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# *Staff Paper*

## **Buying and Selling Fire Protection**

Lynn R Harvey  
Professor and Extension Specialist  
State and Local Government

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Department of Agricultural Economics  
MICHIGAN STATE UNIVERSITY  
East Lansing, Michigan 48824

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# **BUYING AND SELLING FIRE PROTECTION**

by

**Lynn R. Harvey**  
**harveyl@pilot.msu.edu**

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**Summary: "Detailed examination of how and why townships and municipalities buy and sell fire services. Includes outline of various pricing methods." 13 pgs**

Appendix of Fire Protection Statutes not included here.

For additional information contact: Lynn R. Harvey, 34 Agriculture Hall, MSU,  
East Lansing, MI 48824. (517) 353-1619.

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## BUYING AND SELLING FIRE PROTECTION

### Introduction

The provision of fire protection represents one of the basic services of townships and municipalities. While not all local governments *produce* fire protection services, most units arrange for the *provision* of fire protection services for their citizens. Units which do not engage in the direct production and provision of fire protection, generally purchase fire protection through intergovernmental agreements. Some rural townships, in order to provide adequate fire protection services for the entire township, may contract with several neighboring units to secure adequate geographic coverage.

The buying and selling of fire services has the potential to create conflict over the quantity, quality and price of fire protection. The current financial stress that many local governments are experiencing has prompted sellers of fire protection to reconsider pricing methods in order to ascertain whether the unit is covering the costs incurred in selling services to a neighboring unit. Changes in pricing strategies result in buyers of fire protection becoming resistant to accepting higher prices. Buyers of fire services often threaten to exit the agreement and establish their own department if prices are raised. Negotiating a new contract becomes much more difficult when either or both parties are experiencing financial stress. If the seller is the only "game in town," such negotiations take place in a monopolist environment. The entire negotiations process becomes politicized and threats of court action emanate from township, village and city halls. The politicization of the intergovernmental agreement process leads to open bitterness between the parties and frustrates the attempts of reaching a collaborative agreement. The inability to reach consensus on a fire service agreement increases public uncertainty as to whether quality fire protection will be available to residents.

## **Selling Fire Protection**

Why do local units sell fire protection? In general, when municipalities or townships assemble the necessary resources, equipment, personnel and capital to produce fire protection services for their own unit, they may generate excess capacity. Units with excess fire protection capacity choose to sell protection to a neighboring unit in order to recapture a portion of the fixed costs of producing fire protection. A seller faces two key issues: (1) how much fire protection to sell (quantity) while still maintaining a given level of protection for the producing unit; and (2) what price to charge for the service being offered for sale. Establishing the price to charge is generally the source of disagreement between buyers and sellers. A city manager of a medium size city once remarked "that the appropriate price to charge is one upon which the two parties agree." While accepting his statement as true, there are other economic, social and political principles that should be considered.

Research<sup>1</sup> in 1976-78 of 94 communities engaging in the provision of fire protection services found, that the lowest cost per unit of the provision of fire protection occurred in units engaging in joint production. Intergovernmental contracting ranked second, while self-production and provision was the most costly. Therefore it is not difficult to understand why units attempt to sell fire protection to neighboring unit. On the other hand, the large capital investment required by a unit desiring to produce their own fire protection service often serves as a barrier to self-production, thus, provides an incentive to purchase fire services from a neighboring unit of government. When a unit buys fire protection, they not only purchase the services of fire suppression equipment and personnel, but also purchase a portion of the management services of the seller and the security of knowing that fire services will be available.

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<sup>1</sup> "The Organizational and Provision of Fire Protection Services by Municipal Governments in Hillsdale, Jackson, and Lenawee Counties (Michigan)," Department of Agricultural Economics, Michigan State University, May 1978.

## Pricing Fire Protection Services

A producer and seller of fire protection faces two types of costs, fixed and variable. Fixed costs include the costs of vehicles (tankers, grass rigs, pumpers, ladder trucks), buildings, and communications equipment. Since units do not purchase new fire vehicles each year, depreciation serves as a proxy for fixed costs. Variable costs include such items as wages and benefits of fire suppression personnel, operating costs of equipment, fire fighting gear, insurance, utilities, gasoline and repairs to equipment, accounting or bookkeeping services, and other items. The question for the seller is on what basis is fire protection sold?

Units throughout Michigan sell fire protection in a variety of ways; (a) *fire run*; (b) *annual subscription fee*; (c) *subscription fee plus run charge*; (d) *percentage share based on usage*; (e) *state equalized value share*; and (f) *weighted formula*. Each selling method has strengths and weaknesses that need to be recognized by decision-makers. No one single method appears to be a dominant means of selling protection in Michigan, however, some methods are perhaps more appropriate, depending on one's objectives. A brief outline of each will help clarify the differences between the pricing strategies.

### A. Fire Run

Selling protection by the *fire run* is essentially average cost pricing. The seller determines the total costs of fire protection (budget costs) and divides the total costs by the total number of runs for the previous year. Or alternatively, using historical production costs, the seller establishes a cost per run to be charged for future runs. An assumption is made that the established fire run charge includes fixed costs. This method is appealing from the standpoint of its simplicity but masks the problem of treating every fire run as being relatively equal in terms of costs. One cannot logically argue that a fire run to put out a car fire consumes the same level of resources as a fire run to extinguish a barn fire. Year to year fluctuations occur in the number of fire runs thus the cost per run can change from year-to-year. If few fire runs are

encountered in any given year, the producer of the service ends up bearing a larger share of the costs associated with the provision of fire protection. On the other hand, a buyer may find that the costs are high due to a large number of runs due for automobile or trash fires, but in terms of actual hours of service consumed, the governmental unit utilized relatively few fire suppression resources. An additional weakness of the pricing by "fire run" strategy is that sellers seldom take into account fixed costs. While the seller may recapture variable costs, the seller bears fixed cost. Pricing by the fire run introduces uncertainty to both the seller and buyer and may result in an inequitable sharing of costs of production and provision.

### **B. Annual Subscription Fee**

Some municipalities sell fire protection based on an **annual subscription fee** (lump sum) basis for the year. The buyer makes a predetermined payment to the seller and receives fire protection for the entire year with no specified number of runs or consumption levels. The seller is assured of a given revenue contribution from buyers therefore reduces budget uncertainty. Depending on the basis for determining the annual fee, this method of selling could leave either the buyer or seller saddled with costs not accounted by the pricing scheme. Generally, historical usage data is utilized to determine consumption levels thus leading to the establishment of the annual fee. While revenues from selling the service are stable, a seller may go broke providing the service with this pricing method. Fire suppression resources utilized in two major fires may consume the entire annual fee, leaving residents in the producing unit paying for any additional fire protection calls for the buyer. On the other hand, if the subscribing unit experiences few fire calls, the buying unit may have over-contributed to the financing of the services for the year.

### **C. Subscription Fee + Run Charge**

Establishing a *run charge* in addition to the *subscription fee*, in part eliminates the weakness of the previous discussed method. The subscription fee is essentially an access fee for the right of the buyer to purchase service from the seller. The seller then attempts to cover the variable costs of fire protection via the fire run charge. Another interpretation of the subscription fee, is that the fee partially offsets the capital costs incurred by the buyer in the production of fire protection services. Uncertainty again is introduced by assuming that all fire runs consume the same amount of fire suppression resources. Whether the subscription fee actually covers a portion of the capital costs incurred by the buyer is subject to the buyers ability to properly account for the total costs of producing fire services and the accurate apportionment the costs based on consumption of fire services.

#### **D. Percentage Share Based on Usage**

Under this pricing strategy, the seller of fire protection determines that total costs of fire protection and apportions the costs to buyers based on historical usage. Historical usage is determined by calculating the total number of fire personnel hours consumed by the buyer as a percent of total fire personnel hours of the department for the previous year. In order to avoid large year to year swings, a three or four year rolling average of fire personnel hours are utilized to determine percentage shares. The success of this pricing strategy is dependent upon the seller's ability to accurately reflect costs and requires accurate records with respect to personnel hours used in responding to each fire call. This method if implemented properly introduces the principle of equity. Units who historically consume more fire protection services pay more, those who consume less pay less. Utilizing this pricing method, buyers pay for both fixed and variable costs assuming the seller has included both in the budget development process. If the accounting is properly executed, no subsidization on either the buyer or seller occurs since the seller is able to realize not only the variable costs of producing fire protection, but recognizes the incurred capital costs and apportions those costs to the buyer including the sellers own unit. This strategy also insures that the seller



(producer) can count on a pre-determined revenue payments from the buyer(s), thus reduces budget uncertainty.

### **E. State Equalized Value**

A pricing method frequently utilized by sellers of fire services, especially those producing units levying special millage for fire protection, is providing fire services to buyers based on the equivalent yield of millage levy or a fraction of a mill levied on the SEV of the area of the buyer. While SEV reduces budget uncertainty for both the buyer and seller, cross-subsidization of fire protection costs frequently occurs with this method. Since the selling price of fire services is not related to actual production and provision costs, a seller may end up paying for a portion of the fire costs for the buyer or vice-versa. An argument is often made by sellers that since residents in the producing unit fund the fire department through a millage levy, it is only fair that residents in a buying unit pay the same millage levy for fire services.

Sellers of fire protection services have the responsibility of determining fire protection and production costs. How a buyer chooses to pay for the purchased service is a separate issue from pricing. A buyer may elect to pay for fire services through the unit's general fund, service fees, user charges, or unit may ask voters to levy special millage. The issue of pricing on the part of the seller of fire services is separate from the issue of how a buyer pays for services

### **F. Weighted Formula**

A *weighted formula* pricing method takes into account factors which have the potential to impact the demand for fire protection. The factors of *population, state equalized value and historical usage* are discrete and measurable and when combined together in a formula give transparency to the allocated share of fire protection costs, both for the buyer and the seller.

As the **population** of a unit increases, the incidence of fires generally increases. Therefore, including population accounts for added risk of exposure and the potential for the demand for fire services. **State equalized value (SEV)** of a governmental unit is included to represent the value of property to be protected. Similar to insurance, the more valuable the property to be protected, the more willing the owner should be to pay for fire protection. Recognition is made in the formula that open space is less costly to protect as opposed to residential, businesses, and commercial structures. **Historical usage** is included in the weighted formula in order to capture historical consumption patterns. To determine usage, the total number of fire personnel hours utilized in suppressing fires and responding to fire calls is calculated and a three-year rolling average is calculated. A rolling average is used in order to smooth out peaks and valleys in consumption.

Each of the three factors is assigned a weight - for example, SEV may be given a weight of 30 percent, population 30 percent, and usage 40 percent - the actual weights is a political negotiated decision. In rural areas where a significant percent of the SEV is attributed to open agricultural land, only fifty percent of the open space SEV is added to the SEV of residences and other structures. Ideally, if property record cards are computerized, an actual determination of the SEV of building structures could be determined and an agreed upon percentage of open space value added to determine the SEV of the area to be serviced. A percentage of the open space SEV should be included due to reflect the potential occurrence of grass and timber fires.

To calculate a formula share for each buyer of fire protection including the seller, the total population for the units or coverage area (if coverage area is different than the political boundaries) is determined and a percentage population share calculated for each unit (buyer). The total adjusted SEV is determined for the service area and a percentage share assigned to each buyer including the seller. A similar calculation is made with regards to historical usage.

Once the percentage share for each factor, **population**, **SEV** and **historical usage** is determined, the assigned weights are multiplied times the percentage share for each factor. The numerical result represents the weighted share to be used to determine each units financial share for fire protection services. The factor is used to determine both the operating cost share and fixed cost share for participating units.

**Example: Applying the Weighted Formual Pricing Method**

Assume that city is produces excess fire protection capacity and sells fire services to two townships. The negotiated weights for each of the factors are: population 30 percent; SEV 30 percent and usage 40 percent. The following tables demonstrate the determination of financial shares for fire services using the *weighted formula*.

**Table 1: Population**

| Unit       | 1990 Popl'n | % Total Popl'n |
|------------|-------------|----------------|
| City       | 4,575       | 53.5           |
| Township A | 2,225       | 26.0           |
| Township B | 1,750       | 20.5           |
| Total      | 8,550       | 100.0          |

**Table 2: State Equalized Value**

| Unit       | 1992 SEV<br>Adjusted | % SEV |
|------------|----------------------|-------|
| City       | 65,000,000           | 57.0  |
| Township A | 27,000,000           | 23.7  |
| Township B | 22,000,000           | 19.3  |
| Total      | 114,000,000          | 100.0 |

**Table 3: Usage  
Three Year Average - Total Hours**

| Unit       | Usage<br>(3 Year Avg.) | % Usage |
|------------|------------------------|---------|
| City       | 640                    | 41.8    |
| Township A | 480                    | 31.4    |
| Township B | 410                    | 26.8    |
| Total      | 1,530                  | 100.0   |

**Table 4: Factor Share  
(Factor Weight X Percent Factor)  
(Cross-Multiplication)**

| Unit       | Popl'n<br>30%<br>(1) | SEV<br>30%<br>(2) | Usage<br>40%<br>(3) | Sum<br>Weights<br>(1+2+3) |
|------------|----------------------|-------------------|---------------------|---------------------------|
| City       | 0.161                | 0.171             | 0.167               | 0.499                     |
| Township A | 0.078                | 0.071             | 0.126               | 0.275                     |
| Township B | 0.061                | 0.058             | 0.107               | 0.226                     |
| Total      | 0.300                | 0.300             | 0.400               | 1.000                     |

The "sum weights" in Table 4 represent the formula share for each of the three units and are used to determine cost shares for each unit. For example, Township B's weighted factor share is 22.6 percent and would be used to determine their cost share for fire protection services.

Assume the total costs of budgeted fire services (variable cost + fixed cost) for the city in producing fire services is \$86,000 - Township B's share equals \$19,436.

While the weighted formula appears to be a bit more complex as opposed to other pricing strategies discussed, the weighted formula more accurately reflects the benefits and costs of fire protection services. The factors (population, SEV and usage) can be adjusted annually to reflect changes. Normally, population figures are only available every ten years unless a special census is taken, however, local officials may wish to adjust the population figure every five years if information is available. Since SEV and usage changes annually, the new data can be inserted into the formula for updating the weighted factor share for each unit.

Resistance to the adoption of such a pricing formula is usually the result of cost shifts that occur in the adoption of the new pricing strategy, especially if fire services have been historically sold on a subscription fee or fire run basis. The key to the formula is the recognition of the principle that incidence, value to be protected, and usage are captured in one formula. If properly applied, the formula reduces uncertainty in the pricing of services while insuring that costs of the producer are covered. Buyers on the other hand, have a clear understanding of the basis for the determination of their share of the costs to secure fire protection.

### **Determining the Costs of Fire Protection Provision**

The main stumbling block to establishing intergovernmental fire protection revolve around determining what costs the producer includes in production costs. Buyers are often suspicious of producers, fearing that the unit is attempting to cover non-fire protection costs in the fire budget. Buyers are often unwilling to accept the concept that fixed capital costs need to be included in the costs to be passed along to buyers of fire protection. If capital costs are not recognized then the producer of fire services is likely to go out of business or residents living in the producing entity end up paying for a portion

of the costs of provision of fire services to contracting units. The *weighted formula method* of selling fire protection minimizes cross-subsidization for fire services among the participating units.

An appropriate method for capturing capital costs is through the use of depreciation schedules. Buildings and equipment have a certain life of usefulness before they have to be upgraded or replaced. Establishing a depreciation schedule and including the annual costs of depreciation as a fixed costs in determining total annual costs of fire protection production is a way to solve the fixed costs allocation problem.

Sellers must be cognizant of the costs of managing the fire department and the incurred costs of bookkeeping, training of personnel, maintaining inventory and ordering supplies. These costs are legitimate fire production expenses, and need to be included in the total costs of production of fire services. Buyers need to recognize that they are indeed contracting and purchasing a service, a service for which actual production costs can be determined. Buyers need to insist on a clear and detailed accounting for the basis of determining costs, especially capital and management costs.

### **Related Issues in Buying and Selling**

Frequently one hears from buyers of fire protection that the seller needs to discount the cost of providing fire protection services to areas located some distance from the fire station. The argument is put forth that since the citizens in the outlying areas suffer higher personal costs when fires occur due to the time and distance from the fire station, the value of the fire protection service is less. Personal loss due to fire may indeed be greater as the distance from the fire station increases, but this does not mean that fire protection has less value to the residents. While it is true that personal loss increases as one increases the distance from the closest fire station, one must assume that the property owner was well aware of the risks involved in locating residence some distance from fire stations. The costs of providing fire protection to outlying areas of a buyer increase for the seller due to wear and tear on the equipment as well as increased

personnel costs, therefore, the expectation that sellers should discount their service to outlying rural areas lacks economic principles.

Negotiating intergovernmental agreements is a frustrating and time consuming process. The transaction costs of arriving at consensus are high. The **establishment of a fire service committee** comprised of representatives of the various buying units along with representatives of the seller can serve as a problem solving board for both parties. While lacking statutory authority, a fire service committee can serve to deal with problems that arise during the life of the agreement. [Michigan law does permit the creation of a "statutory fire service or administrative board" (P.A. 365, 1982). The act covers the establishment of a joint administrative fire board to oversee fire department operations when a department is jointly owned by two or more units.] In the case of buy-sell relationships through intergovernmental contracting, units can use P.A. 7, 1967 (Extra Session) for the enabling authority. The act is very permissive and permits contracting parties to include in the agreement items such as advisory boards, pricing methods, and other terms/conditions for the buy-sell arrangement.

Waiting to begin the negotiation of a new contract until the old one expires is a poor path to follow. Bad contracts are developed during the heat of the battle and deep political scars that damage intergovernmental relations are usually the end result.

Questions are frequently raised by the buyers of fire protection, who have been contributing to the capital fund of the seller, related to the ownership of equipment acquired through expenditures from the capital fund. Whether a buyer is actually buying into ownership of capital purchases such as fire trucks is dependent upon the language in the intergovernmental fire agreement. Contract language should be clear and concise as to whether buyers are buying just the service rendered by the capital purchases or whether the buyer is indeed purchasing a portion of ownership of the equipment. If the seller is including depreciation costs into the costs of operation, then the buyer is clearly not buying ownership of the equipment. A seller who provides a specialized piece of equipment to service the fire protection needs of a

buyer, may request that the buyer pay a major portion of the cost of acquisition and have the title of the equipment be held by the buyer or in joint ownership. Generally, buyers are not buying into ownership of equipment and buildings unless specified in the contract. It is highly unlikely in the case of a city selling fire protection to a township for example, that the city is selling a portion of the ownership. Municipalities and townships can avoid legal questions by developing a detailed intergovernmental agreement with clear contract language over the type and levels of service being sold and purchased.

The acquisition of fire protection through intergovernmental arrangements has the potential to provide political, social and economic benefits to both the buyer and seller. The key to successful intergovernmental relationships is the development of clearly articulated written agreements. For further reading on intergovernmental contracting readers are encouraged to review the following:

- (1) ***On-Call Fire Departments: The Townships Board's Responsibilities***, G. Lawrence Merrill, Michigan Township Association, 512 Westshire, Lansing, MI 48917, January 1990.
- (2) "Outline of the Legal Aspects of implementing An Intergovernmental Agreement", Lynn R. Harvey, Department Agricultural Economics, 34 Agriculture Hall, Michigan State University, East Lansing, MI 48824, August 1992.
- (3) "Making Intergovernmental Cooperation Work For Your Unit", Lynn R. Harvey, Department Agricultural Economics, 34 Agriculture Hall, Michigan State University, East Lansing, MI 48824, January 1993.