

AN EVALUATION OF THE LEVEL OF SERVICE AND DELIVERY COSTS  
OF FIRE AND EMERGENCY MEDICAL SERVICE IN  
WAUKESHA COUNTY, WISCONSIN

by

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ABSTRACT

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AN EVALUATION OF THE LEVEL OF SERVICE AND DELIVERY COSTS OF  
 (Title)

FIRE AND EMERGENCY MEDICAL SERVICE IN WAUKESHA COUNTY, WI

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The County of Waukesha is located in Southeastern Wisconsin directly West of Milwaukee County. The County covers an area of approximately 524 square miles and has an estimated population of 341,338. The County has experienced rapid growth during the past few decades, and with this rapid growth has come the need for additional services such as schools, roads, parks, police, and fire services. The County contains 37 different municipalities with populations ranging from a low of 262 to a high of 62,197. Property taxes in these municipalities range from a low of \$ 17.52 to a high of \$ 29.18 per \$1000 valuation. The differences of the level of property taxes are a result in the level of services provided in each community. In Waukesha County, fire and emergency medical services are provided by a total of 31 different fire departments, which are all funded by property tax dollars. The level of fire and emergency medical services being provided within Waukesha County varies a great deal for many reasons.

The purpose of the study was to evaluate the level of service currently being provided by the fire departments as measured by their Fire Insurance Rating and to

determine the costs associated with the delivery of fire and emergency medical services. The study could assist the municipalities and fire departments in determining methods of improving services and lowering their costs per capita. Research was conducted by a survey sent to all 31 fire departments in Waukesha County. The survey was used to determine the type of fire departments, the number of emergency calls responded to annually, the fire insurance rating for each department, the resources each department had available, and the annual budget costs. The data collected was used to compare the Fire Insurance Ratings of the fire departments, to identify the overlap of resources available, and to compare the operating and capital budget costs per capita of the fire departments within Waukesha County.

The study revealed that the amount of property tax money being spent on fire and emergency medical service within Waukesha County is significant. The cost per capita being spent in each municipality does relate to the fire insurance rating of each fire department, but the costs are different throughout the County. The study revealed that municipalities and fire departments within Waukesha County should very seriously look at sharing resources of fire stations, fire apparatus, manpower, and response areas. The result would probably be a saving in costs to the property tax paid by the citizens within the County.

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## CHAPTER 1

### RESEARCH PROBLEM AND OBJECTIVES

#### Introduction

The County of Waukesha is located in Southeastern Wisconsin directly West of Milwaukee County. The County covers an area of approximately 524 square miles and has a population estimated in 1997 at 341,338 (Metro Milwaukee Economic Fact Book, 1998). The County has experienced rapid growth during the past few decades. From 1970 to 1990 the population increased by 32 percent from about 231,000 to 304,000 and the population has grown by 11 percent from 1990-95 (Southeastern WI Regional Planning Commission (SEWPC, 1992). With this rapid growth has come the need for additional services such as schools, roads, parks, police, and fire services.

The County Government has an Appointed County Executive with a Board of 35 County Supervisors who are elected for a two-year term. The County contains 37 different municipalities made up of 13 towns, 18 villages, and 6 cities. The populations of the 37 municipalities range from a low of 262 for the Village of Lac La Belle to a high of 62,197 for the City of Waukesha (Wisconsin Department of Revenue, 1994).

In the past years, there have been numerous municipal border disputes between the City of Waukesha and the Town of Pewaukee, and the City of Waukesha and the Town of Waukesha. The disputes have revolved around the issue of the City of Waukesha annexing land from both of the Towns. Other border disputes have been primarily between the City of Oconomowoc and the Town of Summit, and the City of Brookfield and the Town of Brookfield. The border disagreements have cost the citizens of the involved communities a large sum of money for legal expenses through additional property taxes. A border agreement between the City of Waukesha and the Town of Pewaukee was reached in 1998, which allowed the Town of Pewaukee to incorporate as a City and solidify the borders between the two communities.



The County has 111 different taxing districts with the rates based on the municipality, the school district, the sewer and/or sanitary district, and the fire district the property owner lives in. In 1995, the property tax rates varied from a low of \$17.52 per \$1000 valuation in the Town of Eagle to a high of \$29.18 per \$1000 valuation in the Village of Butler (Butler Replaces Waukesha with the Highest Tax Bill, 1995). In these two communities, there was a property tax difference of \$ 1,166.00 for the property owner of a home valued at \$100,000. The difference in property taxes is a direct result of the services that are being provided by each municipality. These services could include police and fire protection, emergency medical service, garbage removal, snow plowing, parks & recreation, road improvements, library services, school districts, water, and sanitary service. Some municipalities provide all the services. As a result the property tax rates are lower in the communities that only provide a limited number of services to the citizens. It is primarily the cities that provide all the services and the towns that provide limited services.

In Waukesha County, fire and emergency medical services are provided by a total of 31 different fire departments. The 31 fire departments are either municipal fire departments or private fire companies, and they are all funded by property tax dollars. The fire departments include fully paid departments, paid-on-call departments, and fully volunteer departments. All the fire departments are represented as members of the Waukesha County Association of Fire Chiefs. This organization's primary purpose is to work together to improve the delivery of fire service & EMS within the County of Waukesha. Membership includes the Fire Chief from each fire department, and all Chief Staff Officers are eligible for membership. All members have a vote in the activities of the Association as individuals.

In 1993, the Waukesha County Association of Fire Chiefs decided to collect the data to determine the amount of resources available from all 31 fire departments within the County. Surveys were sent to all fire departments to collect information on the

resources. The data was compiled into the Waukesha County Association of Fire Chiefs Fire Department Resource Inventory. This inventory is now updated on a semi-annual basis, and the information is then sent to all of the fire departments. It can be used if there is a large emergency to determine resources available from other fire departments for mutual aid. The data collected included the number or amount of personnel, fire stations, fire engines, aerial ladder apparatus, ambulances, hose, ladders, breathing apparatus, and other equipment that each department has on their department or in their inventory. All work to collect the inventory information and to compile the data was completed under the direction of Mr. Bruce Erickson, Associate Dean of Fire Training, at Waukesha County Technical College, in Pewaukee, Wisconsin. Mr. Erickson also serves as the Secretary for the Waukesha County Association of Fire Chiefs.

When the first inventory was compiled in 1993, the members of the Waukesha County Association of Fire Chiefs identified three rather significant factors. The first factor was how important this information was to the Fire Service within the County and how valuable the information could be if there was a large emergency or disaster. The second factor was that the amount of resources available within the County from all of the fire departments was probably more than adequate to handle any type of emergency that could develop. The third factor was the amount of money the taxpayer paid for all of this inventory and very expensive equipment. The data indicated that the 31 fire departments had a total of 1,574 members of which 176 were full time, 632 were paid-on-call, and 766 were volunteers. The 31 departments also had a total of 52 fire stations, some located within a mile of each other. Other information included an inventory of 98 fire engines, 16 aerial ladder apparatus, 60 ambulances, plus other vehicles. The total amount of fire hose in various sizes was 404,480 feet. The number of radios in the departments equaled 511 portables and 356 vehicle radios. The question thought by many in the Fire Service, but not asked, was "How much was all this costing the taxpayers of Waukesha County?" It was obvious that this was a tremendous amount, but how much?

Does it affect the property tax rates? Could these fire department and EMS resources be shared to gain a better value for the citizens?

### Research Problem

In 1992, local governments in the State of Wisconsin for fire protection services, which equaled \$63.86 per capita, spent \$317.3 million dollars. Services for fire protection was the third most costly expenditure for cities and towns. The expense in villages for fire protection services was the fourth highest expense (The Wisconsin Taxpayers Alliance, 1993).

Based on the amount of resources available to the 31 fire departments within the communities being paid for by taxpayers' dollars, it is obvious there is a great deal of duplication of services, equipment, and personnel. In addition, the level of emergency fire and EMS service being provided within Waukesha County varies a great deal for many reasons. Every community needs to address the issue of increasing property taxes required and the reluctance of the citizens to accept the property tax increases. The level of service and the cost of the delivery of fire and EMS service within Waukesha County have never been evaluated.

### Research Objectives

The purpose of the study is to evaluate the level of service currently being provided by the fire departments in Waukesha County as measured by their Fire Insurance Rating and to determine the costs associated with the delivery of fire and EMS service. This information will allow the municipal governments and fire departments to compare the level of service and costs of their agencies with other fire departments within the County. The study will assist the municipalities and fire departments to determine methods of improving services, and of lowering their costs per capita.

### Objectives

The study will address the following objectives:

1. Compare the Fire Insurance Rating of all fire departments within Waukesha County.
2. Identify the overlap of resources available from the fire departments in Waukesha County for fire and EMS Service.
3. Compare operating and capital budget costs per capita in the various municipalities in Waukesha County.
4. Identify areas where resources within the fire departments may be shared.

### Need for the Study

The demand on the taxpayer to fund additional property tax continues to grow each year, and the taxpayers are reluctant to pay any additional taxes. The State Legislature has taken steps to reduce the local property tax by removing the local school district funding from the local tax bill. Every year at budget time, local municipalities look at methods of reducing the local tax bill, while still maintaining services. This study may very well reveal the need for the municipalities within Waukesha County to look at alternative methods for the delivery of fire & EMS services. In many areas of the United States, fire departments are merging or consolidating their services. The result normally is a better level of service with a reduction in costs. Usually the first step in looking at the merger or consolidation of fire departments is the establishment of a study committee made up of local fire service representatives, local government officials, and representatives from the private business sector.

### Limitations of the Study

The following limitations apply to this study:

1. The reluctance of either the fire departments or the municipalities to participate in the research project. This would affect the outcome of the data collected.

2. To determine the level of service within some fire departments could be difficult because of their failure to document their activities or to collect data within their own organization.
3. The fact that the private fire companies are not public municipal organizations may result in the lack of information from them because their records are not public information. This would be a problem if they did not want to cooperate and share information about their fire department with the researcher.
4. The difficulty in relating operating budget costs with the total volume of emergency calls.

#### Assumptions

The assumptions for this study were:

1. The researcher was given full cooperation in the collection of budget information from all fire departments and municipalities involved in the study.
2. All fire departments had information about the frequency and type of emergency responses for their departments.

## CHAPTER 2

### REVIEW OF RELATED LITERATURE

#### Introduction

The level of service provided by their local fire department could affect every citizen of any community, but the fact is very few citizens have any understanding of how their local fire departments operate or the services provided by them. In most instances, unless a citizen has had a need to use the services offered the citizen has a whole misconception about the local fire department. Many citizens think their fire department is staffed by full time paid personnel 24 hours a day, and that the department provides emergency paramedic services just like on television. The fact is every fire department is different in how it is organized under the State law, how it is staffed by personnel, the services that the department provides to the community, and the source of funding to operate. The purpose of this study is to evaluate the level of service being provided by the fire departments in Waukesha County as measured by their fire insurance rating and to determine the costs associated with the delivery of fire and emergency medical services.

This chapter will review research literature relative to this study and will include the following areas:

1. Literature relative to types of fire department organizations
2. Literature relative to fire department staffing
3. Literature relative to services provided by fire departments
4. Literature relative to fire department insurance ratings

#### Types of Fire Department Organizations

All municipal governments such as cities, villages, and townships are responsible for providing fire protection within their community. The fire protection may be provided by a fire department developed by the municipality, established by a joint agreement

between one or more local governments, or through a contract with another municipality or a fire department (WI Department of Industry, Labor, & Human Relations [DILHR], 1993).

According to State Statute 62.13 (1) & (2), every city with a population greater than 4,000 must have its own fire department, and its own Police & Fire Commission. By State Statute 65.65, villages with a population of more than 5,500 must provide fire protection by one of the following methods: create their own municipal fire department, contract for fire protection with another municipality, or develop a joint fire department. In addition, townships under State Statute 60.55 must provide fire protection by establishing their own fire department or by contracting with other municipalities, persons, or organizations (DILHR, 1993).

Fire Departments within the State of Wisconsin are organized under four different principles as follows:

Municipal Fire Departments - The department may be either staffed by full time or volunteer personnel, and the department is an agent of the municipality. The department funding, employee benefits, and payroll are administered by the municipality. The department and the employees of the department are considered to be public sector employees. (DILHR, 1993).

Chapter 213 Fire Departments - These fire departments are organized by forming a body of private individuals that provide fire protection primarily in rural areas. The Chapter 213 fire department then provides fire protection to a municipality by a contract. The department's budget, administration, personnel, and operations are the responsibility of the department directly and not the municipality. This type of department does not have the benefit of liability protection it would have as a municipal department under state law. In addition, the employees of this type of fire department are not considered

public employees and as a result are governed by the Occupational Safety and Health Act (DILHR, 1993). A Chapter 213 fire department is known as a private fire department.

Chapter 181 Nonstock - Nonprofit Corporation Fire Departments - Fire departments organized under the articles of incorporation are very common in the State of Wisconsin. The principles of this type of fire department may be private individuals or municipalities with representation on the board of directors of the corporation. This type of fire department is common with fire districts within the state (DILHR, 1993), and is also known as a private fire department.

#### Literature Relative to Fire Department Staffing

Fire departments that have 100% of their staffing by full time paid personnel are classified as career fire departments. The main distinction of career fire departments is that their personnel are assigned a regular duty schedule to work and are compensated on a regular basis for their work. Roberts (1993) estimated that there are at least two hundred thousand career firefighters in the United States. It is estimated that there are about 40 to 50 career fire departments within the State of Wisconsin, and only two such fire departments within the County of Waukesha. The two departments are the City of Brookfield and the City of Waukesha Fire Departments.

Combination or paid-on-call fire departments rely on both full-time career personnel and paid-on-call or volunteer personnel to provide adequate staffing for their departments. The paid-on-call or volunteer firefighters supplement the full time staff in emergency operations. The combination department may have one or more full time staff, which usually are chief officers, fire inspectors, drivers, or emergency medical technicians (DILHR, 1993). There are only two combination type fire departments in Waukesha County.



Personnel that receive either little or no compensation for their services to the department and community, staff volunteer fire departments. The WI Department of Industry, Labor, & Human Relations classifies volunteer fire departments as any department that does not have any person that receives compensation for more than thirty-six hours or more per week (DILHR, 1993). Volunteer departments may compensate their personnel for answering emergency calls, for participating in training, or for uniforms. The remaining 27 fire departments in Waukesha County are volunteer fire departments.

The National Fire Protection Association (1995) estimated that there are about 1,073,600 firefighters in the United States and 807,900 of these firefighters serve as either volunteers or paid-on-call. The National Fire Protection Association (1995) also estimated, based on the services being provided by the volunteer fire service, that they are saving the public at least \$ 36.8 billion annually in costs if their services were replaced with full time firefighters.

In some communities that are experiencing rapid growth in population and housing, the demand for fire protection and emergency medical services has grown to the point where the volunteer fire departments are no longer able to provide the services required by the citizens. The volunteer firefighters cannot keep up with the demand for additional services and the ability to recruit new members for the fire department is difficult because so many residents commute out of the community for their full time jobs. The result has been that some volunteer fire departments have started paying the volunteer firefighters for answering emergency calls and for training. In Waukesha County, the Village of Big Bend/Vernon Fire Department starting compensating its volunteer firefighters at an annual cost of \$ 44,000 in 1994. This was done to recognize the volunteers for their hours of service and personal expenses such as mileage to and from training and fires. Under the change to compensate the volunteer firefighters each of them would receive an annual base amount in addition to a payment for being an

Emergency Medical Technician and for being an officer ("Officials to Consider Proposal to Pay" 1993).

What combination of personnel is used to staff a fire department is a matter of choice for each community. Roberts (1991) states a number of important factors can influence the decision of how to staff a fire department. These factors are:

1. The financial resources available to the community.
2. The availability of paid-on-call or volunteer personnel to respond to fire department emergencies.
3. The frequency of fire and other emergency calls.
4. The services expected by the community of the fire department.
5. The type of fire department preferred by the citizens of the community.

#### Literature Relative to Services Provided by Fire Departments

Routley (1991) stated the primary mission of most public fire departments is fire suppression. This mission reflects the appraisal in most communities that a combat ready force be ready to respond in order to control and extinguish fires. Routley (1991) further states that while the fire service may place an emphasis on fire prevention, public education, and risk reduction, their ability to respond to and control fires is an overriding priority.

In 1974, the Wisconsin Legislature mandated that all ambulances be staffed by personnel trained and licensed to the level of Emergency Medical Technician Basic Level. As a result, many fire departments became involved with the service of providing Emergency Medical Service (EMS) in their communities. The level of training that has been received by the Emergency Medical Technician (EMT) providing the service can determine the levels of EMS. The Wisconsin Administrative Code established three classes of emergency medical technicians: basic, intermediate, and paramedic. The term "basic life support" is equated with the level of care within the skill level and knowledge

of an EMT-Basic. The term "advanced life support" could be equated with the level of care within the skill level and knowledge of an EMT-Intermediate or an EMT-Paramedic (SEWPC, 1992). In Waukesha County, there are twenty-four ambulance providers, and all of them are licensed to provide basic life support service. In addition, the City of Waukesha was the only provider licensed to provide advanced life support with their paramedic service (SEWPC, 1992).

In 1996, the City of Brookfield Fire Department became the second fire department in Waukesha County to provide advanced life support with their paramedic service. This was the result of a study that was completed in 1993 by a committee of fourteen city officials and residents formed to study the City of Brookfield's emergency medical services. The Brookfield City Council approved the plans to implement the paramedic service at an estimated first year cost of \$ 126,918. The costs included the hiring of three additional firefighters and the cost to train and equip nine paramedics ("Brookfield Approves Paramedic Plan", 1994).

In 1997, the Town of Waukesha and the Village of Mukwonago fire departments both started offering Emergency Medical Technician - Intermediate services to their communities. Since that time, four other fire departments have started providing EMT Intermediate services. Other services provided by many fire departments include hazardous materials response, confined space rescue, water and ice rescue, extrication, fire prevention, fire inspections, public fire education, and juvenile firesetters education.

#### Literature Relative to Fire Department Insurance Ratings

During the past century, the insurance industry in the United States has evaluated and graded the fire protection services of communities throughout the country. This practice continues today by an organization known as the Insurance Services Office/Commercial Risk Services (ISO/CRS). The ISO/CSR continues the Public Protection Classification (PPC) process by applying a document titled, The Fire

Suppression Rating Schedule (FSRS) (Hickey, 1993).

Even though not all states in the United States use the Insurance Service Organization grading schedule, it is used commonly within the State of Wisconsin and is applied to many fire departments approximately every ten years. The purpose of the grading schedule is to assist in the calculation of fire insurance rates. It was not designed to be used for property loss prevention or for the purpose of life safety.

The Fire Suppression Rating Schedule (FSRS) provides a guideline for municipalities to classify their fire department. The FSRS designates ten different Public Protection Classifications, with Class 1 receiving the most rate recognition, and a Class 10 receiving no recognition. The FSRS defines the different levels of public fire suppression capabilities by assigning each fire department a Public Protection Classification rating from Class 1 to Class 10 (Granito, 1991).

The FSRS is a document that establishes fire protection functional needs in three major areas. These areas are: Emergency Operations Centers (EOC) for receiving and handling fire alarms, an emergency services delivery system for fire suppression, and water supply for both fire protection and domestic consumption (Hickey, 1993). When the Insurance Service Organization rates a fire department they evaluate the ability of the fire department to provide services, and they assign points to the rating for each of the three major areas to be evaluated. The three major areas have established standards and deficiency points are assigned for deviations from the standards. Based on the total number of deficiency points accumulated the fire department is given an ISO rating. The highest ISO rating being a one and the lowest ISO rating is a ten. The Public Protection Classification is one guide or ISO rating is used to determine insurance premiums to be paid by commercial, industrial, and residential property owners within a community. As a rule of thumb, the better the classification rating of the fire department, the lower the costs of insurance premiums. The literature review revealed no other studies similar to this study having been previously completed within the State of Wisconsin.

### Summary

The review of literature established that there are many factors that affect the level of fire protection being provided within a community. The method of how the fire department was organized as either a municipal or private fire department affects how they obtain their funding as well as whether or not their employees are considered public employees. The review of literature also established that fire department staffing patterns affect their operations and costs. Career fire departments are staffed 24 hours per day and as a result their response time to emergencies will be better than departments that utilize either volunteers or paid-on-call firefighters who have to respond from either home or work.

The literature review showed that all fire departments provide a level of fire suppression and usually this is given the highest priority within the department. In addition, the review established the fact that most fire departments provide additional services such as Emergency Medical Services, which can be at various levels of response capabilities. In addition, fire departments provide other services, such as fire prevention and inspection, public fire education, hazardous materials response, and confined space rescue.

The literature review further established the fact that fire departments are given a Public Fire Protection Classification by the ISO/CRS that affects the cost of fire insurance premiums paid by property owners within a community.

## Chapter 3

### **RESEARCH DESIGN and METHODS**

#### Introduction

The purpose of the research was to evaluate the amount of funds being spent in Waukesha County for fire protection and emergency medical services by all the municipalities. The amount of funds being spent by each municipality would then be compared with the Public Protection Classification assigned to the municipality by the Insurance Services Organization. This information was then compared for all municipalities in Waukesha County.

This chapter examines the various aspects of the study including the population used to obtain the research data, as well as the instrumentation and the method used to analyze the data collected.

#### Research Design

A descriptive research methodology was utilized to conduct the study with the use of a standard survey process that was sent to the fire departments within Waukesha County. The data collected was from existing documents from each municipality, which are all public records according to law within the State of Wisconsin. The data was analyzed through the use of computer software, and the information was used to summarize the research and make recommendations.

#### Population and Sample

The population of the study was the thirty-one fire departments located within Waukesha County in the State of Wisconsin. The thirty-one fire departments are comprised of career, paid-on-call, and volunteer organizations. In addition, the thirty-one fire departments have been organized under different aspects of the State Statutes. Some are municipal fire departments and some are private corporations organized under either

Chapter 213 or Chapter 181 as fire departments. The departments range in size from the smallest fire department with 16 volunteers and one paid member to the largest department with about 156 members of which only two are fully paid members. The survey was sent to the Fire Chief of each fire department, who had access to the information needed to complete the survey.

#### Data Collection Methods

A survey instrument was developed that allowed information about each fire department to be collected for the final analysis. The information collected included data about the fire department organization, how the department is staffed, compensation paid to firefighters, services provided by the department, fire department ISO rating, and budget figures for the year ending in 1997. A copy of the introduction letter and the actual survey instrument that was sent to Waukesha County Fire Chiefs is included in Appendixes A and B, respectively.

The survey was developed and administered by the following method. The subjects were the fire departments within Waukesha County and the contact person was the Fire Chief of each fire department. A briefing of this study was presented at a monthly meeting of the Waukesha County Fire Chiefs Association. The Fire Chief of each fire department was contacted by mail with a letter of introduction to the survey and the survey itself. The Fire Chief was asked to complete the survey information as requested. A follow-up letter was sent to those that did not respond within two weeks. See Appendix C for a copy of this follow-up letter.

#### Data Analysis

The data on the fire departments was obtained from the surveys. An analysis was completed on the types of services being provided by the fire departments, how the departments were organized and staffed, and the number of major pieces of fire apparatus

they own. This information was then transferred to a format to determine the relationship between the fire department rating classification and the cost per capita of fire and EMS protection within the various communities.



## CHAPTER 4

### **RESULTS OF THE RESEARCH**

#### Introduction

The primary purpose of this research study was to evaluate the level of service being provided by the fire departments as measured by their Fire Insurance Rating and to compare operating costs per capita in the various municipalities in Waukesha County. The research was also completed to collect data related to types of fire departments, resources available, annual operating budgets, annual volume of emergency calls, and services provided by each fire department. This information was gathered by the use of a survey (Appendix B) which was sent to the Fire Chiefs of all 31 fire departments in Waukesha County.

#### Results of Survey

##### Fire Department Organization

All 31 fire departments responded to the survey, but some questions on the survey were not answered by all fire departments. The survey showed that 27 of the 31 fire departments do provide emergency medical service (EMS) to their communities. The survey indicated that four fire departments provide EMS service outside of their municipalities, and this service would be to the communities that have fire departments that do not provide EMS service. The following tables reflect the data regarding the number fire departments that serve the populations indicated for Fire & EMS Service (Table 1) and for Fire Service only (Table 2).

Table 1  
Number of Fire Departments Providing Fire & EMS Service in Waukesha County for Population Indicated

Population Served	Number of Fire Departments
0-9,999	16
10,000 to 19,999	5
20,000 to 29,999	2
30,000 to 39,999	3
40,000 plus	1
Total	27

Table 2  
Number of Fire Departments Providing Fire Service in Waukesha County for Population Indicated

Population Served	Number of Fire Departments
0-9,999	19
10,000 to 19,999	5
20,000 to 29,999	3
30,000 to 39,999	3
40,000 plus	1
Total	31

Of the 31 fire departments, 23 are organized as municipal fire departments and 8 are organized as private fire companies. Private fire companies are organized under State Statute Chapter 213 and Chapter 181. The personnel staffing of the 31 fire departments indicated that 2 departments are staffed by full paid personnel, 3 are staffed by a combination of paid and paid-on-call personnel, 13 are staffed by paid-on-call, and 13 are staffed by volunteers.

The number of fire departments with a Fire Insurance Rating in a hydrant

(Table 3) and non-hydrant (Table 4) area are indicated in the following tables:

Table 3

Fire Department Insurance (ISO) Rating Hydrant Area

ISO Rating	Number of Fire Departments
ISO 2	1
ISO 3	2
ISO 4	7
ISO 5	2
ISO 6	2
ISO 7	4
ISO 8	1

Note. The higher the Insurance Service Organization rating of the fire department the lower the rate of insurance premiums paid in a community. Twelve Fire Departments did not respond to this question, which would indicate that they do not have hydrants in their communities.

Table 4

Fire Department Insurance (ISO) Rating Non-Hydrant Area

ISO Rating	Number of Fire Departments
ISO 6	2
ISO 7	14
ISO 8	2
ISO 9	9

Four Fire Departments did not respond to this question, which indicates they do not have non-hydrant areas in their communities.

The number of fire departments providing fire service to each of the categories with areas in square miles, as indicated, is in Table 5.

Table 5

Square Miles Protected by Number of Fire Departments

Square Miles	Number of Fire Departments
1 to 5	5
6 to 10	6
11 to 19	6
20 to 30	7
31 to 37	7

The survey indicated that there are 52 fire stations within Waukesha County with 21 Fire Departments having just 1 fire station, 4 departments having 2 fire stations, 2 departments having 3 fire stations, 3 departments having 4 fire stations, and 1 department having 5 fire stations.

Personnel

There was a total of 1,542 sworn personnel in the 31 fire departments within the County. Of that number, 190 or 15.29 % are full paid personnel. The balance of the personnel are either paid-on-call or volunteer firefighters. The rate of pay for paid-on-call firefighters ranged from \$ 5.50 to \$ 13.20 per hour for the 13 of the 31 fire departments that responded to that question. The organizational patterns of the type of staffing for the fire departments is typical for this type of county.

Of the 31 departments, 29 answered the questions related to the level of emergency medical training their personnel have received. In Waukesha County, 821 firefighters are trained to the Emergency Medical Technician Basic Level, 22 are trained to the Emergency Medical Technician Intermediate Level, and 32 are trained to the

Paramedic Level. All of these levels of training are State Certified and meet State training standards of the Department of Health and Family Services.

#### Operations and Services Provided

The survey results showed that of the 31 fire departments in Waukesha County 2 provide Paramedic service, 2 provide Emergency Medical Technician - Intermediate service, and 22 provide Emergency Medical Technician Basic service.

The services provided by a fire department are determined by each department based on their ability to supply the resources, personnel, funding, and the need within the community or communities they serve. All 31 departments answered the questions in the survey regarding other special services provided as shown in Table 6. The following services are provided in Waukesha County by the number of fire departments indicated.

Table 6

#### Services Provided by Number of Fire Departments

<u>Service Provided</u>	<u>Number of Fire Departments</u>
Level A Hazardous Material Response	2
Level B Hazardous Material Response	16
Extrication	27
Confined Space Rescue	5
Water Rescue	19
High Angle Rescue	2
Fire Inspection	30
Public Education	30
Underground Storage Tank Inspection	5
Fire Investigation	19

All 31 fire departments responded to the question regarding dispatching with the following results. Their own municipality does the dispatching in 11 departments, 9 departments are dispatched by Lakes Area Associated Communication System, the Waukesha County Sheriff's Department dispatches 8 departments, 1 department is dispatched by Menomonee Falls, and the City of Oconomowoc dispatches three departments. The choice to dispatch your own department or to have some other agency dispatch for each fire department is a decision made at the level of each community. This decision is based on resources, personnel, funding, and relationships with other communities.

#### Emergency Response Information

All 31 fire departments responded to the questions about emergency response activity for their department for the year of 1997, but all of the questions were not answered. The 31 fire departments responded to a total of 6,870 fire calls during 1997. There were 325 structure fires in 1997 according to the 29 fire departments that responded to this question correctly. This equates to about 4.7% of the fires responded to as being structure fires.

During 1997, 26 fire departments reported responding to a total of 13,622 emergency medical calls for basic life support, and 5 fire departments reported responding to a total of 1,466 emergency medical call for advanced life support. The total number of emergency medical emergency calls during 1997 was 15,088 calls.

#### Equipment Information

The research showed that there is a total of 95 fire engines, 20 aerial ladder vehicles, 28 tankers, and 62 ambulances owned by the fire departments in Waukesha County. The number of fire engines operated by each fire department ranged from one engine to eight engines. The typical fire department operated three fire engines. The 20 aerial ladders were within 15 fire departments. Of the 15 fire departments, one department operated three aerial ladders, and two departments operated two aerial

ladders, and the remaining fire departments operated one aerial ladder each.

### Budget Information

The research revealed that in 1997 the 31 fire departments spent for operating budgets a total of \$ 18,993,444 and for Capital Budgets a total of \$ 2,654,623. The combined total equaled \$ 21,648,067 spent in 1997 for Fire & EMS Services in Waukesha County. Of the 27 fire departments that provided EMS service in their community, 21 of them charged some type of fee for EMS calls. The total amount of revenue generated by 19 of these 21 fire departments for EMS fees in 1997 was \$ 1,807,820. These 19 fire departments reported other revenue in 1997 of \$ 1,335,178. The total revenue reported by the 19 fire departments for EMS fees and other revenues was \$ 3,142,998. The remainder of the budgets were supported by property tax dollars.

The per capita costs for the four fire departments that reported only providing fire service to their communities ranged from \$ 6.26 to \$72.83. The per capita costs for the 4 fire departments in Waukesha County that only provide fire protection is shown in Table 7 with their Fire Department ISO rating for both hydrant and non-hydrant areas if applicable. The fact that that the Muskego Fire Department is a private volunteer fire department that does not provide EMS service, and has a limited number of calls contribute to its lower per capita cost of \$ 6.26.

Table 7

### Per Capita Costs for Fire Departments in Waukesha County That Only Provide Fire Protection Service and Their ISO Rating

<u>Fire Department</u>	<u>Per Capita</u>	<u>ISO Rating Hydrant</u>	<u>ISO Rating Non-Hydrant</u>
North Lake	\$72.85	N/A	7
Nashotah	\$63.72	N/A	7
Summit	\$61.75	N/A	7
Muskego	\$ 6.26	7	9

The per capita costs in the 27 fire departments that provided both fire and EMS service ranged from a low of \$ 9.04 to a high of \$ 120.79. The per capita costs for the 27 fire departments in Waukesha County that provide both fire protection and EMS service is shown in Table 8 with their Fire Department ISO rating for both hydrant and non-hydrant areas if applicable. The median cost of all the departments was \$34.88 per capita.

There are a number of communities that have a per capita cost of \$ 30.00 or less. The factors that contribute to this lower per capita cost include the fact they are volunteer fire departments, protecting limited populations, with longer response distances and travel times, and most only provide primarily fire and EMS service.



Table 8  
Per Capita Costs for Fire Departments in Waukesha County that Provide Both Fire Protection and EMS Service and Their ISO Rating

Fire Department	Per Capita	ISO Rating Hydrant	ISO Rating Non-Hydrant
City of Waukesha	\$120.79	2	N/A
City of Brookfield	\$117.57	4	N/A
Butler	\$109.05	3	N/A
Town of Brookfield	\$100.60	4	9
Chenequa	\$95.19	N/A	6
City of Delafield	\$69.79	7	7
Sussex	\$60.00	4	N/A
Lannon	\$65.34	9	9
Pewaukee	\$62.78	5	9
Mukwonago	\$44.99	4	8
Menomonee Falls	\$42.25	4	6
Town of Delafield	\$40.99	N/A	7
Okauchee	\$38.60	N/A	7
Town of Waukesha	\$34.88	N/A	9
Dousman	\$33.43	6	7
New Berlin	\$32.42	3	7
Elm Grove	\$30.00	8	9
Lisbon	\$29.89	N/A	7
Oconomowoc	\$27.65	4	7
Hartland	\$21.60	5	7
Big Bend – Vernon	\$20.80	N/A	7
Eagle	\$18.71	4	9
North Prairie	\$18.52	7	9
Merton	\$18.19	7	8
Stone Bank	\$14.41	N/A	7
Wales	\$13.23	N/A	9
Tess Corners	\$9.04	N/A	7

## CHAPTER 5

### SUMMARIES, CONCLUSIONS, AND RECOMMENDATIONS

#### Introduction

In Waukesha County, fire and emergency medical services are provided by a total of 31 different fire departments, which are all funded by property tax dollars. The level of fire and emergency medical services being provided within Waukesha County varies a great deal for many reasons. The results of the study are summarized, conclusions are developed regarding the objectives of the study and the data collected, and recommendations are made for additional study.

#### Summary

The purpose of the study was to evaluate the level of service currently being provided by the fire departments as measured by their Fire Insurance Rating and to determine the costs associated with the delivery of fire and emergency medical services. The study could assist the municipalities and fire departments in determining methods of improving services and lowering their costs per capita.

Research was conducted by a survey sent to all 31 fire departments in Waukesha County. The survey was used to determine the type of fire departments, the number of emergency calls responded to annually, the fire insurance rating for each department, the resources each department had available, and the annual budget costs. The survey was used to collect data for the 1997 year for all fire departments. The data collected was used to compare the Fire Insurance Ratings of the fire departments, to identify the overlap of resources available, and to compare the operating and capital budget costs per capita of the fire departments within Waukesha County. Insurance companies have no criteria or formulas that require that certain level of services be provided by fire departments. Each municipality determines the level of service that they want their fire department to provide, and the municipality then must fund the services they want delivered to the community.

The study revealed that the amount of property tax money being spent on fire and emergency medical service within Waukesha County is significant. The cost per capita being spent in each municipality does relate to the fire insurance rating of each fire department, but the costs are different throughout the County. The level of service and the cost of the delivery of fire and EMS service within Waukesha County had never been evaluated.

The study only surveyed the number of fire and emergency medical calls each fire department responded to in 1997, and the number of structure fires responded to during the same period. The study did not survey the frequency of calls by multiple departments at the same time or any other data related to actual fire and EMS responses. Each fire department maintains their own fire and EMS response information, and there is no required method for maintaining records of these responses that would allow the records to be evaluated on a County wide basis.

## Conclusions

### Fire Department Insurance Ratings

The Fire Department ISO ratings range from 1 to 10, with a 1 being the highest classification. The higher the Fire Department ISO rating the lower the insurance premiums being paid by property owners. The research concluded that of the thirty-one fire departments in Waukesha County only 18 of them had areas with fire hydrants, and 28 fire departments had areas without fire hydrants. Only three fire departments had areas with all fire hydrants installed. The fire departments with ISO Ratings for a hydrant area ranged from a high rating of 2 to a low of an 8 rating. The fire departments that had ISO ratings for a non-hydrant area ranged from a high of 6 to a low of a 9 rating. Only those

fire departments that serviced areas with fire hydrants had an ISO rating of five or higher. All of the fire departments with non-hydrant areas had an ISO rating of 6 or lower.

The Fire Department Insurance Ratings affect the cost of fire insurance premiums paid by homeowners and owners of businesses. Usually the better the Fire Department rating the lower the cost of fire insurance premiums, but the rates paid by homeowners compared to commercial businesses for property fire insurance are affected differently by the Fire Department Insurance rating. A typical single family homeowner pays the same premium for fire insurance if their fire department has a rating of 1 to 7. There is an increase of about fifteen percent for fire insurance premium costs if the fire department rating is an 8, a seventy-five percent increase if the fire department rating is a 9, and a one-hundred percent increase if the fire department rating is a 10.

For commercial property owners the fire insurance premium remains the same if their Fire Department rating is 1 to 4. There is an increase of about ten percent for fire insurance premium costs if the fire department rating is 5 to 8, a forty to fifty percent increase if the fire department rating is a 9 or 10.

### Overlap of Resources

The study revealed there are a number of areas where the fire department resources overlap each other in Waukesha County. Waukesha County covers an area of about 524 square miles and is protected by thirty-one different fire departments. The fire departments have a total of 52 fire stations and some are located in very close proximity of each other. The fire departments have a total of 1,542 sworn personnel.

In 1997, the fire departments responded to about 6870 fire calls, and one fire department responded to almost 20 percent of those calls. Of the 6,870 fire calls it was reported there were only 325 structure fires in 1997. The result is an average of less than 10.5 structure fires per fire department during the year.

The research concluded that in Waukesha County the fire departments had a total of 95 fire engines and 20 aerial ladders in service. The cost to purchase a new fire engine is about \$ 275,000 and an aerial ladder would cost at least \$550,000 each. The replacement costs for the engines and aerial ladders would exceed 37 million dollars. The study showed that there are ambulances owned by the fire departments, and the cost to purchase an ambulance is about \$ 100,000.

The research indicated that dispatching is another area that shows an overlap of resources based on the fact there are eleven dispatch centers being used for fire and EMS operations by the thirty-one fire departments.

The services being offered by the fire departments were also duplicated in some areas. Thirty fire departments are conducting fire prevention inspections, public education, and nineteen departments are conducting fire investigations. Water rescue was being offered by nineteen of the fire departments. Level B hazardous materials response is being offered within 16 of the fire departments. Some of the hazardous materials response operations are being shared, but there is still five Level B Hazardous Materials Response teams within Waukesha County. Only one Level B Team would be necessary on a hazardous materials incident, and if additional resources were required the Milwaukee Fire Department Level A Hazardous Materials Team could be activated.

The resources that are being shared by the fire departments at the current time is very limited. Some of the departments are doing automatic response to other municipalities area as a method of sharing personnel and equipment. The City of Brookfield Fire Department in 1999 started a Paramedic Training Center and at least two other fire departments sent personnel there for Paramedic training. In 1999, the City of Waukesha signed an agreement with the City of Brookfield to provide emergency response to their community for Confined Space Rescue emergencies. In early 2000, the City of Brookfield and the City of New Berlin combined their hazardous materials team forces into one team.

#### Costs per Capita

In 1997, the thirty-one fire departments in Waukesha County spent over \$21 million dollars to provide fire and EMS service to the residents. The research study used the 1997 operating and capital budgets to determine the total cost for each fire department and then divided that amount by the population serviced to determine the per capita cost for each fire department.

The costs per capita to provide only fire protection service ranged from a low of \$ 6.26 to a high of \$ 72.85. There were four fire departments in this group. The remaining twenty-seven fire departments provided both fire and EMS service. Their per capita costs ranged from a low of \$ 9.04 to a high of \$ 120.79. The two full paid fire departments per capita costs were the highest at \$ 120.79 and \$ 117.57 respectively. The survey revealed that there appeared to be no correlation between the per capita costs for fire and EMS service and the Fire Department ISO rating.

The more money spent per capita did not always result in a higher Fire Department ISO rating. In Table 8, an example is one community with a Fire Department ISO rating of 3 in a hydrant area had a per capita cost of \$ 109.05, and another fire department with the same Fire Department ISO 3 rating only had a per capita cost of \$ 32.42. Both of these communities provided EMS service.

The differences and the wide range in the cost per capita for fire and EMS protection can be contributed primarily the level of services offered by each municipality. The differences in costs per capita are directly related to whether staffing is full time or volunteer, the number of calls answered, the level of services provided, the size of the area protected, and the amount of equipment and vehicles operated. Other factors that would need to be taken into consideration include response times and the number of personnel available upon arrival at the scene of an emergency.

The research showed that the comparison of the per capita costs to the Fire Department ISO ratings is probably not a very effective means of evaluating the effectiveness of a fire department based on the information collected. The study shows that the higher the costs of per capita for fire and EMS service does not necessarily result in an improved Fire Department ISO rating. The fact that Emergency Medical Service is provided or not provided in a community has no affect on the ISO rating of the fire department.

#### Areas to Share Resources

The research showed there are certainly resources that could be shared by the thirty-one fire departments located in Waukesha County. Possibilities include the personnel that staff the departments and this is especially true in the fire departments that

are not fully paid. It is many of these fire departments that are having major problems with having enough personnel available to respond to emergencies.

Another possibility of sharing includes the 52 fire stations located in the county. In some cases the fire stations are only a short distance from each other, and by sharing stations it would be easier to share personnel amongst the various fire departments.

The issue of sharing fire department apparatus has a great deal of merit considering the costs of the vehicles and how often they are used. The concept of having 20 aerial ladders available in the County that only had 325 structure fires in 1997 indicates the need to share this expensive resource. Other factors would have to be considered when looking at the actual number of aerial ladders required such as: travel distances, possibility of multiple fires at the same time, and personnel available for response to emergencies.

Another area where resources could be shared is dispatching. With the number of fire and EMS calls annually within the County there is little need for eleven different dispatch centers. The idea of centralizing the dispatch centers is currently being studied within Waukesha County by a consulting firm hired by the County of Waukesha and local municipalities. The first phase of the study recommended that the eleven different dispatch centers be reduced to two dispatch centers. The reduction of dispatch centers would be accomplished by consolidation of services. The second phase of the consultant study will be completed in the near future and it will address how the consolidation of dispatch centers could be accomplished within Waukesha County.

There are no national or state guidelines on how many hazardous materials teams should be available in a given area or region. Although, the number of hazardous



materials incidents within Waukesha County do not indicate the need for five different Level B Hazardous Materials Response Teams and these five teams could be consolidated into one or two teams for the entire County.

In the area of high angle and confined space rescue most fire departments do not have the resources necessary to develop adequate protection, and level of activity for these type of emergencies would not justify the development of additional teams within the County. These services could be shared by the fire departments that are offering them in their communities with the other fire departments in the County.

### Recommendations

#### Based on the Study

Based on the outcomes of this research study the researcher recommends that the thirty-one fire departments in Waukesha County considering starting to communicate with each other to discuss possible ways of looking further into how they could share resources and possibly reduce their costs to the taxpayers. The discussion should include what resources could be shared, how emergency responses could be better handled, and most importantly what would be best for the citizens and taxpayers of Waukesha County.

Based on the outcome of the study it appears to be obvious that the amount of funds spent on fire and EMS service in Waukesha County are significant, and there are many areas of service and resources that could be shared between the fire departments. It would be beneficial if perhaps either the thirty-seven municipalities in Waukesha County or Waukesha County itself would provide the funding to hire a consulting firm to conduct a study on the fire and EMS services. With the fact there are over \$ 21 million dollars

being spent on this service annually the cost of a consultant study would be a wise investment to at least look at the issue in further detail. A consultant's study could look in more detail at the resources and how they could be shared, and even make recommendations in terms of possible consolidations or mergers of fire departments.

#### Ideas for Additional Research

Ideas for additional research would include looking at other means of evaluating the effectiveness of the current fire and EMS services in Waukesha County. Perhaps a study could be conducted on response times to emergencies and the level of personnel that is on the scene at various emergencies.

Another possibility is a study on the type of emergency calls that are responded to by the fire departments. It would be interesting to know what the value was of the 325 structures that had fires in Waukesha County in 1997, and the total loss they experienced from the fires.

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## APPENDIX A

July 20, 1998

Dear Waukesha County Fire Chief:

As part of the requirements of completing a Masters Degree I am working on my research paper and the subject is "An Evaluation of the Level of Service and Delivery Costs of Fire and Emergency Medical Service Within Waukesha County".

As I mentioned at the last meeting of the Waukesha County Fire Chiefs Association, the results of this survey could be very valuable in assessing the cost of fire and emergency medical service within Waukesha County and provide important information that could help the fire departments within the county prepare for the future.

In conducting this research, it is necessary to collect data about the fire and EMS services from each municipality in Waukesha county, and the purpose of this letter is to ask you to complete the enclosed research survey. The data I am collecting for the survey is all public record and it is possible for me to obtain it from the clerk of each municipality, however, in order to assure that I obtain the most accurate data I am sending the survey to the Fire Chief of each municipality.

I would like to request that you complete the survey and return it to me in the enclosed envelope no later than August 7, 1998. If you have any questions about the survey or the research paper, please feel free to contact me at work 524-3649 or at home 542-0931.

I would like to thank you for taking the time to complete the survey and thereby helping me complete this research paper for my Degree.

Yours respectfully,

Robert W. Stedman  
130 W. St. Paul Avenue  
Waukesha, WI 53188

## APPENDIX B

## Waukesha County Fire &amp; EMS Services Research Survey

Survey Being Conducted by Robert W. Stedman

Directions: Please answer the survey questions about your Fire Department for the year 1997 by either filling in the blanks or checking the appropriate choices listed.

**Organization:**

1. Name of Fire Department: \_\_\_\_\_

Please list name of municipality, population, and check if you are providing fire and/or EMS for each municipality served:

Municipality(s) Served	Population	Fire (X)	EMS (X)
2. _____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. Type of Fire Department Organization: Check Correct (x) Type

Municipal: (1) \_\_\_\_\_ Private Company: (2) \_\_\_\_\_

4. Type of Fire Department: Check Correct (x) Type

Full Paid: (1) \_\_\_\_\_, Paid-On-Call: (2) \_\_\_\_\_, Volunteer: (3) \_\_\_\_\_

5. ISO Rating Hydrant Area: \_\_\_\_\_, ISO Rating Non-Hydrant Area: \_\_\_\_\_

6. Square Miles Serviced: Fire: \_\_\_\_\_ EMS: \_\_\_\_\_

7. Number of Fire Stations: \_\_\_\_\_

**Personnel:**

8. Total Number Sworn Personnel in Department: \_\_\_\_\_

9. Total Number: Full Paid (1) \_\_\_\_\_, Pd-On-Call (2) \_\_\_\_\_, Volunteer (3) \_\_\_\_\_

10. Total Number of Each: Non-EMT (1) \_\_\_\_\_, EMT-B (2) \_\_\_\_\_

EMT-I (3) \_\_\_\_\_, EMT-P (4) \_\_\_\_\_

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Waukesha County Fire & EMS Service Survey

11. If Pd-On-Call department, what is the rate of pay per hour? \_\_\_\_\_

**Operations and Services Provided:**

12. Level of EMS Service Provided: Check (x) Correct Type

EMT-B (1)\_\_\_\_\_, EMT-I (2)\_\_\_\_\_, EMT-P (3)\_\_\_\_\_

13. Other Services Provided by Fire Department: Check (x) All That Apply

Level A Hazardous Materials (1)\_\_\_\_\_, Level B Hazardous Materials (2)\_\_\_\_\_.

Extrication (3)\_\_\_\_\_, Confined Space (4)\_\_\_\_\_, Water Rescue (5)\_\_\_\_\_.

High Angle (6)\_\_\_\_\_, Fire Inspection (7)\_\_\_\_\_, Public Education (8)\_\_\_\_\_.

UST Inspection (9)\_\_\_\_\_, Fire Investigation (10)\_\_\_\_\_.

Other (11) Please List:\_\_\_\_\_

14. Dispatching Is Done By: Check (x) All That Apply

Own Municipality (1)\_\_\_\_\_, LAACS (2)\_\_\_\_\_, Sheriff's Department (3)\_\_\_\_\_

**Response Information:**

15. Number of 1997 Annual Fire Calls:\_\_\_\_\_

16. Number of 1997 Annual Actual Structure Fires:\_\_\_\_\_

17. Number of 1997 Annual EMS Calls: BLS (1)\_\_\_\_\_

18. Number of 1997 Annual EMS Calls: ALS (2)\_\_\_\_\_

**Equipment Information:**

19. Number of Fire Engines (1)\_\_\_\_\_, Number of Aerial Ladders (2)\_\_\_\_\_.

Number of Tankers (3)\_\_\_\_\_, Number of Ambulances (4)\_\_\_\_\_.

Number of Other Fire Vehicles (5)\_\_\_\_\_



## APPENDIX C

August 20, 1998

Dear Waukesha County Fire Chief:

A couple of weeks ago I sent out a survey requesting information about Fire & EMS Service provided by your Department. This survey is being completed as part of a paper I am completing for my Master's degree at the University of Wisconsin – Stout.

I know we all get very busy at this time of the year with budgets and fire prevention activities, but as of this time I have not received your completed survey.

I would appreciate it if you could complete the survey and return it to me as soon possible.

If you have any questions, please give me a call at 524-3649.

Sincerely,

Robert W. Stedman