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Staff Paper

Joint Public Ventures Cost Allocation:
Alternative and Consequences

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Joint Public Ventures Cost Allocation: Alternatives and Consequences

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Summary:"An in depth discussion of the nature, structure and financing of intergovernmental arrangements in the production of public services. Includes economic justification, methods of allocating costs and examples of joint ventures."17 pgs

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Introduction

Public discourse over the last several years has focused on privatization of state and local government services as a means of improving the production and provision of services. The discussion on privatization has been fueled by the perception of critics that the production and provision of services by the public sector has led to inefficiencies and higher tax prices for services. It is assumed that privatizing services previously produced in the public sector automatically leads to gains in efficiency and thus lower costs to the consumer. The privatization debate has often ignored alternative production and provision methods that accomplish the same objective of reducing costs of services. Joint public ventures, joint production, intergovernmental contracting, and private/public ventures represent feasible alternatives to the production and provision of services. The nature of some services do not lend themselves to private market production, therefore only focusing on privatization tends to further muddy the waters and introduce more uncertainty to the discussion. Policymakers must first understand the nature of public services prior to selecting the organizational arrangement to be used in service production and provision.

Once the nature of public services is determined, the organizational arrangement options can be explored including private market options. Allocating costs and determining funding methods represent key issues to be resolved especially when joint ventures are considered. Sustaining joint ventures requires an investment of time and the expenditure of political capital. Successful joint ventures, both public and private, requires patience, perseverance and an open mind.

I. Nature of Public Services

A basic question that must be raised is "how does one determine whether a good or service ought to be produced and provided in the public versus the private sector?" One cannot assume that the public sector selectively determined the services to be termed public services. Exploring factors that influence where services are to be produced will assist in answering the preceding question. While the factors generally identified as reasons for public versus private market production are the subjects of college courses in economics and political science, for the purpose of this discussion they can be identified as - *market failure, free riders, unwilling riders, high exclusion costs, externalities, economies of scale or size, transaction costs, and health and welfare issues.* Other factors could be discussed but for the purposes of this discussion on the nature of public service, the discussion will be limited to these factors.

The term **market failure** is often identified as the reason for the public production and provision of services. What does market failure mean? Generally economists refer market failure to mean that a private market failed to evolve due to the inability to extract rents (profit) from the economy. That is, firms could not generate profits or a rate of return on their investment thus no incentive exists for the market to develop for the good or service in question. The reasons why profits could not be generated may be due to the inability to determine quantity of service demanded and/or the price consumers were willing to pay for the good or service. In private markets, consumers vote with their dollars which signals producers how much to produce and what price to charge. For some services, determining consumer demand is not feasible. For example, how would one determine how much fire protection or police protection each consumer desired and what they would be willing to pay? Some citizens would place a high value on police services and be willing to pay accordingly. Others may not desire police protection of any kind, therefore would be unwilling to contribute to the production of police services.

Let's assume that an enterprising individual decided to establish his or her own police service in a community that does not have police service of any kind available. The entrepreneur sets a price based on the cost of production and a desired rate of return on investment. The entrepreneur contacts each residence in a neighborhood soliciting business, that is signing up subscribers. Assume that one half of the homeowners are home and sign up for the service. The police service owner, on the return visit to the neighborhood, indicates to residents that some of the neighbors have purchased a police protection plan which includes neighborhood road patrol, and do they wish to sign up for police protection. A rational economic actor would say "no - why should I, if my neighbors have signed up, I can still receive the benefits of police services without paying a cent since the police car cannot be invisible in front of my home". The non-payers become **free riders** since the police service producer has no way to enforce payment. Free riders are eliminated through taxation, everyone contributes to the collective production of the service. Although taxation eliminates free riders, **unwilling riders** are created, individuals who do not demand the service but are forced to pay for the service.[1]

Some services have the property of **high exclusion costs**, that is, other users cannot be excluded from enjoying the benefits of the service or good without incurring very high costs (in some cases it is impossible to exclude non-paying beneficiaries). In the police protection example, non-payers would enjoy the same benefits from a neighborhood road patrol as those that signed up. A classic high exclusion cost good is national defense where one cannot be excluded from receiving the benefits from national defense.

The actions of individuals, firms or communities can create costs or provide benefits which extend beyond political boundaries. These costs/benefits are referred to as **externalities**[2]. Examples are crime, education, development which creates congested highways, air and water pollution. Joint or collective action is required to address the problems since the action by one individual, firm or community cannot correct the problem. Government, acting on behalf of all impacted parties, initiates remedial action. If a lake or under ground water aquifer is polluted, the costs are not just borne by the polluter but by all users. The reverse is also true, individuals cannot be excluded from enjoying a clean environment. Government can regulate individual and firm behavior through the adoption of laws prohibiting specific behavior (pollution) and impose penalties for violations. Government can also foster collective production by organizing the service and collecting taxes to cover the cost of production and provision such as in the case of public education. No one community or individual totally captures the benefits or pays the costs of having an educated citizenry, therefore education is publicly produced, although a private education market co-exists in the economy. When problems emerge that spillover political boundaries collective or joint action is required, the same concept is applied to services that provide benefits beyond political boundaries, private action fails therefore government intervention is necessary.

Certain services possess the property of **economies of scale**, thus government involvement is needed in order for the service to be produced. The definition of economies of scale is "declining average

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[1] Schmid, A. Allan, Property, Power, and Public Choice, 2nd Edition, Praeger Publishers, New York, 1987, pp. 46-48.

[2] Fisher, Ronald C., State and Local Public Finance, Scott, Foresman and Company, Glenview, IL, 1988, pp.30-31.

costs as output increases." For example, water and sewer systems require not only a large capital investment to develop needed capacity but such a service requires a large number of users to make the service production possible due to high fixed costs. As more users are added to the system, fixed costs are spread over more users thus lower the costs for all users. While examples exist of privately produced water and sewer systems, natural gas distribution and electrical distribution, government is involved in allocating service areas (granting a monopoly to the producer) and controlling prices (Public Service Commission) that can be charged.

Government becomes involved and is often asked to intervene in cases where the **health and welfare of citizens** are concerned. Private health care is widely available in society but we still produce public health services. Both for economic and welfare reasons, the U.S. maintains a dual health care system. Non-users of private health care can impose costs on others by infecting others (some diseases are not selective by income), lost productivity and income due to illness results, and society bears the cost. Thus it is in the best interests of society to have a healthy citizenry even if it means allocating public funds to care for those unable or unwilling to access private health care. Government assumes the role of insuring equity of access to services.

Furthermore, requiring individuals and communities to hookup to public water and sewer systems is an example of government intervention to protect the health and welfare of individuals. Government involvement in housing either directly through the construction of low income housing or providing subsidies, direct (cash or vouchers) or indirect (providing tax credits or adjusting income tax by deducting property taxes and mortgage interest) is another example of health and welfare factor impacting the production of certain public services. It is doubtful that individuals or firms in a community would provide housing to low income if they were unable to make a positive return on investment, thus a community need (housing) would go unfulfilled.

In some cases, once governmental services are created private markets may evolve to assume the production and distribution of the service (privatization). In most cases when it has been demonstrated that a private market has evolved, public production of the service ceases. A good example is highway construction, most interstates and toll roads are constructed by private firms. The public may maintain the highways after construction but the initial construction is left up to private firms on a bid basis.

The decision of what services to produce, how to produce and who to produces services is a complex decision influenced by law (constitutional and statutory), past practice and community mandates. Given a choice, most communities would prefer to be self-producers and self-providers of services. **Transaction costs,** the costs of reaching a decision and managing a service, are lower under self-production/provision arrangements but total costs may be higher. The financial condition and situations for many communities dictate that alternative production and provision options be pursued as a means to maintain or expand the quantity and quality of community services. The ability to separate the production of a service from the provision of a service makes it possible for the exploration of joint ventures.

The decision to provide a community service is a separate decision from how and whom to produce the service, and what means to be used in financing the service. Separating out each decision step permits the exploration alternative institutional arrangements including co-production or joint production arrangements, contractual relationships (public and private), public-private partnerships, and privatization of services. Each alternative production/provision arrangement exhibits a dimension of consolidation.

II. Organizational Structure and Issues Related to Joint Ventures

The term "consolidation" is a red flag to many policymakers and citizens. The cry of bigger is not better" often is used as a counter to suggestions that services be consolidated. There are essentially three types of consolidation **- functional, geographical, and political**. Functional consolidation, consolidating a specific service function (fire, police, sewer/water, assessing, road maintenance, solid waste collection) is referred to as functional consolidation. Such arrangements would involve two or more units with each legislative body or an appointed oversight board maintaining control over the service.

The consolidation of school districts is an example of geographical consolidation. Political boundaries are not consistent with the new district. A separate governing body (school board) is established to provide oversight.

The most difficult consolidation to achieve is political, that is, merging two separate units of government into a new government. The most recent example of political consolidation is Battle Creek Township and City of Battle Creek. As one would expect, political consolidation is difficult to achieve since a sense of community and community identity is involved. Discussions are currently underway in the Upper Peninsula's Iron County for the consolidation of four home rule cities (Caspian, Gaastra, Iron River and Stambaugh). The uniqueness of the Iron County effort is that all four cities have contiguous boundaries. Preliminary economic analysis indicate that economies of scale in service production and management can be attained. While economics may serve as the incentives for consolidation, social and political reasons often impede consolidation efforts.

Legal Basis for Joint Ventures

The state of Michigan has permissive legislation enabling local governments to engage in contracting, consolidation, and joint ventures for service provision. A broad array of service specific statutes have been adopted as well as two broad statutes -- Urban Cooperation Act (P.a. 7, 1967 Extra Session) and Intergovernmental Transfers of Functions and Responsibilities Act (P.A. 8, 1967 Extra Session).[3] Suffice it to say, that local governments are not legally constrained from entering into joint ventures either contractually or through the formation of new institutional arrangements.

Joint Production Arrangements

Examples of joint production arrangements abound in Michigan. Such arrangements may take the form of districts, authorities, or formal contractual relationship and involve a city-township, a township/village, a city-city, a county-county, and a school-city arrangement for service production and provision, to name a few. Examples can be identified involving every conceivable public service that are produced or provided through a joint arrangement. For examples of the types of joint production

[3] For an excellent review of legal authority of local governments for joint ventures read "Evaluating Authority For Cooperative Arrangements", prepared by Miller, Canfield, Paddock and Stone, P.L.C. for the Metropolitan Affairs Corporation and the Southeast Michigan Council of Governments, June 1994.

arrangements readers are referred to "Intergovernmental Cooperation: Case Studies In Southeast Michigan," a survey completed by SEMCOG covering the period March-July 1994.

The proposed Metro Macomb Fire District[4] involving five cities and one township is an example of functional consolidation of fire services but also serves to illustrate a joint public venture. The proposal recommends the establishment of a fire authority[5] complete with operating by-laws, an authority board that would be responsible for the oversight of the production and provision of fire services in the six municipalities. Each of the municipalities would transfer the responsibility of fire protection to the fire authority.

The creation of a "authority", a special purpose local government, for the production and provision of a public service is a viable option for functional consolidation. The "authority" concept can be applied for emergency services (police, fire and ambulance) as well as sewer and water services, ports, and airports. Cities have adopted the authority concept to enhance downtown development (Downtown Development Authorities).

The advantage of authorities is that the legal organizational framework which require the development of clear and concise by-laws or operating procedures, the inherent power to finance the authority through the levy of property taxes (voter approval required) and the power to bond to finance capital projects. Legislative bodies often perceive the establishment of an authority as diminishing their legislative oversight. In cases where large capital investments are required to develop the necessary infrastructure for the production and delivery of services, organizing as an authority is an advisable alternative.

It is not uncommon for joint fire departments for example to be organized as a district. The creation of a district provides both administrative oversight as well as a financing option through the establishment of a special assessment district. Millage is then levied to generate revenue to support the fixed and operating costs of the service district[6]. Administrative oversight is provided through the creation of an administrative board yet legislative control is maintained by the participating local units. For example, P.A. 365, 1982 provides for the appointment of an administrative board for a joint or multi-unit fire department. The law dictates the size of the board, the appointment procedure and terms of appointment. The Urban Cooperation Act (P.A. 7, 1967 - Extras Session) provides for the creation of an administrative board but leaves the particulars of such things as duties, length of term and appointment procedures to be negotiated by the respective local governing bodies.

Intergovernmental Contracting Arrangements

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[4] "Metro Macomb Fire District: An Exploratory Report", prepared by fire officials in Roseville, Fraser, Mt. Clemens, Eastpointe, St. Clair Shores and Harrison Township, March 1994. Report is available from SEMCOG.

[5] The terms "district" and "authority" are often used interchangeably. As used in local government, a "district" often refers to the legal arrangement for financing the service, such as a special assessment district. An "authority" is a form of local government. Various state statutes enable the formation of authorities both as a legal organization form of government of service delivery and permitting the use of property taxes to finance the new arrangement. The Metro Macomb Fire District as proposed would be organized under the *Municipal Emergency Services Act, P.A. 57, 1988.*

[6] Special assessment millage is levied on all classes of property with the exception of the personal property class.

A majority of services produced and provided by local governments exhibit the property of economies of scale. Therefore in generating the capacity to provide services to community residents, excess capacity is often created. Excess capacity is costly since costs could be lowered by spreading fixed costs over a wider service area and more users. Fire and sewer/water services are good examples where excess capacity is present not only for the service itself but associated administrative oversight. Selling excess capacity through an intergovernmental arrangement has the potential to lower costs not only to the producer, but to the buyer. Research has generally found that buy/sell arrangements result in buyers receiving the service at a price less than the cost of self-production. In Michigan, if a unit of government has the authority to engage in the provision of a service or activity, the law permits the unit to enter into buy/sell or contractual arrangements with other political entities[7]. A variety of state statutes specifically address intergovernmental contracting. The Urban Cooperation Act and the Intergovernmental Transfer of Functions and Responsibilities Act (previously cited) due to the permissive nature of the legislation can be used for any intergovernmental contracting arrangement. The agreements must be filed with the Secretary of State's Office of the Great Seal.

In a review of the P.A. 7 and 8, 1967 (Extra Session) agreements on file, of the 249 service agreements 27 percent dealt with emergency services (police, fire., ambulance and central dispatch) with public transportation agreements second in frequency. The author suspects that numerous other P.A. 7 and 8 agreements have been developed in the state but have not found their way to the Secretary of State office. A 1989 survey of 233 cities, villages and townships in nine southwest Michigan counties found 342 intergovernmental agreements involving 14 types of services with 33 percent involving fire or ambulance service[8].

A 1983 national survey by the Advisory Commission on Intergovernmental Relations[9], identified the ten most frequently contracted services by cities and counties. The survey listed in descending order the following services - jails and detention homes, sewage disposal, animal control, solid waste disposal, water supply, police/fire communications, fire prevention, tax/utility billing and processing, and sanitary inspection. The survey did not distinguish whether the contracted services were from another public jurisdiction or private firm.

Emergency services (fire, police and ambulance), as research indicates, represent services that are frequently provided through intergovernmental contracts or through joint ventures. The substantial capital investments[10] required provide incentives for local governments to seek additional users of the service to

[7] Local governments in Michigan have restrictive powers. In order for a local government to produce or provide services and to collect revenues for such services, authority must have been granted by the legislature. This contrasts to some states where local governments can engage in activities as long as the legislature has not adopted prohibitions.

[8] Winchester, Lucy.,Mark Abeles-Allison, William Knudson, Patrick Patterson, Eric Trachtenberg and George Mansell, Survey of Collaborative Arrangements Among Local Governments in Southwest Michigan, Kellogg Leadership and Local Government Project, Michigan State University, East, Lansing, MI, October 1989.

[9] Advisory Commission of Intergovernmental Relations A-103, Washington, D.C., 1983, Table 4.2, pp. 28.

[10] Fire protection is an example of a service where "lumpiness" in service capacity is noted, meaning that a unit in order to have adequate suppression capacity may need 2.5 fire trucks but purchase three since one cannot buy a half of fire truck, thus excess capacity is generated. Alternatively, a unit short on capacity can purchase the additional capacity from another unit producing fire services. Another example can be found with specialized equipment. A unit may experience an infrequent need

reduce the per unit cost of service. The same incentives can be applied to other services such as sewer, water, transportation, central dispatch, solid waste collection/disposal, and public utilities.

The benefits to contracting for service acquisition are numerous. The benefits include reduced costs due to capturing economies of scale, specialization and bulk purchases, reducing duplication of services, discrete amounts of services can be purchased, producers reduce their fixed costs, and the potential exists for an improvement in the quantity and quality of services. Political and social benefits to contracting include, improving the capacity to address spillover problems, improving a unit's ability to respond to specific articulated demands of citizens for specialized services (e.g. - rural bus transportation for the elderly), and improving the equity of access to services. Successful collaborative efforts expand the sense of community, reduce the problem of jurisdictional boundaries, and create the environment for future joint ventures.

Public/Private Ventures

The production and provision of community services can also be joint ventures between the public and private sector, a form of privatization. As mentioned earlier, the decision to provide a service does not translate into the unit of government serving as producer of the service. What types of services to provide is a separate decision from how to produce and who is to produce the services. Thus, a local government may decide to provide solid waste collection as part of the governmental service package to residents but contract with a private firm to produce the service. Alternatively, a local unit may grant monopoly franchises to a private firm such as in the case of cable TV. Government's can introduce a degree of competitiveness into the public market by bidding out service contracts. Illinois has experimented with privately managed sewer/water systems. While such an example is held up as a privatization model, it should be pointed out that contracting with a private firm to manage a sewer/water system is a joint public-private venture, not total privatization.

Since governments define the "rules of the game" for the market place, even with total privatization, government assumes a role in the marketplace. In some cases, government involvement can increase efficiency in the production and provision of services provided by a private firm. In my neighborhood, solid waste collection is provided by private firms. Each township resident contracts with one of three solid waste disposal firms. I live on a dead end street with fourteen homes, three different firm's garbage trucks traverse the street between Monday and Wednesday servicing residences, resulting in a duplication of services, additional noise, and wear/tear on the roads. The officials desire that solid waste collection occur in a competitive market. The township could improve the distributional efficiency of solid waste collection and lower total costs to the firms by granting franchises by area to private firms. Franchises could be allocated on a competitive bid basis with each firm being granted a monopoly for a given designated service area. Collection costs would be reduced since collection routes would not be subject to duplication and congestion reduced.

Joint public-private ventures are, or could be, initiated with recreation programs between schools and local communities, incarceration facilities, health care (hospital), road construction and maintenance, transportation, maintenance of physical plant and infrastructure. Local governments when deciding on

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for a ladder truck, an expensive piece of fire equipment, neighboring units may have the same low level of need. To reduce costs for all, one ladder truck can be purchased and shared by contract with neighboring units.

production/provision options are encouraged to seek partners from the private sector. In the case of much discussed privatization of jails and prisons[11], the privatization is actually a joint public-private venture. State or local government either put up the capital for construction through bonding or construct the facility and contract with a private firms to operate the facility. A number of municipalities have privatized the maintenance of municipal vehicles (trucks, busses and maintenance equipment) yet upon further examination, the operation is a public-private venture. Local governments have provided tax breaks and incentives for the recipient firms and in some cases put up municipal capital to foster the operation. Such partnerships are not to be minimized since they represent viable solutions to the production and provision of desired community services.

Obstacles to Contracting and Joint Ventures

The benefits to contracting for the acquisition of services are identifiable and quantifiable yet, opportunities to collaborate or engage in joint ventures often fail to materialize due to political, economic and social stumbling blocks. The obstacles to contracting and joint ventures are numerous but not insurmountable. Joint or contractual partnerships may be impeded due to the transaction costs, the costs of reaching joint decisions. The fear over the perceived loss of control, turf protection, "skeletons in the closet", uncertainty of the sustainability of the joint agreement, and the perception that "hidden agendas" are present may serve to constrain viable partnerships from materializing. Local residents and public officials often shy away from joint production arrangements due to the perception that service quality and quantity will change once the unit engages in a joint or contractual venture. The inability to resolve price and cost allocation issues under a co-production or co-production arrangement is often given as the reason that an alternative institutional arrangement failed to reach fruition. But in order for any degree of privatization to occur, private firms willing to engage in the venture must be present in the market place and willing to assume risks.

III. Methods of Cost Allocation Under Joint Production Arrangements

The method of sharing and allocating cost shares under a joint production or contractual arrangement is often critical to the success and failure of joint ventures. The selected cost share allocation method must be transparent, that is, local officials reading the agreement must be able to understand the method for establishing costs and how the appropriate cost shares are allocated among participating members. The lack of transparency in a joint agreement leads to more frequent conflicts and political unrest. As the composition of legislative bodies change due to elections, agreements lacking clarity in how costs are determined and allocated results in pressure to renegotiate agreements, dissolve long standing relationships, and to explore self-production/provision option. Therefore, a necessary step in negotiating sustainable joint ventures involves developing a clear rationale of why a particular cost allocation method has been selected.

Allocating cost shares is a separate decision from selecting a method to finance the service. In joint production arrangements, the sharing of costs and generating needed monies to finance a service become somewhat muddled. However, in contractual buy/sell agreements, how the buyer of a service decides to finance the service rendered by the seller should be the seller's decision. The strengths and weakness of a

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[11] Harvey, Lynn R. "Reinvesting in the Social Infrastructure of Communities." Increasing Understanding of Public Problems and Policies: 1992, pp.119-129. Farm Foundation, Oak Brook, IL. January 1993.

number of cost allocation methods will be discussed to illustrate how the distributional consequences change under each method.

Relating Benefits To Costs

A basic guiding principle in allocating cost shares is, where possible, relate benefits (services received) to the costs of production and provision. In most cases, beneficiaries can be identified and service demand determined through using historical demand information (examining demand over a period of years). Identifying service demand gets complicated with such services as police, fire, animal control, emergency response services, economic development activities or services that are oriented to prevention and emergency response. Individual demand is difficult to determine thus presenting problems in allocating individual tax prices (costs). Therefore, governments rely on broad forms of taxation to finance the services. Other services such as, sewer and water services, streets, sidewalks, curb/gutters, street lighting, inspection, tax assessing, etc. lend themselves to easier identification of beneficiaries and demand. For example, it is not difficult to determine sewer and water usage which makes it possible to price services on a per unit basis. Or curb and gutter cost can be charged to home owners on a per foot basis.

Types of Costs

Determining costs can be a difficult exercise but in most cases, the per unit cost of service can be calculated. Two types of costs need to be quantified: **fixed costs**, costs which do not change with the level of output; and **variable costs**, costs which change with the level of output. Examples of fixed cost would be buildings, capital equipment (police cars, fire trucks, sewer treatment plant and accompanying distribution system for water and sewers, and land to cite a few. In determining fixed costs on an annual basis, depreciation can serve as a proxy for fixed costs. The failure to recognize and account for fixed costs is often the achilles heel of local government financing especially in joint ventures and buy/sell agreements. If allocated cost shares only include the variable cost and fixed costs are ignored, service producers find themselves unable to fund additional capital purchases in future years. Therefore it is critical that units establish depreciation schedules for each piece of equipment or capital investment items utilized in the production and provision of services and include depreciation as an annual cost.

Variable costs include such cost items as wages and benefits, gasoline, equipment repair, disposable or consumable items, insurance, management services and the like. Local governments generally are adept at calculating variable or reoccurring costs since they have to be funded on an annual basis therefore are quite visible, unlike fixed costs which to both consumers and local officials are not readily apparent.

Factors To Consider In Allocating Cost Shares

A variety of options are available to local governments when it comes to allocating cost shares under joint ventures and co-production arrangements. The allocation becomes complicated when factors such as population, tax base wealth, fiscal capacity, and service demand vary between the participating units. Units that are similar in size and demographic composition and engage in joint ventures will find that an equal sharing of cost shares presents no problems. The more dissimilar communities are who desire to enter joint production arrangements the more creative they need to be to insure that equity in cost sharing occurs. Attempting to capture factors which influence demand for services thus impact cost shares promotes equitablity. If two units decide to jointly produce and provide fire services, it may not be appropriate to allocate cost shares on an equal basis if variation is noted in the aforementioned factors[12]. Developing a weighted cost share formula may be more equitable due to the inclusion of factors that influence demand. An equal sharing method may lead to cross-subsidization between the units. A weighted cost share formula is perhaps more applicable to services such as fire, police, ambulance, library, and recreation services. Population density, congestion, household income, or other demographic characteristic may influence demand. An expansion of the weighted formula concept will be discussed later.

Population may serve as the appropriate factor to be used in determining cost shares for jointly produced planning and development services. Or a combination of population and tax base could be used since the output from planning and development has applicability to a wide variety of users (governments, private firms, and individuals). Geographical information systems (GIS) are an example of a much needed available service to local governments but to have each local government engage in the development of a GIS is too costly and duplication would result. A GIS system is an ideal service to be undertaken by forming coalitions and joint arrangements. Once the GIS is developed, the service can be readily made available to surrounding jurisdictions. The issue with GIS is how to allocate the costs of development and how to price the service to users? An alternative would be for units within a region to establish a joint venture, contract with a unit, combination of units, private or an organization like SEMCOG to develop the service with each unit bearing a proportionate share of the development cost. The proportionate share could consist of a combination of population and tax base as measured by SEV. A user fee would also be appropriate.

Jointly produced infrastructure services, such as sewer and water, present less of a challenge in the allocation of cost shares. Since the project is financed over a long period of time through bonding with property taxes levied to cover the fixed costs. Variable costs are easily identified and are related to consumption. Readiness to serve charges are frequently assessed to cover the cost of maintenance and upgrade. Therefore the opportunities for cross-subsidization are minimized.

Buy-sell or contractual arrangements for providing community services present a challenge for both the producer (seller) and buyer. The seller is concerned about covering their total costs of producing and providing services, maintaining service capacity, and establishing the price to charge for the services rendered. Buyers on the other hand are concerned that they not be overcharged for the service since many of the services are provided in a monopoly environment. For example, for services such as police and fire, a municipality may have only one supplier of the service available and the unit does not have the fiscal capacity to become a self-producer. Units contracting services are also concerned whether the supplier of services will accommodate their specific needs. Especially with emergency type services, buyers seek guarantees that the seller will give priority to their service requests and not be accorded a secondary response status. Clearly articulated provisions in the intergovernmental agreement can minimize concern over both price and response.

Uncertainty related to pricing services in a buy-sell arrangement can be reduced by adopting cost share and pricing models that exhibit transparency and permit pricing changes as factors influencing demand and production costs are noted. Thus, sharing costs and pricing services based on a model that

[12] Harvey, Lynn R. "Buying and Selling Fire Protection." Staff Paper 94-4, Department of Agricultural Economics, Michigan State University, East Lansing, MI. January 1993. The paper provides an expanded discussion of the different methods of allocating cost shares for fire protection production and provision and the pricing of fire services in buy/sell arrangements.

incorporates factors that impact demand, provides some assurance that the seller can cover costs and the buyer is not over charged.

Cost Weighted Formula

A ***weighted formula*** pricing method takes into account factors which have the potential to impact the demand for service. For illustration purposes, let us assume that three units of government (two townships and a city) decide to provide fire protection through an intergovernmental agreement with the city producing the services. The question arises as how to allocate costs. The three units agree that they will use a weighted formula. The factors determined to be applicable in the formula are - *population, state equalized value and historical usage.* Each of the variables are discrete and measurable, and 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 Formula 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	1993 SEV 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 (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 30% (1)	SEV 30% (2)	Usage 40% (3)	Sum Weights (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 annual costs of fire services (variable cost + fixed cost) for the city in producing fire services is $86,000 - Township B's share would be $19,436 [0.226 x $86,000).

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.

Additional Uses of Weighted Formulas

The above example illustrated how the weighted formula concept is applied to fire protection in a buy-sell arrangement. The technique could also be used in a joint venture or joint production/provision agreement. If policymakers perceive that additional factors should be captured by the formula, they can be added and adjustments made. The weighted formula concept is applicable to other services such as police, ambulance, and parks/recreation where demographics may vary and impact demand for services. The greatest strength of the weighted formula is the flexibility and adding clarity to how costs are distributed thereby reducing uncertainty.

Other Models of Cost Allocation

Obviously the weighted formula is not the only model for allocating cost share with services are produced and provided through a joint venture. Many examples can be found where participating parties simply allocate share based strictly on SEV. Using tax bases as the determining allocation factor assumes that the demand for service is a function of the value of the property. While simple to administer such an approach fails to capture additional factors that influence demand. However, if units determine that they are going to finance the service through property taxes by levying extra-voted millage then using SEV as a determining factor may be appropriate despite the inherent weaknesses. Some units sell emergency type services (fire, police, ambulance) on a run charge. Experience has shown that run charges reflect average cost pricing (total costs divided by number of runs). The advantage of this approach is that it is simple to administer and understand. However, cross-subsidization often occurs since the approach may not capture the variability in the consumption of services that is present. For example, an average fire run charge of $750 may over-price the fire call for a washdown resulting from a vehicle accident but under-price a call for a structure fire. The method can be strengthened by adding a "stand by" service charge, similar to a readiness to serve charge assessed by sewer/water producers, with the stand by fee being deposited in a capital equipment or replacement fund.

Local units may have to resort to more traditional cost shares allocation methods for services such as, recreation that are produced through a joint venture, and do not have an easily identifiable discrete output measures attached, unlike fire runs, police road patrol or ambulance calls. Factors such as population or number of households could be used to allocate cost shares.

IV. Financing Joint Ventures

The previous section centered on allocating cost shares between partners when producing or buying services under a joint agreement. Financing joint ventures represents a critical decision point, for the selected finance method has far reaching distributional consequences (who benefits and who pays the costs). Local governments have at their disposal the use of general fund revenues, extra-voted property taxes, special assessment, user fees, third party payments, grants and donations/contributions to fund community services. Each financing strategy carries a differing set of issues to be resolved by the body politic. Grants and donations will not be discussed however, recognition should be made that communities have used these monies to either serve as matching dollars or to substitute for other revenue sources to finance community services.

General fund revenues are used to finance services that are made available to all community residents. Units engaging in co-production arrangements for service provision are certainly free to use general fund monies (if available) to support such activities but with stressed budgets, local governments have sought alternative sources of funding.

Extra-voted property taxes have become a common means of supporting local services and often looked to as the means to expand service delivery. Local governments frequent go to the voters requesting additional millage levies for police and fire protection, library, buildings, recreation, purchase new computers, all aimed at maintaining or expanding the level of output of services. Extra-voted revenues become restricted revenues and are treated as special revenue funds meaning that their use is limited for a specific activity. Joint ventures are often funded through the levy of extra-voted millage with the perception that everyone is paying their fair share by using property taxes as the revenue source. While guaranteeing revenue for the activity, inequities may be created since the value of property and the demand or use of the service is not equated.

Special assessment levies is the preferred financing strategy when special assessment districts are established or created by legislative bodies. Special assessment districts are formed when the beneficiaries of a service or public improvement are clearly identifiable such as the case od streets, sidewalks, street lighting, drains and curb/gutters. Increasingly, local governments utilize the special assessment districts for providing fire, police, ambulance, and recreation. Technically special assessment levies are not considered property taxes although property value is used the base for which the levy is assessed. But special assessments are considered as part of the taxing effort of cities, village and townships when calculating the relative tax effort for the state revenue sharing program. Therefore some incentive exists for units to utilize special assessments. Special assessments encounter the same problems as the property tax in relating the service received to means of financing. Some improvements require that special assessment levies be used as the financing means. For example, if a local unit sells bonds to finance a sidewalk project, a special assessment district is created and the annual levy paid to retire the incurred debt.

Economists often refer to the incidence of taxation (who ultimately bears the cost). With some methods of finance, the beneficiaries of a service may not be the ones who actually bear the cost of the service. For example, assume that a unit decides to support a joint police service by creating a special assessment district, therefore all real property owners financially contribute to the production of police services. Visitors to the communities benefit from having police protection but bear zero cost for the service. Many service examples exist in local governments where the payers of a service are different from beneficiaries. This is not unusual but local officials when selecting financing mechanisms should be aware of the relationship between the benefits and who bears the ultimate costs.

User fees and service charges, in large part, eliminate the problem of benefits not being related to costs of the service received. The trend in local governments beginning in the mid-1980s was a higher reliance on user fees and service charges to support community services. This was especially true after the demise of the federal revenue sharing program in 1986 as units scrambled to replace federal monies. User fees increase administrative costs due to collection, monitoring and accounting but help to regulate demand for the service. Municipalities frequently see water usage per household drop once water is sold on a per unit basis versus a lump sum payment each month. Municipalities have found that revenue can be maximized and demand regulated by having a two-tiered pricing system for services for which user fees are attached. Higher prices can be charged during peak demand periods versus off-peak periods (e.g. bus transportation, toll bridges, launch ramps, and golf courses). Providers of such services are able to take advantage of differing demand elasticities of consumers.

While user fees and service charges over a viable option for financing services several problems are created namely, equity of access, regressivity and uncertainty of revenue. Establishing a user fee may eliminate some users from access to the service due to income. User fees are a regressive form of taxation, as one's income goes down the percent of one's income paid to the user fee increases. User fees and charges, unless the good or service is inelastic, impact the use of the service therefore revenue yields are less certain.

User fees are increasingly being used to support fire run calls, selected police services (e.g. - obtaining an accident report for an insurance carrier) and ambulance calls. Even if a governmental unit is producing and providing a service through the general fund or special millage, local units may assess a user fee.

Third party payments represent a source of revenue for local governments. Emergency services, police, fire and ambulance, can in part be supported through third party payments. Home owners and auto insurance policies, in most cases, contain provisions for reimbursing policyholders for costs incurred in ambulance transport and fire suppression calls. Though local governments incur additional costs in billing customers who use emergency services, third party payments can assist in offsetting costs of service provision. Collection rate on third party payments average around 50-60 percent. If a unit determines that residents or users of emergency services are going to be billed for emergency response, an informational campaign is needed to inform citizens of the new strategy. Residents may have to check with their insurance carriers to see if such coverage is provided or a rider can be purchased.

Obviously, local governments can combine financing options to produce and provide community services. Utilizing extra-voted milage to support a service does not preclude the use of third party payments. Or a base level of service can be financed through general fund revenues and additional levels of service provided through the collection of users fees and service charges. Local officials need to examine each revenue option and determine which method matches community needs.

V. Sustaining Joint Ventures

Once joint ventures, co-production or buy-sell agreements are developed, sustaining the relationship in the long run takes effort. The key to successful collaboration is written agreements and the establishment of a policy board to oversee the operation of the joint effort.

Written agreements should contain the legal basis for the contractual relationship, method of cost sharing, the quantity and quality of service to be provided, and the time period covered. Agreements need to be long enough in length so that uncertainty is reduced over the availability of the service. Periodic review or renewal clauses insure that policy bodies re-examine the terms and conditions of the agreement on a regular basis. Additionally, exit clauses or early termination procedures should be detailed in the agreement along with evaluation and reporting procedures.

Administrative oversight is critical to smooth functioning and long lasting joint ventures. Participating units need a forum for problem resolution other than the city council or township board meeting. Administrative oversight boards may be required under some authorizing statutes but in other cases, a board will need to be appointed. While the composition of the board and their responsibilities is subject to negotiation in most cases, boards that contain equal representation perform better than boards that have unequal representation. The tendency exists in negotiating agreements that if one unit is responsible for paying 60 percent of the costs that they receive an additional representative or vote. Agreements so structured tend to be short lived since the unit with fewer votes perceives that they are "steam rolled" in the voting process.

Administrative oversight bodies have the responsibility for making frequent reports back to the respective participating legislative bodies. This not only insures constant communication but alerts the legislative bodies to potential problems. Legislative bodies on the other hand have to empower their representatives to act on behalf of their. Nothing destroys the integrity and confidence of a administrative oversight board than to have the legislative body constantly countermanding recommendations developed by the oversight group.

Joint ventures will increasingly become a sought after option in the production and delivery of community services, cost will dictate the approach. For some units, maintaining service, improving quality and quantity, and expanding services is only feasible by lowering costs or forming new partnerships. Remember -- successful collaborative efforts requires **perseverance, patience, compromise, and an open mind**, with the latter the most difficult to achieve.