td>41,510</td>
</tr>
<tr>
<td>70% Collections</td>
<td>70%</td>
<td>26,415</td>
<td>29,717</td>
<td>33,019</td>
<td>36,321</td>
</tr>
<tr>
<td>60% Collections</td>
<td>60%</td>
<td>22,642</td>
<td>25,472</td>
<td>28,302</td>
<td>31,132</td>
</tr>
<tr>
<td>50% Collections</td>
<td>50%</td>
<td>18,868</td>
<td>21,227</td>
<td>23,585</td>
<td>25,944</td>
</tr>
</tbody>
</table>
Table 9
Stroud Emergency Medical Services
Estimated Revenues - Fees Per Utility Bill

<table>
<thead>
<tr>
<th>CITY METERS&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Fee Per Month and Per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$3.00</td>
</tr>
<tr>
<td>Monthly Fee</td>
<td></td>
</tr>
<tr>
<td>$36.00</td>
<td>$3.00</td>
</tr>
<tr>
<td>Annual Fees</td>
<td></td>
</tr>
<tr>
<td>1,500</td>
<td>$54,000</td>
</tr>
<tr>
<td>90% Collections</td>
<td>$48,600</td>
</tr>
<tr>
<td>80% Collections</td>
<td>$43,200</td>
</tr>
<tr>
<td>70% Collections</td>
<td>$37,800</td>
</tr>
<tr>
<td>60% Collections</td>
<td>$32,400</td>
</tr>
<tr>
<td>50% Collections</td>
<td>$27,000</td>
</tr>
</tbody>
</table>

<sup>a</sup> Information received from the City of Stroud Electric Department
### Table 10
Stroud Emergency Medical Services

Stroud School District - Estimated Revenues - Millage Levies

<table>
<thead>
<tr>
<th>TOTAL NET VALUATION</th>
<th>THREE MILLS</th>
<th>TWO MILLS</th>
<th>ONE MILL</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 1999 ESTIMATED Stroud School District</td>
<td>$19,831,083</td>
<td>$59,493</td>
<td>$39,662</td>
</tr>
</tbody>
</table>

City of Stroud - Sales Tax Revenues

<table>
<thead>
<tr>
<th>Estimated Sales Subject to Sales Tax</th>
<th>Estimated Revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>$20,000,000</td>
<td>$20,000,000</td>
</tr>
</tbody>
</table>

Sales Tax Rates

- 1/4 of 1% Sales Tax: $50,000
- 1/2 of 1% Sales Tax: $100,000
- 1% Sales Tax: $200,000
Table 11  
City of Stroud  
Funding Options for Emergency Medical Services

<table>
<thead>
<tr>
<th></th>
<th>Funding Options for Alternative 1</th>
<th>Funding Options for Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Option 1</td>
<td>Option 2</td>
</tr>
<tr>
<td>Total Annual Capital &amp; Operating Costs</td>
<td>$245,905</td>
<td>$245,905</td>
</tr>
<tr>
<td>Revenues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Call Fee, $750, 70%</td>
<td>$15,750</td>
<td>Emergency Call Fee, $750, 70%</td>
</tr>
<tr>
<td>Non-Emergency Call Fee, $750, 70%</td>
<td>$207,375</td>
<td>Fee, $650, 70%</td>
</tr>
<tr>
<td>Mileage Fee, $4.00, 70%</td>
<td>$26,415</td>
<td>Mileage Fee, $4.50, 70%</td>
</tr>
<tr>
<td>Three Mills</td>
<td>$63,000</td>
<td>Sales Tax Revenues, 1/4 of 1%</td>
</tr>
<tr>
<td>Total Revenues</td>
<td>$249,540</td>
<td>$279,283</td>
</tr>
<tr>
<td>Difference (Revenue Less Cost)</td>
<td>$3,635</td>
<td>$3,494</td>
</tr>
</tbody>
</table>

20
Table 9 illustrates the fee located on a local utility bill. The table illustrates a monthly fee of $3.00, $3.50, $4.00, $4.50, $5.00, $5.50, $6.00, $6.50, $7.00, and $7.50. The fees are based on the current number of city meters. Calculations are based on 100% of collections and for 90%, 80%, 70%, 60%, and 50% of the total fees collected. However, typically this type of collection is 100% collectible; the variance is based on how many utilities are not “in service” at the time of collection.

Table 10 shows the estimated revenues from forming a special taxation district and shows the estimated revenues generated by a sales tax. If an EMS (special taxation) district was created, the district could collect up to 3 mills annually (Table 10). For the Stroud School District in Lincoln County, three mills would generate $59,493, two mills $39,662, and one mill $19,831. This is based on a total net valuation of $19,831,083 for the Stroud School District.

If the City of Stroud should vote a sales tax, a 1/4 of 1% sales tax would generate approximately $50,000, a 1/2 of 1% sales tax would generate about $100,000, and a 1% sales tax would generate an estimated $200,000 (Table 10).

To illustrate how to utilize the revenue tables (Tables 7-10), Table 11 has been created to show two options for funding Alternative 1 and two options for funding Alternative 2.

To fund Alternative 1, revenues would be needed to cover the total annual capital and operating costs of $245,905. Option 1 illustrates a user fee of $750 for emergency calls at a 70% collection rate would generate $15,750; a user fee of $750 for non-emergency calls at a 70% collection rate would generate $207,375. A mileage fee of $4 at a 70% collection rate would generate an additional $26,415. The total revenues generated by user fees and
mileage fees would be $249,540. This would more than cover the costs, with a surplus of revenue over costs of $3,635.

Option 2 shows an alternate method for funding Alternative 1. A user fee of $525 at a 70% collection rate was calculated for both emergency and non-emergency calls, for totals of $11,025 and $145,163, respectively. A mileage fee of $4.50 with an assumed collection rate of 70% would total $29,717. This option assumes the creation of a $5 per month utility bill fee, which would generate a total of $63,000. The total revenues would be $248,905, which would more than cover the costs of $245,905. A surplus of revenue over costs would result, for a total surplus of $3,000.

To fund Alternative 2, one option (Option 1) would include a $650 emergency user fee at a 70% collection rate ($13,650); a $650 non-emergency user fee at a 70% collection rate ($179,725); a mileage fee of $4 at a 70% collection rate ($26,415); and the creation of a special taxation district with the collection of three mills ($59,493). These four funding methods would result in a total of $279,283 in revenues. The total annual capital and operating costs for Alternative 2 are $275,789. This option would result in a surplus of $3,494.

A second option (Option 2) has also been illustrated for Alternative 2. This option includes an emergency user fee of $750 (@ 70%) for $15,750; a non-emergency user fee of $650 (@70%) for $179,725; a mileage fee of $4.50 per mile (@ 70%) for $29,717; and sales tax revenues, generated from the vote of a 1/4 of 1% sales tax, for $50,000. This option would result in a small deficit of $597. This deficit would need to be covered by the City of Stroud or by other revenue sources.
Additional Alternatives and Considerations

The Stroud EMS services an average of 1.16 calls per day, which is 8.17 calls per week, for a total of 425 calls per year. Although no specific data was available on the time of day for Stroud EMS calls, research [1] shows that:

- 13.8% of total EMS calls are received from 8:00 pm - 11:59 pm,
- 7.4% of total EMS calls are received from 12 pm (midnight) - 3:59 am, and
- 7.0% of total EMS calls are received from 4:00 am until 7:59 am.

This represents a total of 28.2% of the total EMS calls from 8:00 pm until 7:59 am. Going one step further with this methodology, Stroud services an average number of calls for these times, as follows:

- 59 average EMS calls per year (1.13 average calls per week or 0.161 calls per day) are received from 8:00 pm - 11:59 pm,
- 31 average EMS calls per year (0.60 average calls per week or 0.086 average EMS calls per day) are received from 12 pm (midnight) - 3:59 am, and
- 30 average EMS calls per year (0.57 average calls per week or 0.082 average EMS calls per day) are received from 4:00 am until 7:59 am.

This totals 120 average calls per year (2.3 average calls per week or 0.329 average calls per day) that are received from 8:00 pm until 7:59 am. This is less than 1/3 of one call per day and less than 3 calls per week.

If the Stroud EMS provider utilized on-call staffing from 8 pm until 8:00 am daily, the cost of providing EMS services could be greatly reduced. Based on Alternative 1, the basic EMS system, this would result in a savings of $43,819 in labor costs and an additional $10,433 in benefits, for a total savings of $54,252. Based on Alternative 2, the advanced
life support EMS system, the savings would be $53,017 in labor costs and an additional $12,623 in benefits, for a total savings of $65,640. The Stroud EMS provider could possibly recognize enough labor and benefits savings that an alternate source of revenues might not be necessary to the operation of the system. Other alternatives could be calculated if the decision makers are interested; i.e., on-call for a different time of day, such as from midnight until 8:00 am.

The Stroud decision makers should also be aware that if the Stroud hospital opens as a "critical access hospital" designation, there exists the possibility that there could be cost-based reimbursement from Medicare. With approximately 60-80% of the EMS calls being Medicare, the EMS service might then be able to operate without the need of additional subsidy revenues. This possibility requires additional confirmation and communication and cannot be relied upon at this time. However, when the outcome of the new "critical access hospital" legislation is determined, this information will be shared with the Stroud decision makers.

**The Creation of an EMS District**

The State of Oklahoma allows for the formation of a special EMS District for the purpose of raising funds to support EMS. **Table 12** outlines the procedures involved in creating an EMS District and the powers and responsibilities of its Board of Trustees. In brief, the County commissioners must call for a special election to create the district. The district may encompass one or more counties, incorporated cities, a township, school districts, or parts of a school district that lie within the borders of a county. The district may
TABLE 12
A SUMMARY OF THE PROCEDURES TO CREATE AN EMS
DISTRICT AND THE POWERS AND RESPONSIBILITIES
OF ITS BOARD OF TRUSTEES ¹

I. Creation of a District
   A. Special election called by the County Commissioners or through them as called
      for by a petition of greater than 10 percent of the registered voters of the
      affected area.

II. Affected Area
   A. One or more counties or portions of counties (must follow school district lines).
   B. Incorporated cities.

III. The Election and Ad Valorem Tax Levy
   A. Both capital and operational millage levy must be approved by a majority of the
      voters.
   B. The operational millage levy cannot exceed three mills and the capital millage
      levy cannot exceed three mills.
   C. The operational millage levy continues until voters change it; the capital
      millage levy is in effect until bonds are completely repaid.

IV. The Board of Trustees
   A. Appointed by the County Commissioners.
   B. Powers and Responsibilities:
      1. Make necessary rules, procedures, and contracts.
      2. Hire appropriate personnel.
      3. Issue bonds upon approval by a majority of the voters at a special election.
         Bonds are paid for out of the capital millage levy.
      4. Responsible for the economical expenditure of funds.
      5. Can charge additional fees for services.
      6. Can sue and be sued.
assess up to three mills of ad valorem taxes to support the operation of the EMS system. The total net assessed valuation for the Stroud School District for FY 1999 was $19,831,083. For a more up-to-date valuation, decision makers should contact the Lincoln County Assessor’s Office. If an EMS District were created, a three mill tax levy (Table 10) for the Stroud school district would raise $59,493 annually ($19,831,083 x .003), a two mill tax levy, $39,662, and a one mill tax levy, $19,831. These funds could be utilized in addition to other revenue sources to support the Stroud EMS service.

**Conclusion**

The review of the Stroud area EMS calls, the estimated costs of alternative Stroud EMS delivery systems, and the projected revenues from alternative funding mechanisms presented in this paper are designed to aid local decision makers as they determine the kind of EMS system best suited to the Stroud EMS area. Through this analysis, the Cooperative Extension Service is not advocating any of the alternatives presented. This report is not in the form of a recommendation. If further analysis is desired, contact your County Extension Director. Personnel in the EMS Division of the Oklahoma State Health Department and Office of Highway Safety are also willing to help in any way they can.
References
