

ANALYZING INSTITUTIONS FOR THE DELIVERY OF  
LOCAL COLLECTIVE GOODS

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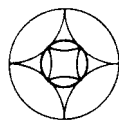
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## ABSTRACT

Public choice theory has proved particularly fruitful when applied to the analysis of institutional arrangements for providing and producing public services in metropolitan areas. Scholars working within traditional disciplines of political science and public administration had reached a theoretical impasse in understanding the complexity of the existing delivery arrangements. By identifying the key attributes of collective goods and the difference between organizing for the provision and for the production of collective goods, scholars working in this interdisciplinary area brought comprehensibility to the study of complex service delivery arrangements. Further, empirical research now supports several counter-intuitive propositions derived from this approach about the effects of institutional arrangements on the effectiveness and efficiency of police agencies serving metropolitan areas.

ANALYZING INSTITUTIONS FOR THE DELIVERY OF  
LOCAL COLLECTIVE GOODS

Important developments in science frequently occur at the boundaries of traditional disciplines when scholars from two or more fields begin to address old questions in new ways. Since the publication of Anthony Downs's An Economic Theory of Democracy<sup>2</sup> in 1957, a group of economists, political scientists, policy analysts, and sociologists have used methods developed in economics to examine the public sector. They refer to their approach as "public choice." An organizing question underlying work in the public choice tradition is: What are the incentives that individual actors face when making decisions in the public sector? Having identified these incentives, public choice theorists predict how different actors will act and how individual behavior will aggregate into collective outcomes. Incentives result from the type of goods involved in a situation combined with the type of institutional arrangements used by individuals for making decisions about allocation, production, distribution, and consumption of those goods. Consequently, public choice theory deals broadly with how the nature of goods combines with the structure of institutions to create incentives leading individuals to adopt strategies that jointly produce outcomes.

Most social scientists by now are familiar with the "classics" in this field by James Buchanan, Gordon Tullock, Mancur Olson, William Riker, Kenneth Arrow, Duncan Black, and William A. Niskanen,<sup>3</sup> among others. Many paradoxes and counter-intuitive results have been generated from these efforts that are now common knowledge among social scientists and occupy major attention by a growing number of scholars. Considerable empirical research in legislative and electoral arenas has been conducted. A vigorous experimental research program

has developed within the past decade. As a result of empirical studies, the theory itself is undergoing progressive reformulation. From the early focus on electoral and representative mechanisms, public choice theorists are addressing a broader array of problems. At the most recent meeting of the Public Choice Society, for example, papers were presented on: "A New Understanding of Unionism in the Public Sector," "Property Rights and the Wild Horse Controversy," "Implications of Rent Seeking for Efficient Pollution Taxation," and a "Positive Model of Social Security."

Public choice theory has proved particularly fruitful when applied to the analysis of institutional arrangements for providing public services in metropolitan areas. Scholars working within the traditional disciplines of political science and public administration had been perplexed by the sheer complexity of the delivery arrangements existing in American metropolitan areas. The dominant view of metropolitan institutions was that they were chaotic and incomprehensible. Given that scholars studying metropolitan service delivery arrangements could not find an order in them, the reaction was to recommend that metropolitan institutions should be radically simplified. Many articles, books, monographs, and reports written by urban scholars recommended the elimination of smaller jurisdictions and the creation of a few, large, general purpose governments to produce all local services in any given metropolitan area.

This literature was the basis for repeated consolidation referenda placed before voters who almost uniformly rejected the proposed reforms. In 1970, Amos Hawley and Basil G. Zimmer summarized the dominant academic view of the day:

A diagnosis of the metropolitan malady is comparatively easy and its logic is too compelling to admit disagreement. Given the diagnosis

the treatment seems just as apparent: consolidate the many political units under a single, over-arching municipal government. With one stroke the many conflicting jurisdictions could be eliminated and a fragmented tax base could be combined into an adequate source of revenue for an entire community. Nothing, it would seem, could be more obvious or more rational. For that reason governmental consolidation has had numerous advocates. It has also had numerous opponents. Indeed, opposition to such a proposal has been monumental.<sup>4</sup>

Scholars working within traditional disciplinary boundaries of political science and public administration had reached a theoretical impasse. All they could do was to reflect upon the incomprehensibility and irrationality of the world as they perceived it. Scientific progress is difficult when the phenomena of interest is perceived as incomprehensible.

A public choice approach to the study of metropolitan institutions has enabled scholars to begin to identify key concepts for making the complexity comprehensible. Vincent Ostrom, Charles M. Tiebout, and Robert Warren, in an article on "The Organization of Government in Metropolitan Areas: A Theoretical Inquiry," urged scholars not to prejudge the performance of institutional arrangements simply because of their complexity.<sup>5</sup> Instead, they urged that the multiplicity of local jurisdictions in a metropolitan area be conceived as a "polycentric political system."

"Polycentric" connotes many centers of decision-making which are formally independent of each other. . . . To the extent that they take each other into account in competitive relationships, enter into various contractual and cooperative undertakings or have recourse to central mechanisms to resolve conflicts, the various political

jurisdictions in a metropolitan area may function in a coherent manner with consistent and predictable patterns of interacting behavior. To the extent that this is so, they may be said to function as a "system."<sup>6</sup>

They urged scholars to adopt a different perspective. First, it was essential to understand why individuals living in metropolitan areas might have created an array of different institutions to serve their needs. Then, one could begin to evaluate the performance of such institutions in relation to alternative structures.

In this early "theoretical inquiry," Ostrom, Tiebout, and Warren identified several important concepts that have become essential to the development of a public choice approach to the study of metropolitan institutions. These include: (1) the characteristics of collective goods; (2) the separation of consumption, or provision, activities from production activities; and (3) how particular attributes of collective goods differentially affect the optimal scale of organization for production and for provision. How these three concepts have affected the way public choice theorists analyze metropolitan institutions will be addressed in the next three sections. Then, several counter-intuitive propositions derived from a public choice approach to the study of metropolitan institutions will be discussed. A brief review of the evidence in support of these propositions will be examined in the last section.

#### THE CHARACTERISTICS OF COLLECTIVE GOODS

All goods sharing two characteristics -- jointness of consumption and infeasibility of exclusion -- are called collective goods. Purely voluntary institutional arrangements are rarely sufficient to enable individuals to achieve optimal performance in the allocation, production, distribution, and consumption of collective goods.

### Jointness of Consumption

Jointness of consumption occurs whenever multiple individuals jointly use a good at the same time.<sup>7</sup> Thus, many individuals jointly use a bridge, a theater, the air waves, or states of affairs such as the level of safety in a community. On the other hand, bread is an example of a good that is not jointly consumed. Once a loaf of bread is obtained by one individual or family, that loaf of bread is no longer available for use by others.

Distinguishing between the units in which the good is produced and the units in which the good is subject to use is helpful in identifying joint consumption.<sup>8</sup> When the unit produced is substantially larger than the unit consumed, joint consumption will occur. In regard to a bridge, for example, the unit produced is a bridge of a particular length and width. The individual unit of use is a bridge crossing.<sup>9</sup> Depending upon the size of the bridge, how lanes are divided, and laws regulating speed, a bridge can be thought of as yielding a continuous flow of bridge crossing units. When few cars cross the bridge, little apparent "subtraction" occurs. As more and more cars simultaneously use the same bridge, the quality of any particular bridge crossing is adversely affected by the number of other users. Congestion begins to occur and everyone begins to slow down. If the maximal capacity of a bridge is exceeded, a level of congestion occurs that drastically affects the quality of each individual's unit of use.

### Feasibility of Exclusion

Exclusion occurs when potential users or consumers can be denied access to consumption units of a particular good unless they meet the terms and conditions of the supplier of that good. Exclusion is frequently difficult to achieve for goods subject to joint consumption, but is not a problem for all such goods. For jointly consumed goods or services, exclusion may be

accomplished when access to an entire production unit is controlled by a vendor. By enclosing a theater in a building, an entrepreneur is able to control access to a performance and enforce the condition that someone must buy a ticket before gaining entry to the theater. The building, and in particular the entrance, is the physical means of packaging the production unit so as to exclude consumers until they meet the terms and conditions set of the vendor. Tickets are the legal instrumentality that gives access to the production unit which is subject to joint use or consumption.

The feasibility of excluding users is affected both by technology and by the way property rights are defined in relationship to a good at a particular location in space and time. Technology affects the capacity to control physical access to the consumption of goods and the costs of gaining exclusion. Property rights doctrines differentially affect the capability of individual vendors to exclude others from consuming or enjoying benefits that have been produced.

#### Results of Using Voluntary Arrangements for Collective Goods

Jointly consumed and nonexcludable collective goods generate serious problems in human organization. Once a collective good is supplied by nature or by others, all individuals within the relevant domain are free to use the good without contributing toward the cost of producing it. Cost-minimizing individuals have an incentive to become "free riders," enjoying the benefits while others pay. Success by free riders encourages others to free ride resulting in a failure to supply such goods under voluntary arrangements. Competitive markets, where each individual is free to decide for himself or herself, will fail to allocate resources toward collective goods efficiently. In some cases the failure is complete. No production and consumption of the collective good result. In other cases less than optimal levels of the collective good are supplied through voluntary arrangements.



Individuals in small groups can monitor each other's actions and personally coerce each other to share costs. But, large groups usually cannot organize effectively under strictly voluntary arrangements. Each individual is more anonymous. Each individual's share of the cost of the good seems insignificant. Thus, each is tempted to free ride unless each can be coerced to contribute a proportionate share of the cost. Collective good situations usually require access to some form of coercive action where each individual can be compelled to share in the costs. The advantage may be such that each user has incentives to create arrangements so that each user pays a proportionate share of the cost: the aggregate benefit exceeds the aggregate cost.

#### SEPARATION OF PROVISION AND PRODUCTION ACTIVITIES

The key problem in obtaining optimal levels of collective goods relates to the provision of the good rather than to the production of the good. If large groups of individuals wish to consume a collective good, they cannot rely on strictly voluntary arrangements to: (1) obtain revenue in a fair and equitable manner, (2) articulate demands, (3) allocate the goods and services to some individuals and exclude others, (4) regulate the patterns of use among the community of users, and (5) monitor the performance of producers. These five activities relate to the consumption (provision side) of service relationships and NOT to the production side. Thus, the key institutional problem to be solved in a public economy involving collective goods is the organization of consumption aspects.

When citizens establish a governmental unit that can use sanctions against those who do not contribute resources toward the provision of a collective good, they are constituting a collective consumption unit. In establishing or changing a collective consumption unit to provide one or more local public goods, many organizational questions must be addressed including:

1. What is the appropriate boundary for including those individuals who are the primary beneficiaries in jointly using or consuming particular collective goods?
2. What are the appropriate mechanisms for enabling individuals to articulate their demands for different quantities and qualities of local collective goods in relation to those who will represent their interests?
3. What mechanisms of revenue collection are fair and efficient means of obtaining the revenue to cover costs of such services?
4. What authority needs to exist to regulate the use of common facilities?
5. Which types of relationships to one or more public or private agencies will enable citizens to receive local services in an efficient, fair, and responsible manner?
6. What are the appropriate mechanisms for enabling those who represent consumers to articulate collective preferences to managers of producing agencies in an effective manner?
7. How do organizational arrangements affect the incentives and cost of monitoring the performance of production agencies?

The first four questions relate to problems of internal organization of a collective consumption unit. Given that the size of the group jointly consuming a good may vary from a small neighborhood to an entire metropolitan area, one should expect to find citizens creating small, medium, and large units of government and not relying on a single scale of organization. Unless appropriate boundaries can be established, effective means for gaining information about citizen preferences can be devised, and appropriate means for generating revenue can be designed, instruments of coercion can be used to

create more harm than good. This is particularly a problem when individuals have little choice about whether they consume particular local collective goods or not. Electoral mechanisms are relatively imperfect mechanisms for enabling citizens to have a voice in determining the type of goods to be provided in their community. Factors such as the size of the unit, the mode of election, and the patterns of representation all affect the way that collective consumption units articulate demands. Other questions of internal organization within a collective consumption unit relate to the choice of methods for obtaining revenue and ways to regulate the use of common facilities.

The last three organizational questions concern the relationships between a collective consumption unit and production units. The primary reason for using a form of collective organization is to solve problems of provision. But once a collective consumption unit is established, how production is organized is an entirely separate question. A collective consumption unit is faced with at least six different institutional arrangements for arranging for the supply of local public goods.<sup>10</sup> These include: (1) establishing and operating its "own" production unit, (2) contracting with a private firm, (3) contracting with another governmental unit, (4) obtaining some services from its own production unit and other services from other governmental or private producers, (5) establishing standards of service that must be met by authorized producers and allowing each consumer to select a private vendor and to procure services from an authorized supplier, and (6) issuing vouchers to families and permitting them to purchase service from any authorized supplier. All of these arrangements are used by collective consumption units in metropolitan areas to arrange for the production of particular collective goods. Given both the diversity of collective consumption units and the diversity of mechanisms each can use to arrange for production, institutions for the governance of

metropolitan areas could be expected to derive significant advantage through complex patterns of organization.

The discussion so far highlights one of the important contributions of public choice theory to the study of metropolitan institutions -- that of comprehensibility. Instead of condemning current institutions as being pathological, public choice theorists recognize the advantage to be gained from a diversity of organizational structures involved in establishing effective collective consumption units and relating them to efficient production units for a diversity of different types of collective goods and services. Individuals trying to solve these problems are led to create a wide variety of different jurisdictions of varying sizes which relate to one another in a myriad of different ways. The reasons for the complexity are now apparent.

Public choice theory has moved beyond simply making comprehensible what was previously incomprehensible. Further theoretical developments have led to positing and testing counter-intuitive propositions about the effects of institutional arrangements on performance in regard to specific types of goods and services. These counter-intuitive propositions relate to the effects of the scale of organization for the production and for the provision of particular urban services. To examine these further theoretical developments, it is necessary to examine additional attributes of goods beyond those of exclusion and jointness discussed above.

#### PARTICULAR ATTRIBUTES OF COLLECTIVE GOODS AND

#### THE SCALE OF ORGANIZATION FOR PRODUCTION AND PROVISION

Other attributes, in addition to those of jointness and exclusion, have an important bearing upon the organization of public economies in metropolitan areas. Goods that are capital intensive, for example, are assumed to achieve economies-of-scale in larger production units while labor intensive services

can be produced at lower average costs in smaller production units. There are, however, other attributes of goods that may affect how provision and production activities are accomplished. To move to testable propositions about the effects of institutional arrangements, one needs to examine the attributes of particular goods and how these affect provision or production activities. Urban police services will be used as the referent since extensive empirical research has been conducted on the effects of institutional arrangements with regard to urban policing.

Police produce a variety of different local collective goods and services that can broadly be divided into direct and intermediate services. Direct services, such as general area patrol, traffic regulation and patrol, and various types of investigatory services, are delivered by police directly to citizens. Police agencies must also provide for themselves many intermediate services required in the production of direct services. They include such services as radio communications, detention, training, and crime laboratory analyses.

Five characteristics of local collective goods combine with institutional arrangements to affect performance in providing or producing direct and intermediate police services. These are: (1) economies-of-scale in production, (2) coproduction, (3) measurability, (4) the size and location of the group of individuals who jointly consume a service, and (5) the degree of choice that citizens have concerning their consumption of a service. The first attribute affects production, the second and third affect both production and provision, while the fourth and fifth attributes primarily affect provision.

#### Economies-of-Scale in Production

Economies-of-scale occur when the average costs of production decrease with increases in the amount of the good being produced. At what level of

output do average costs reach their minimum and at what level of output do average costs begin to rise as more is produced? Many intermediate police services are capital intensive and economies-of-scale are reached in large production units. Crime laboratory analysis, for example, is likely to have average costs falling over an extended range of output. High initial capital expenditure involved in purchasing equipment is large. Highly trained personnel are needed to run analyses. When training is conducted in an "academy," substantial investments are needed in a building and staff leading to an expectation of economies-of-scale in larger academies. Radio communications also involve the purchase of relatively expensive equipment.

In contrast, direct services are highly labor intensive. Between 85 and 90 percent of the costs of direct services relate to personnel or variable expenses, such as gasoline. Serving a larger jurisdiction may increase average costs rather than reducing them for most direct services. In regard to the investigation of infrequent events, such as homicides, one might expect that specialized units serving a large area might process a sufficient number of cases to enhance skills at production.

#### Coproduction of Police Services by Citizens

Physical goods can be produced independently of the inputs of those who may eventually consume them. However, the production of all services involves some input by the consumers being served.<sup>11</sup> If students, for example, do not participate actively in their own education, input resources devoted to education have little effect on results achieved. Students are essential coproducers of education. In regard to safety in a community, citizens are important coproducers. They provide the "public eyes" that may prevent criminal activities or alert the police to problems. Without active help by citizens giving information and being willing to serve as witnesses in court,

police are less effective in solving crimes or in building a case that can be prosecuted in court.

Coproduction of direct police services by citizens is likely to be more intensive in small collective consumption units where citizens perceive themselves to have a stake in preserving the peace and safety of their neighborhoods and view the police as providing valuable services to assist in those efforts. Officers serving in small police departments should also be more oriented to encouraging citizens to help in the coproduction of direct services. In regard to intermediate services, coproduction occurs between direct service producers and the agencies that produce such services as training and detention. The nature of these interorganizational arrangements is more important than the scale of organization of either the direct or intermediate service producer.

#### Measurability

Satisfactory measures of direct police services are extremely difficult to obtain. Conceptually, the output of direct services is states of affairs improved to some degree by the efforts of police. Thus, the "output" of general area patrol is the extent to which it is safer to walk on the streets or keep valuable possessions because of the efforts of police.

One can never directly measure this conceptual output as it requires reference to a counterfactual situation: the state of affairs that would have existed in the absence of police services. Measurement must rely on either statistical inference or on proxy measures. Reliable statistical inference would require that we know the set of factors that cause crime and could accurately predict the level of crime that would occur without any police services. Such knowledge is not available. Police and citizens alike tend to rely on three types of proxy measures: (1) resource inputs, (2) activity levels, and (3) crime rates.

Indicators of resource inputs include the total budget or expenditures, and number of employees. These provide information only about the resources available to produce services and give no information on the level of output. While many social scientists have presumed that output is linearly associated with resource inputs, empirical studies have demonstrated sufficient difficulties with this assumption that it should not be used.<sup>12</sup>

Indicators of activity levels include: number of miles driven, number of tickets issued, number of calls answered, number of arrests, and number of crimes "solved." These are "closer" to what we mean by the output of police, but are still proxy measures and are largely under the control of the producer. A police department can increase its "output" by increasing the number of people arrested or the number of traffic tickets issued. Police can always arrest more drunks on Saturday night and increase their "productivity." Whether that reflects an increase in "output" is highly questionable. Arrests directed at a particular subgroup in society may actually be counterproductive.

Crime rates, the third type of proxy measures, are trace data that survive a long series of transformations under the control of many different actors. Some information is lost at each transformation and systematic distortion can occur at each step. For example, police can record information so that a lesser crime is coded when they want to reduce serious crime while increasing the "seriousness" of the offense when they want to produce a local "crime wave." Since budgetary allocations are frequently increased after a local crime wave has occurred, internal incentives exist within departments to bias data recordation so as to produce the given results.

The difficulties of developing reliable and valid quantitative measures of direct services output lead to the argument that small scale is advantageous in organizing both the production and the provision of direct police services.



The police chief of a very large department is a captive of the statistical reports on activities and crime rates that he receives. He cannot have a good "feel" for what is happening on the street as he is too far removed by status and physical barriers. On the other hand, the police chief in a small department who actively patrols and observes his officers on a day-to-day basis is better able to monitor performance. Police chiefs in small departments are not dependent upon statistics to estimate the quality of police work. In medium-sized departments, the chain of command is quite shallow, and police chiefs still have a relatively accurate picture of what is happening on the street. Thus, police chiefs in small- to medium-sized departments can monitor internal performance based on more accurate information than police chiefs of larger departments.

On the provision side, local public officials representing a large community cannot, on a first-hand basis, know what is happening in many different locations. They are also prisoners of the statistical information they receive. Thus, they have difficulty in articulating demands related to the real performance of officers on the street. In a small community, mayors and local councils have a chance to observe the activities of their local police on a day-to-day basis and are able to specify far more exactly what they want and what they do not want in their community.

While measurement problems are severe in regard to direct services, the output of intermediate services is easier to measure. Many private sector, "for profit" firms sell equivalent types of services such as telephone answering services, laboratory services, training services, and institutionalized care. Since meaningful records of such services can be kept, a direct service producer may easily arrange for intermediate services with alternative producers of those services.

### Size and Location of the Group of Individuals Jointly

#### Consuming a Service

Only a relatively small group of citizens simultaneously consumes the benefits of most direct services. Those who receive the protection of a police car on patrol, for example, live in small and concentrated areas. Traffic patrol and accident investigation on major freeway systems, on the other hand, serve a larger community of individuals some of whom live and work in a particular metropolitan area and some of whom are traveling between more distant locations. Among the intermediate services, radio communication is the only service whose consumers are advantageously located in more concentrated geographic areas. The geographic size of the region depends on the investment made in transmitting equipment and the topography of an area. The remaining intermediate services may jointly affect a relatively large group.

#### Degree of Choice that Citizens Have Concerning Consumption of a Service

Citizens have extremely little choice about whether to consume most direct police services. The existence of a particular style of patrolling in a neighborhood, for example, makes it difficult for anyone living in the neighborhood to avoid being affected unless they physically move from the neighborhood. When aggressive patrol techniques are utilized, for example, and individuals are frequently stopped and frisked, all families living in the neighborhood are forced to consume this type of order. An in-person protest to the officers on patrol may result in physical harm. From the consumers' point of view, living in a small jurisdiction where the voices of individual citizens may carry greater weight is an important institutional factor offsetting to some extent the degree of coercion imposed upon local residents. Citizens can articulate more effectively preferences about how their neighborhoods should be

served. More effective voice is particularly important for poorer families who cannot easily move and who are thus more exposed to threats of coercion either from those who offend against the law or those who serve as police officers.

In regard to intermediate services, citizens are not the actors who can exercise direct choice in any case. It is producers of direct services who may be able to exercise some degree of choice. Choice depends upon the availability of alternative suppliers. If a police department has its own radio transmitter and is tied into other networks, it can exercise some degree of choice concerning its use of alternative facilities.

Counter-Intuitive Expectations About Police Performance  
in Metropolitan Areas

From the labor intensive nature of direct police services, the essential role of citizen as coproducer, and the problem of measuring output, one would expect small- to medium-sized, direct-service producers to be more effective and efficient than large, direct-service producers under similar service conditions. Given the lack of choice over consumption combined with the relatively small size of the group jointly consuming most direct services, one would expect that individual preferences and financing arrangements are more effectively arranged for in small- to medium-sized cities than in large cities. Thus, for direct police services, one would expect small collective consumption units that arrange for the supply of direct services by small scale producers to perform best. This first expectation is directly counter to what had been expected by scholars who proposed large-scale mergers in metropolitan areas.

Given that intermediate services tend to be capital intensive and are easier than direct services to measure, large production agencies should be more effective and efficient than smaller agencies in producing intermediate services. One should not expect smaller direct-service producers to supply

most of their own intermediate service. To the extent that institutional arrangements facilitate contracting or other intergovernmental arrangements, one should expect to find: (1) substantially fewer intermediate-service producers than direct-service producers, (2) that most intermediate producers are large, and (3) that small direct-service producers obtain most intermediate services from larger producers. This second set of expectations is also counter to the traditional presumptions that small agencies cannot afford intermediate services and thus such services were not available to smaller producers.

A third counter-intuitive set of expectations derived from a public choice approach is that the performance of direct-service producers of police services will be enhanced in metropolitan areas containing a large number of other producers. Many factors would lead to this prediction. One important factor is the increased capacity of citizens and public officials to measure and monitor performance. In a metropolitan area with many different producers, citizens obtain information about comparative performance in several ways. Simply driving through the metropolitan area provides regular information about patrol density and the extent and style of enforcement in different jurisdictions. If a citizen or a member of his or her immediate family receives a traffic ticket in two different jurisdictions, an opportunity exists to compare the fairness, courtesy, and honesty of officers working in different jurisdictions. Most citizens in a metropolitan area with many jurisdictions know residents living in different jurisdictions. Informal discussions of such personal events as being victimized, calling the police for assistance, or getting a ticket often occur among friends.

Public officials in a metropolitan area with many producers are apt to be better informed about comparative performance levels. Citizens who are unhappy

with their own police, and who know that their friends and neighbors receive a better level of service, are more apt to call their elected officials than citizens living in a low multiplicity area who have no way to compare the service they receive with other jurisdictions. Further, if city managers and/or mayors in the metropolitan area meet regularly, they can exchange relevant input and output information that helps each of them in their bargaining with police chiefs. The relative monopoly over information that a single producer has is reduced in a metropolitan area with a large number of producers. Thus, police chiefs operating in metropolitan areas with many other police departments are more exposed to removal if they increase staff and other input variables beyond the level at which the more effective departments operate.

Several years of intensive empirical research have been devoted to examining these three counter-intuitive expectations about the performance of police agencies in metropolitan areas. Substantial empirical support exists for all three expectations. Only a brief review of the type of evidence available in support of these propositions can be provided here. Readers interested in examining the evidence further are referred to the work cited where information about measurement instruments, sample design, and findings for this series of studies is available.

#### SMALL- AND MEDIUM-SIZED POLICE AGENCIES ARE MORE EFFECTIVE

##### IN PRODUCING DIRECT SERVICES

The problems of measurement discussed above are difficult not only for the managers of police-production agencies and elected public officials but also for scholars wishing to measure performance. None of the published statistics on inputs, activities, or crime rates provide satisfactory measures for examining the effects of scale of organization on performance. In conducting

studies of this question in the Indianapolis, Chicago, St. Louis, Nashville, Rochester, and Tampa-St. Petersburg metropolitan areas, this problem was met by collecting performance data from interviews at a random sample of households served by the small and large departments being compared. Information was obtained about victimization, willingness to call the police, speed of police response, amount of police follow-up, satisfaction levels with police contacts, and general evaluations of the quality of policing in a neighborhood.

By studying matched neighborhoods with similar service conditions, one can control for many of the other factors that can be expected to affect performance. The consistent finding from this series of studies is that small- and medium-sized police departments perform more effectively than large-sized police departments serving similar neighborhoods and frequently at lower costs.<sup>13</sup> Victimization rates tend to be lower, police response tends to be faster, citizens tend to be more willing to call on police, citizens tend to more positively evaluate specific contacts with the police, and citizens tend to rate police higher across a series of other evaluative questions. Further, in a recent analysis, Parks<sup>14</sup> has shown that citizens living in small communities tend to be more informed about how to change local policies, tend to know more policemen serving their neighborhoods, and call the police more frequently to obtain general information than citizens living in large cities.

The evidence from this series of studies is contrary to the earlier presumption that the presence of many small departments is an impediment to effective policing in metropolitan areas. The Advisory Commission on Intergovernmental Relations argued, for example:

The existence of a very small police force, then, may create police service problems in a metropolitan area. Citizens of these localities having such 'shadow' police forces will often have to

depend on the goodwill of neighboring governments for their basic patrol services. If governmental fragmentation results in a substantial number of these small police forces, the metropolitan area will face the problem of insuring that all localities receive adequate patrol services.<sup>15</sup>

Our studies have shown that citizens being served by small departments are likely to be receiving better services and at lower costs than their neighbors living in the center city. Instead of being a "problem" for the metropolitan area, small departments frequently contribute to the improvement of police services in the area.

SMALL POLICE AGENCIES ARRANGE FOR INTERMEDIATE SERVICES  
FROM LARGE POLICE AGENCIES

In 1975, colleagues at the Workshop in Political Theory and Policy Analysis at Indiana University and the Center for Urban and Regional Studies at the University of North Carolina conducted a major study of police organization in 80 Standard Metropolitan Statistical Areas (SMSAs).<sup>16</sup> A total of 1,159 direct-service producers served residents in these 80 SMSAs. Most of these agencies produced general area patrol, traffic patrol, accident investigation, and burglary investigation services. About 70 percent produced homicide investigations while citizens served by the other 30 percent of the direct-service producers received homicide investigation services from a larger producer in the area -- usually an overlapping sheriff's office or a metropolitan-wide homicide unit.

In regard to intermediate services, we found 70 percent of the direct-service producers also produced their own radio communications, but only a small proportion of any of the direct service producers produced their own entry-level training, crime laboratory analysis, or detention. Only 12 percent

of these agencies produced their own detention, only 6 percent produced their own training, and only 1 percent produced their own crime laboratory analysis. We did not find, however, a single metropolitan area where these intermediate services were not made available to all direct-service producers in the area. In most SMSAs, direct-service producers had a choice between at least two large-scale, intermediate producers.

Since crime laboratories are the most capital intensive of the intermediate services included in this study, one would expect to find the smallest number of these producers of all intermediate-service producers. This is our finding. Only 85 crime laboratories served the 80 SMSAs. Some of these crime labs served more than one SMSA in our study. Almost half of the crime laboratories were operated by state agencies. Federal, regional, county, and private labs composed another third of the producers. Only 16 out of the 916 municipal police departments operated their own crime labs. Thus, not even the central city police departments in most SMSAs establish their own crime laboratories for forensic analysis.

If police agencies were denied access to interorganizational arrangements to assist in the provision of intermediate police services, large, fully-integrated departments would have an intrinsic advantage. Where agencies can work out interjurisdictional contracts, set up regional facilities, and exchange services with one another, small agencies are able to obtain highly professional, intermediate services at low costs without the need to become fully integrated departments.

POLICE PERFORMANCE IS ENHANCED IN METROPOLITAN AREAS  
WITH LARGER NUMBERS OF POLICE AGENCIES

In order to examine the effect of interorganizational arrangements on police performance in a large number of metropolitan areas, we could not



collect performance data through in-person interviews as we did in our earlier studies conducted within metropolitan areas. We had to rely on more indirect measures of performance such as: the allocation of police personnel to on-the-street assignments and the relative efficiency of agencies in producing response capacity and solving crime.

In the 80 SMSA study mentioned above, the study team gathered information on the structure of interorganizational arrangements for service delivery in each of the metropolitan areas. In particular we calculated the number of producers of each type of service (multiplicity) and the proportion of the population being served by the largest producer of each type of service (dominance). By arraying metropolitan areas using the measures of multiplicity and dominance, one can examine the effect of these institutional arrangements on personnel allocation patterns at the metropolitan level. Metropolitan areas with low scores in regard to multiplicity and high scores in regard to dominance come closest to approximating the "consolidated" model. Metropolitan areas with high scores in regard to multiplicity and low scores in regard to dominance come closest to approximating the "fragmented" metropolitan area scorned by these same proponents.

In an analysis conducted in 1979,<sup>17</sup> Parks dichotomized multiplicity and dominance scores at the median to divide the 80 SMSAs into three broad groupings: (1) fragmented -- those SMSAs with below median scores in regard to dominance and above median scores in regard to multiplicity, (2) consolidated -- those SMSAs with above median scores in regard to dominance and below median scores in regard to multiplicity, and (3) mixed -- those SMSAs that represent mid-levels between the least and the most "consolidated structures." Parks found a distinct difference in the availability of sworn officers to conduct patrol in the metropolitan areas depending upon the structure of

interorganizational arrangements. While there are more officers per capita in the most consolidated areas, a lower percentage of these officers is assigned to patrol divisions in these SMSAs.

Secondly, the ratio of full-time sworn officers employed in the area to actual officers on the street at 10:00 pm is highest in the most consolidated areas. For example, in the most consolidated metropolitan areas, putting 100 officers on the street at 10:00 pm would require on the average the employment of 950 officers. In the least consolidated SMSAs, putting 100 officers on the street would require the employment of 680 officers. The mixed areas fall in between the extremes. One-third more officers are required in the most consolidated SMSAs to place the same number of officers on patrol as compared to the least consolidated SMSAs. Citizens living in the most fragmented metropolitan areas receive more police presence on the streets for their tax expenditures than do citizens living in the most consolidated areas.

This finding is consistent with a study of the New York City Police Department -- the most consolidated police force in the U.S.<sup>18</sup> The study found that the New York City police force had increased by approximately 20,000 officers during the two decades from the mid-fifties to the mid-seventies or from 1.39 officers per 1,000 population to 3.92 officers per 1,000 population. However, the number of police officers actually on patrol remained at a constant level of 1,000 officers during the entire period. To place 1,000 officers on the street, the New York Police Department employs in excess of 30,000 officers. Thus, more than 3,000 officers are employed-for every 100 officers on patrol.

Using a more sophisticated technique for measuring the effect of industry structure on relative output levels, Parks and E. Ostrom<sup>19</sup> estimated production possibility frontiers in metropolitan areas that varied in regard to

multiplicity. These production possibility frontiers show the maximum combinations of clearances by arrest and cars on patrol (both standardized by the number of sworn officers to control for agency size) that were obtained by departments in metropolitan areas with differing amounts of multiplicity. The frontiers show the trade-off possibilities for response capacity and clearances among the most efficient departments with the normal concave shape that one would expect (see Figure 1). They show a significant upward shift in output possibilities as the number of patrol producers in a metropolitan area increases. The most efficient producers supply more output for given inputs in high multiplicity SMSAs than do the most efficient producers in lower multiplicity areas. Thus, as expected from a public choice perspective, the presence of many other producers for comparison enhances the efficiency of direct-service producers.

[Figure 1 About Here]

#### CONCLUSION

In this article I have reviewed how public choice theory has been applied to the study of the effects of institutional arrangements in metropolitan areas. Scholars working in the traditional disciplines of political science and public administration had been stymied in efforts to study and understand the complex set of institutional arrangements existing in most American metropolitan areas. The first major contribution of the public choice approach is that of making the phenomenon comprehensible. The patterns of complex relationships between and among small, medium, and large jurisdictions can be understood as the results of citizens and public officials trying to solve problems related to both the provision and production of a wide variety of different collective goods.

Secondly, important counter-intuitive propositions about how institutional arrangements would be related to performance have been derived from this approach and supported by systematic empirical research. In regard to policing, small, direct-service producers are more effective, and in many instances more efficient, than larger producers serving similar neighborhoods. Intermediate services characterized by substantial economies of scale are supplied by one or two large, overlapping, intermediate-service producers in a metropolitan area who make these services available to others through interjurisdictional arrangements. Thus, such services are produced at low average cost and are available even to the smallest direct-service producer. Further, the efficiency of police agencies located in metropolitan areas with many other police agencies tends to be higher than when agencies are located in metropolitan areas with only a few other agencies.

These counter-intuitive findings have significant policy implications given the presumption made in the traditional approach that the presence of large numbers of small agencies in most metropolitan areas is an indicator of chaos and pathology that should be eliminated through drastic metropolitan reforms. Evidence from many other studies about other collective goods is consistent with the evidence presented here.<sup>20</sup> The presence of chaos or order in the world is largely dependent upon the theories used to understand the world. Using a theory that assumes simple, large-scale, hierarchical organization is the most effective and efficient form of organization for all purposes, proponents have tried (and sometimes succeeded) to change the world to make it comprehensible to them. Citizens living in urban areas whose governmental structures have been "modernized" to make them comprehensible to scholars and public officials have had to pay a high price for the inadequacy of earlier approaches to the study of metropolitan institutions.

## NOTES

1. Revision of part of a paper presented at the Conference on "The Analysis of Public Policy in Mixed Economies," at the International Institute of Management, Wissenschaftszentrum, Berlin, July 25-29, 1982. I would like to thank David Kessler, Roger B. Parks, Vincent Ostrom, Paul Sabatier, Mark Sproule-Jones, and L. J. Sharpe for their helpful comments, the National Science Foundation for its support, and Teresa Therrien and Patty Smith for their excellent editing and typing.

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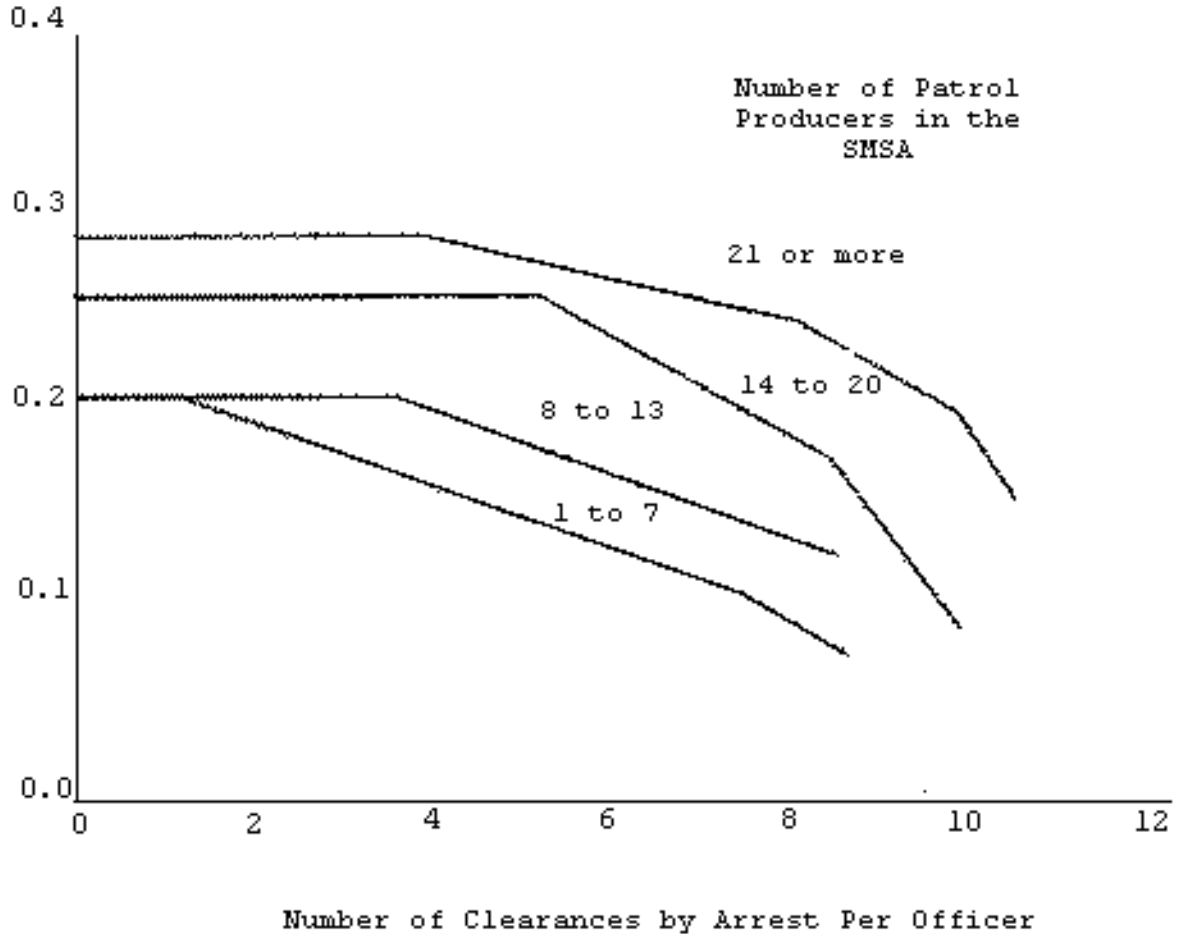
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Figure 1

Frontier Productions Possibility Curves in Metropolitan  
Areas with Varying Levels of Multiplicity



From: Roger B. Parks and Elinor Ostrom, "Developing and Testing Complex Models of Urban Service System," in Urban Policy Analysis: Directions for Future Research edited by Terry N. Clark (Beverly Hills: Sage Publications, 1981), p. 195.