

Mississippi State Department of Health
Division of Emergency Medical Services

MSDH

**Report to House and Senate Public
Health and Welfare Committees**

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Emergency Medical Services

**A Feasibility Study of the
Placement of an Emergency
Medical Services
Vehicle/Ambulance in Every
County in Mississippi, With
Focus on Benton, Carroll,
Greene and Smith Counties**

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Introduction

On a typical day in Mississippi, hundreds of people face medical emergencies that require immediate treatment before reaching a hospital. For these people, emergency medical services (EMS) systems – including a 911 telephone dispatch center, medical treatment by responding emergency personnel, and emergency transportation to a hospital – are the front line of care.

In some situations, emergency services can be the difference between life and death. For example, chances of surviving a sudden cardiac arrest decrease an estimated 10 percent for every minute's delay in treatment. People who need such emergency, prehospital care depend on well-trained personnel reaching them quickly, identifying the type of treatment they need, and, in the case of life-threatening situations such as cardiac arrest, administering needed life-sustaining treatment wherever the person may be.

EMS systems are primarily local, but the state plays a major role in regulating them. The federal government has also adopted a role supporting and promoting efforts to improve EMS systems – for example, by making the improvement of EMS a national health priority. In its Healthy People 2010 initiative outlining health care improvement goals for the next decade, the Department of Health and Human Services (HHS)

established a goal of increasing the proportion of people who can be reached by EMS within 5 minutes in urban areas and within 10 minutes in rural areas.

The 2001 Session of the Mississippi Legislature, through Senate Bill Number 2209, requested a study of the placement of an emergency medical services vehicle/ambulance in every county of the state, including but not limited to, Benton, Carroll, Greene and Smith Counties.

The Mississippi State Department of Health, Division of Emergency Medical Services conducted a feasibility study assessing the activities of the most current full year of data , January 1, 2000 through December 31, 2000. This study assessed the feasibility of placing an emergency medical services vehicle/ambulance in every county of the state with focus on Benton, Carroll, Greene and Smith Counties. The study collected and analyzed data based on the cost to start and maintain an ambulance service, availability of personnel and other variables in a county.

Methodologies The study utilized different methodologies to reach a cost estimate and feasibility of placing and maintaining an emergency medical service vehicle/ambulance. The census of counties was based on the 2000 Mississippi county population estimates as reported by the United States

Census Bureau. The number of patient encounters for ambulance services was determined by information from the Mississippi Emergency Medical Services Information System (MEMSIS) (**Table 11**). MEMSIS is operated and maintained by the Mississippi State Department of Health, Division of Emergency Medical Services (MSDH, DEMS) for the reporting of all ambulance patient encounters by a state licenced ambulance service. The availability of qualified personnel was evaluated by their current address in the MEMSIS Certification Data System (**Table 12**). The cost of operation was determined by interview of like geographically based ambulance services and their current cost to start and maintain an emergency medical service/ambulance on a year to year basis (**Tables 13-17**).

Assessment and Findings

In surveys and assessments conducted in recent years, local EMS systems have reported substantial needs for improving the emergency care they provide. These reported needs, which come under such categories as personnel, training, equipment, and the availability of doctors to advise emergency personnel in the field, tend to vary between urban and rural locations. For example, rural systems were more likely to report training needs in retaining basic clinical skills, while urban systems were more likely to report training needs related to serving a diverse community.

EMS systems are designed to provide a quick, coordinated response of emergency medical care resources for traumatic incidents and medical emergencies. Persons who need such a response may need help for a variety of medical conditions, such as cardiac arrest, diabetes, seizures, or behavioral disorders, or they may have injuries such as burns, wounds, or severe head or spinal damage. The major components of an emergency medical system often include the following:

- **A public access system.** This is generally a 911 emergency telephone line used to contact and dispatch emergency medical personnel.
- **Emergency medical response.** The goal for the initial response is to have medically trained personnel available to the patient as quickly as possible and to provide early stabilizing care. The level of care provided can be either basic life support or advanced life support. (Basic life support responders provide basic first aid, such as stopping bleeding, immobilizing fractures, and administering cardiopulmonary resuscitation. Advanced life support responders provide basic first aid, but also are trained to treat severe trauma and can administer drugs, establish intravenous lines, open airways through endotracheal intubation, and apply other lifesaving or life-

sustaining techniques.) Because most EMS agencies operate independently of other medical facilities and have relatively few physicians among their providers, the ability of field personnel to talk with a physician is important in ensuring appropriate medical care. Such a link to “medical oversight” ensures that field personnel at the scene or during transport have immediately available expert direction that can authorize and guide the care of their patients.

- **Emergency medical transport or transfer.** This involves getting the patient to a hospital or other medical facility. Although an important component of the system, emergency transport does not apply in all cases. In 2000, twenty-one percent (21%) of emergency requests did not result in emergency transport.

EMS systems are typically managed and operated by local communities and jurisdictions, such as counties or municipalities. Entities involved in providing EMS for a particular community may include contracts for ambulance service. Varied sources of EMS funding exist, such as local taxes, billing for services provided, private-sector donations, subscription services, and government grants.

In Mississippi, of 133 licensed ambulance services, corporate ambulance service ownership (66) exceeds the number of hospital (51) and government (13) owned ambulance services. This trend is similar to the national trend toward privatization. Volunteer ambulance services (3) have declined as national volunteering has decreased while liabilities have increased.

An assessment of each of the focus counties is provided as follows:

Benton County Benton County has a population of 8,026 according to the 2000 United States Census Bureau. **(Table 11)** The county currently does not have a state-licensed emergency medical services vehicle/ambulance within its boundaries. The availability of qualified emergency medical service personnel (i.e., State certified EMT-Basics and EMT-Paramedics) who reside in Benton County was assessed. A total of five (5) state-certified EMT-Paramedics and one (1) state-certified EMT-Basic reported by their address as residing in Benton County. Mississippi State Department of Health, Division of Health Facilities Licensure and Certification reports no licensed hospitals in Benton County.

In 2000, 346 runs were reported as originating in Benton County (**Table 11**). The 8 hour segment of a day that a call most frequently occurred was between 8:00 a.m. and 4:00 p.m. accounting for 44% of call volume, and 4:00 p.m. to 12:00 a.m. for 41% of call volume (**Table 2**). The response time to patients reported as a median time of all responses in Benton County was 16 minutes. The median time to arrive at a hospital from the scene of the call was 25 minutes (**Table 6**). The day of the week with the highest demand was Wednesday at 19%. This was only a slight increase of 3% to 8% as compared with the demand on other days (**Table 2**).

Emergency (lights and siren) versus non-emergency (no lights and siren) response to the scene of the call was assessed as well as the level of response for delivering a patient. Emergency responses accounted for 86.3% of the calls. Comparatively, 13.7% of the calls, a non-emergency response was used while 75% of patients delivered used a non-emergency mode and 25% of transports was made to a destination in an emergency mode. No county or municipal contracts for ambulance service exist.

Services rendered to the constituents and travelers of Benton County are provided by ambulance services located in contiguous counties. MedStar Ambulance Service Inc., based in Holly Springs, Marshall County served as the most frequent ambulance provider to Benton County. A total of 79% of the call volume was delivered by MedStar in 2000. Tippah

County Medical Center EMS, based in Ripley, Tippah County provided the second highest at 12% of the call volume (**Table 4**). MedStar's base is approximately 19 miles to the west by highway to the central point of Benton County. Tippah County Medical Center EMS is approximately 15 miles to the east of the same central point by highway. Alliance Healthcare System in Holly Springs is the most frequent patient destination from Benton County at 30.2%. Tippah County Medical Center in Ripley being second at 17.6% and Baptist Memorial of Union County was third at 14%. An additional note of interest is that 8.8% of patients were transported to Tennessee for care (**Table 7**). Emergency air service is available from Memphis Medical Center Air Ambulance Services, Inc. (Hospital Wing) to Benton County. It should be noted that Hospital Wing's service is without any contractual agreement between Benton County and Hospital Wing (**Table 1**). Benton County, in the past 3 years, has not received Emergency Medical Services Operating Funds because there has been no subsidy by the county to provide ambulance service.

Carroll County Carroll County has a population of 10,769 according to the 2000 United States Census Bureau (**Table 11**). The county currently does not have a state-licensed emergency medical services vehicle/ambulance within the boundaries of the county. The availability of qualified emergency medical

service personnel (i.e., State-certified EMT-Basics and EMT-Paramedics) who reside in Carroll County was assessed. Only one (1) State-certified EMT-Basic reported their address as residing in Carroll County. No State certified EMT-Paramedics reported an address in Carroll County.

Mississippi State Department of Health, Division of Health Facilities Licensure and Certification reports no licensed hospitals in Carroll County.

In 2000, 193 runs were reported as originating in Carroll County (Table 11). The 8 hour segment of a day that a call most frequently occurred was between 8:00 a.m. and 4:00 p.m. accounting for 51% of call volume, and 4:00 p.m. to 12 a.m. at 33% of call volume (**Table 2**). The response time to patients reported as a median time of all responses in Carroll County was 13 minutes. The median time to arrive at a hospital from the scene of the call was 19 minutes (**Table 6**). The day of the week with the highest demand was Monday at 18%. This was only an increase of 1% to 8% as compared with the demand on other days (**Table 2**). Emergency (lights and siren) versus non-emergency (no lights and siren) response to the scene of the call was assessed as well as the level of response for delivering a patient. Emergency responses accounted for 86% of the calls, while 14% of the calls, a non-emergency response was used. Conversely,

57.5% of transports to a destination used a non-emergency mode to travel and 42.5% of transports were made to a destination in an emergency mode. Ambulance service to Carroll County is provided from another area via contract. Services rendered to the constituents and travelers of Carroll County are primarily provided by an ambulance service located in a contiguous county. MedStat Ambulance, based in Winona, Montgomery County serves as the most frequent provider to Carroll County. A total of 90% of the call volume was delivered by MedStat in 2000. Less than 10% of the remaining call volume was provided by other services (**Table 4**). MedStat's base is approximately 11 miles to the east by highway to the central point of Carroll County. Tyler Holmes Memorial Hospital in Winona is the most frequent patient destination from Carroll County at 40.4%. Greenwood Leflore Hospital in Greenwood being the second most destination at 28% and Grenada Lake Regional Medical Center in Grenada was third at 5.7% (**Table 7**). Emergency air service is available from Memphis Medical Center Air Ambulance Services, Inc. (Hospital Wing) to Carroll County. It should be noted that Hospital Wing's service is without any contractual agreement between Carroll County and Hospital Wing (**Table 1**). Carroll County, in the past 3 years, has received Emergency Medical Services Operating Funds totaling over \$18,000.

Greene County

Green County has a population of 13,299 according to the 2000 United States Census Bureau (**Table 11**). The county currently does have a state-licensed emergency medical services vehicle/ambulance within the boundaries of the county. The availability of qualified emergency medical service personnel (i.e., State-certified EMT-Basics, EMT-Intermediates and EMT-Paramedics) who reside in Greene County was assessed. Five (5) state-certified EMT-Basics reported their address as residing in Carroll County. Two (2) state-certified EMT-Intermediates as well as two (2) state-certified EMT-Paramedic reported an address in Greene County. Mississippi State Department of Health, Division of Health Facilities Licensure and Certification currently reports no licensed hospitals in Greene County.

In 2000, 532 runs were reported as originating in Greene County (**Table 11**). The 8 hour segment of a day that a call most frequently occurred was between 8:00 a.m. and 4:00 p.m. accounting for 47% of the call volume, and 4:00 p.m. to 12:00 a.m. at 30% of call volume (**Table 2**). The response time to patients reported as a median time of all responses in

Greene County was 5 minutes. The median time to arrive at a hospital from the scene of the call was 28 minutes (**Table 6**). The day of the week with the highest demand was Wednesday at 19%. This was an increase of 1% to 9% as compared with the demand on other days (**Table 2**).

Emergency (lights and siren) versus non-emergency (no lights and siren) response to the scene of the call was assessed as well as the level of response for delivering a patient. Emergency responses accounted for 63.2% of the calls, while 36.8% of the calls, a non-emergency response was used. Conversely, 89.3% of transports to a destination used a non-emergency mode to travel and 10.7% of transports were made to a destination in an emergency mode. Ambulance service is provided currently by Emergystat of Greene County via contract. Services rendered to the constituents and travelers are primarily provided by Emergystat who replaced the County-operated service (Greene County Ambulance Service). During the time studied, Greene County Ambulance Service, based in Leakesville, served as the most frequent provider to Greene County. A total of 73% of the call volume was transported by Greene County Ambulance service in 2000. Greene County Ambulance Service and Greene County Hospital have closed and Greene County has contracted with Emergystat Ambulance Service to provide ambulance services. Emergystat delivered the second highest number of patients at

17% of the call volume. Less than 4% of the call volume was provided by George County Hospital Ambulance Service located in Lucedale, George County (**Table 4**). Greene County was based approximately 1 mile to the east by highway to the central point of county. The current ambulance is located approximately the same distance. George County Hospital is the most frequent patient destination from Greene County at 49.8%. Forrest General Hospital in Hattiesburg was second at 11% and Wayne General Hospital third at 3.6% (**Table 7**). Emergency air service is available from Southeast Mississippi Air Ambulance District to Greene County. It should be noted that air service is with a contractual agreement between Greene County and Southeast Mississippi Air Ambulance District (**Table 1**). Greene County in the past 3 years has received Emergency Medical Services Operating Funds totaling over \$20,000.

Smith County

Smith County has a population of 16,182 according to the 2000 United States Census Bureau (**Table 11**). The county currently does have a state-licenced emergency medical services vehicle/ambulance within the boundaries of the county. The availability of qualified emergency medical service personnel (i.e., state-certified EMT-Basics, EMT-Intermediates and EMT-Paramedics) who reside in Smith County was assessed. Nine (9) state-certified EMT-Basics and Nine (9) state-certified EMT-

Paramedic reported their address as residing in Smith County. Mississippi State Department of Health, Division of Health Facilities Licensure and Certification reports one hospital is licensed in Smith County. Raleigh Community Hospital is located in Raleigh. It needs to be noted that this hospital was not operational in 2000. The hospital was opened in 2001 as a “Critical Access Hospital” with a 24-hour emergency department.

In 2000, 1,084 runs were reported as originating in Smith County (**Table 11**). The 8 hour segment of a day that a call most frequently occurred was between 8:00 a.m. and 4:00 p.m. accounting for 59% of call volume and 4 pm to 12 midnight at 30% of call volume (**Table 2**). The response time to patients reported as median time of all responses in Smith County was 9 minutes. The median time to arrive at a hospital from the scene of the call was 25 minutes (**Table 6**). The days of the week with the highest demand were Monday, Wednesday and Friday at 17%. This was an increase of 2% to 8% as compared with the demand on other days (**Table 2**).

Emergency (lights and siren) versus non-emergency (no lights and siren) response to the scene of the call was assessed as well as the level of response for delivering a patient. Emergency responses accounted for 63.2.% of the calls while, 36.8% of the calls, non-emergency response was used. Conversely, 89.3% of transports to a destination used a non-

emergency mode to travel and 10.7% of transports was made to a destination in an emergency mode. Ambulance service is provided by Emergystat of Smith County via contract. Services rendered to the constituents and travelers is primarily provided by Emergystat . Emergystat of Smith County based in Raleigh serves as the most frequent provider to Smith County. A total of 91% of the call volume was delivered by Emergystat of Smith County in 2000. Emergystat of Simpson County based in Mendenhall, Simpson County provided the second highest number of patients at 5% of the call volume. Less than 4% of the remaining call volume was provided by other services (**Table 4**). Emergystat stations its ambulance approximately central to the median point of the county. Magee General Hospital in Magee, Simpson County is the most frequent patient destination from Smith County at 36.2%. Again, it should be noted that at the time studied Smith County did not have an operational hospital. South Central Regional Medical Center in Laurel, Jones County was the second most utilized hospital at 11% and S.E. Lackey Memorial Hospital was third at 3.6% (**Table 7**). Emergency air transport (aircraft landing at the scene of the emergency) is not available in Smith County (**Table 1**). Smith County, in the past 3 years, has not received Emergency Medical Services Operating Funds because there has been no subsidy by the county to provide ambulance service.

Aggregate Focus

County Assessment The table below represents emergency medical service

vehicle/ambulances contracted to the county, emergency air transportation available to constituents, and hospitals that have emergency departments located in the county.

Table 1 - County Resource Assessment

County	Ambulance Contract	Emergency Air Transport	Hospital with Emergency Department
Benton	None	Hospital Wing *	None
Greene	S.E. Air District (Emergystat)	S.E. Air District	None
Carroll	Medstat	Hospital Wing*	None
Smith	Emergystat	None	Raleigh Community. Critical Assess Hospital (CAH)**

* Not under contract

** Did not open until 2001

The number of ambulance patient encounters per county as reported in 2000 was assessed. The numbers vary in the focused counties. The lowest number of patient encounters was reported at 193 in Carroll to the highest in Smith at 1,084. The population of each respective county based on 2000 Mississippi county population estimates is also assessed (**Table 11**).

The time of day that patient encounters originated was assessed by county for 2000 (**Table 2**). The times reported are representative of an industrial

model of shift division of 8:00 a.m. to 4:00 p.m., 4:00 p.m. to 12:00 a.m. and 12:00 a.m. to 8:00 a.m. Although other variations of an eight hour shift model could be utilized for service proposes, this report is based on the aforementioned model. All counties show their greater call volume between 8: a.m. and 4:00 p.m.

Table 2 - Time call originated by percentile in 2000

County	12:00 am to 7:59 am	8:00 am to 3:59 pm	4:00 pm to 11:59 pm
Benton	15%	44%	41%
Carroll	16%	51%	33%
Greene	22%	47%	30%
Smith	12%	59%	30%

The day of the week summary was assessed to review which days the greater number of patient encounters originate (**Table 3**). The assessment suggests that Wednesday has the overall highest percentage of call volume with Friday being the second highest as a whole. Intra facility transferring of patients could play a role in the elevated call volume. These are days that typically transports of this nature increase.

Table 3 - Day of the week calls originate by percentile in 2000

County	Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.

Benton	11%	12%	12%	19%	15%	16%	14%
Carroll	16%	18%	15%	10%	11%	12%	17%
Greene	13%	11%	14%	19%	15%	17%	10%
Smith	11%	17%	15%	17%	12%	17%	11%
Total	51%	58%	56%	65%	53%	62%	52%

The response mode (to the scene of the call) and the transport mode (to the hospital) was assessed. The use of lights and siren to the scene of the call (emergency response) and the non use of lights and siren (non emergency) were the categories assessed. The assessment indicated that an emergency mode response was used in a majority of the calls consistently in each county. The use of non-emergency mode was used to transport patients to the hospital the majority of patient encounters (**Table 4**).

Table 4 - Response Mode/Transport Mode by percentiles in 2000

County	Response to Scene Non-Emergency	Response to Scene Emergency	Transport Non-Emergency	Transport Emergency
Benton	13.7%	86.3%	75%	25%
Carroll	14%	86%	57.5%	42.5%
Greene	36.8%	63.2%	89.3%	10.7%
Smith	37.5%	62.1%	87.3%	12.7%

Table 5 - Ambulance Services Responding to calls in 2000

County	Ambulance Service with Most Calls	Ambulance Service with 2 nd Highest	Ambulance Service with 3 rd Highest	Ambulance Service with 4 th Highest
Benton	Med Star 79%	Tippah County 12%	EMHC 4%	Others 5%
Carroll	Medstat 90%	Others >10%	N/A	N/A
Greene	Greene Co 73%	Emergystat 17%	George Co. 4%	Others 5%
Smith	Emergystat of Smith County 91%	Emrergystat of Simpson County 5%	Emergystat of Scott County 2%	Others 2%

Table 6 - Median Elapsed times of calls in 2000

County	Time from Ambulance Called To On Scene	Time At Scene Giving Patient Care	Time From Scene To Destination	At Destination
Benton	16 minutes	17 Minutes	25 Minutes	15 Minutes
Carroll	13 Minutes	9 Minutes	19 Minutes	5 minutes
Greene	5 Minutes	13 Minutes	28 minutes	18 Minutes
Smith	9 Minutes	11 Minutes	25 Minutes	14 minutes

The destination of the patients were assessed for the same time period (Tables 7-10). During January 1, 2000, until December 31, 2000, the counties studied did not have a hospital located within their boundaries

with emergency department capabilities. This translates to all patients being transported to another county or state to receive emergency department care. The median response and transport time are represented **(Table 6)**. Median response times vary from 5 minutes in Greene County to 16 minutes in Benton County. The current national goal for rural response is 10 minutes. Benton and Carroll Counties are in excess of this national goal.

Table 7 - Patient destination location from Benton County percentile in 2000

Holly Springs Memorial	30.2%
Not entered (this indicates no transport of patient)	20.3%
Tippah County Hospital	17.6%
Baptist Memorial Hospital of Union County	14%
Tennessee hospitals	8.8%
North Mississippi Medical Center	1.6%

Note : Destinations utilized 1% or less are not included

Table 8 - Patient destination location from Carroll County percentile

in 2000

Tyler Holmes Memorial Hospital	40.4%
Greenwood Leflore Hospital	28%
Not entered (this indicates no transport of patient)	16.6%
Grenada Lake Medical Center	5.7%
Forrest General Hospital	2.1%

Note : Destinations utilized 1% or less are not included

Table 9 - Patient destination location from Greene County percentile in 2000

George County Hospital	49.8%
Not entered (this indicates no transport of patient)	28.8%
Forrest General Hospital	11.1%
Wayne General Hospital	3.6%
Alabama hospitals	2.1%
Perry County Hospital	1.5%

Note : Destinations utilized 1% or less are not included

Table 10 - Patient destination location from Smith County percentile in 2000

Not entered (this indicates no transport of patient)	37.9%
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Magee General Hospital	36.2%
South Cental Regional Medical Center	11.5%
S.E. Lackey Memorial Hospital	4.4%
Forrest General Hospital	2.1%
University of MS Medical Center	1.5%
St. Dominic Hospital	1.4%

Note : Destinations utilized 1% or less are not included

Table 11 - Population and Ambulance Runs 2000

County	2000 Population	Ambulance Runs 2000
Benton	8,026	364
Carroll	10,769	193
Greene	13,299	532
Smith	16,182	1,084

Table 12 -State-Certified EMT's by County in 2000

County	EMT-Basic	EMT- Intermediate	EMT-Paramedic
Benton	1	0	5
Carroll	1	0	0

Green	5	2	2
Smith	9	0	9

Table 13 - Average Hourly Wage for Like Geographical Areas

EMT Basic	EMT-Intermediate	EMT -Paramedic
\$11.56	\$13.06	\$17.13

(this include 25% of base salary for benefits)

Table 14 - One Full Time Employee (FTE) Salary for a 2080 Hour Work Year

EMT Basic	EMT-Intermediate	EMT -Paramedic
\$24,044	\$27,164	\$35,630

Table 15 - One Part Time employee (PTE) Salary for a 1310 Hour Work Year

EMT Basic	EMT-Intermediate	EMT -Paramedic
\$15,143	\$17,108	\$22,430

Table 16 - Approximate Operational Costs of an Ambulance Service for a Like Geographical Area

Capital Costs	Amount	Period
Type II Ambulance (new)	\$ 60,000	4 - 5 years
Ambulance Equipment	\$ 18,000	4 - 5 years

Building/Office/Supplies **	\$ 12,000	annually
Computer equipment	\$ 1,000	4 - 5 years
Communication Equipment ***	\$ 1,000	4 - 5 years
3 FTE EMT-Paramedics	\$106,891	annually
2 PTE EMT-Paramedics	\$ 44,880	annually
3 FTE EMT-Basic	\$ 72,134	annually
3 PTE EMT-Basic	\$ 30,287	annually

* Equipment to stock an ambulance is based on a EMT-Paramedic unit per MSDH, DEMS minimal equipment list

** Based on a rented office with utilities. Sharing a structure with a municipal entity (ie; Fire, Law Enforcement) could drastically reduce this cost

*** Communication equipment can vary from VHF radios to cellular telephones

Table 17 - Approximate Maintenance Costs of an Ambulance Service for a Like Geographical Areas

Diesel Fuel	\$1.50/gal at 8miles per gal/\$7500 per 40,000 miles traveled
Vehicle Maintenance	\$1,500
Insurance	\$2,100**
Permit	\$100/year/unit
Licence	\$250/year for Provider Licence
Miscellaneous	\$1,500

** Approximate cost to meet requirements as described in MCA Section 41-59-27

Table 18 - Emergency Medical Services Operation Fund disbursed by county 1998 to 2000

County	1998	1999	2000

Benton	\$0 *	\$0 *	\$0 *
Carroll	\$6,461	\$6,102	\$6,820
Greene	\$6,752	\$6,265	\$7,546
Smith	\$0 *	\$0 *	\$0 *

*Has not received Emergency Medical Services Operating Fund because there has been no subsidy by the county to provide ambulance service.

**Table 19 - Emergency Medical Services Operation Fund Disbursement
Benton and Smith Counties Could Have Received if
Qualifications Were Met, 1998 to 2000**

County	1998	1999	2000
Benton	\$5,316	\$5,941	\$3,596
Smith	\$9,976	\$10,926	\$6,613

Summary

The cost of the operation of an emergency medical services vehicle/ambulance in a county area comes with many outstanding costs to begin operation. The following assessment is based on a EMT-Paramedic unit which requires a EMT-Paramedic and utilizes a EMT-Basic as a driver and assistant.

The first and foremost of these considerations is personnel. The cost factors used in the study were based on the average cost for the studied areas. The

securing and retention of qualified personnel is paramount. A salary that is competitive to the surrounding services must be maintained to attract the qualified personnel. Ambulance services in close proximity to the study areas were assessed to establish an average salary. State-certified personnel are scarce or non-existent in many of the areas studied (**Table 12**).

Statewide, there were 1,143 state-certified EMT- Paramedics and 1,343 state- certified EMT-Basics in 2000. This number to date has continued to increase. The attraction to work in these areas must start with a competitive salary. The cost of personnel is approximately \$260,000 based on 24 hours a day, 7 days a week, 365 days a year. This includes a crew consisting of 1 EMT-Paramedic and 1 EMT-Basic. Each crew would work 8 hours a day, 5 days a week. This would require 3 full time EMT- Paramedics (3 FTE's) and 3 full time EMT-Basics (3 FTE's). Part time employees needed to cover the off shifts would be 2-3 PTE's of each level of certification (**Tables 13-15**).

This staffing pattern would facilitate the 1 EMT-Paramedic FTE to serve as Operations Manager to carry out managerial and run reporting duties as well as duties on the ambulance. Although this assessment is based on around the clock coverage, there are other staffing patterns that could reduce FTE's but would increase cost. Staffing and availability patterns can vary. One variation is personnel being at the station and readily available during the peak call times and the off-peak time the staff takes call from home. This

model was not investigated due to the need for “on call” personnel to be in close proximity to the station. The scarce population of qualified personnel in the majority of the study areas would prohibit this option at this time **(Table 12)**. This option could be investigated as the numbers of qualified personnel reside in close proximity to the ambulance station increase.

Another model that some areas have utilized is the use of a EMT-Paramedic “sprint” vehicle. This concept has the EMT-Paramedic in a emergency medical services vehicle (non-transport) and two EMT-Basics in a transport ambulance to “rendezvous” with each other for patient care. This is also a costly model. The EMT-Paramedic (1 FTE) must be available on a continuous basis and two EMT-basics (2 FTE's) must also be available. After securing a minimal staffing a process must instituted to retain these qualified individuals. Some services in the state have used hourly wage incentives as remuneration for continuing education. Cost for continuing education can vary with the level and need of the EMT.

The purchase of an ambulance is the next substantial capital expenditure. A Type II ambulance (van style) appears to be the most cost effective unit with a base price of approximately \$60,000 with minimal safety equipment (i.e., lights, siren, stretcher, oxygen delivery system, etc). The life span of a Type II ambulance is approximately 4 to 5 years or 250,000 miles. The State

mandates specifications for design and construction of permitted ambulances. The cost of equipment to stock EMT-Paramedic ambulance is the next capital expense. The standard equipment requirements are based on national standards. Equipment such as a cardiac monitor/defibrillator, medications, spinal mobilization devices and advanced airway management supplies cost approximately \$18,000 to furnish one ambulance. The cost to replace major equipment in a 6 year cycle is \$13,000 per year. The rate of depreciation and need for replacement of major equipment such as vehicles range from 5 to 7 years depending on wear. Communication equipment is mandatory for a licenced ambulance and can vary from cellular phones to two-way radios. The costs vary as well. An estimate of \$1,000 is a base cost, although it can increase for areas with decreased cellular access. Geographic and topographic restrictions of two-way radio communications will need to be investigated to find the best modality. The most important factor is the efficiency of the communication equipment for the geographic service area. Communication between the ambulance and medical control (physician direction of patient care) must be available on a constant basis as possible (**Table 16**).

Office space involves the area where the unit and personnel are housed between calls. This can be a stand-alone structure or shared with an

established municipal entity. Government entity ambulance services often share structures with other safety services to contain cost. Fire departments and law enforcement commonly share physical plants to centralize resources such as bunk rooms, vehicle shelter, and communications. The location of the building should be chosen with the response time to the patient in mind. As discussed in the county assessment, the response to a call is paramount to outcome of patient care. Yearly costs to maintain equipment and replace single use equipment are variable based on use and wear of equipment **(Table 17)**. Maintenance of vehicle expenses can be contracted to perform routine scheduled maintenance at a local level per the manufacturer’s specifications. Oil and filter changes, tires, lubrication, and incidental repairs were estimated by geographically like services at \$1,500 per year. MSDH, DEMS ambulance service licencing is \$250 per year for location and \$100 for each ambulance permitted.

A summary cost of yearly operation estimations are as follows:

Personnel	\$260,000
Building	\$12,000
Fuel	\$7,500
Insurance	\$2,100
EMS Licence	\$250
Vehicle Tag	\$50 (if private company)
Vehicle Maintenance	\$1,500
EMS(Permit) Ambulance	\$100

Replacement of Major Equipment	\$13,000 (based on a 6 year cycle)
Miscellaneous	\$1,500
Total (estimated)	\$297,950

Estimated cost of start up:

Type II Ambulance (new)	\$60,000
Equipment	\$18,000
Computer	\$ 1,000
Communications Equipment	\$ 1,000
Total (estimated)	\$80,000

Total estimated cost to start and maintain an ambulance service consisting of one EMT-Paramedic (advanced life support) ambulance and qualified crew for the first year would be approximately **\$378,000**. This amount would be for one county such as for those without a county-based service.

Subsequent years would be approximately **\$298,000** per county, per year, at current estimations. The cost to place an ambulance in the 4 focus counties would cost would be \$1,512,000 the first year and \$1,192,000 for subsequent years.

Total cost for year 1 and subsequent years to place an ambulance in the 4 focus Mississippi Counties

Year 1				
Start-up Per County	Yearly Costs Per County	Total Annual Cost Per County	Number of Counties	Total Annual Cost

\$80,000	\$298,000	\$378,000	4	\$1,512,000
Subsequent Years				
Start-up Per County	Yearly Costs Per County	Total Annual Cost Per County	Number of Counties	Total Annual Cost
\$0	\$298,000	\$298,000	4	\$1,192,000

Multiplying the initial capital requirement for the start-up and yearly funding needed times the 82 counties, the cost to place one emergency medical services vehicle/ambulance in each of the counties in Mississippi would be projected at \$30,996,000 for the first year. To maintain the service on a year to year basis, \$24,431,900 annually would be required. Because emergency medical services are already relatively available in the other 78 counties, the majority of such projected costs are already being absorbed and/or expended by the system.

Total cost for year 1 and subsequent years to place an ambulance in all 82 Mississippi Counties

Year 1				
Start-up Per County	Yearly Costs Per County	Total Annual Cost Per County	Number of Counties	Total Annual Cost
\$80,000	\$298,000	\$378,000	82	\$30,996,000
Subsequent Years				
Start-up Per County	Yearly Costs Per County	Total Annual Cost Per County	Number of Counties	Total Annual Cost
\$0	\$298,000	\$298,000	82	\$24,431,000

Funds to enhance the development of an ambulance currently service exist in Mississippi. The Emergency Medical Services Operation Fund

(EMSOF) was established in 1982 though legislation which added \$5 to fines assessed statewide on hazardous moving traffic violations. The funds are then distributed per capita to eligible government units (cities, counties, EMS districts) for local level EMS support. The Division of Emergency Medical Services (DEMS) makes disbursements annually upon the request from each governmental unit. According to law, these funds must be used *in addition* to existing annual emergency medical services budgets of the governmental units. DEMS has administered the fund since its establishment. The EMSOF fund was disbursed to only two

of the four counties assessed (**Table 18**). Greene and Carroll Counties have received EMSOF over the past three consecutive years while Benton and Smith Counties have not received funds. If Benton and Smith Counties had met eligibility by supporting an ambulance service, their respective disbursement would have been over \$14,000 for Benton County and \$27,000 for Smith County over the past 3 years (**Table 19**).

It can not be emphasized enough that this study is based on only one vehicle and crew. The coverage of calls will be dependent on the frequency of calls that occur in the same time period that an ambulance is responding, treating and/or transporting a patient. Mutual aid agreements with neighboring services must be secured to provide coverage in the times when the ambulance is being utilized. It is plausible that simultaneous calls will occur and/or multiple patients will be encountered at the call. The assistance from a neighboring service will be necessary. The time required to respond to a call, care for the patient, transport the patient, and be available for the next call can be an hour or more (**Table 6**). During this time, the ambulance would not be available to other patients.

A factor that could not be assessed is the counties use of a “First Responder”. This term is used to describe an individual who may be operating under the

direction of a fire department or local safety service. To date there is no statutory definition of a “First Responder”. Our research concludes that “First Responders” vary from county to county regarding their initial training, retraining, medical oversight, equipment, availability and quality review of patient care. Most “First Responder” entities are not sanctioned by the state or local government to perform patient care and many believe their organized response is covered by the “Good Samaritan Laws” of the state. Their level of training varies from first aid to advanced level EMS. Due to the lack of statutory definition or regulation, an assessment of the numbers of individuals and their activities in patient care are not available for evaluation. Because of this, the impact of their service can not be evaluated or used to plan for the development of placing an ambulance vehicle in a county.

**Concluding
Observations**

This study has identified broad categories of limitations and needs, showing that basic issues in such areas as staffing, training, and equipment are considered to be day-to-day challenges of local EMS systems and state efforts to coordinate these systems. The Mississippi State Department of Health, Division of Emergency Medical Services will begin a comprehensive survey of “Rural EMS” in Mississippi starting in January 2002. This effort is funded by the federal Office of Rural Health. It would be our pleasure to provide you with a report of this assessment to supplement this document.

**Agency
Comments**

If you or your staff have any questions about this study, please contact Jim Craig at (601) 576-7366 or Dave Kuchta at (601) 576-7380. Other major contributors to this report were Dave Kuchta, Deputy Director of EMS; Jim Brown, AAA Ambulance Service, Ikey Roebuck, North Mississippi Medical Center Ambulance Service, and Lamarr Gardner, Delta Regional Ambulance Service.