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Do We Really Want To Consolidate Urban Police Forces? A Reappraisal Of Some Old Assertions

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■ It is frequently assumed that large-scale police forces are necessary to enable departments to specialize and professionalize. It is also assumed that large-scale agencies are more efficient and thus able to produce the same or higher levels of output at lower costs than smaller departments. This study empirically examines these two basic assumptions in six neighborhoods within one metropolitan area. The findings do *not* support the basic assumptions made above and thus underline the importance of further empirical research related to the effect of size on the output of police agencies.

Recommendations for consolidating urban police agencies are usually based on three underlying and little-examined assertions.[1] First proponents of consolidation assert that specialization and professionalization are necessary requisites for effective urban law enforcement. Second, they assert that large size is necessary for specialization and professionalization. Third, large-scale police agencies are thought to be more efficient (able to produce the same or higher levels of output at lower costs) than small departments.[2] Consequently, it is asserted that: (1) small departments can not provide the level and type of service needed in complex urban areas, and (2) small departments cannot produce services at costs as low as large departments. Smaller departments with lower per capita expenditure levels than larger departments are automatically assumed to be providing inferior services. For example, in discussing the "Unigov" legislation for Marion County, Indiana, David M. Lawrence and H. Rutherford Turnbull assert that:

> The legislation drafters were faced with a county sheriff's department and a number of small municipal police forces .... Each of these provided services to the people outside the old city *for less than the city itself could have afforded (albeit with commensurately lower service levels)* and each had deep political strength (emphasis added).[3]

Lawrence and Turnbull offer no evidence that police service is less in the independent communities. They accept as obvious that service must be lower because expenditures are lower.

The study reported here attempts to gather evidence relating to the advisability of consolidation of urban police forces. Before we take further steps to consolidate urban police forces, we believe that it is important to examine the following hypotheses which reflect the expectations of those who urge consolidation:

- H_1: If neighborhood conditions are held constant, citizens served by a larger department will receive better police service than will citizens served by a smaller department.
- H_2: In similar neighborhoods, a larger department will be able to provide a given level of service at a lower cost per unit of service than a smaller department.

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It is important to note that our measures of police output differ from those traditionally utilized. Many previous studies have utilized rates of reported crime, expenditures on police, police officers per capita, number of patrol cars assigned to a specific area, and other so-called "objective" or "direct" measures of output. These measures are inadequate. Rates of reported crime are now widely considered unreliable. The other indicators focus on inputs into the production process. None measures output as received or evaluated by consumers. Our choice of citizen (consumer) reported experiences and evaluations reflects our belief that the measurement of output as the services received by *and* evaluated by citizens provides the appropriate means for assessing the quality of a public service.[4]

Our study is a limited one, involving six neighborhoods in one metropolitan area. The findings are, therefore, tentative in terms of their wider applicability. However, since our findings clearly do *not* support the first hypothesis, and do not allow us either to accept or reject the second, they underline the importance of further empirical research in this area and call into question the validity of the assertions underlying recommendations for urban police consolidation. Further studies have been initiated by the authors and others. Preliminary findings from these studies are consistent with the findings reported in this article.[5]

The Area Studied

The widely heralded city-county consolidation of the City of Indianapolis with Marion County ("Unigov") did not affect the organization of police forces in Marion County. Nor did this legislation change the status of the three relatively small, separately incorporated communities of Beech Grove, Lawrence, and Speedway. The location of these independent communities, each having its own locally controlled police force, immediately adjacent to the territory served by the Indianapolis Police Department, provides an appropriate research site for comparing the provision of neighborhood police services by small-scale and large-scale police departments.

The population of the three independent communities varies from approximately 13,500 to 16,500. The number of policemen serving these communities varies from 18 to 25. Residents in all three communities are predominantly white, middle-income families. The residents share similar educational backgrounds, are employed in a similar range of occupations, and live primarily in owner-occupied residences. One community is organized as a town (Speedway) and the other two as cities.[6]

Three adjoining neighborhoods within the City of Indianapolis were also selected as sample area. These neighborhoods are served by members of the 1,100-man Indianapolis Police Department. Each neighborhood was matched as closely as possible to an adjoining independent community in terms of size, population, and socioeconomic characteristics. The entire City of Indianapolis was *not* selected for comparative study with the three independent communities because of the great variation in population characteristics among neighborhoods within Indianapolis as a whole. Many of the factors which might affect the performance of the police were thus controlled for due to the similarity of the six neighborhoods studied.[7] The most pertinent difference between the three independent communities and the three Indianapolis neighborhoods was the form of their local community organization and the attendant variation in type and scale of local police organization.

Comparative Levels of Police Services

To measure police output we relied upon a set of indicators derived from responses to a sample survey of citizens living in the six neighborhoods.[8] The indicators involved both citizens' *direct experiences* with their local police and their *evaluation of services* provided to the neighborhood in general.

A rough method of assessing crime rate, a negative indicator of police performance, was obtained from the responses to a question regarding victimization.[9] Items on the extent and quality of official contact with police were used to measure police services provided directly to individual citizens. Police services included follow-up of reported crime and answering calls for assistance. The comparative speed in delivery of these services and the relative citizen satisfaction with the quality of service provided were used as further measure of police performance. Five evaluation items on the questionnaire provided data on the comparative levels of citizen satisfaction with police performance in each of the neighborhoods.

No single indicator encompasses all of the

dimensions of police service. Further, we preferred not to weight the indicators since any weighting would have been arbitrary. Therefore, we did not collapse them into a single scale of police output. Rather we looked for a *pattern* of differences in levels of output.

We found a general pattern of higher levels of police output in the independent communities than in the Indianapolis neighborhoods. The citizens living in the independent communities were victims of crime less and received more and better service. They also evaluated the services they received more highly than did citizens living in the Indianapolis neighborhoods. We found the following response patterns for four evaluation items in the independent communities:[10]

1. A higher proportion rated the police as responding very rapidly.
2. A lower proportion indicated that they thought crime was increasing.
3. A higher proportion rated police-citizen relations as good.
4. A higher proportion rated the job being done by police in their neighborhood as good or outstanding.

No difference occurred in responses to one evaluation question: few respondents in any of the six areas reported that they thought their police took bribes.

Output of police in the independent communities was higher than that of the citywide police for nine of 12 indicators. Levels of performance on the remaining measures were similar in the two types of communities. We found that individuals living in the Indianapolis neighborhoods did *not* receive higher levels of police output as measured by *any* of our indicators. While individual Indianapolis neighborhoods did rate higher than some independent communities on single items, the overall pattern, shown on Table I, was for all three independent communities to rank above all three Indianapolis neighborhoods. It is this predominant pattern over a large number of indicators that led us to conclude that the level of police output in the independent communities was higher than in the Indianapolis neighborhoods. Thus the first hypothesis is *not* supported.

Comparative Expenditures for Police Services

At the time of our study, the City of Indianapolis was spending almost twice as much per capita for police as were the three independent

TABLE I

RANK ORDER OF SIX NEIGHBORHOODS ON POLICE PERFORMANCE LEVELS*

	Citizen Experiences						Citizen Evaluations			Cumulative Rank
	Victimization	Willingness To Report	Level of Follow-up	Assistance	Response Time	Promptness	Neighborhood Crime Trend	Police-Citizen Relations	General Evaluation	
Independent Communities										
Beech Grove	4	4	3	3	3	3	2	3	3	3
Lawrence	3	1.5	2	2	2	2	1	2	1	2
Speedway	1	3	1	1	1	1	4	1	2	1
Indianapolis Neighborhoods										
Near Beech Grove	2	6	6	4	5	5	6	5	4	5
Near Lawrence	6	5	5	5.5	4	6	3	4	6	6
Near Speedway	5	1.5	4	5.5	6	4	5	6	5	4

* 1 = highest rating

communities. During 1969, the per capita expenditure of the Indianapolis Police Department was $21.33, while that of the independent communities ranged from $11.80 to $14.49. However, the per capita expenditures for all of Indianapolis is *not* an appropriate measure of the monetary input for each of the three Indianapolis neighborhoods. Such a measure would be appropriate only if police activities were equally distributed throughout the City of Indianapolis. Exact expenditure figures in a given sub-area are difficult to determine for any organization which operates over a much larger area. However, the Indianapolis Police Department was able to provide data which allowed us to make a fairly close estimate of the resources devoted to police protection in the neighborhood studied.[11]

In the course of developing an estimate of expenditures devoted to police services in the three sub-areas of Indianapolis, several methods of allocation were examined. One method of allocation consisted of dividing the total Indianapolis police budget by 48 (the number of patrol beats at the time of our study) to gain an estimated expenditure per beat of $215,865. The survey frames in two of the neighborhoods correspond almost exactly to the boundaries of single beats. The third neighborhood was approximately equivalent to .83 of an Indianapolis Police Department beat. Area expenditures were first estimated by multiplying the estimated expenditure per beat by the portion of a beat within that area.

However, demand for police activity is not uniformly distributed over all beats. Communication dispatches or runs assigned within Indianapolis Police Department beats ranged from 3,957 to 10,866 per beat. Reported crimes ranged from 295 to 1,263 per beat. Two other allocation methods were utilized to reflect demands originating in the sample area. These methods consisted of distributing the total budget (1) according to a beat's percentage of the total communications dispatches (runs assigned) for 1969, and (2) according to the beat's percentage of total offenses reported to police in 1969. The expenditures so estimated were generally lower than the estimated costs using the beat structure only. However, the expenditures made for overhead and back-up services were not adequately taken into account in the allocation of expenditures by communication dispatches or reported crimes. Such supportive services are required independent of the demand in an area. On the other hand, supportive services expenditures were too heavily weighted when allocation was made by beat.

Consequently, we adopted a more complex allocation formula based upon the forces actually assigned to patrol in the areas studied, the departmental structure of the Indianapolis Police Department, and neighborhood demands for service. We considered this method of allocation to provide our best estimate of actual expenditures in the areas studied. Examining the Indianapolis Police Department's budget was divided into the following expenditure categories: supportive services, assigned patrol forces, and criminal investigation forces. The Indianapolis Police Department is organized into four divisions: Executive, Operations, Investigations, and Inspection and Training. In our allocation, personnel expenditures for the Executive Division and the Inspection and Training Division were included in supportive services. Personnel expenditures for Operations officers on traffic detail were also allocated to supportive services, as were budgetary categories for civilian personnel, contractual services, supplies, materials and equipment, and other miscellaneous categories.

Expenditures for patrolmen and the supervisory personnel assigned to sectors and beats were allocated to assigned patrol forces. Included in this category were seven lieutenants, 14 sergeants, and 55 patrolmen per shift, with 4.2 shifts required to allow sufficient personnel to man three shifts seven days a week and provide for time off, vacations, etc. The criminal investigations forces category encompassed the remaining personnel expenditure in the Operations Division, and all personnel in the Investigations Division.

Once the total budget for the Indianapolis Police Department was broken down in this fashion, we developed a formula for calculating the portion of each expenditure category to allocate to each specific sample area.[12] Applying this formula, we estimated expenditures for the three Indianapolis sample areas. The estimates computed by all four methods are shown in Table II. We think that the best estimate was obtained by the method based on both departmental structure and neighborhood demand.

Using this estimate of the expenditure being devoted to police service *in the three sub-areas* of Indianapolis, we found that the independent communities were devoting a slightly higher level of per capita input to police services than the Indianapolis Police Department was devoting to

TABLE II

EXPENDITURES FOR POLICE SERVICES IN INDIANAPOLIS NEIGHBORHOODS AND INDEPENDENT COMMUNITIES

Indianapolis Neighborhoods	Estimation Method: By Uniform Beats	By Per Cent of Offenses Reported	By Per Cent of Communications Dispatches	By Structure and Neighborhood Demand
Near Beech Grove	$179,888	$164,595	$182,691	$169,143
(per capita)	(13.76)	(12.59)	(13.97)	(12.94)
Near Lawrence	$215,865	$163,384	$170,389	$186,567
(per capita)	(11.42)	(8.64)	(9.01)	(9.87)
Near Speedway	$215,865	$196,873	$199,620	$208,173
(per capita)	(9.71)	(8.85)	(8.98)	(9.36)
Average for three Indianapolis Neighborhoods	(11.63)	(10.03)	(10.65)	(10.72)

Independent Communities	Actual Budget
Beech Grove	$164,270
(per capita)	(12.04)
Lawrence	$196,413
(per capita)	(11.80)
Speedway	$217,833
(per capita)	(14.47)
Average for three independent communities	(12.76)

the specific Indianapolis neighborhoods under study.

Considerable resource redistribution was apparently occurring within the area served by the Indianapolis Police Department. Residents of the Indianapolis sample neighborhoods were probably supporting the provision of police services in other parts of Indianapolis as well as in their own neighborhood. In terms of dollar resources devoted to neighborhood police services, the three Indianapolis neighborhoods studied were rather similar to the three independent communities. Per capita expenditures were somewhat higher in two of the three towns than in their matched neighborhoods in Indianapolis, although the per capita rate for all six areas was much lower than the per capita rate for Indianapolis as a whole.

Thus, in regard to the second hypothesis, we

found that the smaller departments were allocating somewhat more resources than the larger department, while providing higher levels of service. Due to the ordinal nature of our output measures, we cannot determine how much higher the service levels were in the independent communities than they were in the Indianapolis neighborhoods. Consequently, we cannot estimate the relative efficiency of the two types of police departments. It is not possible from these findings to recommend acceptance or rejection of the second hypothesis, even though the evidence is more strongly weighted toward rejection than acceptance.[13]

A Tentative Explanation of the Difference in Service Levels

Since the expenditure levels in the independent communities are not considerably higher than in the Indianapolis neighborhoods, one cannot explain their higher service levels strictly on the basis of higher expenditures. What other factors are involved? An examination of some aspects of governmental organization and the ways in which police services are provided to citizens leads us to offer a tentative explanation based on the interaction of two types of structural arrangements. One is the relationship of citizens to their police departments. The other is the production strategies utilized by the police departments studied.

Community Control

A higher level of communication between citizens and their police is present in the three independent communities than in the Indianapolis neighborhoods. Community control of governmental officials can be exercised both formally and informally. We postulate that greater informal communication between citizens and police contributes to greater community control of local police in the independent communities. Most of the police serving the independent communities lived in the town they served. Fifty-two per cent of the residents of the independent communities knew a local policeman, while only 39 per cent of the Indianapolis respondents reported knowing a member of the Indianapolis Police Department. Residents of the independent communities were also more likely to know several local policemen.

When respondents were asked "How could police-citizen relationships be improved?" 53 per cent of the Indianapolis respondents indicated a desire for more personal communication with the police, while only 37 per cent of the respondents living in the independent communities so indicated. Forty per cent of the respondents from the towns responded that no need existed to improve police-citizen relationships, while only half that many gave this response in the Indianapolis neighborhoods.

Formal communication between citizens and police was also greater in the independent communities. Town officials were at once closer to the operations of the police department and more readily accessible to town citizens than were their Indianapolis counterparts. For example, the mayor's office in Lawrence is located immediately behind the police dispatcher's desk, and all calls coming in to the police department can be heard by the mayor. When a resident calls the Town Hall in Speedway, the town clerk answers the phone. When a call is placed for the Speedway police chief, the call is put through without any screening. On the other hand, placing a call to the police chief of Indianapolis is virtually impossible for most citizens. Gaining an appointment with the chief requires several levels of clearance. Even the ratio of citizens to elected councilmen is very much greater in the City of Indianapolis than it is in the independent communities. In Indianapolis, each city councilman serves approximately 25,000 citizens, while city councilmen in the independent communities serve between 2,500 and 3,000 citizens. The smaller size of the constituencies in the independent communities appears to facilitate a greater interaction between the citizen and the councilman representing him.

Production Strategies

The second structural arrangement which appears to be responsible for the differences in service levels is a differenc in production strategy. The two types of departments followed different patterns of internal resource allocation (production strategies). The Indianapolis Department might be characterized as task oriented. Within the Indianapolis Department, specialized units dealt with particular problems. This high degree of division of labor is characteristic of modern departments designated "professional" by experts in the field. The independent communities had police departments which might be characterized as patrol oriented. Little job specialization was institutionalized.

Two distinct patterns of internal resource allocation illustrate the different production strategies. As shown in Table III, almost half of the expenditures for police service in the Indianapolis neighborhoods were for supportive services, while in the independent communities, supportive services accounted for about one-third of the total expenditures for police. The Indianapolis Department provided more back-up to its men on patrol and in criminal investigation. Computerized records were maintained, an independent crime laboratory was supported by the Department, and each patrolman was assigned his own patrol car on a 24-hour basis.[14] On the other hand, the independent communities maintained minimal administrative and clerical staffs, small laboratory facilities, less technical equipment, and fewer patrol cars.[15] Beech Grove was the independent community which spent the largest share of its police budget on supportive services. Its expenditures for supportive services fell between those of Lawrence and Speedway, but its total expenditures were less. Inasmuch as it is the smallest department of the three, this suggests that there may be a minimal level of supportive services expenditures required for the provision of police services at this level of output.

The difference in production strategies was also apparent in the distribution of resources between patrol and criminal investigation within the two types of departments. In the three Indianapolis areas, expenditure on patrol personnel roughly equalled expenditures for personnel specializing in criminal investigation. In the three towns, roughly nine times as much was devoted to patrol force salaries as to criminal investigative personnel. The Indianapolis Department staffed a variety of special units to handle specific kinds of problem situations. It was equipped with vice and narcotics squads, task forces, and a large, specialized detective bureau. The town departments each had one or two detectives but relied primarily on patrolmen to provide all police services. The difference in production strategies is also reflected in the ratio of patrolmen on the street to citizens served by the two types of departments. As shown on Table IV, the Indianapolis Department provided patrolmen at rates ranging from one patrolman to 10,000 citizens to one patrolman to 13,000 citizens in the areas studied. The smaller police departments provided one patrolman for every three to four thousand residents. Thus, an Indianapolis patrolman was responsible for providing service to from two to four times as many citizens. The patrol concentration in the independent communities was also greater in areal terms. Each patrolman covered less than one square mile in the independent communities, while in the three Indianapolis neighborhoods the area per patrolman varied from 1.6 square miles to nearly three square miles.

We would not anticipate that the difference in production strategy by itself accounted for higher police outputs in the independent communities. A

TABLE III
ALLOCATION OF POLICE EXPENDITURES IN THE SIX STUDY AREAS
PER CENT * OF TOTAL FOR:

Independent Communities	Supportive Services	Assigned Patrol	Criminal Investigation Forces	Total Expenditures
Beech Grove	43%	52%	5%	$164,270
Lawrence	34	59	7	$196,413
Speedway	35	58	6	$217,833
Indianapolis Neighborhoods				
Near Beech Grove	49%	23%	28%	$169,143
Near Lawrence	48	27	25	$186,567
Near Speedway	48	25	27	$208,173

* Does not always total 100 due to round-off.

TABLE IV
MANPOWER ASSIGNED TO PATROLLING

Independent Communities	Number of Officers Assigned To Patrol in the Area	Population Per Officer Assigned To Patrol	Area Covered Per Officer Assigned To Patrol (Square Miles)
Beech Grove	3.0	4,489	.83
Lawrence	4.5	3,699	.94
Speedway	5.0	3,011	.84
Indianapolis Neighborhoods			
Near Beech Grove	1.3	10,461	1.62
Near Lawrence	1.6	12,039	2.88
Near Speedway	1.7	13,318	2.39
All of Indianapolis	98.0	4,960	.83

large investment in generalized patrolling simply increases the availability of policemen in the area. The critical question is how the policemen who are patrolling respond to citizen demands for service. Where mechanisms exist to insure that the policemen are responsive to citizen requirements for service, then an increase in the availability of police should lead to better service. Alternatively, if the police are insulated from the needs of the citizens served, their increased presence may be perceived as a force imposed from outside.

Conclusions

Any conclusions from this study must be considered highly speculative, due to the small number of sample areas included. However, findings from several studies initiated after the Indianapolis study have been consistent with these findings, giving us more confidence in the lack of warrantability of the two hypothesis based on traditional reform assumptions.

We have seen in six neighborhoods in Marion County, Indiana, that: (1) small police departments can provide higher levels of service than larger departments, and (2) high degrees of specialization and professionalization are not required for effective police services. On the basis of this, we believe more serious attention should be paid to proposals for creating small jurisdictions within large cities to provide generalized patrol services while enhancing opportunities for community control.[16]

At the same time, a large-scale police jurisdiction in the same city may be needed to provide the more technical services which require specialization of personnel and equipment. Conceptualization reform as either *total consolidation* or *total decentralization* may *not* lead to better police services in metropolitan areas. Conscious use of overlapping jurisdictions of varying sizes may be necessary to combine the advantages of both small and large scale.[17] The design of police agencies involving *both* small-scale, locally controlled components and large-scale, metropolitanwide components existing side by side may well provide a more satisfactory solution to the problem of providing police services in large urban areas. Clearly, further empirical research, not reliance upon the assertions of the '20s and '30s, is called for in this area.

Notes

1. For an analysis of the propositions underlying the metropolitan reform tradition in general, see Elinor Ostrom, "Metropolitan Reform: Propositions Derived from Two Traditions," *Social Science Quarterly* (December 1972).
2. See Daniel L. Skoler and June M. Hetler, "Governmental Restructuring and Criminal Administration: The Challenge of Consolidation," in *Crisis in Urban Government. A Symposium: Restructuring Metropolitan Area Government* (Silver Springs, Md.: Thos. Jefferson Publishing Company, 1971), pp. 53-76; O. W. Wilson, *Police Administration* (New York: McGraw-Hill Book Company, 1963); President's Com-

mission on Law Enforcement and Administration of Justice, *The Challenge of Crime in a Free Society* (Washington, D. C.: U.S. Government Printing Office, 1967); and J. L. McCausland, "Crime in the Suburbs," in Charles H. Haar (ed.), *The End of Innocence. A Suburban Reader* (Glenview, Ill.: Scott, Foresman & Company, 1972), pp. 61-64.

3. David Lawrence and H. Rutherford Turnbull, III, "Unigov: City-County Consolidation in Indianapolis," *Popular Government,* Vol. 36 (November 1969), p. 22
4. For a more formal discussion of the distinction between "objective" or "direct" outputs and consumer-oriented outputs, see D. P. Bradford, R. A. Malt, and W.E. Oates, "The Rising Cost of Local Public Services: Some Evidence and Reflections," *National Tax Journal,* Vol. XXII, No. 2 (June 1969), and Roger B. Parks, *Outputs of Police Agencies in the St. Louis Metropolitan Area,* unpublished Ph.D. dissertation, Indiana University.
5. See Samir Ishak, *Consumers' Perception of Police Performance. Consolidation vs. Deconcentration. The Case of Grand Rapids, Michigan, Metropolitan Area,* unpublished Ph.D. dissertation, Indiana University, 1972; Elinor Ostrom and Roger Parks, "Suburban Police Departments: Too Many and Too Small," in *The Suburbanization of the City,* Louis Masotti and Jeffrey Hadden (eds.), Vol. VII of the *Urban Affairs Annual Review* (Spring 1973); and Elinor Ostrom and Gordon Whitaker, "Black Citizens and the Police: Some Effects of Community Control," paper presented at the 1971 meeting of the American Political Science Association, Chicago, September 7-11. A more extensive study has now been initiated in the St. Louis metropolitan area.
6. We will, however, refer to these three separately incorporated municipalities as "towns" from time to time for the sake of brevity and to distinguish them from the three Indianapolis neighborhoods.
7. A more detailed description of the matching process is contained in Elinor Ostrom and Gordon Whitaker, "Does Local Community Control of Police Make a Difference? Some Preliminary Findings," *Midwest Journal of Political Science* (February 1973), and Elinor Ostrom, William Baugh, Richard Guarasci, Roger Parks, and Gordon Whitaker, *Community Organization and the Provision of Police Services,* Sage Professional Papers in Administrative and Policy Studies (Beverly Hills: Sage Publishers, 1973).
8. An area probability sample was drawn for each of the six neighborhoods from Marion County zoning maps. The neighborhoods inside Indianapolis were matched to the independent communities by using information from the 1960 census and physical examination of the neighborhoods themselves. During April 1970, 722 respondents were interviewed (373 from the independent communities and 349 from the Indianapolis communities) from a total sample of 940 households: a response rate of 76 per cent. William Baugh and Richard Guarasci shared much of the responsibility for the design of the questionnaire, the determination of sampling methods, and the supervision of efforts in the field.
9. Victimization surveys appear to be a more accurate method for estimating crime rates at least for some types of crime than official records. Considerable experimentation has been undertaken to ascertain the relative reliability of victimization surveys when compared to official crime statistics. Richard W. Dodge and Anthony G. Turner conclude that "... evidence indicates a significant volume of crimes committed against citizens never become known to the police," "Methodological Foundations for Establishing a National Survey of Victimization," presented at the 1971 American Statistical Association Meeting, Fort Collins, Colorado, August 23-26, 1971. See also Albert D. Biderman, "Surveys of Population Samples for Estimating Crime Incidence," *The Annals of the American Academy of Political and Social Science,* Vol. 374 (November 1967), pp. 16-33; Philip H. Ennis, "Criminal Victimization in the United States: A Report of a National Survey," *Field Survey II* (Washington, D.C.: U.S. Government Printing Office, 1969); and Albert J. Reiss (ed.), "Studies in Crime and Law Enforcement in Major Metropolitan Areas," *Field Survey III* (Washington, D.C.: U.S. Government Printing Office, 1967).
10. The size of civil jurisdiction in which a respondent lived was more strongly and consistently related to responses to each of the four evaluation questions than were respondents' direct experiences with the police or with victimization. Background characteristics of respondents were found to have no appreciable effect on the association between the type and size of community of residence and evaluation of police performance. See Gordon Whitaker, *Urban Police Departments: Scale and Structure Related to Service,* unpublished Ph.D. dissertation, Indiana University, 1972.
11. This is an essentially arbitrary question of how to allocate joint costs to operations within a large organization. See Otto Eckstein, *Water Resource Development* (Cambridge: Harvard University Press, 1958), ch. 9; Roland McKean, *Efficiency in Government Through Systems Analysis* (New York: John Wiley & Sons, 1958), pp. 44-46; and Roscoe C. Martin, *et al., River Basin Administration and the Delaware* (Syracuse: Syracuse University Press, 1960), ch. 9, for allocation methods and a general discussion. We would like to thank Lt. Douglas Lawrence of the Planning and Research Branch, Indianapolis Police Department, for his help in obtaining the cost and manpower data used in our allocation of expenditures.
12. The assigned patrol expenditure (P_s) in an area is simply computed as the sum of the salaries paid to the men patrolling in the area, both the beat patrolmen and the beat's share of sector forces. The criminal investigation expenditure (CI_s) is computed as:

$$CI_s = \frac{R_s}{R_t} \times CI_t$$

where CI_t = the total criminal investigation expenditure in Indianapolis,

R_t = the total number of offenses reported in Indianapolis in 1969, and

R_s = the number of offenses reported in the sample area in 1969.

The supportive services expenditures (SS_s) for a given area was computed as the sum of two components, supportive services for assigned patrol (SS_{ps}) and supportive services for criminal investigation (SS_{cis}). The supportive services for assigned patrol component was computed as:

$$SS_{ps} = \frac{f_s}{48} \times SS_t \times \frac{P_t}{P_t + CI_t}$$

f_s = the fraction of a beat (or beats) represented by the sample area,

SS_t = the total Indianapolis supportive services expenditures

P_t = the total Indianapolis patrol expenditure

CI_t = the total Indianapolis criminal investigation expenditure, and

48 = the number of uniform patrol beats in effect at the time of our survey.

The other supportive services component, for criminal investigation, was computed as:

$$SS_{cis} = SS_t \times \frac{CI_t}{P_t + CI_t} \times \frac{R_s}{R_t}$$

where all of the factors are as defined above.

Finally, the total expenditure by the Indianapolis Police Department in a sample area (E_s) was computed as the sum of the assigned patrol, criminal investigation, and supportive services components

$$E_s = P_s + CI_s + SS_s$$

A somewhat similar formula to the one utilized in this study has been recommended by Donald C. Shoup and Arthur Rosett in *Fiscal Exploitation of Central Cities by Overlapping Governments: A Case Study of Law Enforcement in Los Angeles County* (Los Angeles: University of California, Institute of Government and Public Affairs, 1969).

13. Samir Ishak, in a similarly designed study in the Grand Rapids Metropolitan area, found smaller departments providing higher levels of service at less cost than a larger police department. See Ishak, *op.cit.*
14. See Donald M. Fisk, *The Indianapolis Police Fleet Plan. An Example of Program Evaluation for Local Government* (Washington, D.C.: The Urban Institute, 1970).
15. Each of the police departments serving the independent communities can utilize the facilities of the state police crime laboratory located in the Indianapolis area, as can the Indianapolis Police Department.
16. See Charles Press, "The Cities Within a Great City: A Decentralist Approach to Centralization," *Centennial Review*, Vol. 7 (1963), pp. 113-130, and Arthur I. Waskow, *Running Riot* (New York: Herder and Herder, 1970).
17. See Vincent Ostrom, Charles M. Tiebout, and Robert Warren, "The Organization of Government in Metropolitan Areas: A Theoretical Inquiry," *American Political Science Review*, Vol. 55 (December 1961), pp. 831-842. See also Vincent Ostrom, *The Political Theory of a Compound Republic* (Blacksburg, Va.: Center for the Study of Public Choice, Virginia Polytechnic Institute, 1971), and Vincent Ostrom, *The Intellectual Crisis in American Public Administration* (University, Ala.: University of Alabama Press, 1973).